ATTEST^{TM}

Conformance Test Suite

Precision Time Protocol – High Accuracy

Version 1.1

Test Plan

Part Number: T / TP PTP-HA 0419/1.3

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Introduction

The ATTEST™ Precision Time Protocol – High Accuracy Conformance test suite consists of following test groups:

S. No.	Group	Test cases
1	Inter Operation with Default PTP Profiles	4
2	Message Format Group (MFG)	4
3	Message Handling Group (MHG)	3
4	Optional Parameters Verification (OPV)	1
5	PTP Accuracy Group (PAG)	10
6	PTP-HA Configuration Group (PCG)	15
7	PTP External Configuration Group (PEG)	23
8	State Machine Group (SMG)	22
	Total	**82**

Test Plans

1. Inter Operation with Default PTP profiles (IDP)

1.1. tc_conf_ptp-ha_idp_001

```
Test Case         : tc_conf_ptp-ha_idp_001
Test Case Version : 1.2
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : Inter Operation with Default PTP profiles (IDP)

Title             : Inter-operation with the Delay Request-Response
                    Default PTP profile when DUT is master

Purpose           : To verify that a PTP enabled device using Delay
                    Request-Response mechanism synchronizes its High
                    Accuracy Delay Request-Response Default PTP profile to
                    Delay Request-Response Default PTP Profile when it is
                    master.

Reference         : P1588/D1.3, February 2018 V3.01 Clause J.5.4 Page 414

Conformance Type  : SHALL
```

```
Topology

                  TEE                                  DUT
            +---------------+                     +--------------+
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |       BC      | T1               P1 |    OC/BC     |
            |    (Slave)    |---------------------|   (Master)   |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            +---------------+                     +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
 Ladder Diagram    :


         TEE                                                      DUT
```

```
   [slave]                                                  [master]
      |                                                         |
      |                                          <Enable PTP> | P1
      |                          <Enable PTP with BC/OC clock> |
      |                       <Clock mode - one-step/two-step> |
      |                        <Configure logAnnounceInterval, | P1
      |                                announceReceiptTimeout> |
      |                            <Configure logSyncInterval> | P1
      |                     <Configure logMinDelayReqInterval> | P1
      |                       <Configure Priority1, Priority2> | P1
      |                                        <Enable L1SYNC> | P1
      |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
      |                   <Disable L1SynOptParams option> | P1
      |             <Enable asymmetryCorrectionPortDS.enable> | P1
      | <Configure timestampCorrectionPortDS.egressLatency, | P1
      |             timestampCorrectionPortDS.ingressLatency, |
      |          asymmetryCorrectionPortDS.constantAsymmetry, |
      |    asymmetryCorrectionPortDS.scaledDelayCoefficient> |
      |                                                         |
      |                              ANNOUNCE [MSG_TYPE = 0x0B,|
      |                                       PRI=X, DN = DN1] |
   T1 |-------------------------------------------------<<--| P1
      |                                                         |
      | ANNOUNCE [MSG_TYPE = 0x0B,                              |
      | PRI=X+1, DN = DN1]                                      |
   T1 |-->>-------------------------------------------------| P1
      |                                                         |
      |    PTP SIGNALLING with L1 Sync TLV [MSG_TYPE = 0x0C,|
      |                                              DN = DN1] |
   T1 |-------------------------------------------------<<--| P1
      |                                                         |
      |                                  SYNC [MSG_TYPE = 0x00,|
      |                                              DN = DN1] |
   T1 |-------------------------------------------------<<--| P1
      |                                                         |
      |                        <If Clock Step = Two Step, then |
      |                                    receive FOLLOW_UP> |
      |                                                         |
      |                             FOLLOW_UP [MSG_TYPE = 0x08,|
      |                                              DN = DN1] |
   T1 |-------------------------------------------------<<--| P1
      |                                                         |
      | DELAY_REQ [MSG_TYPE = 0x01,                             |
      | DN = DN1]                                               |
   T1 |-->>-------------------------------------------------| P1
      |                                                         |
      |                            DELAY_RESP [MSG_TYPE = 0x09,|
      |                                              DN = DN1] |
   T1 |-------------------------------------------------<<--| P1
      |                                                         |
      |                      <Check L1SYNC port status - IDLE> | P1
      |                                                         |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
```

```
    PRI       = Priority
    BC        = Boundary Clock
    OC        = Ordinary Clock

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile



Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
     i.   Enable DUT's port P1.
    ii.   Enable PTP on port P1.
   iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
    iv.   Configure clock mode as One-step/Two-step.
     v.   Configure default values for Priority1, Priority2,
          logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
          logMinDelayReqInterval.
    vi.   Enable L1SYNC on DUT's port P1.
   vii.   Configure default values for L1SyncInterval and
          L1SyncReceiptTimeout.
  viii.   Disable L1SynOptParams on DUT.
    ix.   Enable asymmetryCorrectionPortDS.enable.
     x.   Configure default values for timestampCorrectionPortDS.
          egressLatency, timestampCorrectionPortDS.egressLatency,
          asymmetryCorrectionPortDS.constantAsymmetry and
          asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
     i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X

Step 4 : Send ANNOUNCE message on port T1 with following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X+1

Step 5 : Observe that DUT transmits PTP signaling message with L1 Sync TLV
         on port P1 with the following parameters.

              PTP Header
```

```
                Message Type  = 0x0C
                Domain Number = DN1

Step 6 : Observe that DUT transmits SYNC message on the port P1 with
         following parameters.

            PTP Header
                Message Type  = 0x00
                Domain Number = DN1

Step 7 : If the clock is two step, observe that DUT transmits FOLLOW_UP
         message on the port P1 with following parameters.

            PTP Header
                Message Type  = 0x08
                Domain Number = DN1

Step 8 : Send DELAY_REQ message on the port T1 with following parameters.

            PTP Header
                Message Type  = 0x01
                Domain Number = DN1

Step 9 : Observe that DUT transmits DELAY_RESP message on the port P1 with
         following parameters.

            PTP Header
                Message Type  = 0x09
                Domain Number = DN1

Step 10: Verify that DUT's L1SYNC port status P1 is in IDLE state.
```

1.2. tc_conf_ptp-ha_idp_002

```
Test Case         : tc_conf_ptp-ha_idp_002
Test Case Version : 1.0
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : Inter-operation with the Peer-to-peer Default PTP
                    profile when DUT is master

Title             : Inter-operation with the Peer-to-peer Default
                    PTP profile when DUT is master

Purpose           : To verify that a PTP enabled device using Peer-to-Peer
                    delay mechanism synchronizes its High Accuracy
                    Peer-to-Peer Delay PTP profile to Peer-to-Peer Default
                    PTP profile when it is master.

Reference         : P1588/D1.3, February 2018 V3.01 Clause J.5.4 Page 414

Conformance Type  : SHALL
```

Topology

```
      TEE                                   DUT
+---------------+                    +--------------+
|               |                    |              |
|               |                    |              |
|               |                    |              |
|               |                    |              |
|      BC       | T1              P1 |    OC/BC     |
|    (Slave)    |--------------------|   (Master)   |
|               |                    |              |
|               |                    |              |
|               |                    |              |
|               |                    |              |
+---------------+                    +--------------+
```

```
Legends:

    TEE     : Test Execution Engine
    DUT     : Device Under Test
    OC      : Ordinary Clock
    BC      : Boundary Clock
    T1      : Port 1 at TEE
    P1      : Port 1 at DUT
```

Ladder Diagram :

```
     TEE                                                     DUT
   [slave]                                                [master]
      |                                                       |
      |                                        <Enable PTP>   | P1
      |                           <Enable PTP with BC/OC clock> |
      |                        <Clock mode - one-step/two-step> |
      |                            <Set delay mechanism as P2P> |
      |                         <Configure logAnnounceInterval, | P1
      |                                 announceReceiptTimeout> |
      |                             <Configure logSyncInterval> | P1
      |                     <Configure logMinDelayReqInterval> | P1
      |                        <Configure Priority1, Priority2> | P1
      |                                          <Enable L1SYNC> | P1
      |     <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
      |                        <Disable L1SynOptParams option> | P1
      |               <Enable asymmetryCorrectionPortDS.enable> | P1
      | <Configure timestampCorrectionPortDS.egressLatency, | P1
      |             timestampCorrectionPortDS.ingressLatency, |
      |          asymmetryCorrectionPortDS.constantAsymmetry, |
      |    asymmetryCorrectionPortDS.scaledDelayCoefficient> |
      |                                                       |
      |                          ANNOUNCE [MSG_TYPE = 0x0B,|
      |                                   PRI=X, DN = DN1] |
   T1 |-------------------------------------------------<<--| P1
      |                                                       |
      | ANNOUNCE [MSG_TYPE = 0x0B,                            |
      | PRI=X+1, DN = DN1]                                    |
   T1 |-->>----------------------------------------------------| P1
      |                                                       |
```

```
       |    PTP SIGNALLING with L1 Sync TLV [MSG_TYPE = 0x0C,|
       |                                          DN = DN1] |
    T1 |------------------------------------------------<<--| P1
       |                                                    |
       | PDELAY_REQ [MSG_TYPE = 0x02,                       |
       | SRC_PORT_IDEN = E, DN = DN1]                       |
    T1 |-->>------------------------------------------------| P1
       |                                                    |
       |                        PDELAY_RESP [MSG_TYPE = 0x03,|
       |                         SRC_PORT_IDEN = F, DN = DN1 |
       |                                  REQ_PORT_IDEN = E] |
    T1 |------------------------------------------------<<--| P1
       |                                                    |
       |              PDELAY_RESP_FOLLOW_UP [MSG_TYPE = 0x0A,|
       |                         SRC_PORT_IDEN = F, DN = DN1 |
       |                                  REQ_PORT_IDEN = E] |
    T1 |------------------------------------------------<<--| P1
       |                                                    |
       |                   <Check L1SYNC port status - IDLE> | P1
       |                                                    |
```

Legends :

```
    MSG_TYPE       = Message Type
    DN             = Domain Number
    PRI            = Priority
    BC             = Boundary Clock
    OC             = Ordinary Clock
    P2P            = Peer to Peer
    SRC_PORT_IDEN  = Source Port Identity
    REQ_PORT_IDEN  = Requesting Port Identity
```

NOTE :

1. This objective is verified using the High Accuracy Peer to Peer Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's port P1.
ii. Enable PTP on port P1.
iii. Enable PTP globally with device type as Boundary/Ordinary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure delaymechanism as Peer to peer.
vi. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vii. Enable L1SYNC on DUT's port P1.
viii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
ix. Disable L1SynOptParams on DUT.
x. Enable asymmetryCorrectionPortDS.enable.

```
   xi.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.ingressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Priority      = X

Step 4 : Send ANNOUNCE message on the port T1 with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Priority      = X+1

Step 5 : Observe that DUT transmits PTP message with L1 Sync TLV on the
         port P1 with the following parameters.

             PTP Header
                 Message Type  = 0x0C
                 Domain Number = DN1

Step 6 : Send PDELAY_REQ message on the port T1 with following parameters.

             PTP Header
                 Message Type          = 0x02
                 Domain Number         = DN1
                 Source Port Identity  = E

Step 7 : Observe that DUT transmits PDELAY_RESP message on the port P1 with
         following parameters.

             PTP Header
                 Message Type              = 0x03
                 Domain Number             = DN1
                 Source Port Identity      = F
                 Requesting Port Identity  = E

Step 7a: If the clock is two-step clock, observe that DUT transmits
         PDELAY_RESP_FOLLOW_UP message on the port P1 with following
         parameters.

             PTP Header
                 Message Type              = 0x0A
                 Domain Number             = DN1
                 Source Port Identity      = F
                 Requesting Port Identity  = E
```



```
Step 8 : Verify that DUT's L1SYNC port status P1 is in IDLE state.
```

1.3. tc_conf_ptp-ha_idp_003

```
Test Case          : tc_conf_ptp-ha_idp_003
Test Case Version  : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : Inter Operation with Default PTP profiles (IDP)

Title              : Inter-operation with the Delay Request-Response
                     Default PTP profile when DUT is slave

Purpose            : To verify that a PTP enabled device using Delay
                     Request-Response mechanism synchronizes its High
                     Accuracy Delay Request-Response Default PTP profile to
                     Delay Request-Response Default PTP Profile when it is
                     slave.

Reference          : P1588/D1.3, February 2018 V3.01 Clause J.5.4 Page 414

Conformance Type   : SHALL
```

```
Topology

                  TEE                                    DUT
            +---------------+                      +--------------+
            |               |                      |              |
            |               |                      |              |
            |               |                      |              |
            |               |                      |              |
            |       BC      | T1                P1 |    OC/BC     |
            |    (Master)   |----------------------|   (Slave)    |
            |               |                      |              |
            |               |                      |              |
            |               |                      |              |
            |               |                      |              |
            +---------------+                      +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
Ladder Diagram     :


         TEE                                                    DUT
```

```
     [master]                                              [slave]
        |                                                     |
        |                                       <Enable PTP> | P1
        |                        <Enable PTP with BC/OC clock> |
        |                     <Clock mode - one-step/two-step> |
        |                      <Configure logAnnounceInterval, | P1
        |                              announceReceiptTimeout> |
        |                          <Configure logSyncInterval> | P1
        |                   <Configure logMinDelayReqInterval> | P1
        |                     <Configure Priority1, Priority2> | P1
        |                                      <Enable L1SYNC> | P1
        |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
        |                      <Disable L1SynOptParams option> | P1
        |            <Enable asymmetryCorrectionPortDS.enable> | P1
        | <Configure timestampCorrectionPortDS.egressLatency, | P1
        |            timestampCorrectionPortDS.ingressLatency, |
        |         asymmetryCorrectionPortDS.constantAsymmetry, |
        |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
        |                                                     |
        |                           ANNOUNCE [MSG_TYPE = 0x0B,|
        |                                    PRI=X, DN = DN1] |
     T1 |-------------------------------------------------<<--| P1
        |                                                     |
        | ANNOUNCE [MSG_TYPE = 0x0B,                          |
        | PRI=X-1, DN = DN1]                                  |
     T1 |-->>-------------------------------------------------| P1
        |                                                     |
        | <Send Sync/ Sync & Follow-up messages               |
        | based on clock step>                                |
        |                                                     |
        |    PTP SIGNALLING with L1 Sync TLV [MSG_TYPE = 0x0C,|
        |                                           DN = DN1] |
     T1 |-------------------------------------------------<<--| P1
        |                                                     |
        |                          DELAY_REQ [MSG_TYPE = 0x01,|
        |                               DN = DN1, SEQ_ID = D] |
     T1 |-------------------------------------------------<<--| P1
        |                                                     |
        | DELAY_RESP [MSG_TYPE = 0x09,                        |
        | DN = DN1, SEQ_ID = D]                               |
     T1 |-->>-------------------------------------------------| P1
        |                                                     |
        |                  <Check L1SYNC port status - IDLE> | P1
        |                                                     |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRI       = Priority
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
```

```
    Response Default PTP Profile


Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Priority      = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value decremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Priority1     = X-1

Step 5 : Send periodic SYNC message on the port P1 with following
          parameters:

             PTP Header
                 Message Type    = 0x00
                 Domain Number   = DN1

Step 5a: If the clock is two-step clock, send periodic FOLLOW_UP message on
         port T1 with following parameters:
```

```
            PTP Header
                Message Type     = 0x08
                Domain Number    = DN1

Step 6 : Observe that DUT transmits PTP signaling message with L1 Sync TLV
         on port P1 with the following parameters.

            PTP Header
                Message Type  = 0x0C
                Domain Number = DN1

Step 7 : Observe that DUT transmits DELAY_REQ message on the port P1 with
         following parameters :

            PTP Header
                Message Type              = 0x02
                Domain Number             = DN1
                Sequence ID               = D

Step 8 : Send periodic DELAY_RESP on the port P1 and with following
         parameters:

            PTP Header
                Message Type             = 0x03
                Domain Number            = DN1
                Sequence Id              = D

Step 9 : Verify that DUT's L1SYNC port status P1 is in IDLE state.
```

1.4. tc_conf_ptp-ha_idp_004

```
Test Case          : tc_conf_ptp-ha_idp_004
Test Case Version  : 1.0
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : Inter Operation with Default PTP profiles (IDP)

Title              : Inter-operation with the Peer to Peer Default
                     PTP profile when DUT is slave

Purpose            : To verify that a PTP enabled device using Peer to Peer
                     Delay mechanism synchronizes its High Accuracy
                     Peer to Peer Delay PTP profile to Peer to Peer
                     Default PTP profile when it is slave.

Reference          : P1588/D1.3, February 2018 V3.01 Clause J.5.4 Page 414

Conformance Type   : SHALL
```

```
Topology

                  TEE                                     DUT
            +---------------+                     +--------------+
```

```
        |              |                     |             |
        |              |                     |             |
        |              |                     |             |
        |              |                     |             |
        |      BC      | T1               P1 |   OC/BC     |
        |   (Master)   |---------------------|  (Slave)    |
        |              |                     |             |
        |              |                     |             |
        |              |                     |             |
        |              |                     |             |
        +--------------+                     +-------------+

Legends:

    TEE      : Test Execution Engine
    DUT      : Device Under Test
    OC       : Ordinary Clock
    BC       : Boundary Clock
    T1       : Port 1 at TEE
    P1       : Port 1 at DUT


Ladder Diagram    :


      TEE                                                       DUT
    [master]                                                  [slave]
       |                                                         |
       |                                          <Enable PTP>   | P1
       |                           <Enable PTP with BC/OC clock> |
       |                        <Clock mode - one-step/two-step> |
       |                            <Set delay mechanism as P2P> |
       |                         <Configure logAnnounceInterval, | P1
       |                                 announceReceiptTimeout> |
       |                             <Configure logSyncInterval> | P1
       |                      <Configure logMinDelayReqInterval> | P1
       |                        <Configure Priority1, Priority2> | P1
       |                                          <Enable L1SYNC> | P1
       |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
       |                       <Disable L1SynOptParams option> | P1
       |              <Enable asymmetryCorrectionPortDS.enable> | P1
       | <Configure timestampCorrectionPortDS.egressLatency,    | P1
       |           timestampCorrectionPortDS.ingressLatency,    |
       |        asymmetryCorrectionPortDS.constantAsymmetry,    |
       |   asymmetryCorrectionPortDS.scaledDelayCoefficient>    |
       |                                                         |
       |                               ANNOUNCE [MSG_TYPE = 0x0B,|
       |                                    PRI=X, DN = DN1]     |
    T1 |------------------------------------------------<<--| P1
       |                                                         |
       | ANNOUNCE [MSG_TYPE = 0x0B,                              |
       | PRI=X-1, DN = DN1]                                      |
    T1 |-->>----------------------------------------------------| P1
       |                                                         |
       | <Send Sync/ Sync & Follow-up messages                   |
       | based on clock step>                                    |
       |                                                         |
```

```
        |          < Wait for 6s to complete BMCA >           |
        |                                                     |
        |    PTP SIGNALLING with L1 Sync TLV [MSG_TYPE = 0x0C,|
        |                                          DN = DN1]  |
     T1 |-------------------------------------------------<<--| P1
        |                                                     |
        |               PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,|
        |                          SRC_PRT_ID = E, SEQ_ID = D] |
     T1 |-------------------------------------------------<<--| P1
        |                                                     |
        | PDELAY_RESP [CLK_ID = CLK1,                         |
        | REQ_PRT_ID = E, SEQ_ID = D,                         |
        | MSG_TYPE = 0x03, DN = DN1]                          |
     T1 |-->>-------------------------------------------------| P1
        |                                                     |
        | PDELAY_RESP_FOLLOW_UP [MSG_TYPE = 0x0A,             |
        | SRC_PORT_IDEN = F, DN = DN1,                        |
        | REQ_PORT_IDEN = E]                                  |
     T1 |-->>-------------------------------------------------| P1
        |                                                     |
        |                  <Check L1SYNC port status - IDLE> | P1
        |                                                     |
```

Legends   :

```
    MSG_TYPE       = Message Type
    DN             = Domain Number
    PRI            = Priority
    BC             = Boundary Clock
    OC             = Ordinary Clock
    P2P            = Peer to Peer
    SEQ_ID         = Sequence ID
    SRC_MAC        = Source mac address
    CLK_ID         = Clock Identity
```

NOTE :

1. This objective is verified using the High Accuracy Peer to Peer Default PTP Profile

Procedure   :

(Initial Part)

Step 1 : Initialization of DUT

- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure delaymechanism as Peer to peer.
- vi. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vii. Enable L1SYNC on DUT's port P1.
- viii. Configure default values for L1SyncInterval and

```
        L1SyncReceiptTimeout.
   ix.  Disable L1SynOptParams on DUT.
    x.  Enable asymmetryCorrectionPortDS.enable.
   xi.  Configure default values for timestampCorrectionPortDS.
        egressLatency, timestampCorrectionPortDS.ingressLatency,
        asymmetryCorrectionPortDS.constantAsymmetry and
        asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.  Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Priority      = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value decremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Priority1     = X-1

Step 5 : Send periodic SYNC message on the port P1 with following
         parameters:

             PTP Header
                 Message Type    = 0x00
                 Domain Number   = DN1

Step 5a: If the clock is two-step clock, send periodic FOLLOW_UP message on
         port T1 with following parameters:

             PTP Header
                 Message Type     = 0x08
                 Domain Number    = DN1

Step 6: Wait for 6s for completing BMCA.

Step 7 : Observe that DUT transmits PTP signaling message with L1 Sync TLV
         on port P1 with the following parameters.

             PTP Header
                 Message Type  = 0x0C
                 Domain Number = DN1

Step 8 : Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

             PTP Header
```



```
                Message Type              = 0x02
                Domain Number             = DN1
                Sequence ID               = D
                Source Port Identity      = E

Step 9 : Send periodic PDELAY_RESP on the port P1 and with following
         parameters:

             PTP Header
                 Message Type              = 0x03
                 Domain Number             = DN1
                 Sequence Id               = D
                 Requesting Port Identity = E

Step 10: Verify that DUT's L1SYNC port status P1 is in IDLE state.
```

2. Message Format Group (MFG)

2.1. tc_conf_ptp-ha_mfg_001

```
Test Case          : tc_conf_ptp-ha_mfg_001
Test Case Version : 1.0
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : Message Format Group (MFG)

Title              : L1SYNC Message with optParamsEnabled is set to FALSE
                     - transport UDP over IP

Purpose            : To verify that a PTP enabled device sends L1Sync
                     signaling message in correct format when
                     optParamsEnabled is set to FALSE and transport over UDP
                     over IP.

Reference          : P1588/D1.3, February 2018 V3.01 Clause O.6.1 Page 447,
                     Clause O.6.2 Page 447, Clause O.6.4 Pages 448 and 449,
                     Clause 13.12.2 Page 225

Conformance Type  : SHALL
```

Topology

```
                TEE                                 DUT
          +--------------+                    +-------------+
          |              |                    |             |
          |              |                    |             |
          |              |                    |             |
          |              |                    |             |
          |      BC      | T1              P1 |    OC/BC    |
          |    (Slave)   |--------------------|   (Master)  |
          |              |                    |             |
          |              |                    |             |
          |              |                    |             |
          |              |                    |             |
```

```
          +--------------+                     +-------------+

   Legends:

       TEE     : Test Execution Engine
       DUT     : Device Under Test
       OC      : Ordinary Clock
       BC      : Boundary Clock
       T1      : Port 1 at TEE
       P1      : Port 1 at DUT
```

```
Ladder Diagram    :


         TEE                                                     DUT
          |                                                       |
          |                                         <Enable PTP> | P1
          |                       <Enable PTP with BC/OC clock> |
          |                    <Clock mode - one-step/two-step> |
          |                     <Configure logAnnounceInterval, | P1
          |                             announceReceiptTimeout> |
          |                         <Configure logSyncInterval> | P1
          |                 <Configure logMinDelayReqInterval> | P1
          |                   <Configure Priority1, Priority2> | P1
          |                                      <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                    <Disable L1SynOptParams option> | P1
          |          <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |          timestampCorrectionPortDS.ingressLatency, |
          |       asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                       |
          |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0x0C,|
          |                                  DN = DN1, OPE = 0] |
       T1 |-------------------------------------------------<<--| P1
          |                                                       |

Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    OPE       = Optional Parameters Enabled

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile

 2. This objective is applicable only for device implementation supports
    transport over UDP over IP


Procedure         :
```

```
(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.ingressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Verify that DUT transmits L1 Sync Signaling message on the port P1
         when optParamsEnabled is set to false. Checking that the following
         PTP message fields have correct information.

               Ethernet Fields
                  1) Source MAC            = Unicast MAC
                  2) Destination MAC       = Multicast MAC
                                             (01:00:5E:00:00:6B)
                  3) Ether Type            = 0x0800 (IP)

               IPv4 Fields
                  4) IP Protocol           = 17 (UDP)
                  5) Destination IP        = 224.0.0.107
                                             (non-forwardable address)
                  6) Source IP             = Unicast IP
                  7) Checksum              = Valid

               UDP Fields
                  8) UDP Destination Port = 320 (General Message)
                  9) Checksum              = Valid

               PTP Fields
                  10) messageType          = 0xC (Signaling message) (4 bits)
                  11) majorSdoId           = 0x000 (4 bits)
                  12) versionPTP           = 2 (4 bits)
                  13) minorVersionPTP      = 1 (4 bits)
                  14) messageLength        = non-zero (2 octets)
                  15) domainNumber         = 0 - 127 (1 octet)
                  16) minorSdoId           = 0 (1 octet)
                  17) flagField            = 0x0000 - 0xFFFF (2 octets)
                  18) correctionField      = 0  (8 octets)
                  19) messageTypeSpecific = (4 octets)
```

```
   20) sourcePortIdentity  = non-zero (10 octets)
   21) sequenceId          = 0 - 65535 (2 octets)
   22) controlField        = 05 (1 octet)
   23) logMessageInterval  = 0x7F (1 octet)
   24) targetPortIdentity  = non-zero (10 octets)

L1Sync Details
   25) tlvType             = 0x8001 (L1_SYNC) (2 octets)
   26) length field        = 2 (2 octets)
   27) TCR                 = 0 or 1 (1 bit)
   28) RCR                 = 0 or 1 (1 bit)
   29) CR                  = 0 or 1 (1 bit)
   30) OPE                 = 0 (1 bit)
   31) Reserved            = 4 bits
   32) ITC                 = 0 or 1 (1 bit)
   33) IRC                 = 0 or 1 (1 bit)
   34) IC                  = 0 or 1 (1 bit)
   35) Reserved            = 5 bits
```

2.2. tc_conf_ptp-ha_mfg_002

```
Test Case          : tc_conf_ptp-ha_mfg_002
Test Case Version  : 1.0
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : Message Format Group (MFG)

Title              : L1Sync message with optParamsEnabled is set to TRUE
                     - transport UDP over IP

Purpose            : To verify that a PTP enabled device sends L1Sync
                     signaling message in correct format when
                     optParamsEnabled is set to TRUE and transport over UDP
                     over IP.

Reference          : P1588/D1.3, February 2018 V3.01 Clause O.6.1 Page 447,
                     Clause O.6.2 Page 447, Clause O.6.4 Pages 448 and 449,
                     Clause O.8.5 Page 455 and 456,Clause 13.12.2 Page 225

Conformance Type   : SHALL
```

Topology

```
           TEE                                 DUT
     +---------------+                    +--------------+
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |       BC      | T1              P1 |    OC/BC     |
     |    (Slave)    |--------------------|   (Master)   |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
```

```
         |              |                     |             |
         +--------------+                     +-------------+
```

```
   Legends:

       TEE     : Test Execution Engine
       DUT     : Device Under Test
       OC      : Ordinary Clock
       BC      : Boundary Clock
       T1      : Port 1 at TEE
       P1      : Port 1 at DUT
```

Ladder Diagram :

```
         TEE                                                   DUT
          |                                                     |
          |                                       <Enable PTP> | P1
          |                        <Enable PTP with BC/OC clock> |
          |                     <Clock mode - one-step/two-step> |
          |                      <Configure logAnnounceInterval, | P1
          |                              announceReceiptTimeout> |
          |                          <Configure logSyncInterval> | P1
          |                    <Configure logMinDelayReqInterval> | P1
          |                     <Configure Priority1, Priority2> | P1
          |                                      <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                      <Disable L1SynOptParams option> | P1
          |            <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |            timestampCorrectionPortDS.ingressLatency, |
          |         asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                     |
          |                       <Enable L1SynOptParams option> | P1
          |                                                     |
          |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0x0C,|
          |                                    DN = DN1, OPE = 1] |
       T1 |-------------------------------------------------<<--| P1
          |                                                     |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    OPE       = Optional Parameters Enabled
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

2. This objective is applicable only for device implementation supports transport over UDP over IP

```
Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.ingressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Enable L1SynOptParams on DUT.

Step 4 : Verify that DUT transmits L1 Sync Signaling message on the port P1
         when optParamsEnabled is set to true. Checking that the following
         PTP message fields have correct information.

               Ethernet Fields
                  1) Source MAC            = Unicast MAC
                  2) Destination MAC       = Multicast MAC
                                             (01:00:5E:00:00:6B)
                  3) Ether Type            = 0x0800 (IP)

               IPv4 Fields
                  4) IP Protocol           = 17 (UDP)
                  5) Destination IP        = 224.0.0.107
                                             (non-forwardable address)
                  6) Source IP             = Unicast IP
                  7) Checksum              = Valid

               UDP Fields
                  8) UDP Destination Port = 320 (General Message)
                  9) Checksum              = Valid

               PTP Fields
                 10) messageType           = 0xC (Signaling message) (4 bits)
                 11) majorSdoId            = 0x000 (4 bits)
                 12) versionPTP            = 2 (4 bits)
                 13) minorVersionPTP       = 1 (4 bits)
                 14) messageLength         = non-zero (2 octets)
```

```
  15) domainNumber         = 0 - 127 (1 octet)
  16) minorSdoId           = 0 (1 octet)
  17) flagField            = 0x0000 - 0xFFFF (2 octets)
  18) correctionField      = 0 (8 octets)
  19) messageTypeSpecific  = (4 octets)
  20) sourcePortIdentity   = non-zero (10 octets)
  21) sequenceId           = 0 - 65535 (2 octets)
  22) controlField         = 05 (1 octet)
  23) logMessageInterval   = 0x7F (1 octet)
  24) targetPortIdentity   = non-zero (10 octets)

L1Sync Details
  25) tlvType              = 0x8001 (L1_SYNC) (2 octets)
  26) length field         = 2 (2 octets)
  27) TCR                  = 0 or 1 (1 bit)
  28) RCR                  = 0 or 1 (1 bit)
  29) CR                   = 0 or 1 (1 bit)
  30) OPE                  = 1 (1 bit)
  31) Reserved             = 4 bits
  32) ITC                  = 0 or 1 (1 bit)
  33) IRC                  = 0 or 1 (1 bit)
  34) IC                   = 0 or 1 (1 bit)
  35) Reserved             = 5 bits

L1Sync TLV Extended Details
   36) TCT                 = 0 or 1 (1 bit)
   37) POV                 = 0 or 1 (1 bit)
   38) FOV                 = 0 or 1 (1 bit)
   39) Reserved            = (5 bits)
   40) phaseOffsetTx       = non-zero (8 octets)
   41) phaseOffsetTxTimestamp  = non-zero (10 octets)
   42) freqOffsetTx        = non-zero (8 octets)
   43) freqOffsetTxTimestamp   = non-zero (10 octets)
   44) Reserved            = (1 octet)
```

2.3. tc_conf_ptp-ha_mfg_003

```
Test Case         : tc_conf_ptp-ha_mfg_003
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : Message Format Group (MFG)

Title             : L1Sync message with optParamsEnabled is set to FALSE
                    - transport over IEEE 802.3/Ethernet

Purpose           : To verify that a PTP enabled device sends L1Sync
                    signaling message in correct format when
                    optParamsEnabled is set to FALSE and transport over
                    IEEE 802.3/Ethernet.

Reference         : P1588/D1.3, February 2018 V3.01 Clause O.6.1 Page 447,
                    Clause O.6.2 Page 447, Clause O.6.4 Pages 448 and 449,
                    Clause 13.12.2 Page 225
```



```
 Conformance Type  : SHALL


Topology

                  TEE                                 DUT
            +---------------+                    +--------------+
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               | T1              P1 |              |
            |      BC       |--------------------|    OC/BC     |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            +---------------+                    +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT


 Ladder Diagram    :

          TEE                                                     DUT
           |                                                       |
           |                                        <Enable PTP> | P1
           |                         <Enable PTP with BC/OC clock> |
           |                      <Clock mode - one-step/two-step> |
           |                       <Configure logAnnounceInterval, | P1
           |                               announceReceiptTimeout> |
           |                           <Configure logSyncInterval> | P1
           |                   <Configure logMinDelayReqInterval> | P1
           |                      <Configure Priority1, Priority2> | P1
           |                                     <Enable L1SYNC> | P1
           |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
           |                       <Disable L1SynOptParams option> | P1
           |             <Enable asymmetryCorrectionPortDS.enable> | P1
           | <Configure timestampCorrectionPortDS.egressLatency, | P1
           |             timestampCorrectionPortDS.ingressLatency, |
           |          asymmetryCorrectionPortDS.constantAsymmetry, |
           |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
           |                                                       |
           |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0x0C,|
           |                                  DN = DN1, OPE = 0] |
        T1 |-------------------------------------------------<<--| P1
           |                                                       |

 Legends           :
```



```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    OPE       = Optional Parameters Enabled
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

2. This objective is applicable only for device implementation supports transport over IEEE 802.3/Ethernet

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE

- i. Add port T1 at TEE.

(Part 1)

Step 3 : Verify that DUT transmits L1 Sync Signaling message on the port P1 when optParamsEnabled is set to false. Checking that the following PTP message fields have correct information.

Ethernet Fields

1) Source MAC = Unicast MAC
2) Destination MAC = 01:80:C2:00:00:0E (non-forwardable address)
3) Ether Type = 0x88F7 (PTPv2 over Ethernet)

PTP Fields

4) messageType = 0xC (Signaling message) (4 bits)
5) majorSdoId = 0x000 (4 bits)
6) versionPTP = 2 (4 bits)
7) minorVersionPTP = 1 (4 bits)
8) messageLength = non-zero (2 octets)
9) domainNumber = 0 - 127 (1 octet)

```
    10) minorSdoId = 0 (1 octet)
    11) flagField = 0x0000 - 0xFFFF (2 octets)
    12) correctionField = 0 (8 octets)
    13) messageTypeSpecific = 0 (4 octets)
    14) sourcePortIdentity = non-zero (10 octets)
    15) sequenceId = 0 - 65535 (2 octets)
    16) controlField = 05 (1 octet)
    17) logMessageInterval = 0x7F (1 octet)
    18) targetPortIdentity = non-zero (10 octets)

  L1Sync Details
    19) tlvType = 0x8001 (L1_SYNC)(2 octets)
    20) length field = 2 (2 octets)
    21) TCR = 0 or 1 (1 bit)
    22) RCR = 0 or 1 (1 bit)
    23) CR = 0 or 1 (1 bit)
    24) OPE = 1 (1 bit)
    25) Reserved = 4 bits
    26) ITC = 0 or 1 (1 bit)
    27) IRC = 0 or 1 (1 bit)
    28) IC = 0 or 1 (1 bit)
    29) Reserved = 5 bits
```

2.4. tc_conf_ptp-ha_mfg_004

```
Test Case          : tc_conf_ptp-ha_mfg_004
Test Case Version  : 1.0
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : Message Format Group (MFG)

Title              : L1Sync message with optParamsEnabled is set to TRUE
                     - transport over IEEE 802.3/Ethernet

Purpose            : To verify that a PTP enabled device sends L1Sync
                     signaling message in correct format when
                     optParamsEnabled is set to TRUE and transport over
                     IEEE 802.3/Ethernet.

Reference          : P1588/D1.3, February 2018 V3.01 Clause O.6.1 Page 447,
                     Clause O.6.2 Page 447, Clause O.6.4 Pages 448 and 449,
                     Clause O.8.5 Page 455 and 456, Clause 13.12.2 Page 225

Conformance Type   : SHALL
```

Topology

```
          TEE                                  DUT
    +---------------+                    +--------------+
    |               |                    |              |
    |               |                    |              |
    |               |                    |              |
    |               |                    |              |
    |       BC      | T1              P1 |    OC/BC     |
```

```
          |    (Slave)   |---------------------|   (Master)  |
          |              |                     |             |
          |              |                     |             |
          |              |                     |             |
          |              |                     |             |
          +--------------+                     +-------------+

   Legends:

       TEE      : Test Execution Engine
       DUT      : Device Under Test
       OC       : Ordinary Clock
       BC       : Boundary Clock
       T1       : Port 1 at TEE
       P1       : Port 1 at DUT
```

```
Ladder Diagram    :

         TEE                                                      DUT
          |                                                        |
          |                                          <Enable PTP>  | P1
          |                             <Enable PTP with BC/OC clock> |
          |                          <Clock mode - one-step/two-step> |
          |                           <Configure logAnnounceInterval, | P1
          |                                   announceReceiptTimeout> |
          |                               <Configure logSyncInterval> | P1
          |                         <Configure logMinDelayReqInterval> | P1
          |                          <Configure Priority1, Priority2> | P1
          |                                            <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                           <Disable L1SynOptParams option> | P1
          |                <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |            timestampCorrectionPortDS.ingressLatency, |
          |         asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0x0C,|
          |                                                        |
          |                           <Enable L1SynOptParams option> | P1
          |                                                        |
          |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0x0C,|
          |                                     DN = DN1, OPE = 1] |
       T1 |------------------------------------------------<<--| P1
          |                                                        |

Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    OPE       = Optional Parameters Enabled
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

2. This objective is applicable only for device implementation supports transport over IEEE 802.3/Ethernet

```
Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.ingressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Enable L1SynOptParams on DUT.

Step 4 : Verify that DUT transmits L1 Sync Signaling message on the port
         P1 when optParamsEnabled is set to true. Checking that the
         following PTP message fields have correct information.

               Ethernet Fields
                  1) Source MAC           = Unicast MAC
                  2) Destination MAC      = 01:80:C2:00:00:0E
                                            (non-forwardable address)
                  3) Ether Type           = 0x88F7 (PTPv2 over Ethernet)

               PTP Fields
                  4) messageType          = 0xC (Signaling message) (4 bits)
                  5) majorSdoId           = 0x000 (4 bits)
                  6) versionPTP           = 2 (4 bits)
                  7) minorVersionPTP      = 1 (4 bits)
                  8) messageLength        = non-zero (2 octets)
                  9) domainNumber         = 0 - 127 (1 octet)
                 10) minorSdoId           = 0 (1 octet)
                 11) flagField            = 0x0000 - 0xFFFF (2 octets)
                 12) correctionField      = 0 (8 octets)
                 13) messageTypeSpecific  = (4 octets)
                 14) sourcePortIdentity   = non-zero (10 octets)
                 15) sequenceId           = 0 - 65535 (2 octets)
```

```
  16) controlField          = 05 (1 octet)
  17) logMessageInterval    = 0x7F (1 octet)
  18) targetPortIdentity    = non-zero (10 octets)

L1Sync Details
   19) tlvType              = 0x8001 (L1_SYNC)(2 octets)
   20) length field         = 2 (2 octets)
   21) TCR                  = 0 or 1 (1 bit)
   22) RCR                  = 0 or 1 (1 bit)
   23) CR                   = 0 or 1 (1 bit)
   24) OPE                  = 1 (1 bit)
   25) Reserved             = 4 bits
   26) ITC                  = 0 or 1 (1 bit)
   27) IRC                  = 0 or 1 (1 bit)
   28) IC                   = 0 or 1 (1 bit)
   29) Reserved             = 5 bits

L1Sync TLV Extended Details
   30) TCT                  = 0 or 1 (1 bit)
   31) POV                  = 0 or 1 (1 bit)
   32) FOV                  = 0 or 1 (1 bit)
   33) Reserved             = 5 bits
   34) phaseOffsetTx        = non-zero (8 octets)
   35) phaseOffsetTxTimestamp  = non-zero (10 octets)
   36) freqOffsetTx         = non-zero (8 octets)
   37) freqOffsetTxTimestamp   = non-zero (10 octets)
   38) Reserved             = 1 octet
```

3. *Message Handling Group (MHG)*

3.1. tc_conf_ptp-ha_mhg_001

```
Test Case         : tc_conf_ptp-ha_mhg_001
Test Case Version : 1.0
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA Message Handling Group (MHG)

Title             : Non-forwarding of L1Sync messages with
                    non-forwardable address on transport over UDP over IP

Purpose           : To verify that a PTP enabled device does not forward
                    PTP signaling message with L1 Sync TLV destined
                    with non-forwardable address (224.0.0.107) on transport
                    over UDP over IP.

Reference         : P1588/D1.3, February 2018 V3.01 Clause O.6.1 Page 447

Conformance Type  : SHALL
```

Topology

```
            TEE                                    DUT
      +--------------+                       +-------------+
```

```
| +----------+ | T1                P1 |               |
| |    BC    |-+---------------------|  (Master)     |
| | (Slave)  | |                     |               |
| +----------+ |                     |               |
|              |                     |      BC       |
|              |                     |               |
| +----------+ | T2                P2 |               |
| |    BC    |-+---------------------|  (Master)     |
| | (Slave)  | |                     |               |
| +----------+ |                     |               |
+--------------+                     +--------------+
```

```
Legends:

    TEE     : Test Execution Engine
    DUT     : Device Under Test
    OC      : Ordinary Clock
    BC      : Boundary Clock
    T1, T2  : Ports 1 and 2 at TEE
    P1, P2  : Ports 1 and 2 at DUT
```

```
Ladder Diagram    :

       TEE                                                     DUT
        |                                                       |
        |                                        <Enable PTP> | P1
        |                                        <Enable PTP> | P2
        |                          <Enable PTP with BC clock> |
        |                    <Clock mode - one-step/two-step> |
        |                     <Configure logAnnounceInterval, | P1
        |                             announceReceiptTimeout> |
        |                         <Configure logSyncInterval> | P1
        |                  <Configure logMinDelayReqInterval> | P1
        |                    <Configure Priority1, Priority2> | P1
        |                                      <Enable L1SYNC> | P1
        |                                      <Enable L1SYNC> | P2
        |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
        |                     <Disable L1SynOptParams option> | P1
        |           <Enable asymmetryCorrectionPortDS.enable> | P1
        | <Configure timestampCorrectionPortDS.egressLatency, | P1
        |           timestampCorrectionPortDS.ingressLatency, |
        |        asymmetryCorrectionPortDS.constantAsymmetry, |
        |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
        |                                                       |
        |                           ANNOUNCE [MSG_TYPE = 0x0B, |
        |                                            DN = DN1] |
     T1 |-------------------------------------------------<<--| P1
        |                                                       |
        |                           ANNOUNCE [MSG_TYPE = 0x0B, |
        |                                            DN = DN1] |
     T2 |-------------------------------------------------<<--| P2
        |                                                       |
        |PTP SIGNALLING with L1 Sync TLV [MSG_TYPE = 0x0C,     |
        |DN = DN1, DEST_IP = 224.0.0.170]                      |
     T1 |------>>-----------------------------------------------| P1
        |                                                       |
```

```
           |    PTP SIGNALLING with L1 Sync TLV [MSG_TYPE = 0x0C,|
           |              DN = DN1, DEST_IP = Y,SRC_IP!=TEE_IP1] |
        T2 |                    XXX------------------------<<--| P2
           |                                                   |
           |                                  <Disable L1SYNC> | P2
           |                                                   |
           |PTP SIGNALLING with L1 Sync TLV [MSG_TYPE = 0x0C,    |
           |DN = DN1, DEST_IP = 224.0.0.170]                   |
        T1 |------>>-------------------------------------------| P1
           |                                                   |
           |    PTP SIGNALLING with L1 Sync TLV [MSG_TYPE = 0x0C,|
           |                                        DN = DN1] |
        T2 |                    XXX------------------------<<--| P2
           |                                                   |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    TCR       = txCoherentIsRequired
    RCR       = rxCoherentIsRequired
    CR        = congruentIsRequired
    DEST_IP   = Destination IP
    SRC_IP    = Source IP
    TEE_IP1   = TEE IP of port1
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

2. This objective is applicable only for device implementation supports transport over UDP over IP

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's ports P1 and P2.
ii. Enable PTP on ports P1 and P2.
iii. Enable PTP globally with device type as Boundary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vi. Enable L1SYNC on DUT's ports P1 and P2.
vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
viii. Disable L1SynOptParams on DUT.
ix. Enable asymmetryCorrectionPortDS.enable.
x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.ingressLatency,

```
          asymmetryCorrectionPortDS.constantAsymmetry and
          asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add ports T1 and T2 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1

Step 4 : Observe that DUT transmits ANNOUNCE message on the port P2 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1

Step 5 : Send periodic L1SYNC Signaling message on port T1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0C
                 Domain Number = DN1
                 Destination IP= 224.0.0.107

Step 6 : Verify that DUT transmits only its own L1 Sync Signaling messages
         and does not re-transmit L1 Sync Signaling messages from TEE port
         T1. Observe that DUT does not transmits L1 Sync Signaling messages
         with non-forwardable address and source IP is not equal to TEE port
         IP (T2) on port P2.

Step 7 : Disable L1SYNC on port P2.

Step 8 : Send periodic L1SYNC Signaling message on port T1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0C
                 Domain Number = DN1
                 Destination IP= 224.0.0.107

Step 9 : Verify that DUT does not transmit any L1 Sync Signaling messages on
         port P2.
```

3.2. tc_conf_ptp-ha_mhg_002

```
Test Case         : tc_conf_ptp-ha_mhg_002
Test case Version : 1.4
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
```



```
Module Name       : PTP-HA Message Handling Group (MHG)

Title             : Non-forwarding of L1Sync messages with
                    non-forwardable address on transport over
                    IEEE 802.3/Ethernet

Purpose           : To verify that a PTP enabled device does not forward PTP
                    signaling message with L1 Sync TLV destined with
                    non-forwardable address (01:80:C2:00:00:0E) on transport
                    over IEEE 802.3/Ethernet.

Reference         : P1588/D1.3, February 2018 V3.01 Clause O.6.1 Page 447

Conformance Type  : SHALL
```

Topology

```
          TEE                                DUT
    +--------------+                    +-------------+
    | +----------+ | T1              P1 |             |
    | |    BC    |-+--------------------|  (Master)   |
    | | (Slave)  | |                    |             |
    | +----------+ |                    |             |
    |              |                    |      BC     |
    |              |                    |             |
    | +----------+ | T2              P2 |             |
    | |    BC    |-+--------------------|  (Master)   |
    | | (Slave)  | |                    |             |
    | +----------+ |                    |             |
    +--------------+                    +-------------+
```

```
Legends:

    TEE     : Test Execution Engine
    DUT     : Device Under Test
    OC      : Ordinary Clock
    BC      : Boundary Clock
    T1, T2  : Ports 1 and 2 at TEE
    P1, P2  : Ports 1 and 2 at DUT
```

```
Ladder Diagram    :

     TEE                                                     DUT
      |                                                       |
      |                                        <Enable PTP> | P1
      |                                        <Enable PTP> | P2
      |                          <Enable PTP with BC clock> |
      |                    <Clock mode - one-step/two-step> |
      |                     <Configure logAnnounceInterval, | P1
      |                             announceReceiptTimeout> |
      |                         <Configure logSyncInterval> | P1
      |                  <Configure logMinDelayReqInterval> | P1
      |                    <Configure Priority1, Priority2> | P1
      |                                     <Enable L1SYNC> | P1
      |                                     <Enable L1SYNC> | P2
```

```
        |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
        |                      <Disable L1SynOptParams option> | P1
        |            <Enable asymmetryCorrectionPortDS.enable> | P1
        | <Configure timestampCorrectionPortDS.egressLatency,  | P1
        |            timestampCorrectionPortDS.ingressLatency, |
        |         asymmetryCorrectionPortDS.constantAsymmetry, |
        |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
        |                                                      |
        |                           ANNOUNCE [MSG_TYPE = 0x0B, |
        |                                            DN = DN1] |
     T1 |-------------------------------------------------<<--| P1
        |                                                      |
        |                           ANNOUNCE [MSG_TYPE = 0x0B, |
        |                                            DN = DN1] |
     T2 |-------------------------------------------------<<--| P2
        |                                                      |
        |PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0x0C,      |
        |DN = DN1, DEST_MAC = 01:80:C2:00:00:0E]               |
     T1 |------>>----------------------------------------------| P1
        |                                                      |
        |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0x0C,|
        |            DN = DN1, DEST_MAC = Y,SRC_MAC!=TEE_MAC1]|
     T2 |                xxx------------------------------<<--| P2
        |                                                      |
        |                                     <Disable L1SYNC> | P2
        |                                                      |
        |PTP SIGNALLING with L1 Sync TLV [MSG_TYPE = 0x0C,     |
        |DN = DN1, DEST_MAC = 01:80:C2:00:00:0E]               |
     T1 |------>>----------------------------------------------| P1
        |                                                      |
        |    PTP SIGNALLING with L1 Sync TLV [MSG_TYPE = 0x0C,|
        |                                            DN = DN1] |
     T2 |                xxx------------------------------<<--| P2
        |                                                      |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    DEST_MAC  = Destination MAC
    TEE_MAC1  = TEE MAC of port1
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile
2. This objective is applicable only for device implementation supports transport over IEEE 802.3/Ethernet

Procedure :

(Initial Part)

```
Step 1 : Initialization of DUT
     i.   Enable DUT's ports P1 and P2.
    ii.   Enable PTP on ports P1 and P2.
   iii.   Enable PTP globally with device type as Boundary clock.
    iv.   Configure clock mode as One-step/Two-step.
     v.   Configure default values for Priority1, Priority2,
          logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
          logMinDelayReqInterval.
    vi.   Enable L1SYNC on DUT's ports P1 and P2.
   vii.   Configure default values for L1SyncInterval and
          L1SyncReceiptTimeout.
  viii.   Disable L1SynOptParams on DUT.
    ix.   Enable asymmetryCorrectionPortDS.enable.
     x.   Configure default values for timestampCorrectionPortDS.
          egressLatency, timestampCorrectionPortDS.ingressLatency,
          asymmetryCorrectionPortDS.constantAsymmetry and
          asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
     i.   Add ports T1 and T2 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1

Step 4 : Observe that DUT transmits ANNOUNCE message on the port P2 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1

Step 5 : Send periodic L1SYNC Signaling message on port T1 with
         following parameters.

             PTP Header
                 Message Type    = 0x0C
                 Domain Number   = DN1
                 Destination MAC = 01:80:C2:00:00:0E

Step 6 : Verify that DUT transmits only its own L1 Sync Signaling messages
         and does not re-transmit L1 Sync Signaling messages from TEE port
         T1.Observe that DUT does not transmits L1 Sync Signaling messages
         with non-forwardable address and source mac address of the TEE port
         MAC(T2) on Port P2.

Step 7 : Disable L1SYNC on port P2.

Step 8 : Send periodic L1SYNC Signaling message on port T1 with
         following parameters.
```

```
            PTP Header
                Message Type  = 0x0C
                Domain Number = DN1
                Destination MAC = 01:80:C2:00:00:0E

 Step 9 : Verify that DUT does not transmit any L1 Sync Signaling messages on
          port P2.
```

3.3. tc_conf_ptp-ha_mhg_003

```
 Test Case          : tc_conf_ptp-ha_mhg_003
 Test Case Version : 1.4
 Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
 Module Name        : PTP-HA Message Handling Group (MHG)

 Title              : Discarding of PTP signaling message with L1 Sync TLV
                      with invalid domain number.

 Purpose            : To verify that a PTP enabled device does not accept PTP
                      signaling message with L1 Sync TLV and invalid domain
                      number.

 Reference          : P1588/D1.3, February 2018 V3.01 Clause O.7.2 Page 449
                      Clause J.5.2 Page 412.

 Conformance Type   : SHALL
```

Topology

```
            TEE                                  DUT
      +---------------+                     +--------------+
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      |               | T1               P1 |              |
      |       BC      |---------------------|    OC/BC     |
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      +---------------+                     +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```



```
Ladder Diagram    :

          TEE                                                   DUT
        [slave]                                              [master]
           |                                                     |
           |                                        <Enable PTP> | P1
           |                       <Enable PTP with BC/OC clock> |
           |                    <Clock mode - one-step/two-step> |
           |                     <Configure logAnnounceInterval, | P1
           |                             announceReceiptTimeout> |
           |                         <Configure logSyncInterval> | P1
           |                  <Configure logMinDelayReqInterval> | P1
           |                    <Configure Priority1, Priority2> | P1
           |                                     <Enable L1SYNC> | P1
           |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
           |                     <Disable L1SynOptParams option> | P1
           |           <Enable asymmetryCorrectionPortDS.enable> | P1
           | <Configure timestampCorrectionPortDS.egressLatency, | P1
           |           timestampCorrectionPortDS.ingressLatency, |
           |        asymmetryCorrectionPortDS.constantAsymmetry, |
           |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
           |                                                     |
           |                          ANNOUNCE [MSG_TYPE = 0x0B, |
           |                     DN = DN1, SEQ_ID = Y, PRI1 = X] |
        T1 |-------------------------------------------------<<--| P1
           |                                                     |
           | ANNOUNCE [MSG_TYPE = 0x0B,                          |
           | DN = DN1, SEQ_ID = A, PRI1 = X+1]                   |
        T1 |-->>-------------------------------------------------| P1
           |                                                     |
           |                   <Check L1SYNC port status - IDLE> | P1
           |                                                     |
           |                      PTP SIGNALING with L1 Sync TLV |
           |                          [MSG_TYPE = 0xC, DN = DN1, |
           |                                  TLV_TYPE = 0x8001] |
        T1 |-------------------------------------------------<<--| P1
           |                                                     |
           | PTP SIGNALING with L1 Sync TLV                      |
           | [MSG_TYPE = 0xC, DN = DN1,                          |
           | TLV_TYPE = 0x8001, TCR = 0, RCR = 0,                |
           | CR = 0, ITC = 0, IRC = 0, IC = 0]                   |
        T1 |-->>-------------------------------------------------| P1
           |                                                     |
           |   <Wait for the expiry of L1SyncReceiptTimeout>     |
           |                                                     |
           |             <Check L1SYNC port status - LINK_ALIVE> | P1
           |                                                     |
           | PTP SIGNALING with L1 Sync TLV                      |
           | [MSG_TYPE = 0xC, DN = 128,                          |
           | TLV_TYPE = 0x8001, TCR = 0, RCR = 0,                |
           | CR = 0, ITC = 0, IRC = 0, IC = 0]                   |
        T1 |-->>-------------------------------------------------| P1
           |                                                     |
           |       <Wait for the expiry of twice                 |
           |                    the L1SyncReceiptTimeout>        |
           |                                                     |
           |                   <Check L1SYNC port status - IDLE> | P1
```

```
        |                                                       |
        |                     <Configure Domain Number = 127>|
        |                                                       |
        | PTP SIGNALING with L1 Sync TLV                        |
        | [MSG_TYPE = 0xC, DN = 127,                            |
        | TLV_TYPE = 0x8001, TCR = 0, RCR = 0,                  |
        | CR = 0, ITC = 0, IRC = 0, IC = 0]                     |
     T1 |-->>---------------------------------------------------| P1
        |                                                       |
        |   <Wait for the expiry of L1SyncReceiptTimeout>       |
        |                                                       |
        |             <Check L1SYNC port status - LINK_ALIVE> | P1
        |                                                       |
        | PTP SIGNALING with L1 Sync TLV                        |
        | [MSG_TYPE = 0xC, DN = 128,                            |
        | TLV_TYPE = 0x8001, TCR = 0, RCR = 0,                  |
        | CR = 0, ITC = 0, IRC = 0, IC = 0]                     |
     T1 |-->>---------------------------------------------------| P1
        |                                                       |
        |       <Wait for the expiry of twice                   |
        |                    the L1SyncReceiptTimeout>          |
        |                                                       |
        |                   <Check L1SYNC port status - IDLE> | P1
        |                                                       |
```

```
Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    TCR       = txCoherentIsRequired
    RCR       = rxCoherentIsRequired
    CR        = congruentIsRequired
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.

```
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.ingressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0
```

```
Step 8 : Wait for the expiry of L1SyncReceiptTimeout.

Step 9 : Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 10: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = 128
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 11: Wait for the expiry of twice the L1SyncReceiptTimeout.

Step 12: Verify that the DUT's L1SYNC port status P1 is in IDLE state.

Step 13: Configure domain number as 127 on Port P1 in DUT.

Step 14: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = 127
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 15: Wait for the expiry of L1SyncReceiptTimeout.

Step 16: Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 17: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = 128
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
```



```
                 IC            = 0

Step 18: Wait for the expiry of twice the L1SyncReceiptTimeout.

Step 19 : Verify that the DUT's L1SYNC port status P1 is in IDLE state.
```

4. Optional Parameters Verification (OPV)

4.1. tc_conf_ptp-ha_opv_001

```
Test Case          : tc_conf_ptp-ha_opv_001
Test Case Version : 1.1
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA Optional Parameters Verification (OPV)

Title              : L1SyncOptParamsPortDS.timestampsCorrectedTx

Purpose            : To verify that a PTP enabled device supports to enable
                     L1SyncOptParamsPortDS.timestampsCorrectedTx only when
                     L1SyncBasicPortDS.optParamsEnabled is enabled.

Reference          : P1588/D1.3, Febraury 2018, V3.01 Clause O.8.4.2.1
                     Page 453

Conformance Type  : SHALL
```

```
Topology

                  TEE                                  DUT
            +---------------+                     +--------------+
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |       BC      | T1               P1 |    OC/BC     |
            |    (Slave)    |---------------------|   (Master)   |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            +---------------+                     +--------------+

    Legends:

        TEE      : Test Execution Engine
        DUT      : Device Under Test
        OC       : Ordinary Clock
        BC       : Boundary Clock
        T1       : Port 1 at TEE
        P1       : Port 1 at DUT

Ladder Diagram     :
```

```
     TEE                                                    DUT
      |                                                      |
      |                                        <Enable PTP> | P1
      |                       <Enable PTP with BC/OC clock> |
      |                    <Clock mode - one-step/two-step> |
      |                     <Configure logAnnounceInterval, | P1
      |                             announceReceiptTimeout> |
      |                         <Configure logSyncInterval> | P1
      |                  <Configure logMinDelayReqInterval> | P1
      |                    <Configure Priority1, Priority2> | P1
      |                                      <Enable L1SYNC> | P1
      |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
      |                     <Disable L1SynOptParams option> | P1
      |           <Enable asymmetryCorrectionPortDS.enable> | P1
      | <Configure timestampCorrectionPortDS.egressLatency, | P1
      |           timestampCorrectionPortDS.ingressLatency, |
      |        asymmetryCorrectionPortDS.constantAsymmetry, |
      |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
      |                                                      |
      |!<Enable L1SyncOptParamsPortDS.timestampsCorrectedTx>|
      |                                                      |
      |                      PTP SIGNALING with L1 Sync TLV |
      |                [MSG_TYPE = 0x0C, DN = DN1, OPE = 0] |
   T1 |--------------------------------------------------<<--| P1
      |                                                      |
      |         <Enable L1SyncBasicPortDS.optParamsEnabled> |
      |                                                      |
      | <Enable L1SyncOptParamsPortDS.timestampsCorrectedTx>|
      |                                                      |
      |                      PTP SIGNALING with L1 Sync TLV |
      |       [MSG_TYPE = 0x0C, DN = DN1, OPE = 1, TCT = 1] |
   T1 |--------------------------------------------------<<--| P1
      |                                                      |
```

Legends :

```
MSG_TYPE  = Message Type
DN        = Domain Number
BC        = Boundary Clock
OC        = Ordinary Clock
TCR       = txCoherentIsRequired
RCR       = rxCoherentIsRequired
CR        = congruentIsRequired
OPE       = optParamsEnabled
TCT       = timestampsCorrectedTx
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

```
(Initial Part)

Step 1 : Initialization of DUT
     i.   Enable DUT's port P1.
    ii.   Enable PTP on port P1.
   iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
    iv.   Configure clock mode as One-step/Two-step.
     v.   Configure default values for Priority1, Priority2,
          logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
          logMinDelayReqInterval.
    vi.   Enable L1SYNC on DUT's port P1.
   vii.   Configure default values for L1SyncInterval and
          L1SyncReceiptTimeout.
  viii.   Disable L1SynOptParams on DUT.
    ix.   Enable asymmetryCorrectionPortDS.enable.
     x.   Configure default values for timestampCorrectionPortDS.
          egressLatency, timestampCorrectionPortDS.ingressLatency,
          asymmetryCorrectionPortDS.constantAsymmetry and
          asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
     i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that the DUT does not allow to enable
         L1SyncOptParamsPortDS.timestampsCorrectedTx.

Step 4 : If DUT allows to enable L1SyncOptParamsPortDS.timestampsCorrectedTx
         at Step 3, observe that DUT transmits PTP SIGNALING message with
         L1 Sync TLV on the port P1 with following parameters.

             PTP Header
                 Message Type  = 0x0C
                 Domain Number = DN1
             L1SYNC TLV
                 OPE           = 0

Step 5 : Enable L1SyncBasicPortDS.optParamsEnabled.

Step 6 : Enable L1SyncOptParamsPortDS.timestampsCorrectedTx.

Step 7 : Verify that DUT transmits PTP SIGNALING message with extended
         format of the L1_SYNC_TLV on the port P1 with following parameters.

             PTP Header
                 Message Type  = 0x0C
                 Domain Number = DN1
             L1SYNC TLV (with extended format)
                 OPE           = 1
                 TCT           = 1
```

5. PTP Accuracy Group (PAG)

5.1. tc_conf_ptp-ha_pag_002

```
Test Case          : tc_conf_ptp-ha_pag_002
Test Case Version  : 1.6
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP Accuracy Group (PAG)

Title              : Egress timestamp in Delay_Req message

Purpose            : To verify that a PTP enabled device generates Egress
                     timestamp in Delay_Req (event) messages from
                     timestampCorrectionPortDS.egressLatency when using
                     Delay Request-Response mechanism.

Reference          : IEEE 1588-2017 Clause 16.7.1 Page 301, Clause 7.3.4.2
                     Page 68, Clause 8.2.16.2 Page 128

Conformance Type   : SHALL
```

Topology

```
            TEE                                  DUT
      +---------------+                    +--------------+
      |               |                    |              |
      |               |                    |              |
      |               |                    |              |
      |               |                    |              |
      |               | T1             P1  |              |
      |      BC       |--------------------|    OC/BC     |
      |               |                    |              |
      |               |                    |              |
      |               |                    |              |
      |               |                    |              |
      +---------------+                    +--------------+
```

```
    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
 Ladder Diagram    :

         TEE                                                      DUT
          |                                                        |
```

```
    |                                      <Enable PTP> | P1
    |                         <Enable PTP with BC/OC clock> |
    |                      <Clock mode - one-step/two-step> |
    |                       <Configure logAnnounceInterval, | P1
    |                               announceReceiptTimeout> |
    |                           <Configure logSyncInterval> | P1
    |                   <Configure logMinDelayReqInterval> | P1
    |                     <Configure Priority1, Priority2> | P1
    |                                       <Enable L1SYNC> | P1
    |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
    |                       <Disable L1SynOptParams option> | P1
    |             <Enable asymmetryCorrectionPortDS.enable> | P1
    | <Configure timestampCorrectionPortDS.egressLatency, | P1
    |            timestampCorrectionPortDS.ingressLatency, |
    |         asymmetryCorrectionPortDS.constantAsymmetry, |
    |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
    |                                                     |
    |                          ANNOUNCE [MSG_TYPE = 0x0B, |
    |                                 DN = DN1, PRI1 = X] |
T1  |------------------------------------------------<<--| P1
    |                                                     |
    | ANNOUNCE [MSG_TYPE = 0x0B,                          |
    | DN = DN1, PRI1 = X-1]                               |
T1  |-->>------------------------------------------------| P1
    |                                                     |
T1  | <Enable auto responder to Delay_Req messages>       | P1
    |                                                     |
    | <Send Sync/ Sync & Follow-up messages               |
    | based on clock step>                                |
    |                                                     |
    |          < Wait for 6s to complete BMCA >           |
    |                                                     |
    |                       PTP SIGNALING with L1 Sync TLV |
    |                           [MSG_TYPE = 0xC, DN = DN1, |
    |                                   TLV_TYPE = 0x8001] |
T1  |------------------------------------------------<<--| P1
    |                                                     |
    | PTP SIGNALING with L1 Sync TLV                      |
    | [MSG_TYPE = 0xC, DN = DN1,                          |
    | TLV_TYPE = 0x8001, TCR = 1,                         |
    | RCR = 1, CR = 1, ITC = 1,                           |
    | IRC = 1, IC = 1]                                    |
T1  |-->>------------------------------------------------| P1
    |                                                     |
    |             <Check L1SYNC port status - L1_SYNC_UP> | P1
    |                                                     |
    | <Check non-zero absolute value of currentDS.        |
    |             offsetFromMaster is lowest as possible> |
    |                                                     |
    |                      <Get currentDS.meanDelay (MD1)> |
    |                                                     |
    |  <Configure timestampCorrectionPortDS.egressLatency |
    |                                 value to 2^(32+16)> |
    |                                                     |
    |               DELAY_REQ [MSG_TYPE = 0x01, DN = DN1] |
T1  |------------------------------------------------<<--| P1
    |                                                     |
```

```
          | <Check non-zero absolute value of currentDS.          |
          |             offsetFromMaster is lowest as possible>   |
          |                                                       |
          |                     <Get currentDS.meanDelay (MD2)>   |
          |                                                       |
          |                       MD2 < MD1                       |
          |                                                       |
          |  <Configure timestampCorrectionPortDS.egressLatency   |
          |                             value to -2^(32+16)>      |
          |                                                       |
          |                DELAY_REQ [MSG_TYPE = 0x01, DN = DN1]  |
       T1 |-------------------------------------------------<<--| P1
          |                                                       |
          | <Check non-zero absolute value of currentDS.          |
          |             offsetFromMaster is lowest as possible>   |
          |                                                       |
          |                     <Get currentDS.meanDelay (MD3)>   |
          |                                                       |
          |                       MD3 > MD1                       |
          |                                                       |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRT1      = priority1
    MD1 - MD3 = currentDS.meanDelay

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile



Procedure        :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency = 0, timestampCorrectionPortDS.egressLatency = 0,
         asymmetryCorrectionPortDS.constantAsymmetry = 0 and
         asymmetryCorrectionPortDS.scaledDelayCoefficient = 0.
```

```
Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type     = 0x0B
                 Domain Number    = DN1
                 Priority1        = X

Step 4 : Send periodic ANNOUNCE message on port T1 with following parameters

             PTP Header
                 Message Type     = 0x0B
                 Domain Number    = DN1
                 Priority1        = X-1

Step 5 : Enable auto responder to respond every Delay_Req messages received
         on port T1.

Step 6 : Send periodic SYNC message on the port P1 with with following
         parameters:

             PTP Header
                 Message Type     = 0x00
                 Domain Number    = DN1

Step 6a: If the clock is two-step clock, send periodic FOLLOW_UP message on
         port T1 with following parameters:

             PTP Header
                 Message Type     = 0x08
                 Domain Number    = DN1

Step 7 : Wait for 6s for completing BMCA.

Step 8 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 9 : Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
```

```
        RCR          = 1
        CR           = 1
        ITC          = 1
        IRC          = 1
        IC           = 1
```

Step 10: Observe that the DUT's L1SYNC port status of P1 is L1_SYNC_UP.

Step 11: Check whether the non-zero absolute value of currentDS. offsetFromMaster in DUT becomes lowest as possible to ensure that the DUT synchronizes it's time with TEE.

Step 12: Get currentDS.meanDelay (MD1) of DUT.

Step 13: Configure egressLatency on port P1 by setting egressLatency to 4 294 967 296 ns (i.e., the value of dataset expressed in TimeInterval asymmetryCorrectionPortDS.egressLatency = 2^48).

Step 14: Observe that the DUT transmits DELAY_REQ message on port P1 with following parameters to ensure the DUT is ready with configured asymmetryCorrectionPortDS.egressLatency value.

```
    PTP Header
        Message Type     = 0x01
        Domain Number    = DN1
```

Step 15: Check whether the non-zero absolute value of currentDS. offsetFromMaster in DUT becomes lowest as possible to ensure that the DUT synchronizes it's time with TEE.

Step 16: Get currentDS.meanDelay (MD2) of DUT.

Step 17: Observe that MD2 is lesser than MD1.

Step 18: Configure egressLatency on port P1 by setting egressLatency to -4 294 967 296 ns (i.e., the value of dataset expressed in TimeInterval asymmetryCorrectionPortDS.egressLatency = -2^48).

Step 19: Observe that the DUT transmits DELAY_REQ message on port P1 with following parameters to ensure the DUT is ready with configured asymmetryCorrectionPortDS.egressLatency value.

```
    PTP Header
        Message Type     = 0x01
        Domain Number    = DN1
```

Step 20: Check whether the non-zero absolute value of currentDS. offsetFromMaster in DUT becomes lowest as possible to ensure that the DUT synchronizes it's time with TEE.

Step 21: Get currentDS.meanDelay (MD3) of DUT.

Step 22: Verify that MD3 is greater than MD1.

5.2. tc_conf_ptp-ha_pag_003

```
Test Case          : tc_conf_ptp-ha_pag_003
Test Case Version  : 1.2
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP Accuracy Group (PAG)

Title              : Egress timestamp in Pdelay_Req message

Purpose            : To verify that a PTP enabled device generates Egress
                     timestamp in Pdelay_Req (event) messages from
                     timestampCorrectionPortDS.egressLatency when using
                     Peer to Peer Delay mechanism.

Reference          : IEEE 1588-2017 Clause 16.7.1 Page 301, Clause 7.3.4.2
                     Page 68, Clause 8.2.16.2 Page 128

Conformance Type   : SHALL
```

```
Topology


            TEE                                 DUT
      +--------------+                     +-------------+
      |              |                     |             |
      |              |                     |             |
      |              |                     |             |
      |              |                     |             |
      |      BC      | T1               P1 |    OC/BC    |
      |   (Master)   |---------------------|   (Slave)   |
      |              |                     |             |
      |              |                     |             |
      |              |                     |             |
      |              |                     |             |
      +--------------+                     +-------------+


    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
Ladder Diagram     :

         TEE                                                     DUT
          |                                                       |
          |                                         <Enable PTP>  | P1
          |                         <Enable PTP with BC/OC clock> |
```

```
    |                    <Clock mode - one-step/two-step> |
    |                        <Set delay mechanism as P2P> |
    |                     <Configure logAnnounceInterval, | P1
    |                             announceReceiptTimeout> |
    |                         <Configure logSyncInterval> | P1
    |                  <Configure logMinDelayReqInterval> | P1
    |                    <Configure Priority1, Priority2> | P1
    |                                     <Enable L1SYNC> | P1
    |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
    |                     <Disable L1SynOptParams option> | P1
    |           <Enable asymmetryCorrectionPortDS.enable> | P1
    | <Configure timestampCorrectionPortDS.egressLatency, | P1
    |           timestampCorrectionPortDS.ingressLatency, |
    |        asymmetryCorrectionPortDS.constantAsymmetry, |
    |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
    |                                                     |
    |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
    |                                DN = DN1, PRI1 = X]  |
T1  |-----------------------------------------------<<--| P1
    |                                                     |
    | ANNOUNCE [MSG_TYPE = 0x0B,                          |
    | DN = DN1, PRI1 = X-1]                               |
T1  |-->>-------------------------------------------------| P1
    |                                                     |
T1  | <Enable auto responder to Pdelay_Req messages>      | P1
    |                                                     |
    | <Send Sync/ Sync & Follow-up messages               |
    | based on clock step>                                |
    |                                                     |
    |          < Wait for 6s to complete BMCA >           |
    |                                                     |
    |                     PTP SIGNALING with L1 Sync TLV  |
    |                         [MSG_TYPE = 0xC, DN = DN1,  |
    |                                 TLV_TYPE = 0x8001]  |
T1  |-----------------------------------------------<<--| P1
    |                                                     |
    | PTP SIGNALING with L1 Sync TLV                      |
    | [MSG_TYPE = 0xC, DN = DN1,                          |
    | TLV_TYPE = 0x8001, TCR = 1,                         |
    | RCR = 1, CR = 1, ITC = 1,                           |
    | IRC = 1, IC = 1]                                    |
T1  |-->>-------------------------------------------------| P1
    |                                                     |
    |            <Check L1SYNC port status - L1_SYNC_UP>  | P1
    |                                                     |
    | <Check non-zero absolute value of currentDS.        |
    |            offsetFromMaster is lowest as possible>  |
    |                                                     |
    |                      <Get currentDS.meanDelay (MD1)> |
    |                                                     |
    |  <Configure timestampCorrectionPortDS.egressLatency |
    |                                     value to 2^32>  |
    |                                                     |
    |             PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1]  |
T1  |-----------------------------------------------<<--| P1
    |                                                     |
    | <Check non-zero absolute value of currentDS.        |
```

```
          |             offsetFromMaster is lowest as possible> |
          |                                                     |
          |                     <Get currentDS.meanDelay (MD2)> |
          |                                                     |
          |                       MD2 < MD1                     |
          |                                                     |
          |  <Configure timestampCorrectionPortDS.egressLatency |
          |                                value to -2^(32+16)> |
          |                                                     |
          |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1] |
       T1 |--------------------------------------------------<<--| P1
          |                                                     |
          | <Check non-zero absolute value of currentDS.        |
          |             offsetFromMaster is lowest as possible> |
          |                                                     |
          |                     <Get currentDS.meanDelay (MD3)> |
          |                                                     |
          |                       MD3 > MD1                     |
          |                                                     |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRT1      = priority1
    MD1 - MD3 = currentDS.meanDelay

NOTE :

 1. This objective is verified using the High Accuracy Peer to Peer Default
    PTP Profile



Procedure        :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure delaymechanism as Peer to peer.
   vi.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
  vii.   Enable L1SYNC on DUT's port P1.
 viii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
   ix.   Disable L1SynOptParams on DUT.
    x.   Enable asymmetryCorrectionPortDS.enable.
   xi.   Configure default values for timestampCorrectionPortDS.
         egressLatency = 0, timestampCorrectionPortDS.ingressLatency = 0,
         asymmetryCorrectionPortDS.constantAsymmetry = 0 and
         asymmetryCorrectionPortDS.scaledDelayCoefficient = 0.
```

```
Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type     = 0x0B
                 Domain Number    = DN1
                 Priority1        = X

Step 4 : Send periodic ANNOUNCE message on port T1 with following parameters

             PTP Header
                 Message Type     = 0x0B
                 Domain Number    = DN1
                 Priority1        = X-1

Step 5 : Enable auto responder to respond every Pdelay_Req messages received
         on port T1.

Step 6 : Send periodic SYNC message on the port P1 with with following
         parameters:

             PTP Header
                 Message Type     = 0x00
                 Domain Number    = DN1

Step 6a: If the clock is two-step clock, send periodic FOLLOW_UP message on
         port T1 with following parameters:

             PTP Header
                 Message Type     = 0x08
                 Domain Number    = DN1

Step 7 : Wait for 6s for completing BMCA.

Step 8 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 9 : Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
```

```
            RCR           = 1
            CR            = 1
            ITC           = 1
            IRC           = 1
            IC            = 1
```

Step 10: Observe that the DUT's L1SYNC port status of P1 is L1_SYNC_UP.

Step 11: Check whether the non-zero absolute value of currentDS. offsetFromMaster in DUT becomes lowest as possible to ensure that the DUT synchronizes it's time with TEE.

Step 12: Get currentDS.meanDelay (MD1) of DUT.

Step 13: Configure egressLatency on port P1 by setting egressLatency to 4 294 967 296 ns (i.e., the value of dataset expressed in TimeInterval asymmetryCorrectionPortDS.egressLatency = 2^48).

Step 14: Observe that DUT transmits PDELAY_REQ message on the port P1 with following parameters to ensure the DUT is ready with configured asymmetryCorrectionPortDS.egressLatency value.

```
        PTP Header
            Message Type              = 0x02
            Domain Number             = DN1
```

Step 15: Check whether the non-zero absolute value of currentDS. offsetFromMaster in DUT becomes lowest as possible to ensure that the DUT synchronizes it's time with TEE.

Step 16: Get currentDS.meanDelay (MD2) of DUT.

Step 17: Observe that MD2 is lesser than MD1.

Step 18: Configure egressLatency on port P1 by setting egressLatency to -4 294 967 296 ns (i.e., the value of dataset expressed in TimeInterval asymmetryCorrectionPortDS.egressLatency = -2^48).

Step 19: Observe that DUT transmits PDELAY_REQ message on the port P1 with following parameters to ensure the DUT is ready with configured asymmetryCorrectionPortDS.egressLatency value.

```
        PTP Header
            Message Type              = 0x02
            Domain Number             = DN1
```

Step 20: Check whether the non-zero absolute value of currentDS. offsetFromMaster in DUT becomes lowest as possible to ensure that the DUT synchronizes it's time with TEE.

Step 21: Get currentDS.meanDelay (MD3) of DUT.

Step 22: Verify that MD3 is greater than MD1.

5.3. tc_conf_ptp-ha_pag_004

```
Test Case         : tc_conf_ptp-ha_pag_004
Test Case Version : 1.9
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP Accuracy Group (PAG)

Title             : Calculation of delayAsymmetry in Delay Request-Response
                    mechanism

Purpose           : To verify that a PTP enabled device performs computation
                    of delayAsymmetry each time the value of meanDelay is
                    updated in Delay Request-Response mechanism

Reference         : P1588/D1.3, February 2018 V3.01 clause 16.8.3 Page 302,
                    Clause 7.4.2 Page 73

Conformance Type  : SHALL
```

```
Topology


               TEE                                    DUT
         +---------------+                      +--------------+
         |               |                      |              |
         |               |                      |              |
         |               |                      |              |
         |               |                      |              |
         |               | T1                P1 |              |
         |       BC      |----------------------|    OC/BC     |
         |               |                      |              |
         |               |                      |              |
         |               |                      |              |
         |               |                      |              |
         +---------------+                      +--------------+


    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
 Ladder Diagram    :

          TEE                                                   DUT
           |                                                     |
           |                                      <Enable PTP> | P1
           |                        <Enable PTP with BC/OC clock> |
```

```
   |                    <Clock mode - one-step/two-step> |
   |                     <Configure logAnnounceInterval, | P1
   |                             announceReceiptTimeout> |
   |                         <Configure logSyncInterval> | P1
   |                  <Configure logMinDelayReqInterval> | P1
   |                    <Configure Priority1, Priority2> | P1
   |                                     <Enable L1SYNC> | P1
   |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
   |                     <Disable L1SynOptParams option> | P1
   | <Configure timestampCorrectionPortDS.egressLatency, | P1
   |           timestampCorrectionPortDS.ingressLatency, |
   |        asymmetryCorrectionPortDS.constantAsymmetry, |
   |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
   |                                                     |
   |  <Configure timestampCorrectionPortDS.egressLatency |
   |                         value to -4 000 000 000 ns> |
   |                                                     |
   | <Configure timestampCorrectionPortDS.ingressLatency |
   |                         value to -4 000 000 000 ns> |
   |                                                     |
   |           <Enable asymmetryCorrectionPortDS.enable> | P1
   |                                                     |
   |                          ANNOUNCE [MSG_TYPE = 0x0B, |
   |                          DN = DN1, PRI1 = X]        |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   | ANNOUNCE [MSG_TYPE = 0x0B,                          |
   |   DN = DN1, PRI1 = X-1]                             |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
T1 | <Enable auto responder to Delay_Req messages>       | P1
   |                                                     |
   | <Send Sync/ Sync & Follow-up msgs                   |
   | based on clock step>                                |
   |                                                     |
   |          < Wait for 6s to complete BMCA >           |
   |                                                     |
   | PTP SIGNALING with L1 Sync TLV                      |
   | [MSG_TYPE = 0xC, DN = DN1,                          |
   | TLV_TYPE = 0x8001, TCR = 1,                         |
   | RCR = 1, CR = 1, ITC = 1,                           |
   | IRC = 1, IC = 1]                                    |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   |             <Check L1SYNC port status - L1_SYNC_UP> | P1
   |                                                     |
   | <Check non-zero absolute value of currentDS.        |
   |             offsetFromMaster is lowest as possible> |
   |                                                     |
   |                     <Get currentDS.meanDelay (MD1)> |
   |                                                     |
   |                          <Get delayAsymmetry (DA1)> |
   |                                                     |
   |                                     <Check DA1 = 0> |
   |                                                     |
   |       DELAY_REQ [MSG_TYPE=0X01, DN = DN1, CF = CF1] |
T1 |-------------------------------------------------<<--| P1
```



```
    |                                                    |
    |                                   <Check CF1 = 0>  |
    |                                                    |
    |               <Configure asymmetryCorrectionPortDS. |
    |                               scaledDelayCoefficient |
    |                                            to 2^62> |
    |                                                    |
    |                 DELAY_REQ [MSG_TYPE=0X01, DN = DN1] |
 T1 |--------------------------------------------------<<--| P1
    |                                                    |
    | <Check non-zero absolute value of currentDS.       |
    |             offsetFromMaster is lowest as possible> |
    |                                                    |
    |                     <Get currentDS.meanDelay (MD2)> |
    |                                                    |
    |                          <Get delayAsymmetry (DA2)> |
    |                                                    |
    |                           <Check DA2 = (1/3) * MD2> |
    |                                                    |
    |       DELAY_REQ [MSG_TYPE=0X01, DN = DN1, CF = CF2] |
 T1 |--------------------------------------------------<<--| P1
    |                                                    |
    |                            <Check CF2 = (-1) * DA2> |
    |                                                    |
    |               <Configure asymmetryCorrectionPortDS. |
    |                                    constantAsymmetry |
    |                                       to 2^(32+16)> |
    |                                                    |
    |                 DELAY_REQ [MSG_TYPE=0X01, DN = DN1] |
 T1 |--------------------------------------------------<<--| P1
    |                                                    |
    | <Check non-zero absolute value of currentDS.       |
    |             offsetFromMaster is lowest as possible> |
    |                                                    |
    |                     <Get currentDS.meanDelay (MD3)> |
    |                                                    |
    |                          <Get delayAsymmetry (DA3)> |
    |                                                    |
    |               <Check DA2 = (1/3) * MD3 + 2^(32+16)> |
    |                                                    |
    |       DELAY_REQ [MSG_TYPE=0X01, DN = DN1, CF = CF3] |
 T1 |--------------------------------------------------<<--| P1
    |                                                    |
    |                            <Check CF3 = (-1) * DA3> |
    |                                                    |
    |               <Configure asymmetryCorrectionPortDS. |
    |                               scaledDelayCoefficient |
    |                                           to -2^62> |
    |                                                    |
    |               <Configure asymmetryCorrectionPortDS. |
    |                                    constantAsymmetry |
    |                                               to 0> |
    |                                                    |
    |                 DELAY_REQ [MSG_TYPE=0X01, DN = DN1] |
 T1 |--------------------------------------------------<<--| P1
    |                                                    |
    | <Check non-zero absolute value of currentDS.       |
```

```
        |            offsetFromMaster is lowest as possible> |
        |                                                    |
        |                    <Get currentDS.meanDelay (MD4)> |
        |                                                    |
        |                         <Get delayAsymmetry (DA4)> |
        |                                                    |
        |                           <Check DA4 = (-1) * MD4> |
        |                                                    |
        |      DELAY_REQ [MSG_TYPE=0X01, DN = DN1, CF = CF4] |
     T1 |-------------------------------------------------<<--| P1
        |                                                    |
        |                           <Check CF4 = (-1) * DA4> |
        |                                                    |
        |        <Disable asymmetryCorrectionPortDS.enable> | P1
        |                                                    |
        |                 DELAY_REQ [MSG_TYPE=0X01, DN = DN1] |
     T1 |-------------------------------------------------<<--| P1
        |                                                    |
        | <Check non-zero absolute value of currentDS.      |
        |            offsetFromMaster is lowest as possible> |
        |                                                    |
        |                    <Get currentDS.meanDelay (MD5)> |
        |                                                    |
        |                         <Get delayAsymmetry (DA5)> |
        |                                                    |
        |                           <Check DA5 = (-1) * MD5> |
        |                                                    |
        |      DELAY_REQ [MSG_TYPE=0X01, DN = DN1, CF = CF5] |
     T1 |-------------------------------------------------<<--| P1
        |                                                    |
        |                           <Check CF5 = (-1) * DA5> |
        |                                                    |
```

```
Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRT1      = priority1
    SEQ_ID    = Sequence ID
    CF1 - CF5 = Correction Field
    MD1 - MD5 = currentDS.meanDelay
    DA1 - DA5 = currentDS.delayAsymmetry

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile



Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
```

```
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency = 0, timestampCorrectionPortDS.ingressLatency = 0,
         asymmetryCorrectionPortDS.constantAsymmetry = 0 and
         asymmetryCorrectionPortDS.scaledDelayCoefficient = 0.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Configure egressLatency and ingressLatency on port P1 by setting
         egressLatency and ingressLatency to -4 000 000 000 ns.

Step 4 : Enable asymmetryCorrectionPortDS.enable.

Step 5 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Priority1     = X

Step 6 : Send periodic ANNOUNCE message with Priority1 value decremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Priority1     = X-1

Step 7 : Enable auto responder to respond every Delay_Req messages received
         on port T1.

Step 8 : Send periodic SYNC message on port T1 with following parameters.

             PTP Header
                 Message Type         = 0x00
                 Domain Number        = DN1
                 Source Port Identity = E
                 Sequence ID          = B

Step 8a: If the clock is two step, send periodic FOLLOW_UP message on port
         T1 with following parameters.

             PTP Header
```

```
                Message Type         = 0x08
                Domain Number        = DN1
                Source Port Identity = E
                Sequence ID          = B

Step 9 : Wait for 6s for completing BMCA.

Step 10: Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1
                ITC           = 1
                IRC           = 1
                IC            = 1

Step 11: Observe that the DUT's L1SYNC port status of P1 is L1_SYNC_UP.

Step 12: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 13: Get currentDS.meanDelay (MD1) value for Port P1 in DUT.

Step 14: Get delayAsymmetry (DA1) value for Port P1 in DUT.

Step 15: Check whether DA1 = 0

Step 16: Observe that DUT transmits DELAY_REQ on the port P1 with following
         parameters and record correction field (CF1).

            PTP Header
                Message Type             = 0x01
                Domain Number            = DN1

Step 17: Check whether CF1 = 0.

Step 18: Configure scaledDelayCoefficient on port P1 by setting
         scaledDelayCoefficient to 1 (i.e., the value of dataset expressed
         in RelativeDifference asymmetryCorrectionPortDS.
         scaledDelayCoefficient = 2^62).

Step 19: Observe that DUT transmits DELAY_REQ message on the port P1 with
         following parameters to ensure the DUT is ready with configured
         asymmetryCorrectionPortDS.scaledDelayCoefficient value.

            PTP Header
                Message Type             = 0x01
                Domain Number            = DN1

Step 20: Check whether the non-zero absolute value of currentDS.
```

offsetFromMaster in DUT becomes lowest as possible to ensure that the DUT synchronizes it's time with TEE.

Step 21: Get currentDS.meanDelay (MD2) value for Port P1 in DUT.

Step 22: Get delayAsymmetry (DA2) value for Port P1 in DUT.

Step 23: Check whether DA2 = (1/3) * MD2 (with margin of error).

Step 24: Observe that DUT transmits DELAY_REQ on the port P1 with following parameters and record correction field (CF2).

```
PTP Header
    Message Type             = 0x01
    Domain Number            = DN1
```

Step 25: Check whether CF2 = (-1) * DA2 (with margin of error).

Step 26: Configure constantAsymmetry on port P1 by setting constantAsymmetry to 4 294 967 296 ns (i.e., the value of dataset expressed in TimeInterval asymmetryCorrectionPortDS.constantAsymmetry = 2^48).

Step 27: Observe that DUT transmits DELAY_REQ message on the port P1 with following parameters to ensure the DUT is ready with configured asymmetryCorrectionPortDS.constantAsymmetry value.

```
PTP Header
    Message Type             = 0x01
    Domain Number            = DN1
```

Step 28: Check whether the non-zero absolute value of currentDS. offsetFromMaster in DUT becomes lowest as possible to ensure that the DUT synchronizes it's time with TEE.

Step 29: Get currentDS.meanDelay (MD3) value for Port P1 in DUT.

Step 30: Get delayAsymmetry (DA3) value for Port P1 in DUT.

Step 31: Check whether DA3 = (1/3)*MD2 + 4 294 967 296 ns (i.e., 2^(32+16) in TimeInterval) (with margin of error).

Step 32: Observe that DUT transmits DELAY_REQ on the port P1 with following parameters and record correction field (CF3).

```
PTP Header
    Message Type             = 0x01
    Domain Number            = DN1
```

Step 33: Check whether CF3 = (-1) * DA3 (with margin of error).

Step 34: Configure scaledDelayCoefficient on port P1 by setting scaledDelayCoefficient to -1 (i.e., the value of dataset expressed in RelativeDifference asymmetryCorrectionPortDS. scaledDelayCoefficient = -2^62).

Step 35: Configure asymmetryCorrectionDS.constantAsymmetry as 0.

Step 36: Observe that DUT transmits DELAY_REQ message on the port P1 with following parameters to ensure the DUT is ready with configured asymmetryCorrectionPortDS.scaledDelayCoefficient and asymmetryCorrectionPortDS.constantAsymmetry values.

```
    PTP Header
        Message Type             = 0x01
        Domain Number            = DN1
```

Step 37: Check whether the non-zero absolute value of currentDS. offsetFromMaster in DUT becomes lowest as possible to ensure that the DUT synchronizes it's time with TEE.

Step 38: Get currentDS.meanDelay (MD4) value for Port P1 in DUT.

Step 39: Get delayAsymmetry (DA4) value for Port P1 in DUT.

Step 40: Check whether DA4 = (-1) * MD4 (with margin of error).

Step 41: Observe that DUT transmits DELAY_REQ on the port P1 with following parameters and record correction field (CF4).

```
    PTP Header
        Message Type             = 0x01
        Domain Number            = DN1
```

Step 42: Check whether CF4 = (-1) * DA4 (with margin of error).

Step 43: Disable asymmetryCorrectionPortDS.enable.

Note: The asymmetryCorrectionPortDS.enable is not allowed to be set to FALSE in the High Accuracy Default PTP Profile. Despite providing FALSE value of this data set member to the DUT, it is expected that the value of asymmetryCorrectionPortDS.enable remains TRUE and the measurements of meanDelay and delayAsymmetry are made accordingly.

Step 44: Observe that DUT transmits DELAY_REQ message on the port P1 with following parameters to ensure the DUT is ready with configured asymmetryCorrectionPortDS.enable value.

```
    PTP Header
        Message Type             = 0x01
        Domain Number            = DN1
```

Step 45: Check whether the non-zero absolute value of currentDS. offsetFromMaster in DUT becomes lowest as possible to ensure that the DUT synchronizes it's time with TEE.

Step 46: Get currentDS.meanDelay (MD5) value for Port P1 in DUT.

Step 47: Get delayAsymmetry (DA5) value for Port P1 in DUT.

Step 48: Check whether DA5 = (-1) * MD5 (with margin of error).

Step 49: Observe that DUT transmits DELAY_REQ on the port P1 with following parameters and record correction field (CF5).

```
            PTP Header
                Message Type             = 0x01
                Domain Number            = DN1

Step 50: Verify whether CF5 = (-1) * DA5 (with margin of error).

Note: The default value of margin of error can be changed through ATTEST GUI
      (i.e., Go to Configuration Manager and select desired configuration,
      go to Protocol Options > PTP-HA > Global).
```

5.4. tc_conf_ptp-ha_pag_005

```
Test Case          : tc_conf_ptp-ha_pag_005
Test Case Version  : 1.5
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP Accuracy Group (PAG)

Title              : Calculation of delayAsymmetry in Peer to Peer Delay
                     mechanism when DUT is slave

Purpose            : To verify that a PTP enabled device performs computation
                     of delayAsymmetry each time the value of meanDelay is
                     updated in Peer to Peer Delay mechanism when DUT is
                     slave.

Reference          : P1588/D1.3, February 2018 V3.01 clause 16.8.3 page 302
                     Clause 7.4.2 Page 73

Conformance Type   : SHALL
```

Topology

```
          TEE                                 DUT
    +---------------+                     +--------------+
    |               |                     |              |
    |               |                     |              |
    |               |                     |              |
    |               |                     |              |
    |      BC       | T1               P1 |    OC/BC     |
    |   (Master)    |---------------------|   (Slave)    |
    |               |                     |              |
    |               |                     |              |
    |               |                     |              |
    |               |                     |              |
    +---------------+                     +--------------+
```

```
    Legends:

        TEE      : Test Execution Engine
        DUT      : Device Under Test
        OC       : Ordinary Clock
```

```
BC      : Boundary Clock
T1      : Port 1 at TEE
P1      : Port 1 at DUT
```

Ladder Diagram :

```
  TEE                                                     DUT
   |                                                       |
   |                                         <Enable PTP> | P1
   |                         <Enable PTP with BC/OC clock> |
   |                      <Clock mode - one-step/two-step> |
   |                          <Set delay mechanism as P2P> |
   |                       <Configure logAnnounceInterval, | P1
   |                               announceReceiptTimeout> |
   |                          <Configure logSyncInterval> | P1
   |                   <Configure logMinDelayReqInterval> | P1
   |                      <Configure Priority1, Priority2> | P1
   |                                        <Enable L1SYNC> | P1
   |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
   |                       <Disable L1SynOptParams option> | P1
   |            <Enable asymmetryCorrectionPortDS.enable> | P1
   | <Configure timestampCorrectionPortDS.egressLatency,  | P1
   |            timestampCorrectionPortDS.ingressLatency,  |
   |         asymmetryCorrectionPortDS.constantAsymmetry,  |
   |    asymmetryCorrectionPortDS.scaledDelayCoefficient> |
   |                                                       |
   |  <Configure timestampCorrectionPortDS.egressLatency  |
   |                          value to -4 000 000 000 ns> |
   |                                                       |
   | <Configure timestampCorrectionPortDS.ingressLatency  |
   |                          value to -4 000 000 000 ns> |
   |                                                       |
   |            <Enable asymmetryCorrectionPortDS.enable> | P1
   |                                                       |
   |                           ANNOUNCE [MSG_TYPE = 0x0B, |
   |                                  DN = DN1, PRI1 = X] |
T1 |-------------------------------------------------<<--| P1
   |                                                       |
   | ANNOUNCE [MSG_TYPE = 0x0B,                            |
   | DN = DN1, PRI1 = X-1]                                 |
T1 |-->>--------------------------------------------------| P1
   |                                                       |
T1 | <Enable auto responder to Pdelay_Req messages>       | P1
   |                                                       |
   | <Send Sync/ Sync & Follow-up msgs                     |
   | based on clock step>                                  |
   |                                                       |
   | PTP SIGNALING with L1 Sync TLV                        |
   | [MSG_TYPE = 0xC, DN = DN1,                            |
   | TLV_TYPE = 0x8001, TCR = 1,                           |
   | RCR = 1, CR = 1, ITC = 1,                             |
   | IRC = 1, IC = 1]                                      |
T1 |-->>--------------------------------------------------| P1
   |                                                       |
```

```
    |             <Check L1SYNC port status - L1_SYNC_UP> | P1
    |                                                     |
    | <Check non-zero absolute value of currentDS.        |
    |             offsetFromMaster is lowest as possible> |
    |                                                     |
    |                     <Get currentDS.meanDelay (MD1)> |
    |                                                     |
    |                          <Get delayAsymmetry (DA1)> |
    |                                                     |
    |                                     <Check DA1 = 0> |
    |                                                     |
    |    PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, CF = CF1] |
 T1 |-------------------------------------------------<<--| P1
    |                                                     |
    |                                     <Check CF1 = 0> |
    |                                                     |
    |               <Configure asymmetryCorrectionPortDS. |
    |                              scaledDelayCoefficient |
    |                                            to 2^62> |
    |                                                     |
    |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1] |
 T1 |-------------------------------------------------<<--| P1
    |                                                     |
    | <Check non-zero absolute value of currentDS.        |
    |             offsetFromMaster is lowest as possible> |
    |                                                     |
    |                     <Get currentDS.meanDelay (MD2)> |
    |                                                     |
    |                          <Get delayAsymmetry (DA2)> |
    |                                                     |
    |                           <Check DA2 = (1/3) * MD2> |
    |                                                     |
    |    PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, CF = CF2] |
 T1 |-------------------------------------------------<<--| P1
    |                                                     |
    |                            <Check CF2 = (-1) * DA2> |
    |                                                     |
    |               <Configure asymmetryCorrectionPortDS. |
    |                                   constantAsymmetry |
    |                                       to 2^(32+16)> |
    |                                                     |
    |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1] |
 T1 |-------------------------------------------------<<--| P1
    |                                                     |
    | <Check non-zero absolute value of currentDS.        |
    |             offsetFromMaster is lowest as possible> |
    |                                                     |
    |                     <Get currentDS.meanDelay (MD3)> |
    |                                                     |
    |                          <Get delayAsymmetry (DA3)> |
    |                                                     |
    |               <Check DA2 = (1/3) * MD3 + 2^(32+16)> |
    |                                                     |
    |    PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, CF = CF3] |
 T1 |-------------------------------------------------<<--| P1
    |                                                     |
    |                            <Check CF3 = (-1) * DA3> |
```

```
       |                                                    |
       |                <Configure asymmetryCorrectionPortDS. |
       |                               scaledDelayCoefficient |
       |                                            to -2^62> |
       |                                                    |
       |                <Configure asymmetryCorrectionPortDS. |
       |                                  constantAsymmetry |
       |                                             to 0> |
       |                                                    |
       |               PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1] |
    T1 |-------------------------------------------------<<--| P1
       |                                                    |
       | <Check non-zero absolute value of currentDS.       |
       |             offsetFromMaster is lowest as possible> |
       |                                                    |
       |                      <Get currentDS.meanDelay (MD4)> |
       |                                                    |
       |                         <Get delayAsymmetry (DA4)> |
       |                                                    |
       |                           <Check DA4 = (-1)*MD4> |
       |                                                    |
       |     PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, CF = CF4] |
    T1 |-------------------------------------------------<<--| P1
       |                                                    |
       |                          <Check CF4 = (-1) * DA4> |
       |                                                    |
       |          <Disable asymmetryCorrectionPortDS.enable> | P1
       |                                                    |
       |               PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1] |
    T1 |-------------------------------------------------<<--| P1
       |                                                    |
       | <Check non-zero absolute value of currentDS.       |
       |             offsetFromMaster is lowest as possible> |
       |                                                    |
       |                      <Get currentDS.meanDelay (MD5)> |
       |                                                    |
       |                         <Get delayAsymmetry (DA5)> |
       |                                                    |
       |                          <Check DA5 = (-1) * MD5> |
       |                                                    |
       |      PDELAY_REQ [MSG_TYPE=0X02, DN = DN1, CF = CF5] |
    T1 |-------------------------------------------------<<--| P1
       |                                                    |
       |                          <Check CF5 = (-1) * DA5> |
       |                                                    |
```

```
Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRT1      = priority1
    SEQ_ID    = Sequence ID
    CF1 - CF5 = Correction Field
    MD1 - MD5 = currentDS.meanDelay
    DA1 - DA5 = currentDS.delayAsymmetry

NOTE :
```

1. This objective is verified using the High Accuracy Peer to Peer Default PTP Profile

```
Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
     i.   Enable DUT's port P1.
    ii.   Enable PTP on port P1.
   iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
    iv.   Configure clock mode as One-step/Two-step.
     v.   Configure delaymechanism as Peer to peer.
    vi.   Configure default values for Priority1, Priority2,
          logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
          logMinDelayReqInterval.
   vii.   Enable L1SYNC on DUT's port P1.
  viii.   Configure default values for L1SyncInterval and
          L1SyncReceiptTimeout.
    ix.   Disable L1SynOptParams on DUT.
     x.   Enable asymmetryCorrectionPortDS.enable.
    xi.   Configure default values for timestampCorrectionPortDS.
          egressLatency = 0, timestampCorrectionPortDS.ingressLatency = 0,
          asymmetryCorrectionPortDS.constantAsymmetry = 0 and
          asymmetryCorrectionPortDS.scaledDelayCoefficient = 0.

Step 2 : Initialization of TEE
     i.   Add port T1 at TEE.

(Part 1)

Step 3 : Configure egressLatency and ingressLatency on port P1 by setting
         egressLatency and ingressLatency to -4 000 000 000 ns.

Step 4 : Enable asymmetryCorrectionPortDS.enable.

Step 5 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Priority1     = X

Step 6 : Send periodic ANNOUNCE message with Priority1 value decremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Priority1     = X-1

Step 7 : Enable auto responder to respond every Pdelay_Req messages received
```



```
         on port T1.

Step 8 : Send periodic SYNC message on port T1 with following parameters.

             PTP Header
                 Message Type         = 0x00
                 Domain Number        = DN1
                 Source Port Identity = E
                 Sequence ID          = B

Step 8a: If the clock is two step, send periodic FOLLOW_UP message on port
         T1 with following parameters.

             PTP Header
                 Message Type         = 0x08
                 Domain Number        = DN1
                 Source Port Identity = E
                 Sequence ID          = B

Step 9 : Wait for 6s for completing BMCA.

Step 10: Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 1
                 IRC           = 1
                 IC            = 1

Step 11: Observe that the DUT's L1SYNC port status of P1 is L1_SYNC_UP.

Step 12: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 13: Get currentDS.meanDelay (MD1) value for Port P1 in DUT.

Step 14: Get delayAsymmetry (DA1) value for Port P1 in DUT.

Step 15: Check whether DA1 = 0.

Step 16: Observe that DUT transmits PDELAY_REQ on the port P1 with following
         parameters and record correction field (CF1).

             PTP Header
                 Message Type             = 0x01
                 Domain Number            = DN1

Step 17: Check whether CF1 = 0.
```

```
Step 18: Configure value of scaledDelayCoefficient on port P1 by setting
         scaledDelayCoefficient to 1 (i.e., the value of dataset expressed
         in RelativeDifference asymmetryCorrectionPortDS.
         scaledDelayCoefficient = 2^62).

Step 19: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters to ensure the DUT is ready with configured
         asymmetryCorrectionPortDS.scaledDelayCoefficient value.

             PTP Header
                 Message Type             = 0x02
                 Domain Number            = DN1

Step 20: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 21: Get currentDS.meanDelay (MD2) value for Port P1 in DUT.

Step 22: Get delayAsymmetry (DA2) value for Port P1 in DUT.

Step 23: Check whether DA2 = (1/3)*MD2 (with margin of error).

Step 24: Observe that DUT transmits PDELAY_REQ on the port P1 with following
         parameters and record correction field (CF2).

             PTP Header
                 Message Type            = 0x01
                 Domain Number           = DN1

Step 25: Check whether CF2 = (-1) * DA2 (with margin of error).

Step 26: Configure constantAsymmetry on port P1 by setting constantAsymmetry
         to 4 294 967 296 ns (i.e., the value of dataset expressed in
         TimeInterval asymmetryCorrectionPortDS.constantAsymmetry = 2^48).

Step 27: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters to ensure the DUT is ready with configured
         asymmetryCorrectionPortDS.constantAsymmetry value.

             PTP Header
                 Message Type             = 0x02
                 Domain Number            = DN1

Step 28: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 29: Get currentDS.meanDelay (MD3) value for Port P1 in DUT.

Step 30: Get delayAsymmetry (DA3) value for Port P1 in DUT.

Step 31: Check whether DA3 = (1/3)*MD2 + 4 294 967 296 ns (i.e., 2^(32+16)
         in TimeInterval) (with margin of error).

Step 32: Observe that DUT transmits PDELAY_REQ on the port P1 with following
         parameters and record correction field (CF3).
```



```
        PTP Header
            Message Type            = 0x01
            Domain Number           = DN1
```

Step 33: Check whether CF3 = (-1) * DA3 (with margin of error).

Step 34: Configure value of scaledDelayCoefficient on port P1 by setting scaledDelayCoefficient to -1 (i.e., the value of dataset expressed in RelativeDifference asymmetryCorrectionPortDS. scaledDelayCoefficient = -2^62).

Step 35: Configure constantAsymmetry on port P1 by setting constantAsymmetry to 0 ns (i.e., the value of dataset expressed in TimeInterval asymmetryCorrectionPortDS.constantAsymmetry = 0).

Step 36: Observe that DUT transmits PDELAY_REQ message on the port P1 with following parameters to ensure the DUT is ready with configured asymmetryCorrectionPortDS.scaledDelayCoefficient and asymmetryCorrectionPortDS.constantAsymmetry values.

```
        PTP Header
            Message Type             = 0x02
            Domain Number            = DN1
```

Step 37: Check whether the non-zero absolute value of currentDS. offsetFromMaster in DUT becomes lowest as possible to ensure that the DUT synchronizes it's time with TEE.

Step 38: Get currentDS.meanDelay (MD4) value for Port P1 in DUT.

Step 39: Get delayAsymmetry (DA4) value for Port P1 in DUT.

Step 40: Check whether DA4 = (-1)*MD4 (with margin of error).

Step 41: Observe that DUT transmits PDELAY_REQ on the port P1 with following parameters and record correction field (CF4).

```
        PTP Header
            Message Type            = 0x01
            Domain Number           = DN1
```

Step 42: Check whether CF4 = (-1) * DA4 (with margin of error).

Step 43: Disable asymmetryCorrectionPortDS.enable.

Note: The asymmetryCorrectionPortDS.enable is not allowed to be set to FALSE in the High Accuracy Default PTP Profile. Despite providing FALSE value of this data set member to the DUT, it is expected that the value of asymmetryCorrectionPortDS.enable remains TRUE and the measurements of meanDelay and delayAsymmetry are made accordingly.

Step 44: Observe that DUT transmits PDELAY_REQ message on the port P1 with following parameters to ensure the DUT is ready with configured asymmetryCorrectionPortDS.enable value.

```
        PTP Header
```

Message Type = 0x02
Domain Number = DN1

Step 45: Check whether the non-zero absolute value of currentDS. offsetFromMaster in DUT becomes lowest as possible to ensure that the DUT synchronizes it's time with TEE.

Step 46: Get currentDS.meanDelay (MD5) value for Port P1 in DUT.

Step 47: Get delayAsymmetry (DA5) value for Port P1 in DUT.

Step 48: Check whether DA5 = (-1) * MD5 (with margin of error).

Step 49: Observe that DUT transmits PDELAY_REQ on the port P1 with following parameters and record correction field (CF5).

PTP Header
Message Type = 0x02
Domain Number = DN1

Step 50: Verify whether CF5 = (-1) * DA5 (with margin of error).

Note: The default value of margin of error can be changed through ATTEST GUI (i.e., Go to Configuration Manager and select desired configuration, go to Protocol Options > PTP-HA > Global).

5.5. tc_conf_ptp-ha_pag_006

```
Test Case         : tc_conf_ptp-ha_pag_006
Test Case Version : 1.4
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP Accuracy Group (PAG)

Title             : Calculation of delayAsymmetry in Peer to Peer Delay
                    mechanism when DUT is master

Purpose           : To verify that a PTP enabled device performs computation
                    of delayAsymmetry each time the value of meanDelay is
                    updated in Peer to Peer Delay mechanism when DUT is
                    master.

Reference         : P1588/D1.3, February 2018 V3.01 clause 16.8.3 page 302
                    Clause 7.4.2 Page 73

Conformance Type  : SHALL
```

Topology

```
          TEE                                    DUT
     +--------------+                     +-------------+
     |              |                     |             |
     |              |                     |             |
```

```
        |              |                     |             |
        |              |                     |             |
        |      BC      | T1               P1 |    OC/BC    |
        |    (Slave)   |---------------------|   (Master)  |
        |              |                     |             |
        |              |                     |             |
        |              |                     |             |
        |              |                     |             |
        +--------------+                     +-------------+
```

```
Legends:

    TEE     : Test Execution Engine
    DUT     : Device Under Test
    OC      : Ordinary Clock
    BC      : Boundary Clock
    T1      : Port 1 at TEE
    P1      : Port 1 at DUT
```

Ladder Diagram   :

```
         TEE                                                      DUT
          |                                                        |
          |                                          <Enable PTP> | P1
          |                           <Enable PTP with BC/OC clock> |
          |                        <Clock mode - one-step/two-step> |
          |                            <Set delay mechanism as P2P> |
          |                         <Configure logAnnounceInterval, | P1
          |                                 announceReceiptTimeout> |
          |                             <Configure logSyncInterval> | P1
          |                      <Configure logMinDelayReqInterval> | P1
          |                        <Configure Priority1, Priority2> | P1
          |                                         <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                         <Disable L1SynOptParams option> | P1
          |              <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |              timestampCorrectionPortDS.ingressLatency, |
          |           asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                        |
          |  <Configure timestampCorrectionPortDS.egressLatency |
          |                            value to -4 000 000 000 ns> |
          |                                                        |
          | <Configure timestampCorrectionPortDS.ingressLatency |
          |                            value to -4 000 000 000 ns> |
          |                                                        |
          |              <Enable asymmetryCorrectionPortDS.enable> | P1
          |                                                        |
          |                             ANNOUNCE [MSG_TYPE = 0x0B, |
          |                                    DN = DN1, PRI1 = X] |
      T1  |--------------------------------------------------<<--| P1
          |                                                        |
          | ANNOUNCE [MSG_TYPE = 0x0B,                             |
```

```
   | DN = DN1, PRI1 = X+1]                                 |
T1 |-->>---------------------------------------------------| P1
   |                                                       |
T1 | <Enable auto responder to Pdelay_Req messages>        | P1
   |                                                       |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1]   |
T1 |-------------------------------------------------<<--| P1
   |                                                       |
   |                   <Get portDS.meanLinkDelay (MLD1)>   |
   |                                                       |
   |                          <Get delayAsymmetry (DA1)>   |
   |                                                       |
   |                                     <Check DA1 = 0>   |
   |                                                       |
   |    PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, CF = CF1]   |
T1 |-------------------------------------------------<<--| P1
   |                                                       |
   |                                     <Check CF1 = 0>   |
   |                                                       |
   |               <Configure asymmetryCorrectionPortDS.   |
   |                              scaledDelayCoefficient   |
   |                                            to 2^62>   |
   |                                                       |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1]   |
T1 |-------------------------------------------------<<--| P1
   |                                                       |
   |                   <Get portDS.meanLinkDelay (MLD2)>   |
   |                                                       |
   |                          <Get delayAsymmetry (DA2)>   |
   |                                                       |
   |                          <Check DA2 = (1/3) * MLD2>   |
   |                                                       |
   |    PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, CF = CF2]   |
T1 |-------------------------------------------------<<--| P1
   |                                                       |
   |                            <Check CF2 = (-1) * DA2>   |
   |                                                       |
   |               <Configure asymmetryCorrectionPortDS.   |
   |                                   constantAsymmetry   |
   |                                       to 2^(32+16)>   |
   |                                                       |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1]   |
T1 |-------------------------------------------------<<--| P1
   |                                                       |
   |                   <Get portDS.meanLinkDelay (MLD3)>   |
   |                                                       |
   |                          <Get delayAsymmetry (DA3)>   |
   |                                                       |
   |              <Check DA2 = (1/3) * MLD3 + 2^(32+16)>   |
   |                                                       |
   |    PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, CF = CF3]   |
T1 |-------------------------------------------------<<--| P1
   |                                                       |
   |                            <Check CF3 = (-1) * DA3>   |
   |                                                       |
   |               <Configure asymmetryCorrectionPortDS.   |
   |                              scaledDelayCoefficient   |
```

```
      |                                           to -2^62> |
      |                                                     |
      |                <Configure asymmetryCorrectionPortDS. |
      |                                  constantAsymmetry |
      |                                              to 0> |
      |                                                     |
      |               PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1] |
   T1 |------------------------------------------------<<--| P1
      |                                                     |
      |                   <Get portDS.meanLinkDelay (MLD4)> |
      |                                                     |
      |                          <Get delayAsymmetry (DA4)> |
      |                                                     |
      |                           <Check DA4 = (-1) * MLD4> |
      |                                                     |
      |     PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, CF = CF4] |
   T1 |------------------------------------------------<<--| P1
      |                                                     |
      |                            <Check CF4 = (-1) * DA4> |
      |                                                     |
      |          <Disable asymmetryCorrectionPortDS.enable> | P1
      |                                                     |
      |               PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1] |
   T1 |------------------------------------------------<<--| P1
      |                                                     |
      |                   <Get portDS.meanLinkDelay (MLD5)> |
      |                                                     |
      |                          <Get delayAsymmetry (DA5)> |
      |                                                     |
      |                           <Check DA5 = (-1) * MLD5> |
      |                                                     |
      |       PDELAY_REQ [MSG_TYPE=0X02, DN = DN1, CF = CF5] |
   T1 |------------------------------------------------<<--| P1
      |                                                     |
      |                            <Check CF5 = (-1) * DA5> |
      |                                                     |
```

```
Legends           :

    MSG_TYPE         = Message Type
    DN               = Domain Number
    PRT1             = priority1
    SEQ_ID           = Sequence ID
    CF1 - CF5        = Correction Field
    DA1 - DA5        = currentDS.delayAsymmetry
    MLD1 - MLD5      = currentDS.meanLinkDelay

NOTE :

 1. This objective is verified using the High Accuracy Peer to Peer Default
    PTP Profile



Procedure         :

(Initial Part)
```

```
Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure delaymechanism as Peer to peer.
   vi.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
  vii.   Enable L1SYNC on DUT's port P1.
 viii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
   ix.   Disable L1SynOptParams on DUT.
    x.   Enable asymmetryCorrectionPortDS.enable.
   xi.   Configure default values for timestampCorrectionPortDS.
         egressLatency = 0, timestampCorrectionPortDS.egressLatency = 0,
         asymmetryCorrectionPortDS.constantAsymmetry = 0 and
         asymmetryCorrectionPortDS.scaledDelayCoefficient = 0.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Configure egressLatency and ingressLatency on port P1 by setting
         egressLatency and ingressLatency to -4 000 000 000 ns.

Step 4 : Enable asymmetryCorrectionPortDS.enable.

Step 5 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Priority1     = X

Step 6 : Send periodic ANNOUNCE message with Priority1 value decremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Priority1     = X+1

Step 7 : Enable auto responder to respond every Pdelay_Req messages received
         on port T1.

Step 8 : Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters.

             PTP Header
                 Message Type               = 0x02
                 Domain Number              = DN1
```

```
Step 9 : Get portDS.meanLinkDelay (MLD1) value for Port P1 in DUT.

Step 10: Get delayAsymmetry (DA1) value for Port P1 in DUT.

Step 10: Check whether DA1 = 0.

Step 11: Observe that DUT transmits PDELAY_REQ on the port P1 with following
         parameters and record correction field (CF1).

             PTP Header
                 Message Type             = 0x01
                 Domain Number            = DN1

Step 12: Check whether CF1 = 0.

Step 13: Configure scaledDelayCoefficient on port P1 by setting
         scaledDelayCoefficient to 1 (i.e., the value of dataset expressed
         in RelativeDifference asymmetryCorrectionPortDS.
         scaledDelayCoefficient = 2^62).

Step 14: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters to ensure the DUT is ready with configured
         asymmetryCorrectionPortDS.scaledDelayCoefficient value.

             PTP Header
                 Message Type              = 0x02
                 Domain Number             = DN1

Step 15: Get portDS.meanLinkDelay (MLD2) value for Port P1 in DUT.

Step 16: Get delayAsymmetry (DA2) value for Port P1 in DUT.

Step 17: Check whether DA2 = (1/3)*MLD2 (with margin of error).

Step 18: Observe that DUT transmits PDELAY_REQ on the port P1 with following
         parameters and record correction field (CF2).

             PTP Header
                 Message Type             = 0x01
                 Domain Number            = DN1

Step 19: Check whether CF2 = (-1) * DA2 (with margin of error).

Step 20: Configure constantAsymmetry on port P1 by setting constantAsymmetry
         to 4 294 967 296 ns (i.e., the value of dataset expressed in
         TimeInterval asymmetryCorrectionPortDS.constantAsymmetry = 2^48).

Step 21: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters to ensure the DUT is ready with configured
         asymmetryCorrectionPortDS.constantAsymmetry value.

             PTP Header
                 Message Type              = 0x02
                 Domain Number             = DN1

Step 22: Get portDS.meanLinkDelay (MLD3) value for Port P1 in DUT.
```

```
Step 23: Get delayAsymmetry (DA3) value for Port P1 in DUT.

Step 24: Check whether DA3 = (1/3)*MLD2 + 4 294 967 296 ns (i.e., 2^(32+16)
         in TimeInterval) (with margin of error).

Step 25: Observe that DUT transmits PDELAY_REQ on the port P1 with following
         parameters and record correction field (CF3).

             PTP Header
                 Message Type             = 0x01
                 Domain Number            = DN1

Step 26: Check whether CF3 = (-1) * DA3 (with margin of error).

Step 27: Configure scaledDelayCoefficient on port P1 by setting
         scaledDelayCoefficient to -1 (i.e., the value of dataset expressed
         in RelativeDifference asymmetryCorrectionPortDS.
         scaledDelayCoefficient = -2^62).

Step 28: Configure constantAsymmetry on port P1 by setting constantAsymmetry
         to 0 (i.e., the value of dataset expressed in TimeInterval
         asymmetryCorrectionPortDS.constantAsymmetry = 0).

Step 29: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters to ensure the DUT is ready with configured
         asymmetryCorrectionPortDS.scaledDelayCoefficient and
         asymmetryCorrectionPortDS.constantAsymmetry values.

             PTP Header
                 Message Type              = 0x02
                 Domain Number             = DN1

Step 30: Get portDS.meanLinkDelay (MLD4) value for Port P1 in DUT.

Step 31: Get delayAsymmetry (DA4) value for Port P1 in DUT.

Step 32: Check whether DA4 = (-1) * MLD4 (with margin of error).

Step 33: Observe that DUT transmits PDELAY_REQ on the port P1 with following
         parameters and record correction field (CF4).

             PTP Header
                 Message Type             = 0x01
                 Domain Number            = DN1

Step 34: Check whether CF4 = (-1) * DA4 (with margin of error).

Step 35: Disable asymmetryCorrectionPortDS.enable.

Note: The asymmetryCorrectionPortDS.enable is not allowed to be set to FALSE
      in the High Accuracy Default PTP Profile. Despite providing FALSE
      value of this data set member to the DUT, it is expected that the
      value of asymmetryCorrectionPortDS.enable remains TRUE and the
      measurements of meanDelay and delayAsymmetry are made accordingly.

Step 36: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters to ensure the DUT is ready with configured
```

```
         asymmetryCorrectionPortDS.enable value.

             PTP Header
                 Message Type              = 0x02
                 Domain Number             = DN1

Step 37: Get portDS.meanLinkDelay (MLD5) value for Port P1 in DUT.

Step 38: Get delayAsymmetry (DA5) value for Port P1 in DUT.

Step 39: Check whether DA5 = (-1) * MLD5 (with margin of error).

Step 40: Observe that DUT transmits PDELAY_REQ on the port P1 with following
         parameters and record correction field (CF5).

             PTP Header
                 Message Type             = 0x02
                 Domain Number            = DN1

Step 41: Verify whether CF5 = (-1) * DA5 (with margin of error).

Note: The default value of margin of error can be changed through ATTEST GUI
      (i.e., Go to Configuration Manager and select desired configuration,
      go to Protocol Options > PTP-HA > Global).
```

5.6. tc_conf_ptp-ha_pag_007

```
Test Case         : tc_conf_ptp-ha_pag_007
Test Case Version : 1.1
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP Accuracy Group (PAG)

Title             : Egress timestamp in Pdelay_Resp message

Purpose           : To verify that a PTP enabled device generates Egress
                    timestamp in Pdelay_Resp (event) messages from
                    timestampCorrectionPortDS.egressLatency when using
                    Peer to Peer Delay mechanism.

Reference         : IEEE 1588-2017 Clause 16.7.1 Page 301, Clause 7.3.4.2
                    Page 68, Clause 8.2.16.2 Page 128

Conformance Type  : SHALL
```

Topology

```
             TEE                                 DUT
       +--------------+                    +-------------+
       |              |                    |             |
       |              |                    |             |
       |              |                    |             |
       |              |                    |             |
```

```
          |       BC       | T1                P1 |     OC/BC     |
          |    (Master)    |----------------------|    (Slave)    |
          |                |                      |               |
          |                |                      |               |
          |                |                      |               |
          |                |                      |               |
          +----------------+                      +---------------+


  Legends:

      TEE      : Test Execution Engine
      DUT      : Device Under Test
      OC       : Ordinary Clock
      BC       : Boundary Clock
      T1       : Port 1 at TEE
      P1       : Port 1 at DUT




Ladder Diagram    :

         TEE                                                      DUT
          |                                                        |
          |                                         <Enable PTP>   | P1
          |                        <Enable PTP with BC/OC clock>   |
          |                     <Clock mode - one-step/two-step>   |
          |                         <Set delay mechanism as P2P>   |
          |                      <Configure logAnnounceInterval,   | P1
          |                              announceReceiptTimeout>   |
          |                          <Configure logSyncInterval>   | P1
          |                  <Configure logMinDelayReqInterval>    | P1
          |                     <Configure Priority1, Priority2>   | P1
          |                                       <Enable L1SYNC>  | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout>    | P1
          |                      <Disable L1SynOptParams option>   | P1
          |           <Enable asymmetryCorrectionPortDS.enable>    | P1
          | <Configure timestampCorrectionPortDS.egressLatency,    | P1
          |           timestampCorrectionPortDS.ingressLatency,    |
          |        asymmetryCorrectionPortDS.constantAsymmetry,    |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient>    |
          |                                                        |
          |                          ANNOUNCE [MSG_TYPE = 0x0B,    |
          |                          DN = DN1, PRI1 = X]           |
      T1  |-------------------------------------------------<<--| P1
          |                                                        |
          | ANNOUNCE [MSG_TYPE = 0x0B,                             |
          |   DN = DN1, PRI1 = X-1]                                |
      T1  |-->>----------------------------------------------------| P1
          |                                                        |
          | <Send Sync/ Sync & Follow-up messages                  |
          | based on clock step>                                   |
          |                                                        |
          | PTP SIGNALING with L1 Sync TLV                         |
          | [MSG_TYPE = 0xC, DN = DN1,                             |
          | TLV_TYPE = 0x8001, TCR = 1,                            |
```

```
      | RCR = 1, CR = 1, ITC = 1,                             |
      | IRC = 1, IC = 1]                                      |
   T1 |-->>---------------------------------------------------| P1
      |                                                       |
      |            <Check L1SYNC port status - L1_SYNC_UP>    | P1
      |                                                       |
      | PDELAY_REQ [MSG_TYPE = 0x01, DN = DN1]                |
   T1 |-->>---------------------------------------------------| P1
      |                                                       |
      |                      PDELAY_RESP [MSG_TYPE = 0x09,    |
      |                                          DN = DN1]    |
   T1 |------------------------------------------------<<--| P1
      |                                                       |
      | <Check non-zero absolute value of currentDS.          |
      |             offsetFromMaster is lowest as possible>   |
      |                                                       |
      | <Calculate meanDelay (MD1)>                           |
      |                                                       |
      |  <Configure timestampCorrectionPortDS.egressLatency   |
      |                                value to 2^(32+16)>    |
      |                                                       |
      | PDELAY_REQ [MSG_TYPE = 0x01, DN = DN1]                |
   T1 |-->>---------------------------------------------------| P1
      |                                                       |
      |                      PDELAY_RESP [MSG_TYPE = 0x09,    |
      |                                          DN = DN1]    |
   T1 |------------------------------------------------<<--| P1
      |                                                       |
      | <Check non-zero absolute value of currentDS.          |
      |             offsetFromMaster is lowest as possible>   |
      |                                                       |
      | <Calculate meanDelay (MD2)>                           |
      |                                                       |
      |                       MD2 < MD1                       |
      |                                                       |
      |  <Configure timestampCorrectionPortDS.egressLatency   |
      |                               value to -2^(32+16)>    |
      |                                                       |
      | PDELAY_REQ [MSG_TYPE = 0x01, DN = DN1]                |
   T1 |-->>---------------------------------------------------| P1
      |                                                       |
      |                      PDELAY_RESP [MSG_TYPE = 0x09,    |
      |                                          DN = DN1]    |
   T1 |------------------------------------------------<<--| P1
      |                                                       |
      | <Check non-zero absolute value of currentDS.          |
      |             offsetFromMaster is lowest as possible>   |
      |                                                       |
      | <Calculate meanDelay (MD3)>                           |
      |                                                       |
      |                       MD3 > MD1                       |
      |                                                       |

Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
```

```
    PRT1      = priority1
    DTS       = DUT's Timestamp
```

NOTE :

1. This objective is verified using the High Accuracy Peer to Peer Default PTP Profile

2. meanDelay is calculated with below formulae:
   * For one-step clock:

     [(t4 - t1) - <correctedPdelayRespCorrectionField>]/2

   * For two-step clock:
     [(t4 - t1) - (responseOriginTimestamp - requestReceiptTimestamp) - <correctedPdelayRespCorrectionField> - correctionField of Pdelay_Resp_Follow_Up]/2

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure delaymechanism as Peer to peer.
- vi. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vii. Enable L1SYNC on DUT's port P1.
- viii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- ix. Disable L1SynOptParams on DUT.
- x. Enable asymmetryCorrectionPortDS.enable.
- xi. Configure default values for timestampCorrectionPortDS. egressLatency = 0, timestampCorrectionPortDS.ingressLatency = 0, asymmetryCorrectionPortDS.constantAsymmetry = 0 and asymmetryCorrectionPortDS.scaledDelayCoefficient = 0.

Step 2 : Initialization of TEE
- i. Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with following parameters.

```
        PTP Header
            Message Type     = 0x0B
            Domain Number    = DN1
            Priority1        = X
```

Step 4 : Send periodic ANNOUNCE message on port T1 with following parameters

```
            PTP Header
                Message Type     = 0x0B
                Domain Number    = DN1
                Priority1        = X-1

Step 5 : Send periodic SYNC message on the port P1 with following
         parameters:

            PTP Header
                Message Type     = 0x00
                Domain Number    = DN1

Step 5a: If the clock is two-step clock, send periodic FOLLOW_UP message on
         port T1 with following parameters:

            PTP Header
                Message Type     = 0x08
                Domain Number    = DN1

Step 6 : Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1
                ITC           = 1
                IRC           = 1
                IC            = 1

Step 7 : Observe that the DUT's L1SYNC port status of P1 is L1_SYNC_UP.

Step 8 :  Send periodic PDELAY_REQ message on port T1 with following
          parameters.

            PTP Header
                Message Type     = 0x01
                Domain Number    = DN1

Step 9 : Observe that the DUT transmits PDELAY_RESP message on the port P1
         with following parameters.

             PTP Header
                 Message Type    = 0x09
                 Domain Number   = DN1

Step 10: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 11: Calculate meanDelay (MD1) at TEE.
```

```
Step 12: Configure egressLatency on port P1 by setting egressLatency to
         4 294 967 296 ns (i.e., the value of dataset expressed in
         TimeInterval asymmetryCorrectionPortDS.egressLatency = 2^48).

Step 13: Send periodic PDELAY_REQ message on port T1 with following
         parameters.

             PTP Header
                 Message Type     = 0x01
                 Domain Number    = DN1

Step 14: Observe that the DUT transmits PDELAY_RESP message on the port P1
         with following parameters.

              PTP Header
                  Message Type    = 0x09
                  Domain Number   = DN1

Step 15: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 16: Calculate meanDelay (MD2) at TEE.

Step 17: Observe that MD2 is lesser than MD1.

Step 18: Configure egressLatency on port P1 by setting egressLatency to
         -4 294 967 296 ns (i.e., the value of dataset expressed in
         TimeInterval asymmetryCorrectionPortDS.egressLatency = -2^48).

Step 19: Send periodic PDELAY_REQ message on port T1 with following
         parameters.

             PTP Header
                 Message Type     = 0x01
                 Domain Number    = DN1

Step 20: Observe that the DUT transmits PDELAY_RESP message on the port P1
         with following parameters.

              PTP Header
                  Message Type    = 0x09
                  Domain Number   = DN1

Step 21: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 22: Calculate meanDelay (MD3) at TEE.

Step 23: Verify that MD3 is greater than MD1.
```

5.7. tc_conf_ptp-ha_pag_008


```
Test Case         : tc_conf_ptp-ha_pag_008
Test Case Version : 1.8
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP Accuracy Group (PAG)

Title             : Ingress timestamp in Sync message

Purpose           : To verify that a PTP enabled device generates Ingress
                    timestamp in Sync (event) messages from
                    timestampCorrectionPortDS.ingressLatency when using
                    Delay Request-Response mechanism.

Reference         : IEEE 1588-2017 Clause 16.7.1 Page 301, Clause 7.3.4.2
                    Page 68, Clause 8.2.16.2 Page 128

Conformance Type  : SHALL
```

Topology

```
           TEE                                    DUT
      +--------------+                      +--------------+
      |              |                      |              |
      |              |                      |              |
      |              |                      |              |
      |              |                      |              |
      |              | T1                P1 |              |
      |      BC      |----------------------|    OC/BC     |
      |              |                      |              |
      |              |                      |              |
      |              |                      |              |
      |              |                      |              |
      +--------------+                      +--------------+
```

```
Legends:

    TEE     : Test Execution Engine
    DUT     : Device Under Test
    OC      : Ordinary Clock
    BC      : Boundary Clock
    T1      : Port 1 at TEE
    P1      : Port 1 at DUT
```

```
Ladder Diagram    :

         TEE                                                  DUT
          |                                                    |
          |                                     <Enable PTP> | P1
          |                       <Enable PTP with BC/OC clock> |
          |                    <Clock mode - one-step/two-step> |
          |                     <Configure logAnnounceInterval, | P1
          |                             announceReceiptTimeout> |
```

```
    |                       <Configure logSyncInterval> | P1
    |                <Configure logMinDelayReqInterval> | P1
    |                  <Configure Priority1, Priority2> | P1
    |                                    <Enable L1SYNC> | P1
    |   <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
    |                   <Disable L1SynOptParams option> | P1
    |         <Enable asymmetryCorrectionPortDS.enable> | P1
    | <Configure timestampCorrectionPortDS.egressLatency, | P1
    |           timestampCorrectionPortDS.ingressLatency, |
    |        asymmetryCorrectionPortDS.constantAsymmetry, |
    |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
    |                                                     |
    |                        ANNOUNCE [MSG_TYPE = 0x0B,  |
    |                        DN = DN1, PRI1 = X]          |
 T1 |-------------------------------------------------<<--| P1
    |                                                     |
    | ANNOUNCE [MSG_TYPE = 0x0B,                          |
    |   DN = DN1, PRI1 = X-1]                             |
 T1 |-->>--------------------------------------------------| P1
    |                                                     |
 T1 | <Enable auto responder to Delay_Req messages>       | P1
    |                                                     |
    | <Send Sync/ Sync & Follow-up msgs                   |
    | based on clock step>                                |
    |                                                     |
    |         < Wait for 6s to complete BMCA >            |
    |                                                     |
    | PTP SIGNALING with L1 Sync TLV                      |
    | [MSG_TYPE = 0xC, DN = DN1,                          |
    | TLV_TYPE = 0x8001, TCR = 1,                         |
    | RCR = 1, CR = 1, ITC = 1,                           |
    | IRC = 1, IC = 1]                                    |
 T1 |-->>--------------------------------------------------| P1
    |                                                     |
    |            <Check L1SYNC port status - L1_SYNC_UP> | P1
    |                                                     |
    | <Check non-zero absolute value of currentDS.        |
    |            offsetFromMaster is lowest as possible> |
    |                                                     |
    | SYNC [MSG_TYPE = 0x00, DN = DN1,                    |
    | SEET1(ORG_TS = OTS1, CF = SYNC_CF1)]                |
 T1 |-->>--------------------------------------------------| P1
    |                                                     |
    | <If Clock Step = Two Step, then                     |
    |      send FOLLOW_UP and include CF = FU_CF1>        |
    |                                                     |
    |                           <Get DUT's time (DTS1)> |
    |                                                     |
    |                 DTS1 - SEET1 < 1                    |
    |                                                     |
    | <Configure timestampCorrectionPortDS.ingressLatency |
    |                              value to 2^(32+16)> |
    |                                                     |
    |    PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC, |
    |                          DN = DN1,TLV_TYPE=0x8001] |
 T1 |-------------------------------------------------<<--| P1
    |                                                     |
```

```
        | <Send Sync/ Sync & Follow-up msgs                     |
        | based on clock step>                                  |
        |                                                       |
        | <Check non-zero absolute value of currentDS.          |
        |             offsetFromMaster is lowest as possible>   |
        |                                                       |
        | SYNC [MSG_TYPE = 0x00, DN = DN1,                      |
        | SEET2(ORG_TS = OTS2, CF = SYNC_CF2)]                  |
     T1 |-->>---------------------------------------------------| P1
        |                                                       |
        | <If Clock Step = Two Step, then                       |
        |      send FOLLOW_UP and include CF = FU_CF2>          |
        |                                                       |
        |                            <Get DUT's time (DTS2)>    |
        |                                                       |
        |                  DTS2 - SEET2 > 1                     |
        |                                                       |
        | <Configure timestampCorrectionPortDS.ingressLatency   |
        |                              value to -2^(32+16)>     |
        |                                                       |
        |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,   |
        |                         DN = DN1,TLV_TYPE=0x8001]     |
     T1 |-----------------------------------------------<<--| P1
        |                                                       |
        | <Send Sync/ Sync & Follow-up msgs                     |
        | based on clock step>                                  |
        |                                                       |
        | <Check non-zero absolute value of currentDS.          |
        |             offsetFromMaster is lowest as possible>   |
        |                                                       |
        | SYNC [MSG_TYPE = 0x00, DN = DN1,                      |
        | SEET3(ORG_TS = OTS3, CF = SYNC_CF3)]                  |
     T1 |-->>---------------------------------------------------| P1
        |                                                       |
        | <If Clock Step = Two Step, then                       |
        |      send FOLLOW_UP and include CF = FU_CF3>          |
        |                                                       |
        |                            <Get DUT's time (DTS3)>    |
        |                                                       |
        |                  SEET3 - DTS3 > 1                     |
        |                                                       |

Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRT1      = priority1
    ORG_TS    = Origin Timestamp
    CF        = CorrectionField
    DTS       = DUT's Timestamp
    SEET      = SyncEventEgressTimestamp

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile
```

```
Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
     i.   Enable DUT's port P1.
    ii.   Enable PTP on port P1.
   iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
    iv.   Configure clock mode as One-step/Two-step.
     v.   Configure default values for Priority1, Priority2,
          logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
          logMinDelayReqInterval.
    vi.   Enable L1SYNC on DUT's port P1.
   vii.   Configure default values for L1SyncInterval and
          L1SyncReceiptTimeout.
  viii.   Disable L1SynOptParams on DUT.
    ix.   Enable asymmetryCorrectionPortDS.enable.
     x.   Configure default values for timestampCorrectionPortDS.
          egressLatency = 0, timestampCorrectionPortDS.ingressLatency = 0,
          asymmetryCorrectionPortDS.constantAsymmetry = 0 and
          asymmetryCorrectionPortDS.scaledDelayCoefficient = 0.

Step 2 : Initialization of TEE
     i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type         = 0x0B
                 Domain Number        = DN1
                 Priority1            = X

Step 4 : Send periodic ANNOUNCE message on port T1 with following parameters

             PTP Header
                 Message Type         = 0x0B
                 Domain Number        = DN1
                 Priority1            = X-1

Step 5 : Enable auto responder to respond every Delay_Req messages received
         on port T1.

Step 6 : Send periodic SYNC message on port T1 with following parameters.

             PTP Header
                 Message Type         = 0x00
                 Domain Number        = DN1
                 Source Port Identity = E
                 Sequence ID          = B

Step 6a: If the clock is two step, send periodic FOLLOW_UP message on port
         T1 with following parameters.
```

```
            PTP Header
                Message Type         = 0x08
                Domain Number        = DN1
                Source Port Identity = E
                Sequence ID          = B

Step 7 : Wait for 6s to complete BMCA.

Step 8 : Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1
                ITC           = 1
                IRC           = 1
                IC            = 1

Step 9 : Observe that the DUT's L1SYNC port status of P1 is L1_SYNC_UP.

Step 10: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 11: Send SYNC message on port T1 with following parameters.

            PTP Header
                Message Type         = 0x00
                Domain Number        = DN1
                Source Port Identity = E
                Sequence ID          = B
                Origin Timestamp     = OTS1
                Correction Field     = SYNC_CF1

Step 11a:If the clock is two step, send FOLLOW_UP message on port T1 with
         following parameters.

            PTP Header
                Message Type         = 0x08
                Domain Number        = DN1
                Source Port Identity = E
                Sequence ID          = B
                Correction Field     = FU_CF1

Note: Calculate SyncEventEgressTimestamp (SEET1) from SYNC and FOLLOW_UP
      messages.

Step 12: Get DUT's time and convert it into epoch Timestamp (DTS1).

Step 13: Observe that time difference of DTS1 and SEET1 is lesser than 1
         (i.e., DTS1 - SEET1 < 1)
```

```
Step 14: Configure ingressLatency on port P1 by setting ingressLatency to
         4 294 967 296 ns (i.e., the value of dataset expressed in
         TimeInterval asymmetryCorrectionPortDS.ingressLatency = 2^48).

Step 15: Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 16: Send periodic SYNC message on port T1 with following parameters.

             PTP Header
                 Message Type         = 0x00
                 Domain Number        = DN1
                 Source Port Identity = E
                 Sequence ID          = B

Step 16a:If the clock is two step, send periodic FOLLOW_UP message on port
         T1 with following parameters.

             PTP Header
                 Message Type         = 0x08
                 Domain Number        = DN1
                 Source Port Identity = E
                 Sequence ID          = B

Step 17: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 18: Send SYNC message on port T1 with following parameters.

             PTP Header
                 Message Type         = 0x00
                 Domain Number        = DN1
                 Source Port Identity = E
                 Sequence ID          = B
                 Origin Timestamp     = OTS2
                 Correction Field     = SYNC_CF2

Step 18a:If the clock is two step, send FOLLOW_UP message on port T1 with
         following parameters.

             PTP Header
                 Message Type         = 0x08
                 Domain Number        = DN1
                 Source Port Identity = E
                 Sequence ID          = B
                 Correction Field     = FU_CF2

Note: Calculate SyncEventEgressTimestamp (SEET2) from SYNC and FOLLOW_UP
      messages.
```

```
Step 19: Get DUT's time and convert it into epoch Timestamp (DTS2).

Step 20: Observe that time difference of DTS2 and SEET2 is greater than 1.
         (i.e., DTS2 - SEET2 > 1)

Step 21: Configure ingressLatency on port P1 by setting ingressLatency to
         -4 294 967 296 ns (i.e., the value of dataset expressed in
         TimeInterval asymmetryCorrectionPortDS.ingressLatency = -2^48).

Step 22: Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 23: Send periodic SYNC message on port T1 with following parameters.

             PTP Header
                 Message Type         = 0x00
                 Domain Number        = DN1
                 Source Port Identity = E
                 Sequence ID          = B

Step 23a:If the clock is two step, send periodic FOLLOW_UP message on port
         T1 with following parameters.

             PTP Header
                 Message Type         = 0x08
                 Domain Number        = DN1
                 Source Port Identity = E
                 Sequence ID          = B

Step 24: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 25: Send SYNC message on port T1 with following parameters.

             PTP Header
                 Message Type         = 0x00
                 Domain Number        = DN1
                 Source Port Identity = E
                 Sequence ID          = B
                 Origin Timestamp     = OTS3
                 Correction Field     = SYNC_CF3

Step 25a:If the clock is two step, send FOLLOW_UP message on port T1 with
         following parameters.

             PTP Header
                 Message Type         = 0x08
                 Domain Number        = DN1
                 Source Port Identity = E
```

```
                  Sequence ID          = B
                  Correction Field     = FU_CF3

Note: Calculate SyncEventEgressTimestamp (SEET3) from SYNC and FOLLOW_UP
      messages.

Step 26: Get DUT's time and convert it into epoch Timestamp (DTS3).

Step 27: Verify that time difference of SEET3 and DTS3 is greater than 1.
         (i.e., SEET3 - DTS3 > 1)
```

5.8. tc_conf_ptp-ha_pag_009

```
Test Case          : tc_conf_ptp-ha_pag_009
Test Case Version  : 1.4
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP Accuracy Group (PAG)

Title              : Ingress timestamp in Delay_Req message

Purpose            : To verify that a PTP enabled device generates Ingress
                     timestamp in Delay_Req (event) messages from
                     timestampCorrectionPortDS.ingressLatency when using
                     Delay Request-Response mechanism.

Reference          : IEEE 1588-2017 Clause 16.7.1 Page 301, Clause 7.3.4.2
                     Page 68, Clause 8.2.16.2 Page 128, Clause 11.3.2
                     Page 193

Conformance Type   : SHALL
```

Topology

```
                  TEE                                  DUT
            +---------------+                    +--------------+
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               | T1              P1 |              |
            |      BC       |--------------------|    OC/BC     |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            +---------------+                    +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
```



```
OC      : Ordinary Clock
BC      : Boundary Clock
T1      : Port 1 at TEE
P1      : Port 1 at DUT
```

```
Ladder Diagram    :

         TEE                                                    DUT
          |                                                      |
          |                                        <Enable PTP>  | P1
          |                       <Enable PTP with BC/OC clock>  |
          |                    <Clock mode - one-step/two-step>  |
          |                     <Configure logAnnounceInterval,  | P1
          |                             announceReceiptTimeout>  |
          |                         <Configure logSyncInterval>  | P1
          |                  <Configure logMinDelayReqInterval>  | P1
          |                    <Configure Priority1, Priority2>  | P1
          |                                      <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout>  | P1
          |                     <Disable L1SynOptParams option>  | P1
          |           <Enable asymmetryCorrectionPortDS.enable>  | P1
          | <Configure timestampCorrectionPortDS.egressLatency,  | P1
          |           timestampCorrectionPortDS.ingressLatency,  |
          |        asymmetryCorrectionPortDS.constantAsymmetry,  |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient>  |
          |                                                      |
          |                          ANNOUNCE [MSG_TYPE = 0x0B,  |
          |                          DN = DN1, PRI1 = X]         |
       T1 |-----------------------------------------------<<--| P1
          |                                                      |
          | ANNOUNCE [MSG_TYPE = 0x0B,                           |
          |   DN = DN1, PRI1 = X+1]                              |
       T1 |-->>-----------------------------------------------| P1
          |                                                      |
          |                    SYNC [MSG_TYPE = 0x00, DN = DN1]  |
       T1 |-----------------------------------------------<<--| P1
          |                                                      |
          |                    SYNC [MSG_TYPE = 0x00, DN = DN1,  |
          |                ORG_TS = S_OTS1, CF = SYNC_CF1](TS1)  |
       T1 |-----------------------------------------------<<--| P1
          |                                                      |
          |                     <If Clock Step = Two Step, then  |
          |          receive FOLLOW_UP and include CF = FU_CF1>  |
          |                                                      |
          | DELAY_REQ [MSG_TYPE = 0x01, DN = DN1,                |
          |  ORG_TS = D_OTS1, CF = 0](TS2)                       |
       T1 |-->>-----------------------------------------------| P1
          |                                                      |
          |                         DELAY_RESP [MSG_TYPE = 0x09, |
          |                                DN = DN1, RTS = RTS1] |
       T1 |-->>-----------------------------------------------| P1
          |                                                      |
          | <Calculate meanDelay (MD1)>                          |
          |                                                      |
```

```
        | <Configure timestampCorrectionPortDS.ingressLatency |
        |                                 value to 2^(32+16)> |
        |                                                     |
        |                    SYNC [MSG_TYPE = 0x00, DN = DN1, |
        |                ORG_TS = S_OTS2, CF = SYNC_CF2](TS1) |
     T1 |------------------------------------------------<<--| P1
        |                                                     |
        |                     <If Clock Step = Two Step, then |
        |          receive FOLLOW_UP and include CF = FU_CF2> |
        |                                                     |
        | DELAY_REQ [MSG_TYPE = 0x01, DN = DN1,               |
        |  ORG_TS = D_OTS2, CF = 0](TS2)                      |
     T1 |-->>-------------------------------------------------| P1
        |                                                     |
        |                        DELAY_RESP [MSG_TYPE = 0x09, |
        |                               DN = DN1, RTS = RTS2] |
     T1 |-->>-------------------------------------------------| P1
        |                                                     |
        | <Calculate meanDelay (MD2)>                         |
        |                                                     |
        |                       MD2 < MD1                     |
        |                                                     |
        | <Configure timestampCorrectionPortDS.ingressLatency |
        |                                value to -2^(32+16)> |
        |                                                     |
        |                    SYNC [MSG_TYPE = 0x00, DN = DN1, |
        |                ORG_TS = S_OTS3, CF = SYNC_CF3](TS1) |
     T1 |------------------------------------------------<<--| P1
        |                                                     |
        |                     <If Clock Step = Two Step, then |
        |          receive FOLLOW_UP and include CF = FU_CF3> |
        |                                                     |
        | DELAY_REQ [MSG_TYPE = 0x01, DN = DN1,               |
        |  ORG_TS = D_OTS3, CF = 0](TS2)                      |
     T1 |-->>-------------------------------------------------| P1
        |                                                     |
        |                        DELAY_RESP [MSG_TYPE = 0x09, |
        |                               DN = DN1, RTS = RTS3] |
     T1 |-->>-------------------------------------------------| P1
        |                                                     |
        | <Calculate meanDelay (MD3)>                         |
        |                                                     |
        |                       MD3 > MD1                     |
        |                                                     |

Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRT1      = priority1
    ORG_TS    = originTimestamp
    CF        = correctionField
    RTS       = receiveTimestamp
    TS        = Timestamp

NOTE :
```

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

2. meanDelay is calculated with below formulae:
   * For one-step clock:

     [(t2 - t3) + (receiveTimestamp of Delay_Resp message - originTimestamp of Sync message) - <correctedSyncCorrectionField> - correctionField of Delay_Resp message]/2.

   * For two-step clock:
     [(t2 - t3) + (receiveTimestamp of Delay_Resp message - preciseOriginTimestamp of Follow_Up message) - <correctedSyncCorrectionField> - correctionField of Follow_Up message - correctionField of Delay_Resp message]/2.

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS.egressLatency = 0, timestampCorrectionPortDS.ingressLatency = 0, asymmetryCorrectionPortDS.constantAsymmetry = 0 and asymmetryCorrectionPortDS.scaledDelayCoefficient = 0.

Step 2 : Initialization of TEE
- i. Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with following parameters.

```
PTP Header
    Message Type     = 0x0B
    Domain Number    = DN1
    Priority1        = X
```

Step 4 : Send periodic ANNOUNCE message on port T1 with following parameters

```
PTP Header
    Message Type     = 0x0B
```

```
                Domain Number    = DN1
                Priority1        = X+1

Step 5 : Observe that DUT transmits SYNC message on port P1 with following
         parameters.

             PTP Header
                 Message Type         = 0x00
                 Domain Number        = DN1

Step 6 : Observe that DUT transmits SYNC message on port P1 with following
         parameters and store timestamp TS1.

             PTP Header
                 Message Type         = 0x00
                 Domain Number        = DN1
                 Origin Timestamp     = S_OTS1
                 Correction Field     = SYNC_CF1

Step 7 : If the clock is two step, observe that DUT transmits FOLLOW_UP
         message on the port P1 with following parameters.

             PTP Header
                 Message Type         = 0x08
                 Domain Number        = DN1
                 Correction Field     = FU_CF1

Step 8 : Send DELAY_REQ message on port T1 with following parameters and
         store timestamp TS2.

             PTP Header
                 Message Type         = 0x01
                 Domain Number        = DN1
                 Origin Timestamp     = D_OTS1
                 Correction Field     = 0

Step 9 : Observe that the DUT transmits DELAY_RESP message on the port P1
         with following parameters.

              PTP Header
                  Message Type        = 0x09
                  Domain Number       = DN1
                  Receive Timestamp   = RTS1

Step 10: Calculate meanDelay (MD1) at TEE.

Step 11: Configure ingressLatency on port P1 by setting ingressLatency to
         4 294 967 296 ns (i.e., the value of dataset expressed in
         TimeInterval asymmetryCorrectionPortDS.ingressLatency = 2^48).

Step 12: Observe that DUT transmits SYNC message on port P1 with following
         parameters and store timestamp TS1.

             PTP Header
                 Message Type         = 0x00
                 Domain Number        = DN1
                 Origin Timestamp     = S_OTS2
```

```
                Correction Field     = SYNC_CF2

Step 13: If the clock is two step, observe that DUT transmits FOLLOW_UP
         message on the port P1 with following parameters.

             PTP Header
                 Message Type         = 0x08
                 Domain Number        = DN1
                 Correction Field     = FU_CF2

Step 14: Send DELAY_REQ message on port T1 with following parameters and
         store timestamp TS2.

             PTP Header
                 Message Type         = 0x01
                 Domain Number        = DN1
                 Origin Timestamp     = D_OTS2
                 Correction Field     = 0

Step 15: Observe that the DUT transmits DELAY_RESP message on the port P1
         with following parameters.

              PTP Header
                  Message Type        = 0x09
                  Domain Number       = DN1
                  Receive Timestamp   = RTS2

Step 16: Calculate meanDelay (MD2) at TEE.

Step 17: Observe that MD2 is lesser than MD1.

Step 18: Configure ingressLatency on port P1 by setting ingressLatency to
         -4 294 967 296 ns (i.e., the value of dataset expressed in
         TimeInterval asymmetryCorrectionPortDS.ingressLatency = -2^48).

Step 19: Observe that DUT transmits SYNC message on port P1 with following
         parameters and store timestamp TS1.

             PTP Header
                 Message Type         = 0x00
                 Domain Number        = DN1
                 Origin Timestamp     = S_OTS3
                 Correction Field     = SYNC_CF3

Step 20: If the clock is two step, observe that DUT transmits FOLLOW_UP
         message on the port P1 with following parameters.

             PTP Header
                 Message Type         = 0x08
                 Domain Number        = DN1
                 Correction Field     = FU_CF3

Step 21: Send DELAY_REQ message on port T1 with following parameters and
         store timestamp TS2.

             PTP Header
                 Message Type         = 0x01
```

```
                 Domain Number        = DN1
                 Origin Timestamp     = D_OTS3
                 Correction Field     = 0

Step 22: Observe that the DUT transmits DELAY_RESP message on the port P1
         with following parameters.

              PTP Header
                  Message Type        = 0x09
                  Domain Number       = DN1
                  Receive Timestamp   = RTS3

Step 23: Calculate meanDelay (MD3) at TEE.

Step 24: Verify that MD3 is greater than MD1.
```

5.9. tc_conf_ptp-ha_pag_010

```
Test Case          : tc_conf_ptp-ha_pag_010
Test Case Version  : 1.0
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP Accuracy Group (PAG)

Title              : Ingress timestamp in Pdelay_Req message

Purpose            : To verify that a PTP enabled device generates Ingress
                     timestamp in Pdelay_Req (event) messages from
                     timestampCorrectionPortDS.ingressLatency when using
                     Peer to Peer Delay mechanism.

Reference          : IEEE 1588-2017 Clause 16.7.1 Page 301, Clause 7.3.4.2
                     Page 68, Clause 8.2.16.2 Page 128, Clause 11.3.2
                     Page 192

Conformance Type   : SHALL
```

Topology

```
             TEE                                 DUT
      +--------------+                     +-------------+
      |              |                     |             |
      |              |                     |             |
      |              |                     |             |
      |              |                     |             |
      |      BC      | T1               P1 |    OC/BC    |
      |    (Slave)   |---------------------|   (Master)  |
      |              |                     |             |
      |              |                     |             |
      |              |                     |             |
      |              |                     |             |
      +--------------+                     +-------------+
```

```
Legends:

    TEE     : Test Execution Engine
    DUT     : Device Under Test
    OC      : Ordinary Clock
    BC      : Boundary Clock
    T1      : Port 1 at TEE
    P1      : Port 1 at DUT


Ladder Diagram    :

         TEE                                                    DUT
          |                                                      |
          |                                        <Enable PTP> | P1
          |                        <Enable PTP with BC/OC clock> |
          |                     <Clock mode - one-step/two-step> |
          |                         <Set delay mechanism as P2P> |
          |                      <Configure logAnnounceInterval, | P1
          |                              announceReceiptTimeout> |
          |                          <Configure logSyncInterval> | P1
          |                  <Configure logMinDelayReqInterval> | P1
          |                     <Configure Priority1, Priority2> | P1
          |                                      <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                      <Disable L1SynOptParams option> | P1
          |            <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |           timestampCorrectionPortDS.ingressLatency, |
          |        asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                      |
          |                          ANNOUNCE [MSG_TYPE = 0x0B, |
          |                          DN = DN1, PRI1 = X]        |
      T1  |------------------------------------------------<<--| P1
          |                                                      |
          | ANNOUNCE [MSG_TYPE = 0x0B,                           |
          |   DN = DN1, PRI1 = X+1]                              |
      T1  |-->>--------------------------------------------------| P1
          |                                                      |
          | PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,               |
          |  SRC_PRT_ID = E, SEQ_ID = D,                         |
          |  ORG_TS = 0, CF = 0](TS1)                            |
      T1  |-->>--------------------------------------------------| P1
          |                                                      |
          |            PDELAY_RESP [MSG_TYPE = 0x03, DN = DN1, |
          |                     SRC_MAC = SRC1, CLK_ID = CLK1, |
          |                         REQ_PRT_ID = E, SEQ_ID = D |
          |                  RRT = RRT1, CF = PDRESP_CF1](TS2) |
      T1  |-->>--------------------------------------------------| P1
          |                                                      |
          |                     <If Clock Step = Two Step, then |
          |           receive Pdelay_Resp_Follow_Up and include |
          |                     ROT = ROT1, CF = PDRESP_FU_CF1> |
          |                                                      |
```

```
     | <Calculate meanDelay (MD1)>                      |
     |                                                  |
     | <Configure timestampCorrectionPortDS.ingressLatency |
     |                                  value to 2^32> |
     |                                                  |
     | PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,           |
     |  CLK_ID = CLK1, SRC_PRT_ID = E, SEQ_ID = D,      |
     |  ORG_TS = 0, CF = 0](TS1)                        |
  T1 |-->>----------------------------------------------| P1
     |                                                  |
     |             PDELAY_RESP [MSG_TYPE = 0x03, DN = DN1, |
     |                      SRC_MAC = SRC1, CLK_ID = CLK1, |
     |                          REQ_PRT_ID = E, SEQ_ID = D |
     |                RRT = RRT2, CF = PDRESP_CF2](TS2) |
  T1 |-->>----------------------------------------------| P1
     |                                                  |
     |                     <If Clock Step = Two Step, then |
     |           receive Pdelay_Resp_Follow_Up and include |
     |                     ROT = ROT2, CF = PDRESP_FU_CF2> |
     |                                                  |
     | <Calculate meanDelay (MD2)>                      |
     |                                                  |
     | <Configure timestampCorrectionPortDS.ingressLatency |
     |                            value to -2^(32+16)> |
     |                                                  |
     | PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,           |
     |  SRC_PRT_ID = E, SEQ_ID = D,                     |
     |  ORG_TS = 0, CF = 0](TS1)                        |
  T1 |-->>----------------------------------------------| P1
     |                                                  |
     |             PDELAY_RESP [MSG_TYPE = 0x03, DN = DN1, |
     |                      SRC_MAC = SRC1, CLK_ID = CLK1, |
     |                          REQ_PRT_ID = E, SEQ_ID = D |
     |                RRT = RRT3, CF = PDRESP_CF3](TS2) |
  T1 |-->>----------------------------------------------| P1
     |                                                  |
     |                     <If Clock Step = Two Step, then |
     |           receive Pdelay_Resp_Follow_Up and include |
     |                     ROT = ROT3, CF = PDRESP_FU_CF3> |
     |                                                  |
     | <Calculate meanDelay (MD3)>                      |
     |                                                  |
     |               MD2 < MD1 & MD3 > MD1              |
     |                                                  |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRT1      = priority1
```

NOTE :

1. This objective is verified using the High Accuracy Peer to Peer Default PTP Profile

2. meanDelay is calculated with below formulae:

* For one-step clock:

[(t4 - t1) - <correctedPdelayRespCorrectionField>]/2

* For two-step clock:
[(t4 - t1) - (responseOriginTimestamp - requestReceiptTimestamp) - <correctedPdelayRespCorrectionField> - correctionField of Pdelay_Resp_Follow_Up]/2

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
i. Enable DUT's port P1.
ii. Enable PTP on port P1.
iii. Enable PTP globally with device type as Boundary/Ordinary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure delaymechanism as Peer to peer.
vi. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vii. Enable L1SYNC on DUT's port P1.
viii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
ix. Disable L1SynOptParams on DUT.
x. Enable asymmetryCorrectionPortDS.enable.
xi. Configure default values for timestampCorrectionPortDS. egressLatency = 0, timestampCorrectionPortDS.egressLatency = 0, asymmetryCorrectionPortDS.constantAsymmetry = 0 and asymmetryCorrectionPortDS.scaledDelayCoefficient = 0.

Step 2 : Initialization of TEE
i. Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with following parameters.

PTP Header
Message Type = 0x0B
Domain Number = DN1
Priority1 = X

Step 4 : Send periodic ANNOUNCE message on port T1 with following parameters

PTP Header
Message Type = 0x0B
Domain Number = DN1
Priority1 = X+1

Step 5 : Send PDELAY_REQ message on the port T1 with following parameters and store timestamp TS1.

```
        PTP Header
            Message Type          = 0x02
            Domain Number         = DN1
            Clock ID              = CLK1
            Sequence ID           = D
            Source Port Identity = E
            Origin Timestamp      = 0
            Correction Field      = 0
```

Step 6 : Observe that the DUT transmits PDELAY_RESP on port T1 and with following parameters and store timestamp TS2.

```
        PTP Header
            Message Type               = 0x03
            Domain Number              = DN1
            Source Mac                 = SRC1
            Clock ID                   = CLK1
            Sequence Id                = D
            Requesting Port Identity  = E
            Request Receipt Timestamp = RRT1
            Correction Field           = PDRESP_CF1
```

Step 6a: If the clock is two step, observe that DUT transmits PDELAY_RESP_FOLLOW_UP message on port P1 with following parameters.

```
        PTP Header
            Message Type               = 0x0A
            Domain Number              = DN1
            Sequence Id                = D
            Source Port Identity       = F
            Requesting Port Identity  = E
            Correction Field           = PDRESP_FU_CF1
```

Step 7 : Calculate meanDelay (MD1) at TEE.

Step 8 : Configure ingressLatency on port P1 by setting ingressLatency to 4 294 967 296 ns (i.e., the value of dataset expressed in TimeInterval asymmetryCorrectionPortDS.ingressLatency = 2^48).

Step 9 : Send PDELAY_REQ message on the port T1 with following parameters and store timestamp TS1.

```
        PTP Header
            Message Type          = 0x02
            Domain Number         = DN1
            Sequence ID           = D
            Source Port Identity = E
            Origin Timestamp      = 0
            Correction Field      = 0
```

Step 10: Observe that the DUT transmits PDELAY_RESP on port T1 and with following parameters and store timestamp TS2.

```
        PTP Header
            Message Type               = 0x03
            Domain Number              = DN1
            Source Mac                 = SRC1
```

```
        Clock ID                    = CLK1
        Sequence Id                 = D
        Requesting Port Identity    = E
        Request Receipt Timestamp   = RRT2
        Correction Field            = PDRESP_CF2
```

Step 10a: If the clock is two step, observe that DUT transmits PDELAY_RESP_FOLLOW_UP message on port P1 with following parameters.

```
    PTP Header
        Message Type                = 0x0A
        Domain Number               = DN1
        Sequence Id                 = D
        Source Port Identity        = F
        Requesting Port Identity    = E
        Correction Field            = PDRESP_FU_CF2
```

Step 11: Calculate meanDelay (MD2) at TEE.

Step 12: Configure ingressLatency on port P1 by setting ingressLatency to -4 294 967 296 ns (i.e., the value of dataset expressed in TimeInterval asymmetryCorrectionPortDS.ingressLatency = -2^48).

Step 13: Send PDELAY_REQ message on the port T1 with following parameters and store timestamp TS1.

```
    PTP Header
        Message Type          = 0x02
        Domain Number         = DN1
        Sequence ID           = D
        Source Port Identity  = E
        Origin Timestamp      = 0
        Correction Field      = 0
```

Step 14: Observe that the DUT transmits PDELAY_RESP on port T1 and with following parameters and store timestamp TS2.

```
    PTP Header
        Message Type                = 0x03
        Domain Number               = DN1
        Source Mac                  = SRC1
        Clock ID                    = CLK1
        Sequence Id                 = D
        Requesting Port Identity    = E
        Request Receipt Timestamp   = RRT3
        Correction Field            = PDRESP_CF3
```

Step 14a: If the clock is two step, observe that DUT transmits PDELAY_RESP_FOLLOW_UP message on port P1 with following parameters.

```
    PTP Header
        Message Type                = 0x0A
        Domain Number               = DN1
        Sequence Id                 = D
        Source Port Identity        = F
        Requesting Port Identity    = E
        Correction Field            = PDRESP_FU_CF3
```



```
Step 15: Calculate meanDelay (MD3) at TEE.

Step 16: Verify that MD2 < MD1 & MD3 > MD1.
```

5.10. tc_conf_ptp-ha_pag_011

```
Test Case          : tc_conf_ptp-ha_pag_011
Test Case Version : 1.2
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP Accuracy Group (PAG)

Title              : Ingress timestamp in Pdelay_Resp message

Purpose            : To verify that a PTP enabled device generates Ingress
                     timestamp in Pdelay_Resp (event) messages from
                     timestampCorrectionPortDS.ingressLatency when using
                     Peer to Peer Delay mechanism.

Reference          : IEEE 1588-2017 Clause 16.7.1 Page 301, Clause 7.3.4.2
                     Page 68, Clause 8.2.16.2 Page 128

Conformance Type  : SHALL
```

Topology

```
           TEE                                  DUT
    +---------------+                    +--------------+
    |               |                    |              |
    |               |                    |              |
    |               |                    |              |
    |               |                    |              |
    |      BC       | T1              P1 |    OC/BC     |
    |   (Master)    |--------------------|   (Slave)    |
    |               |                    |              |
    |               |                    |              |
    |               |                    |              |
    |               |                    |              |
    +---------------+                    +--------------+
```

```
Legends:

    TEE     : Test Execution Engine
    DUT     : Device Under Test
    OC      : Ordinary Clock
    BC      : Boundary Clock
    T1      : Port 1 at TEE
    P1      : Port 1 at DUT
```

```
Ladder Diagram    :

         TEE                                                  DUT
          |                                                    |
          |                                       <Enable PTP> | P1
          |                     <Enable PTP with BC/OC clock> |
          |                  <Clock mode - one-step/two-step> |
          |                      <Set delay mechanism as P2P> |
          |                   <Configure logAnnounceInterval, | P1
          |                           announceReceiptTimeout> |
          |                       <Configure logSyncInterval> | P1
          |                <Configure logMinDelayReqInterval> | P1
          |                  <Configure Priority1, Priority2> | P1
          |                                    <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                   <Disable L1SynOptParams option> | P1
          |             <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |            timestampCorrectionPortDS.ingressLatency, |
          |         asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                    |
          |                          ANNOUNCE [MSG_TYPE = 0x0B, |
          |                          DN = DN1, PRI1 = X]       |
       T1 |------------------------------------------------<<--| P1
          |                                                    |
          | ANNOUNCE [MSG_TYPE = 0x0B,                         |
          |   DN = DN1, PRI1 = X-1]                            |
       T1 |-->>------------------------------------------------| P1
          |                                                    |
       T1 | <Enable auto responder to Pdelay_Req messages>     | P1
          |                                                    |
          | <Send Sync/ Sync & Follow-up messages              |
          | based on clock step>                               |
          |                                                    |
          |          < Wait for 6s to complete BMCA >          |
          |                                                    |
          | PTP SIGNALING with L1 Sync TLV                     |
          | [MSG_TYPE = 0xC, DN = DN1,                         |
          | TLV_TYPE = 0x8001, TCR = 1,                        |
          | RCR = 1, CR = 1, ITC = 1,                          |
          | IRC = 1, IC = 1]                                   |
       T1 |-->>------------------------------------------------| P1
          |                                                    |
          |            <Check L1SYNC port status - L1_SYNC_UP> | P1
          |                                                    |
          | <Check non-zero absolute value of currentDS.       |
          |            offsetFromMaster is lowest as possible> |
          |                                                    |
          |                    <Get currentDS.meanDelay (MD1)> |
          |                                                    |
          | <Configure timestampCorrectionPortDS.ingressLatency |
          |                                value to 2^(32+16)> |
          |                                                    |
          |             PDELAY_REQ [MSG_TYPE = 0x01, DN = DN1] |
       T1 |------------------------------------------------<<--| P1
```

```
          |                                                     |
          | <Check non-zero absolute value of currentDS.        |
          |             offsetFromMaster is lowest as possible> |
          |                                                     |
          |                     <Get currentDS.meanDelay (MD2)> |
          |                                                     |
          |                       MD2 < MD1                     |
          |                                                     |
          | <Configure timestampCorrectionPortDS.ingressLatency |
          |                                value to -2^(32+16)> |
          |                                                     |
          |              PDELAY_REQ [MSG_TYPE = 0x01, DN = DN1] |
       T1 |-------------------------------------------------<<--| P1
          |                                                     |
          | <Check non-zero absolute value of currentDS.        |
          |             offsetFromMaster is lowest as possible> |
          |                                                     |
          |                     <Get currentDS.meanDelay (MD3)> |
          |                                                     |
          |                       MD3 > MD1                     |
          |                                                     |
```

```
Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRT1      = priority1
    DTS       = DUT's Timestamp
```

NOTE :

1. This objective is verified using the High Accuracy Peer to Peer Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's port P1.
ii. Enable PTP on port P1.
iii. Enable PTP globally with device type as Boundary/Ordinary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure delaymechanism as Peer to peer.
vi. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vii. Enable L1SYNC on DUT's port P1.
viii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
ix. Disable L1SynOptParams on DUT.
x. Enable asymmetryCorrectionPortDS.enable.
xi. Configure default values for timestampCorrectionPortDS. egressLatency = 0, timestampCorrectionPortDS.egressLatency = 0, asymmetryCorrectionPortDS.constantAsymmetry = 0 and

```
        asymmetryCorrectionPortDS.scaledDelayCoefficient = 0.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type     = 0x0B
                 Domain Number    = DN1
                 Priority1        = X

Step 4 : Send periodic ANNOUNCE message on port T1 with following parameters

             PTP Header
                 Message Type     = 0x0B
                 Domain Number    = DN1
                 Priority1        = X-1

Step 5 : Enable auto responder to respond every Pdelay_Req messages received
         on port T1.

Step 6 : Send periodic SYNC message on the port P1 with with following
         parameters:

             PTP Header
                 Message Type     = 0x00
                 Domain Number    = DN1

Step 6a: If the clock is two-step clock, send periodic FOLLOW_UP message on
         port T1 with following parameters:

             PTP Header
                 Message Type     = 0x08
                 Domain Number    = DN1

Step 7: Wait for 6s for completing BMCA.

Step 8 : Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 1
                 IRC           = 1
                 IC            = 1

Step 9 : Observe that the DUT's L1SYNC port status of P1 is L1_SYNC_UP.
```

```
Step 10: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 11: Get currentDS.meanDelay (MD1) of DUT.

Step 12: Configure ingressLatency on port P1 by setting ingressLatency to
         4 294 967 296 ns (i.e., the value of dataset expressed in
         TimeInterval asymmetryCorrectionPortDS.ingressLatency = 2^48).

Step 13: Observe that the DUT transmits PDELAY_REQ message on port P1 with
         following parameters to ensure the DUT is ready with configured
         asymmetryCorrectionPortDS.ingressLatency value.

             PTP Header
                 Message Type     = 0x01
                 Domain Number    = DN1

Step 14: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 15: Get currentDS.meanDelay (MD2) of DUT.

Step 16: Observe that MD2 is lesser than MD1.

Step 17: Configure ingressLatency on port P1 by setting ingressLatency to
         -4 294 967 296 ns (i.e., the value of dataset expressed in
         TimeInterval asymmetryCorrectionPortDS.ingressLatency = -2^48).

Step 18: Observe that the DUT transmits PDELAY_REQ message on port P1 with
         following parameters to ensure the DUT is ready with configured
         asymmetryCorrectionPortDS.ingressLatency value.

             PTP Header
                 Message Type     = 0x01
                 Domain Number    = DN1

Step 19: Check whether the non-zero absolute value of currentDS.
         offsetFromMaster in DUT becomes lowest as possible to ensure that
         the DUT synchronizes it's time with TEE.

Step 20: Get currentDS.meanDelay (MD3) of DUT.

Step 21: Verify that MD3 is greater than MD1.
```

6. PTP-HA Configuration Group (PCG)

6.1. tc_conf_ptp-ha_pcg_001

```
Test Case         : tc_conf_ptp-ha_pcg_001
Test Case Version : 1.4
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
```



```
Module Name       : PTP-HA Configuration Group (PCG)

Title             : Default initialization values for attributes - High
                    Accuracy Delay Request-Response mechanism

Purpose           : To verify that a PTP enabled device stores all
                    attributes with default initialization values for High
                    Accuracy Delay Request-Respone mechanism. Checking that
                    the following attributes have correct default values.
                    1) defaultDS.domainNumber = 0
                    2) portDS.logAnnounceInterval = 1
                    3) portDS.logSyncInterval = 0
                    4) portDS.logMinDelayReqInterval = 0
                    5) portDS.announceReceiptTimeout = 3
                    6) defaultDS.priority1 = 128
                    7) defaultDS.priority2 = 128
                    8) defaultDS.slaveOnly = FALSE
                    9) defaultDS.SdoId = 0x000
                    10) L1SyncBasicPortDS.L1SyncEnabled = TRUE
                    11) L1SyncBasicPortDS.txCoherencyIsRequired = TRUE
                    12) L1SyncBasicPortDS.rxCoherencyIsRequired = TRUE
                    13) L1SyncBasicPortDS.congruencyIsRequired = TRUE
                    14) L1SyncBasicPortDS.optParametersConfigured = FALSE
                    15) L1SyncBasicPortDS.logL1SyncInterval = 0
                    16) L1SyncBasicPortDS.L1SyncReceiptTimeout = 3
                    17) defaultDS.externalPortConfigurationEnabled = FALSE
                    18) timestampCorrectionPortDS.egressLatency = Default is
                        zero unless specified otherwise by implementation.
                    19) timestampCorrectionPortDS.ingressLatency = Default
                        is zero unless specified otherwise by
                        implementation.
                    20) asymmetryCorrectionPortDS.constantAsymmetry =
                        Default is zero unless specified otherwise by
                        implementation.
                    21) asymmetryCorrectionPortDS.scaledDelayCoefficient =
                        Default is zero unless specified otherwise by
                        implementation.
                    22) asymmetryCorrectionPortDS.enable = TRUE
                    23) portDS.masterOnly = FALSE
                    Note: The default values of these attributes can be
                    changed through ATTEST GUI (Go to Configuration Manager
                    and select desired configuration, go to
                    Protocol Options > PTP-HA > PTP-HA Attributes).

Reference         : P1588/D1.3, February 2018 V3.01 Clause J.5.2 Page 412,
                    Table 150 Page 413

Conformance Type  : MUST
```

Topology

```
              TEE                                  DUT
        +---------------+                   +--------------+
        |               |                   |              |
        |               |                   |              |
        |               |                   |              |
```

```
        |              |                     |             |
        |              | T1               P1 |             |
        |      BC      |---------------------|    OC/BC    |
        |              |                     |             |
        |              |                     |             |
        |              |                     |             |
        |              |                     |             |
        +--------------+                     +-------------+

Legends:

    TEE     : Test Execution Engine
    DUT     : Device Under Test
    OC      : Ordinary Clock
    BC      : Boundary Clock
    T1      : Port 1 at TEE
    P1      : Port 1 at DUT


Ladder Diagram    :

        TEE                                                   DUT
         |                                                     |
         |                       <Enable PTP with BC/OC clock> |
         |                    <Clock mode - one-step/two-step> |
         |                                        <Enable PTP> | P1
         |                                     <Enable L1SYNC> | P1
         |                                                     |
         |                   <Check portDS.masterOnly = FALSE> | P1
         |                                                     |
         |                 <Check defaultDS.slaveOnly = FALSE> | P1
         |                                                     |
         | <Check timestampCorrectionPortDS.egressLatency = 0> | P1
         |                                                     |
         | <Check timestampCorrectionPortDS.ingressLatency = 0>| P1
         |                                                     |
         |                                             <Check  | P1
         |    asymmetryCorrectionPortDS.constantAsymmetry = 0> |
         |                                                     |
         |                                             <Check  | P1
         | asymmetryCorrectionPortDS.scaledDelayCoefficient=0> |
         |                                                     |
         |                                              <Check | P1
         | defaultDS.externalPortConfigurationEnabled = FALSE> |
         |                                                     |
         |                                             <Check  | P1
         |            asymmetryCorrectionPortDS.enable = TRUE> |
         |                                                     |
         |                        ANNOUNCE [MSG_TYPE = 0x0B,   |
         |                    DN = 0, PRI1 = 128, PRI2 = 128,  |
         |                     SDOID = 0x000, Timestamp = Ta]  |
      T1 |------------------------------------------------<<--| P1
         |                                                     |
         |                        ANNOUNCE [MSG_TYPE = 0x0B,   |
         |                    DN = 0, PRI1 = 128, PRI2 = 128,  |
         |                     SDOID = 0x000, Timestamp = Tb]  |
      T1 |------------------------------------------------<<--| P1
```



```
   |                                                    |
   |                        ANNOUNCE [MSG_TYPE = 0x0B, |
   |                   DN = 0, PRI1 = 128, PRI2 = 128, |
   |                    SDOID = 0x000, Timestamp = Tc] |
T1 |-------------------------------------------------<<--| P1
   |                                                    |
   |              <Check ((Tb - Ta) + (Tc - Tb))/2 = 2s> |
   |                                                    |
   | ANNOUNCE [MSG_TYPE = 0x0B,                         |
   | DN = 0, PRI1 = 129, PRI2 = 128,                    |
   | SDOID = 0x000]                                     |
T1 |-->>-------------------------------------------------| P1
   |                                                    |
   |                            SYNC [MSG_TYPE = 0x00, |
   |                   DN = 0, PRI1 = 128, PRI2 = 128, |
   |                    SDOID = 0x000, Timestamp = Ta] |
T1 |-------------------------------------------------<<--| P1
   |                                                    |
   |                            SYNC [MSG_TYPE = 0x00, |
   |                   DN = 0, PRI1 = 128, PRI2 = 128, |
   |                    SDOID = 0x000, Timestamp = Tb] |
T1 |-------------------------------------------------<<--| P1
   |                                                    |
   |                            SYNC [MSG_TYPE = 0x00, |
   |                   DN = 0, PRI1 = 128, PRI2 = 128, |
   |                    SDOID = 0x000, Timestamp = Tc] |
T1 |-------------------------------------------------<<--| P1
   |                                                    |
   |              <Check ((Tb - Ta) + (Tc - Tb))/2 = 1s> |
   |                                                    |
   |               PTP_SIGNALING message with L1SYNC TLV |
   |    [MSG_TYPE = 0xC, DN = 0, PRI1 = 128, PRI2 = 128, |
   |           SDOID = 0x000, TCR = 1,  RCR = 1, CR = 1, |
   |                            OPE = 0, Timestamp = Ta] |
T1 |-------------------------------------------------<<--| P1
   |                                                    |
   |               PTP_SIGNALING message with L1SYNC TLV |
   |    [MSG_TYPE = 0xC, DN = 0, PRI1 = 128, PRI2 = 128, |
   |           SDOID = 0x000, TCR = 1,  RCR = 1, CR = 1, |
   |                            OPE = 0, Timestamp = Tb] |
T1 |-------------------------------------------------<<--| P1
   |                                                    |
   |               PTP_SIGNALING message with L1SYNC TLV |
   |    [MSG_TYPE = 0xC, DN = 0, PRI1 = 128, PRI2 = 128, |
   |           SDOID = 0x000, TCR = 1,  RCR = 1, CR = 1, |
   |                            OPE = 0, Timestamp = Tc] |
T1 |-------------------------------------------------<<--| P1
   |                                                    |
   |              <Check ((Tb - Ta) + (Tc - Tb))/2 = 1s> |
   |                                                    |
   | ANNOUNCE [MSG_TYPE = 0x0B,                         |
   | DN = 0, PRI1 = 127, PRI2 = 128,                    |
   | SDOID = 0x000]                                     |
T1 |-->>-------------------------------------------------| P1
   |                                                    |
   | <Send Sync/ Sync & Follow-up messages              |
   | based on clock step>                               |
```

```
     |                                                      |
     |          < Wait for 6s to complete BMCA >            |
     |                                                      |
     |                        DELAY_REQ [MSG_TYPE = 0x01,   |
     |                    DN = 0, PRI1 = 128, PRI2 = 128,   |
     |                     SDOID = 0x000, Timestamp = Ta]   |
  T1 |-------------------------------------------------<<--| P1
     |                                                      |
     |                        DELAY_REQ [MSG_TYPE = 0x01,   |
     |                    DN = 0, PRI1 = 128, PRI2 = 128,   |
     |                     SDOID = 0x000, Timestamp = Tb]   |
  T1 |-------------------------------------------------<<--| P1
     |                                                      |
     |                        DELAY_REQ [MSG_TYPE = 0x01,   |
     |                    DN = 0, PRI1 = 128, PRI2 = 128,   |
     |                     SDOID = 0x000, Timestamp = Tc]   |
  T1 |-------------------------------------------------<<--| P1
     |                                                      |
     |            <Check ((Tb - Ta) + (Tc - Tb))/2 <= 2s>   |
     |                                                      |
     | PTP SIGNALING with L1 Sync TLV                       |
     | [MSG_TYPE = 0xC, DN = 0,                             |
     | PRI1 = 128, PRI2 = 128, SDOID = 0x000,               |
     | TLV_TYPE = 0x8001, TCR = 0, RCR = 0, CR = 0]         |
  T1 |---->>------------------------------------------------| P1
     |                                                      |
     |            <Check L1SYNC port status - LINK_ALIVE>   | P1
     |                                                      |
     | PTP SIGNALING with L1 Sync TLV                       |
     | [MSG_TYPE = 0xC, DN = 0,                             |
     | PRI1 = 128, PRI2 = 128, SDOID = 0x000,               |
     | TLV_TYPE = 0x8001, TCR = 0, RCR = 0, CR = 0]         |
  T1 |---->>----XX                                          | P1
     |                                                      |
     |                   <Wait for 3s>                      |
     |                                                      |
     |                  <Check L1SYNC port status - IDLE>   | P1
     |                                                      |
     | ANNOUNCE [MSG_TYPE = 0x0B,                           |
     | DN = 0, PRI1 = 127, PRI2 = 128,                      |
     | SDOID = 0x000]                                       |
  T1 |---->>----XX                                          | P1
     |                                                      |
     |                         ANNOUNCE [MSG_TYPE = 0x0B,   |
     |                             DN = 0, SDOID = 0x000]   |
  T1 |                    XX---------------------------<<--| P1
     |                                        (within 6s)   |
     |                                                      |
     |                         ANNOUNCE [MSG_TYPE = 0x0B,   |
     |                             DN = 0, SDOID = 0x000]   |
  T1 |-------------------------------------------------<<--| P1
     |                                                      |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
```

```
    BC        = Boundary Clock
    OC        = Ordinary Clock

NOTE :

 1. This objective is verified using the High Accuracy Delay
    Request-Response Default PTP Profile



Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
     i.   Enable DUT's port P1.
    ii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iii.   Configure clock mode as One-step/Two-step.
    iv.   Enable PTP on port P1.
     v.   Enable L1SYNC on DUT's port P1.

Step 2 : Initialization of TEE
     i.   Add port T1 at TEE.

(Part 1)

Step 3 : Verify whether portDS.masterOnly is set to FALSE on port P1.

Step 4 : Verify whether defaultDS.slaveOnly is set to FALSE.

Step 5 : Verify whether timestampCorrectionPortDS.egressLatency = 0 on
         port P1.

Step 6 : Verify whether timestampCorrectionPortDS.ingressLatency = 0 on
         port P1.

Step 7 : Verify whether timestampCorrectionPortDS.constantAsymmetry = 0 on
         port P1.

Step 8 : Verify whether timestampCorrectionPortDS.scaledDelayCoefficient = 0
         on port P1.

Step 9 : Verify whether asymmetryCorrectionPortDS.enable is set to TRUE on
         port P1.

Step 10: Verify whether defaultDS.externalPortConfigurationEnabled is set to
         FALSE on port P1.

Step 11: Check whether that the DUT transmits three consecutive ANNOUNCE
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

             PTP Header
                 Message Type       = 0x0B
                 Domain Number      = 0
                 Priority1          = 128
                 Priority2          = 128
```

```
                majorSdoId         = 0
                minorSdoId         = 0

Step 12: Verify whether ((Tb - Ta) + (Tc - Tb))/2 = 2s

Step 13: Send periodic ANNOUNCE message on port T1 with following
         parameters:

            PTP Header
                Message Type       = 0x0B
                Domain Number      = 0
                Priority1          = 129
                Priority2          = 128
                majorSdoId         = 0
                minorSdoId         = 0

Step 14: Check whether that the DUT transmits three consecutive SYNC
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

            PTP Header
                Message Type       = 0x00
                Domain Number      = 0
                Priority1          = 128
                Priority2          = 128
                majorSdoId         = 0
                minorSdoId         = 0

Step 15: Verify whether ((Tb - Ta) + (Tc - Tb))/2 = 1s

Step 16: Check whether that the DUT transmits three consecutive PTP
         SIGNALING message with L1 Sync TLV messages on the port P1 with
         following parameters and store timestamps Ta, Tb and Tc for
         messages respectively.

            PTP Header
                Message Type       = 0xC
                Domain Number      = DN1
                Priority1          = 128
                Priority2          = 128
                majorSdoId         = 0
                minorSdoId         = 0
            L1_SYNC TLV
                TLV_TYPE           = 0x8001
                TCR                = 1
                RCR                = 1
                CR                 = 1
                OPE                = 0

Step 17: Verify whether ((Tb - Ta) + (Tc - Tb))/2 = 1s

Step 18: Send periodic ANNOUNCE message on port T1 with following
         parameters:

            PTP Header
                Message Type       = 0x0B
                Domain Number      = 0
```

```
                Priority1          = 127
                Priority2          = 128
                majorSdoId         = 0
                minorSdoId         = 0

Step 19: Send periodic SYNC message on the port P1 with following
          parameters:

            PTP Header
                Message Type       = 0x00
                Domain Number      = 0
                majorSdoId         = 0
                minorSdoId         = 0

Step 19a:If the clock is two-step clock, send periodic FOLLOW_UP message on
         port T1 with following parameters:

            PTP Header
                Message Type       = 0x08
                Domain Number      = 0
                majorSdoId         = 0
                minorSdoId         = 0

Step 20: Wait for 6s for completing BMCA.

Step 21: Check whether that the DUT transmits three consecutive DELAY_REQ
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

            PTP Header
                Message Type       = 0x01
                Domain Number      = 0
                Priority1          = 128
                Priority2          = 128
                majorSdoId         = 0
                minorSdoId         = 0

Step 22: Verify whether ((Tb - Ta) + (Tc - Tb))/2 <= 2s

Step 23: Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = 0
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 0
                RCR           = 0
                CR            = 0
                ITC           = 0
                IRC           = 0
                IC            = 0

Step 24: Observe that DUT's L1SYNC port status P1 is in LINK_ALIVE state.

Step 25: Stop sending L1SYNC SIGNALLING message on the port T1.
```

```
Step 26: Wait for expiry of 3s.

Step 27: Verify that DUT's L1SYNC port status P1 is in IDLE state.

Step 28: Stop ANNOUNCE, SYNC and FOLLOW_UP (if two-step clock) messages on
         port T1.

Step 29: Observe that DUT does not transmit ANNOUNCE message on the port P1
         within 6s.

             PTP Header
                 Message Type       = 0x0B
                 Domain Number      = 0
                 majorSdoId         = 0
                 minorSdoId         = 0

Step 30: Verify that DUT transmits ANNOUNCE message on the port P1 with
         following parameters:

             PTP Header
                 Message Type       = 0x0B
                 Domain Number      = 0
                 majorSdoId         = 0
                 minorSdoId         = 0
```

6.2. tc_conf_ptp-ha_pcg_002

```
Test Case          : tc_conf_ptp-ha_pcg_002
Test Case Version  : 1.2
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA Configuration Group (PCG)

Title              : Domain Number

Purpose            : To verify that a PTP enabled device supports to
                     configure domain number in range 0 to 127.

Reference          : P1588/D1.3, February 2018 V3.01 Clause J.5.2 Page 412

Conformance Type   : SHALL
```

Topology

```
                  TEE                                  DUT
            +---------------+                     +--------------+
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               | T1               P1 |              |
            |      BC       |---------------------|    OC/BC     |
            |               |                     |              |
```

```
        |              |                      |             |
        |              |                      |             |
        |              |                      |             |
        +--------------+                      +-------------+

Legends:

    TEE      : Test Execution Engine
    DUT      : Device Under Test
    OC       : Ordinary Clock
    BC       : Boundary Clock
    T1       : Port 1 at TEE
    P1       : Port 1 at DUT
```

```
Ladder Diagram    :

         TEE                                                      DUT
          |                                                        |
          |                                         <Enable PTP> | P1
          |                           <Enable PTP with BC/OC clock> |
          |                        <Clock mode - one-step/two-step> |
          |                         <Configure logAnnounceInterval, | P1
          |                                 announceReceiptTimeout> |
          |                             <Configure logSyncInterval> | P1
          |                      <Configure logMinDelayReqInterval> | P1
          |                        <Configure Priority1, Priority2> | P1
          |                                         <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                  <Disable L1SynOptParams option> | P1
          |              <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |            timestampCorrectionPortDS.ingressLatency, |
          |         asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                        |
          |    PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,   |
          |                              DN = 0,TLV_TYPE=0x8001] |
       T1 |-------------------------------------------------<<--| P1
          |                                                        |
          |                       <Configure Domain Number = 127>|
          |                                                        |
          |    PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,   |
          |                            DN = 127,TLV_TYPE=0x8001] |
       T1 |-------------------------------------------------<<--| P1
          |                                                        |
          |                       !<Configure Domain Number = -1>|
          |                                                        |
          |    PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,   |
          |                             DN = -1,TLV_TYPE=0x8001] |
       T1 |                      XX-------------------------<<--| P1
          |                                                        |
          |                         <Configure Domain Number = 0>|
          |                                                        |
          |    PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,   |
          |                              DN = 0,TLV_TYPE=0x8001] |
       T1 |-------------------------------------------------<<--| P1
```

```
          |                                                    |

Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile



Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.ingressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part I)

Step 3 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

                      PTP Header
                          Message Type  = 0xC
                          Domain Number = 0
                      L1_SYNC TLV
                          TLV_TYPE      = 0x8001

Step 4 : Configure domain number as 127 on Port P1 in DUT.

Step 5 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:
```

```
                    PTP Header
                        Message Type  = 0xC
                        Domain Number = 127
                    L1_SYNC TLV
                        TLV_TYPE      = 0x8001

Step 6 : Observe that DUT does not allow to configure domain number as -1 on
         port P1 in DUT.

Step 7 : If DUT allows to configure domain number in step 6, observe that
         DUT does not transmit PTP SIGNALING message with L1 Sync TLV on the
         port P1 with following parameters:

                    PTP Header
                        Message Type  = 0xC
                        Domain Number = -1
                    L1_SYNC TLV
                        TLV_TYPE      = 0x8001

Step 8 : Configure domain number as 0 on Port P1 in DUT.

Step 9 : Verify that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

                    PTP Header
                        Message Type  = 0xC
                        Domain Number = 0
                    L1_SYNC TLV
                        TLV_TYPE      = 0x8001
```

6.3. tc_conf_ptp-ha_pcg_003

```
Test Case          : tc_conf_ptp-ha_pcg_003
Test Case Version  : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA Configuration Group (PCG)

Title              : logAnnounceInterval

Purpose            : To verify that a PTP enabled device transmits Announce
                     messages at configured logAnnounceInterval
                     (allowable range: 0 to 4).

Reference          : P1588/D1.3, February 2018 V3.01 Clause J.5.2 Page 412
                     Clause 7.7.2.2 Page 96

Conformance Type   : SHALL
```

Topology

```
             TEE                                  DUT
        +--------------+                     +-------------+
        |              |                     |             |
```

```
       |              |                     |             |
       |              |                     |             |
       |              |                     |             |
       |              | T1               P1 |             |
       |       BC     |---------------------|    OC/BC    |
       |              |                     |             |
       |              |                     |             |
       |              |                     |             |
       |              |                     |             |
       +--------------+                     +-------------+

   Legends:

       TEE      : Test Execution Engine
       DUT      : Device Under Test
       OC       : Ordinary Clock
       BC       : Boundary Clock
       T1       : Port 1 at TEE
       P1       : Port 1 at DUT


Ladder Diagram    :

        TEE                                                     DUT
         |                                                       |
         |                                        <Enable PTP> | P1
         |                         <Enable PTP with BC/OC clock> |
         |                      <Clock mode - one-step/two-step> |
         |                       <Configure logAnnounceInterval, | P1
         |                               announceReceiptTimeout> |
         |                           <Configure logSyncInterval> | P1
         |                   <Configure logMinDelayReqInterval> | P1
         |                      <Configure Priority1, Priority2> | P1
         |                                       <Enable L1SYNC> | P1
         |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
         |                       <Disable L1SynOptParams option> | P1
         |             <Enable asymmetryCorrectionPortDS.enable> | P1
         | <Configure timestampCorrectionPortDS.egressLatency,   | P1
         |          timestampCorrectionPortDS.ingressLatency,    |
         |       asymmetryCorrectionPortDS.constantAsymmetry,    |
         |   asymmetryCorrectionPortDS.scaledDelayCoefficient>   |
         |                                                       |
         |                          ANNOUNCE [MSG_TYPE = 0x0B,   |
         |                           DN = DN1,Timestamp = Ta]    |
      T1 |-------------------------------------------------<<--| P1
         |                                                       |
         |                          ANNOUNCE [MSG_TYPE = 0x0B,   |
         |                           DN = DN1,Timestamp = Tb]    |
      T1 |-------------------------------------------------<<--| P1
         |                                                       |
         |                          ANNOUNCE [MSG_TYPE = 0x0B,   |
         |                           DN = DN1,Timestamp = Tc]    |
      T1 |-------------------------------------------------<<--| P1
         |                                                       |
         |                  <Check ((Tb - Ta) + (Tc - Tb))/2 = 2s> |
         |                                                       |
         |                     <Configure announce interval = 0> |
```

```
     |                                                     |
     |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
     |                         DN = DN1,Timestamp = Ta]    |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
     |                          DN = DN1,Timestamp = Tb]   |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
     |                          DN = DN1,Timestamp = Tc]   |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |             <Check ((Tb - Ta) + (Tc - Tb))/2 = 1s>  |
     |                                                     |
     |                  <Configure announce interval = 4>  |
     |                                                     |
     |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
     |                         DN = DN1,Timestamp = Ta]    |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
     |                          DN = DN1,Timestamp = Tb]   |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
     |                          DN = DN1,Timestamp = Tc]   |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |            <Check ((Tb - Ta) + (Tc - Tb))/2 = 16s>  |
     |                                                     |
     |                  <Configure announce interval = 1>  |
     |                                                     |
     |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
     |                         DN = DN1,Timestamp = Ta]    |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
     |                          DN = DN1,Timestamp = Tb]   |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
     |                          DN = DN1,Timestamp = Tc]   |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |             <Check ((Tb - Ta) + (Tc - Tb))/2 = 2s>  |
     |                                                     |
```

Legends   :

    MSG_TYPE = Message Type
    DN   = Domain Number

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

```
Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
     i.   Enable DUT's port P1.
    ii.   Enable PTP on port P1.
   iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
    iv.   Configure clock mode as One-step/Two-step.
     v.   Configure default values for Priority1, Priority2,
          logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
          logMinDelayReqInterval.
    vi.   Enable L1SYNC on DUT's port P1.
   vii.   Configure default values for L1SyncInterval and
          L1SyncReceiptTimeout.
  viii.   Disable L1SynOptParams on DUT.
    ix.   Enable asymmetryCorrectionPortDS.enable.
     x.   Configure default values for timestampCorrectionPortDS.
          egressLatency, timestampCorrectionPortDS.ingressLatency,
          asymmetryCorrectionPortDS.constantAsymmetry and
          asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
     i.   Add port T1 at TEE.

(Part 1)

Step 3 : Check whether that the DUT transmits three consecutive ANNOUNCE
          messages on the port P1 with following parameters and store
          timestamps Ta, Tb and Tc for messages respectively.

              PTP Header
                  Message Type       = 0x0B
                  Domain Number      = DN1

Step 4 : Check whether ((Tb - Ta) + (Tc - Tb))/2 = 2s

Step 5 : Configure Log Announce Interval as 0 on Port P1 in DUT.

Step 6 : Check whether that the DUT transmits three consecutive ANNOUNCE
          messages on the port P1 with following parameters and store
          timestamps Ta, Tb and Tc for messages respectively.

              PTP Header
                  Message Type       = 0x0B
                  Domain Number      = DN1

Step 7 : Check whether ((Tb - Ta) + (Tc - Tb))/2 = 1s

Step 8 : Configure Log Announce Interval as 4 on Port P1 in DUT.

Step 9 : Check whether that the DUT transmits three consecutive ANNOUNCE
          messages on the port P1 with following parameters and store
          timestamps Ta, Tb and Tc for messages respectively.
```

```
            PTP Header
                Message Type       = 0x0B
                Domain Number      = DN1

Step 10: Check whether ((Tb - Ta) + (Tc - Tb))/2 = 16s

Step 11: Configure Log Announce Interval as 1 on Port P1 in DUT.

Step 12: Check whether that the DUT transmits three consecutive ANNOUNCE
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

            PTP Header
                Message Type       = 0x0B
                Domain Number      = DN1

Step 13: Verify whether ((Tb - Ta) + (Tc - Tb))/2 = 2s
```

6.4. tc_conf_ptp-ha_pcg_004

```
Test Case          : tc_conf_ptp-ha_pcg_004
Test Case Version  : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA Configuration Group (PCG)

Title              : logSyncInterval

Purpose            : To verify that a PTP enabled device transmits Sync
                     messages at configured logSyncInterval (allowable
                     range: -1 to +1).

Reference          : P1588/D1.3, February 2018 V3.01 Clause J.5.2 Page 412
                     Clause 7.7.2.3 Page 96

Conformance Type   : SHALL
```

Topology

```
          TEE                                  DUT
     +---------------+                    +--------------+
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |               | T1              P1 |              |
     |      BC       |--------------------|    OC/BC     |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     +---------------+                    +--------------+
```

```
   Legends:

       TEE     : Test Execution Engine
       DUT     : Device Under Test
       OC      : Ordinary Clock
       BC      : Boundary Clock
       T1      : Port 1 at TEE
       P1      : Port 1 at DUT


Ladder Diagram    :

         TEE                                                      DUT
          |                                                        |
          |                                          <Enable PTP> | P1
          |                           <Enable PTP with BC/OC clock> |
          |                        <Clock mode - one-step/two-step> |
          |                         <Configure logAnnounceInterval, | P1
          |                                 announceReceiptTimeout> |
          |                             <Configure logSyncInterval> | P1
          |                      <Configure logMinDelayReqInterval> | P1
          |                        <Configure Priority1, Priority2> | P1
          |                                         <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                         <Disable L1SynOptParams option> | P1
          |              <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |              timestampCorrectionPortDS.ingressLatency, |
          |           asymmetryCorrectionPortDS.constantAsymmetry, |
          |    asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                        |
          |                              ANNOUNCE [MSG_TYPE = 0x0B, |
          |                                      DN = DN1,PRT1 = Z] |
       T1 |--------------------------------------------------<<--| P1
          |                                                        |
          | ANNOUNCE [MSG_TYPE = 0x0B,                             |
          |         DN = DN_1,PRT1=Z+1]                            |
       T1 |-->>----------------------------------------------------| P1
          |                                                        |
          |                         SYNC [MSG_TYPE = 0x00,DN = DN1, |
          |                                        Timestamp = Ta]  |
       T1 |--------------------------------------------------<<--| P1
          |                                                        |
          |                         SYNC [MSG_TYPE = 0x00,DN = DN1, |
          |                                        Timestamp = Tb]  |
       T1 |--------------------------------------------------<<--| P1
          |                                                        |
          |                         SYNC [MSG_TYPE = 0x00,DN = DN1, |
          |                                        Timestamp = Tc]  |
       T1 |--------------------------------------------------<<--| P1
          |                                                        |
          |                  <Check ((Tb - Ta) + (Tc - Tb))/2 = 1s> |
          |                                                        |
          |                          <Configure sync interval = -1> |
          |                                                        |
          |                         SYNC [MSG_TYPE = 0x00,DN = DN1, |
          |                                        Timestamp = Ta]  |
```

```
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                    SYNC [MSG_TYPE = 0x00,DN = DN1,  |
   |                                   Timestamp = Tb]   |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                    SYNC [MSG_TYPE = 0x00,DN = DN1,  |
   |                                   Timestamp = Tc]   |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |           <Check ((Tb - Ta) + (Tc - Tb))/2 = 0.5s>  |
   |                                                     |
   |                     <Configure sync interval =  1>  |
   |                                                     |
   |                    SYNC [MSG_TYPE = 0x00,DN = DN1,  |
   |                                   Timestamp = Ta]   |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                    SYNC [MSG_TYPE = 0x00,DN = DN1,  |
   |                                   Timestamp = Tb]   |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                    SYNC [MSG_TYPE = 0x00,DN = DN1,  |
   |                                   Timestamp = Tc]   |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |             <Check ((Tb - Ta) + (Tc - Tb))/2 = 2s>  |
   |                                                     |
   |                      <Configure sync interval = 0>  |
   |                                                     |
   |                    SYNC [MSG_TYPE = 0x00,DN = DN1,  |
   |                                   Timestamp = Ta]   |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                    SYNC [MSG_TYPE = 0x00,DN = DN1,  |
   |                                   Timestamp = Tb]   |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                    SYNC [MSG_TYPE = 0x00,DN = DN1,  |
   |                                   Timestamp = Tc]   |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |             <Check ((Tb - Ta) + (Tc - Tb))/2 = 1s>  |
   |                                                     |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRT1      = Priority1
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

```
Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.ingressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters:

             PTP Header
                 Message Type    = 0x0B
                 Domain Number   = DN1
                 Priority1       = Z

Step 4 : Send ANNOUNCE message on port T1 with following parameters:

             PTP Header
                 Message Type    = 0x0B
                 Domain Number   = DN1
                 Priority1       = Z+1

Step 5 : Check whether that the DUT transmits three consecutive SYNC
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

             PTP Header
                 Message Type       = 0x00
                 Domain Number      = DN1

Step 6 : Check whether ((Tb - Ta) + (Tc - Tb))/2 = 1s

Step 7 :Configure Sync Interval as -1 on Port P1 in DUT.

Step 8 : Check whether that the DUT transmits three consecutive SYNC
         messages on the port P1 with following parameters and store
```

```
          timestamps Ta, Tb and Tc for messages respectively.

              PTP Header
                  Message Type       = 0x00
                  Domain Number      = DN1

Step 9 : Check whether ((Tb - Ta) + (Tc - Tb))/2 = 0.5s

Step 10: Configure Sync Interval as 1 on Port P1 in DUT.

Step 11: Check whether that the DUT transmits three consecutive SYNC
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

              PTP Header
                  Message Type       = 0x00
                  Domain Number      = DN1

Step 12: Check whether ((Tb - Ta) + (Tc - Tb))/2 = 2s

Step 13: Configure Sync Interval as 0 on Port P1 in DUT.

Step 14:Check whether that the DUT transmits three consecutive SYNC
        messages on the port P1 with following parameters and store
        timestamps Ta, Tb and Tc for messages respectively.

              PTP Header
                  Message Type       = 0x00
                  Domain Number      = DN1

Step 15:Verify whether ((Tb - Ta) + (Tc - Tb))/2 = 1s
```

6.5. tc_conf_ptp-ha_pcg_005

```
Test Case         : tc_conf_ptp-ha_pcg_005
Test Case Version : 1.4
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA Configuration Group (PCG)

Title             : logMinDelayRequestInterval

Purpose           : To Verify that a PTP enabled device transmits
                    Delay_Req messages at configured
                    logMinDelayRequestInterval (allowable range: 0 to 5).

Reference         : P1588/D1.3, February 2018 V3.01 Clause J.5.2 Page 412
                    Clause 7.7.2.4 Page 96 Clause 9.5.11 Page 174

Conformance Type  : SHALL
```

Topology

```
                  TEE                                  DUT
```

```
        +--------------+                     +-------------+
        |              |                     |             |
        |              |                     |             |
        |              |                     |             |
        |              |                     |             |
        |              | T1               P1 |             |
        |      BC      |---------------------|    OC/BC    |
        |              |                     |             |
        |              |                     |             |
        |              |                     |             |
        |              |                     |             |
        +--------------+                     +-------------+

Legends:

    TEE     : Test Execution Engine
    DUT     : Device Under Test
    OC      : Ordinary Clock
    BC      : Boundary Clock
    T1      : Port 1 at TEE
    P1      : Port 1 at DUT
```

```
Ladder Diagram    :

        TEE                                                     DUT
         |                                                       |
         |                                         <Enable PTP> | P1
         |                       <Enable PTP with BC/OC clock> |
         |                    <Clock mode - one-step/two-step> |
         |                     <Configure logAnnounceInterval, | P1
         |                             announceReceiptTimeout> |
         |                         <Configure logSyncInterval> | P1
         |                  <Configure logMinDelayReqInterval> | P1
         |                    <Configure Priority1, Priority2> | P1
         |                                      <Enable L1SYNC> | P1
         |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
         |                     <Disable L1SynOptParams option> | P1
         |           <Enable asymmetryCorrectionPortDS.enable> | P1
         | <Configure timestampCorrectionPortDS.egressLatency, | P1
         |           timestampCorrectionPortDS.ingressLatency, |
         |        asymmetryCorrectionPortDS.constantAsymmetry, |
         |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
         |                                                      |
         |                          ANNOUNCE [MSG_TYPE = 0x0B, |
         |                                  DN = DN1,PRT1 = Z] |
      T1 |-------------------------------------------------<<--| P1
         |                                                      |
         | ANNOUNCE [MSG_TYPE = 0x0B,                           |
         |          DN = DN1,PRT1 = Z-1]                        |
      T1 |-->>--------------------------------------------------| P1
         |                                                      |
         | <Send Sync/ Sync & Follow-up messages                |
         | based on clock step>                                 |
         |                                                      |
         |                DELAY_REQ [MSG_TYPE = 0x01,DN = DN1, |
         |                                    Timestamp = Ta]  |
```

```
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                DELAY_REQ [MSG_TYPE = 0x01,DN = DN1, |
   |                                    Timestamp = Tb]  |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                DELAY_REQ [MSG_TYPE = 0x01,DN = DN1, |
   |                                    Timestamp = Tc]  |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |             <Check ((Tb - Ta) + (Tc - Tb))/2 <= 2s> |
   |                                                     |
   |               <Configure DelayRequest interval = 5> |
   |                                                     |
   |                DELAY_REQ [MSG_TYPE = 0x01,DN = DN1, |
   |                                    Timestamp = Ta]  |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                DELAY_REQ [MSG_TYPE = 0x01,DN = DN1, |
   |                                    Timestamp = Tb]  |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                DELAY_REQ [MSG_TYPE = 0x01,DN = DN1, |
   |                                    Timestamp = Tc]  |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |            <Check ((Tb - Ta) + (Tc - Tb))/2 <= 64s> |
   |                                                     |
   |               <Configure DelayRequest interval = 1> |
   |                                                     |
   |                DELAY_REQ [MSG_TYPE = 0x01,DN = DN1, |
   |                                    Timestamp = Ta]  |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                DELAY_REQ [MSG_TYPE = 0x01,DN = DN1, |
   |                                    Timestamp = Tb]  |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                DELAY_REQ [MSG_TYPE = 0x01,DN = DN1, |
   |                                    Timestamp = Tc]  |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |            <Check ((Tb - Ta) + (Tc - Tb))/2 <=  4s> |
   |                                                     |
   |               <Configure DelayRequest interval = 0> |
   |                                                     |
   |                DELAY_REQ [MSG_TYPE = 0x01,DN = DN1, |
   |                                    Timestamp = Ta]  |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                DELAY_REQ [MSG_TYPE = 0x01,DN = DN1, |
   |                                    Timestamp = Tb]  |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                DELAY_REQ [MSG_TYPE = 0x01,DN = DN1, |
   |                                    Timestamp = Tc]  |
T1 |-------------------------------------------------<<--| P1
```

```
          |                                                      |
          |             <Check ((Tb - Ta) + (Tc - Tb))/2 <= 2s> |
          |                                                      |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile



Procedure        :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.ingressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters:

             PTP Header
                 Message Type    = 0x0B
                 Domain Number   = DN1
                 Priority1       = Z

Step 4 : Send periodic ANNOUNCE message with Priority1 value decremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.
```

```
            PTP Header
                Message Type  = 0x0B
                Domain Number = DN1
                Priority1     = Z-1

Step 5 : Send periodic SYNC message on the port P1 with following
          parameters:

            PTP Header
                Message Type    = 0x00
                Domain Number   = DN1

Step 5b: If the clock is two-step clock, send periodic FOLLOW_UP message on
         port T1 with following parameters:

            PTP Header
                Message Type     = 0x08
                Domain Number    = DN1

Step 6 : Check whether that the DUT transmits three consecutive DELAY_REQ
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

            PTP Header
                Message Type       = 0x01
                Domain Number      = DN1

Step 7 : Check whether ((Tb - Ta) + (Tc - Tb))/2 <= 2s

Step 8 : Configure DelayRequest Interval as 5 on Port P1 in DUT.

Step 9 : Check whether that the DUT transmits three consecutive DELAY_REQ
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

            PTP Header
                Message Type       = 0x01
                Domain Number      = DN1

Step 10: Check whether ((Tb - Ta) + (Tc - Tb))/2 <= 64s

Step 11: Configure DelayRequest Interval as 1 on Port P1 in DUT.

Step 12: Check whether that the DUT transmits three consecutive DELAY_REQ
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

            PTP Header
                Message Type       = 0x01
                Domain Number      = DN1

Step 13: Check whether ((Tb - Ta) + (Tc - Tb))/2 <= 4s

Step 14: Configure DelayRequest Interval as 0 on Port P1 in DUT.

Step 15: Check whether that the DUT transmits three consecutive DELAY_REQ
         messages on the port P1 with following parameters and store
```

```
         timestamps Ta, Tb and Tc for messages respectively.

             PTP Header
                 Message Type       = 0x01
                 Domain Number      = DN1

Step 16: Check whether ((Tb - Ta) + (Tc - Tb))/2 <= 4s
```

6.6. tc_conf_ptp-ha_pcg_006

```
Test Case         : tc_conf_ptp-ha_pcg_006
Test Case Version : 1.5
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA Configuration Group (PCG)

Title             : announceReceiptTimeout

Purpose           : To verify that a PTP enabled device supports to
                    configure announceReceiptTimeout interval to range of
                    value 2 to 10.

Reference         : P1588/D1.3, February 2018 V3.01 Clause J.5.2 Page 412

Conformance Type  : SHALL
```

Topology

```
                  TEE                                     DUT
            +---------------+                     +--------------+
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               | T1               P1 |              |
            |      BC       |---------------------|    OC/BC     |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            +---------------+                     +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT

 Ladder Diagram    :
```



```
  TEE                                                   DUT
   |                                                     |
   |                                        <Enable PTP> | P1
   |                       <Enable PTP with BC/OC clock> |
   |                    <Clock mode - one-step/two-step> |
   |                     <Configure logAnnounceInterval, | P1
   |                             announceReceiptTimeout> |
   |                         <Configure logSyncInterval> | P1
   |                  <Configure logMinDelayReqInterval> | P1
   |                    <Configure Priority1, Priority2> | P1
   |                                     <Enable L1SYNC> | P1
   |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
   |                     <Disable L1SynOptParams option> | P1
   |           <Enable asymmetryCorrectionPortDS.enable> | P1
   | <Configure timestampCorrectionPortDS.egressLatency, | P1
   |           timestampCorrectionPortDS.ingressLatency, |
   |        asymmetryCorrectionPortDS.constantAsymmetry, |
   |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
   |                                                     |
   |               ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,  |
   |                             ANN_INT = 1, PRIOR = Z] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |  ANNOUNCE [MSG_TYPE = 0x0B,                         |
   |  DN = DN1, ANN_INT = 1, PRIOR = Z-1]                |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   | <Send Sync/ Sync & Follow-up messages               |
   | based on clock step>                                |
   |                                                     |
   |          < Wait for 6s to complete BMCA >           |
   |                                                     |
   |  ANNOUNCE [MSG_TYPE = 0x0B,                         |
   |  DN = DN1, ANN_INT = 1, PRIOR = Z-1]                |
T1 |---->>----XX                                         | P1
   |                                                     |
   |               ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,  |
   |                                        ANN_INT = 1] |
T1 |                     XX--------------------------<<--| P1
   |                                         (within 6s) |
   |                                                     |
   |               ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,  |
   |                                        ANN_INT = 1] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |              <Configure announceReceiptTimeout = 2> |
   |                                                     |
   |  ANNOUNCE [MSG_TYPE = 0x0B,                         |
   |  DN = DN1, ANN_INT = 1, PRIOR = Z-1]                |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   | <Send Sync/ Sync & Follow-up messages               |
   | based on clock step>                                |
   |                                                     |
   |          < Wait for 6s to complete BMCA >           |
   |                                                     |
   |  ANNOUNCE [MSG_TYPE = 0x0B,                         |
```



```
   |  DN = DN1, ANN_INT = 1, PRIOR = Z-1]                 |
T1 |---->>----XX                                          | P1
   |                                                      |
   |               ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,   |
   |                                         ANN_INT = 1] |
T1 |                      XX--------------------------<<--| P1
   |                                          (within 4s) |
   |                                                      |
   |               ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,   |
   |                                         ANN_INT = 1] |
T1 |--------------------------------------------------<<--| P1
   |                                                      |
   |             <Configure announceReceiptTimeout = 10>  |
   |                                                      |
   |  ANNOUNCE [MSG_TYPE = 0x0B,                          |
   |  DN = DN1, ANN_INT = 1, PRIOR = Z-1]                 |
T1 |-->>--------------------------------------------------| P1
   |                                                      |
   | <Send Sync/ Sync & Follow-up messages                |
   | based on clock step>                                 |
   |                                                      |
   |           < Wait for 6s to complete BMCA >           |
   |                                                      |
   |  ANNOUNCE [MSG_TYPE = 0x0B,                          |
   |  DN = DN1, ANN_INT = 1, PRIOR = Z-1]                 |
T1 |---->>----XX                                          | P1
   |                                                      |
   |               ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,   |
   |                                         ANN_INT = 1] |
T1 |                      XX--------------------------<<--| P1
   |                                          within 20s) |
   |                                                      |
   |               ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,   |
   |                                         ANN_INT = 1] |
T1 |--------------------------------------------------<<--| P1
   |                                                      |
   |              <Configure announceReceiptTimeout = 3>  |
   |                                                      |
   |  ANNOUNCE [MSG_TYPE = 0x0B,                          |
   |  DN = DN1, ANN_INT = 1, PRIOR = Z-1]                 |
T1 |-->>--------------------------------------------------| P1
   |                                                      |
   | <Send Sync/ Sync & Follow-up messages                |
   | based on clock step>                                 |
   |                                                      |
   |           < Wait for 6s to complete BMCA >           |
   |                                                      |
   |  ANNOUNCE [MSG_TYPE = 0x0B,                          |
   |  DN = DN1, ANN_INT = 1, PRIOR = Z-1]                 |
T1 |---->>----XX                                          | P1
   |                                                      |
   |               ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,   |
   |                                         ANN_INT = 1] |
T1 |                      XX--------------------------<<--| P1
   |                                           within 6s) |
   |                                                      |
   |               ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,   |
```



```
        |                                        ANN_INT = 1] |
     T1 |------------------------------------------------<<--| P1
        |                                                     |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile

 2. Timeout = (2 ^ logAnnounceInterval) * announceReceiptTimeout



Procedure        :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.ingressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters:

             PTP Header
                 Message Type       = 0x0B
                 Domain Number      = DN1
                 Priority1          = Z
                 ANN_INT            = 1

Step 4 : Send periodic ANNOUNCE message with Priority1 value decremented
```

```
          from the Priority1 value of received Announce message on port T1
          with following parameters.

              PTP Header
                  Message Type       = 0x0B
                  Domain Number      = DN1
                  Priority1          = Z-1
                  ANN_INT            = 1

Step 5 : Send periodic SYNC message on the port P1 with following
         parameters:

              PTP Header
                  Message Type       = 0x00
                  Domain Number      = DN1

Step 5a: If the clock is two-step clock, send periodic FOLLOW_UP message on
         port T1 with following parameters:

              PTP Header
                  Message Type       = 0x00
                  Domain Number      = DN1

Step 6 : Wait for 6s for completing BMCA and stop ANNOUNCE, SYNC and
         FOLLOW_UP (if two-step clock) messages to port T1.

Step 7 : Observe that DUT does not transmit ANNOUNCE message on the port P1
         within 6s.

              PTP Header
                  Message Type       = 0x0B
                  Domain Number      = DN1
                  ANN_INT            = 1

Step 8 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters after 6s:

              PTP Header
                  Message Type       = 0x0B
                  Domain Number      = DN1
                  ANN_INT            = 1

Step 9 : Configure announceReceiptTimeout as 2 on DUT.

Step 10: Send periodic ANNOUNCE message on port T1 with following parameters

              PTP Header
                  Message Type       = 0x0B
                  Domain Number      = DN1
                  Priority1          = Z-1
                  ANN_INT            = 1

Step 11: Send periodic SYNC message on the port P1 with following
         parameters:

              PTP Header
                  Message Type       = 0x00
```

```
                Domain Number      = DN1

Step 11a: If the clock is two-step clock, send periodic FOLLOW_UP message on
         port T1 with following parameters:

            PTP Header
                Message Type       = 0x00
                Domain Number      = DN1

Step 12: Wait for 6s for completing BMCA and stop ANNOUNCE, SYNC and
         FOLLOW_UP (if two-step clock) messages to port T1.

Step 13: Observe that DUT does not transmit ANNOUNCE message on the port P1
         within 4s.

            PTP Header
                Message Type       = 0x0B
                Domain Number      = DN1
                ANN_INT            = 1

Step 14: Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters after 4s:

            PTP Header
                Message Type       = 0x0B
                Domain Number      = DN1
                ANN_INT            = 1

Step 15: Configure announceReceiptTimeout as 10 on DUT.

Step 16: Send periodic ANNOUNCE message on port T1 with following parameters

            PTP Header
                Message Type       = 0x0B
                Domain Number      = DN1
                Priority1          = Z-1
                ANN_INT            = 1

Step 17: Send periodic SYNC message on the port P1 with following
         parameters:

            PTP Header
                Message Type       = 0x00
                Domain Number      = DN1

Step 18a: If the clock is two-step clock, send periodic FOLLOW_UP message on
         port T1 with following parameters:

            PTP Header
                Message Type       = 0x00
                Domain Number      = DN1

Step 19: Wait for 6s for completing BMCA and stop ANNOUNCE, SYNC and
         FOLLOW_UP (if two-step clock) messages to port T1.

Step 20: Observe that DUT does not transmit ANNOUNCE message on the port P1
         within 20s.
```

```
        PTP Header
            Message Type       = 0x0B
            Domain Number      = DN1
            ANN_INT            = 1
```

Step 21: Observe that DUT transmits ANNOUNCE message on the port P1 with following parameters after 20s:

```
        PTP Header
            Message Type       = 0x0B
            Domain Number      = DN1
            ANN_INT            = 1
```

Step 22: Configure announceReceiptTimeout as 3 on DUT.

Step 23: Send periodic ANNOUNCE message on port T1 with following parameters

```
        PTP Header
            Message Type       = 0x0B
            Domain Number      = DN1
            Priority1          = Z-1
            ANN_INT            = 1
```

Step 24: Send periodic SYNC message on the port P1 with following parameters:

```
        PTP Header
            Message Type       = 0x00
            Domain Number      = DN1
```

Step 25a: If the clock is two-step clock, send periodic FOLLOW_UP message on port T1 with following parameters:

```
        PTP Header
            Message Type       = 0x00
            Domain Number      = DN1
```

Step 26: Wait for 6s for completing BMCA and stop ANNOUNCE, SYNC and FOLLOW_UP (if two-step clock) messages to port T1.

Step 27: Verify that DUT does not transmit ANNOUNCE message on the port P1 within 6s.

```
        PTP Header
            Message Type       = 0x0B
            Domain Number      = DN1
            ANN_INT            = 1
```

Step 28: Verify that DUT transmits ANNOUNCE message on the port P1 with following parameters after 6s:

```
        PTP Header
            Message Type       = 0x0B
            Domain Number      = DN1
            ANN_INT            = 1
```

6.7. tc_conf_ptp-ha_pcg_007

```
Test Case         : tc_conf_ptp-ha_pcg_007
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA Configuration Group (PCG)

Title             : logMinpdelayRequestInterval

Purpose           : To Verify that the PTP enabled device transmits
                    Pdelay_Req messages at configured
                    logMinPdelayReqInterval (allowable range: 0 to 5)

Reference         : P1588/D1.3, February 2018 V3.01 Clause J.5.2 Page 412
                    Clause 7.7.2.5 Page 97

Conformance Type  : SHALL
```

Topology

```
          TEE                                    DUT
     +---------------+                     +--------------+
     |               |                     |              |
     |               |                     |              |
     |               |                     |              |
     |               |                     |              |
     |               | T1               P1 |              |
     |      BC       |---------------------|    OC/BC     |
     |               |                     |              |
     |               |                     |              |
     |               |                     |              |
     |               |                     |              |
     +---------------+                     +--------------+
```

```
    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
 Ladder Diagram    :

         TEE                                                      DUT
          |                                                        |
          |                                          <Enable PTP> | P1
          |                           <Enable PTP with BC/OC clock> |
          |                        <Clock mode - one-step/two-step> |
          |                            <Set delay mechanism as P2P> |
          |                         <Configure logAnnounceInterval, | P1
```

```
   |                         announceReceiptTimeout> |
   |                     <Configure logSyncInterval> | P1
   |              <Configure logMinDelayReqInterval> | P1
   |                <Configure Priority1, Priority2> | P1
   |                                  <Enable L1SYNC> | P1
   |   <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
   |                 <Disable L1SynOptParams option> | P1
   |       <Enable asymmetryCorrectionPortDS.enable> | P1
   | <Configure timestampCorrectionPortDS.egressLatency, | P1
   |           timestampCorrectionPortDS.ingressLatency, |
   |        asymmetryCorrectionPortDS.constantAsymmetry, |
   |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
   |                                                  |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
   |                                  Timestamp = Ta]  |
T1 |-------------------------------------------------<<--| P1
   |                                                  |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
   |                                  Timestamp = Tb]  |
T1 |-------------------------------------------------<<--| P1
   |                                                  |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
   |                                  Timestamp = Tc]  |
T1 |-------------------------------------------------<<--| P1
   |                                                  |
   |       <Check ((Tb - Ta) + (Tc - Tb))/2 = 0.9s - 2s> |
   |                                                  |
   |              <Configure PdelayRequestInterval = 2 > |
   |                                                  |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
   |                                  Timestamp = Ta]  |
T1 |-------------------------------------------------<<--| P1
   |                                                  |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
   |                                  Timestamp = Tb]  |
T1 |-------------------------------------------------<<--| P1
   |                                                  |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
   |                                  Timestamp = Tc]  |
T1 |-------------------------------------------------<<--| P1
   |                                                  |
   |       <Check ((Tb - Ta) + (Tc - Tb))/2 = 3.6s - 8s> |
   |                                                  |
   |              <Configure PdelayRequestInterval = 5 > |
   |                                                  |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
   |                                  Timestamp = Ta]  |
T1 |-------------------------------------------------<<--| P1
   |                                                  |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
   |                                  Timestamp = Tb]  |
T1 |-------------------------------------------------<<--| P1
   |                                                  |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
   |                                  Timestamp = Tc]  |
T1 |-------------------------------------------------<<--| P1
   |                                                  |
```

```
          |      Check ((Tb - Ta) + (Tc - Tb))/2 = 28.8s - 64s> |
          |                                                      |
          |               <Configure PdelayRequestInterval = 0> |
          |                                                      |
          |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
          |                                      Timestamp = Ta]  |
       T1 |--------------------------------------------------<<--| P1
          |                                                      |
          |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
          |                                      Timestamp = Tb]  |
       T1 |--------------------------------------------------<<--| P1
          |                                                      |
          |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
          |                                      Timestamp = Tc]  |
       T1 |--------------------------------------------------<<--| P1
          |                                                      |
          |       <Check ((Tb - Ta) + (Tc - Tb))/2 = 0.9s - 2s> |
          |                                                      |
```

```
Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number

NOTE :

 1. This objective is verified using the High Accuracy Peer to Peer Default
    PTP Profile



Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
     i.   Enable DUT's port P1.
    ii.   Enable PTP on port P1.
   iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
    iv.   Configure clock mode as One-step/Two-step.
     v.   Configure delaymechanism as Peer to peer.
    vi.   Configure default values for Priority1, Priority2,
          logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
          logMinDelayReqInterval.
   vii.   Enable L1SYNC on DUT's port P1.
  viii.   Configure default values for L1SyncInterval and
          L1SyncReceiptTimeout.
    ix.   Disable L1SynOptParams on DUT.
     x.   Enable asymmetryCorrectionPortDS.enable.
    xi.   Configure default values for timestampCorrectionPortDS.
          egressLatency, timestampCorrectionPortDS.ingressLatency,
          asymmetryCorrectionPortDS.constantAsymmetry and
          asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
     i.   Add port T1 at TEE.
```

```
(Part 1)

Step 3 : Check whether the DUT transmits three consecutive PDELAY_REQ
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

             PTP Header
                 Message Type       = 0x0B
                 Domain Number      = DN1

Step 4 : Check whether ((Tb - Ta) + (Tc - Tb))/2 = 0.9 to 2s.

Step 5 : Configure PdelayRequestInterval as 2 on Port P1 in DUT.

Step 6 : Check whether the DUT transmits three consecutive PDELAY_REQ
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

             PTP Header
                 Message Type       = 0x0B
                 Domain Number      = DN1

Step 7 : Check whether ((Tb - Ta) + (Tc - Tb))/2 = 3.6s to 8s.

Step 8 : Configure PdelayRequestInterval as 5 on Port P1 in DUT.

Step 9 : Check whether the DUT transmits three consecutive PDELAY_REQ
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

             PTP Header
                 Message Type       = 0x0B
                 Domain Number      = DN1

Step 10: Check whether ((Tb - Ta) + (Tc - Tb))/2 = 28.8s to 64s.

Step 11: Configure PdelayRequestInterval as 0 on Port P1 in DUT.

Step 12: Check whether the DUT transmits three consecutive PDELAY_REQ
         messages on the port P1 with following parameters and store
         timestamps Ta, Tb and Tc for messages respectively.

             PTP Header
                 Message Type       = 0x0B
                 Domain Number      = DN1

Step 13: Check whether ((Tb - Ta) + (Tc - Tb))/2 = 0.9s to 2s.
```

6.8. tc_conf_ptp-ha_pcg_008

```
Test Case          : tc_conf_ptp-ha_pcg_008
Test Case Version  : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA Configuration Group (PCG)
```

```
Title            : logL1SyncInterval

Purpose          : To verify that a PTP enabled device transmits L1Sync
                   messages at configured logL1SyncInterval (allowable
                   range: -4 to 4)

Reference        : IEEE 1588-2017 Clause J.5.3 Table 150 Page 413 Clause
                   O.4.6 Page 443

Conformance Type : SHALL
```

```
Topology

            TEE                                  DUT
      +---------------+                     +--------------+
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      |               | T1               P1 |              |
      |       BC      |---------------------|    OC/BC     |
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      +---------------+                     +--------------+

    Legends:

        TEE      : Test Execution Engine
        DUT      : Device Under Test
        OC       : Ordinary Clock
        BC       : Boundary Clock
        T1       : Port 1 at TEE
        P1       : Port 1 at DUT
```

```
Ladder Diagram    :

     TEE                                                     DUT
      |                                                       |
      |                                         <Enable PTP> | P1
      |                           <Enable PTP with BC/OC clock> |
      |                        <Clock mode - one-step/two-step> |
      |                         <Configure logAnnounceInterval, | P1
      |                                 announceReceiptTimeout> |
      |                             <Configure logSyncInterval> | P1
      |                     <Configure logMinDelayReqInterval> | P1
      |                        <Configure Priority1, Priority2> | P1
      |                                       <Enable L1SYNC> | P1
      |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
      |                        <Disable L1SynOptParams option> | P1
      |              <Enable asymmetryCorrectionPortDS.enable> | P1
      | <Configure timestampCorrectionPortDS.egressLatency, | P1
      |           timestampCorrectionPortDS.ingressLatency, |
```

```
     |         asymmetryCorrectionPortDS.constantAsymmetry, |
     |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
     |                                                     |
     |               PTP_SIGNALING message with L1SYNC TLV  |
     |              [MSG_TYPE =0xC,DN = DN1,Timestamp = Ta] |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |               PTP_SIGNALING message with L1SYNC TLV  |
     |              [MSG_TYPE =0xC,DN = DN1,Timestamp = Tb] |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |               PTP_SIGNALING message with L1SYNC TLV  |
     |              [MSG_TYPE =0xC,DN = DN1,Timestamp = Tc] |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |               <Check ((Tb - Ta) + (Tc - Tb))/2 = 1s> |
     |                                                     |
     |                     <Configure L1Sync interval = -4> |
     |                                                     |
     |               PTP_SIGNALING message with L1SYNC TLV  |
     |              [MSG_TYPE =0xC,DN = DN1,Timestamp = Ta] |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |               PTP_SIGNALING message with L1SYNC TLV  |
     |              [MSG_TYPE =0xC,DN = DN1,Timestamp = Tb] |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |               PTP_SIGNALING message with L1SYNC TLV  |
     |              [MSG_TYPE =0xC,DN = DN1,Timestamp = Tc] |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |          <Check ((Tb - Ta) + (Tc - Tb))/2 = 0.0625s> |
     |                                                     |
     |                     <Configure L1Sync interval =  4> |
     |                                                     |
     |               PTP_SIGNALING message with L1SYNC TLV  |
     |              [MSG_TYPE =0xC,DN = DN1,Timestamp = Ta] |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |               PTP_SIGNALING message with L1SYNC TLV  |
     |              [MSG_TYPE =0xC,DN = DN1,Timestamp = Tb] |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |               PTP_SIGNALING message with L1SYNC TLV  |
     |              [MSG_TYPE =0xC,DN = DN1,Timestamp = Tc] |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |              <Check ((Tb - Ta) + (Tc - Tb))/2 = 16s> |
     |                                                     |
     |                     <Configure L1Sync interval =  0> |
     |                                                     |
     |               PTP_SIGNALING message with L1SYNC TLV  |
     |              [MSG_TYPE =0xC,DN = DN1,Timestamp = Ta] |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |               PTP_SIGNALING message with L1SYNC TLV  |
     |              [MSG_TYPE =0xC,DN = DN1,Timestamp = Tb] |
```

```
       T1 |-------------------------------------------------<<--| P1
          |                                                     |
          |             PTP_SIGNALING message with L1SYNC TLV  |
          |            [MSG_TYPE =0xC,DN = DN1,Timestamp = Tc] |
       T1 |-------------------------------------------------<<--| P1
          |                                                     |
          |             <Check ((Tb - Ta) + (Tc - Tb))/2 = 1s> |
          |                                                     |
```

Legends :

MSG_TYPE = Message Type
DN = Domain Number

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
- i. Add port T1 at TEE.

(Part 1)

Step 3 : Check whether the DUT transmits three consecutive PTP SIGNALING message with L1 Sync TLV messages on the port P1 with following parameters and store timestamps Ta, Tb and Tc for messages respectively.

PTP Header
- Message Type = 0xC
- Domain Number = DN1

```
          L1_SYNC TLV
              TLV_TYPE           = 0x8001

Step 4 : Check whether ((Tb - Ta) + (Tc - Tb))/2 = 1s

Step 5 : Configure L1Sync interval as -4 on Port P1 in DUT.

Step 6 : Check whether the DUT transmits three consecutive PTP
         SIGNALING message with L1 Sync TLV messages on the port P1 with
         following parameters and store timestamps Ta, Tb and Tc for
         messages respectively.

          PTP Header
              Message Type       = 0xC
              Domain Number      = DN1
          L1_SYNC TLV
              TLV_TYPE           = 0x8001

Step 7 : Check whether ((Tb - Ta) + (Tc - Tb))/2 = 0.0625s

Step 8 : Configure L1Sync interval as 4 on Port P1 in DUT.

Step 9 : Check whether the DUT transmits three consecutive PTP SIGNALING
         message with L1 Sync TLV messages on the port P1 with following
         parameters and store timestamps Ta, Tb and Tc for messages
         respectively.

          PTP Header
              Message Type       = 0xC
              Domain Number      = DN1
          L1_SYNC TLV
              TLV_TYPE           = 0x8001

Step 10: Check whether ((Tb - Ta) + (Tc - Tb))/2 = 16s

Step 11: Configure L1Sync interval as 0 on Port P1 in DUT.

Step 12: Check whether the DUT transmits three consecutive PTP SIGNALING
         message with L1 Sync TLV messages on the port P1 with following
         parameters and store timestamps Ta, Tb and Tc for messages
         respectively.

          PTP Header
              Message Type       = 0xC
              Domain Number      = DN1
          L1_SYNC TLV
              TLV_TYPE           = 0x8001

Step 13: Check whether ((Tb - Ta) + (Tc - Tb))/2 = 1s
```

6.9. tc_conf_ptp-ha_pcg_009

```
Test Case         : tc_conf_ptp-ha_pcg_009
Test Case Version : 1.4
```

```
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA Configuration Group (PCG)

Title             : L1SyncReceiptTimeout

Purpose           : To verify that a PTP enabled device supports to
                    configure L1SyncReceiptTimeout in range of value 2 to 10

Reference         : P1588/D1.3, February 2018 V3.01 Clause J.5.3 Table 150,
                    Page 413 Clause O.4.7 Page 443

Conformance Type  : SHALL
```

Topology

```
          TEE                                  DUT
      +--------------+                     +-------------+
      |              |                     |             |
      |              |                     |             |
      |              |                     |             |
      |              |                     |             |
      |              | T1              P1  |             |
      |      BC      |---------------------|    OC/BC    |
      |              |                     |             |
      |              |                     |             |
      |              |                     |             |
      |              |                     |             |
      +--------------+                     +-------------+

   Legends:

       TEE      : Test Execution Engine
       DUT      : Device Under Test
       OC       : Ordinary Clock
       BC       : Boundary Clock
       T1       : Port 1 at TEE
       P1       : Port 1 at DUT
```

```
Ladder Diagram    :

         TEE                                                    DUT
          |                                                      |
          |                                        <Enable PTP>  | P1
          |                          <Enable PTP with BC/OC clock> |
          |                       <Clock mode - one-step/two-step> |
          |                        <Configure logAnnounceInterval, | P1
          |                                announceReceiptTimeout> |
          |                            <Configure logSyncInterval> | P1
          |                     <Configure logMinDelayReqInterval> | P1
          |                       <Configure Priority1, Priority2> | P1
          |                                        <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout>    | P1
          |                        <Disable L1SynOptParams option> | P1
          |              <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency,    | P1
```

```
    |          timestampCorrectionPortDS.ingressLatency, |
    |       asymmetryCorrectionPortDS.constantAsymmetry, |
    |  asymmetryCorrectionPortDS.scaledDelayCoefficient> |
    |                                                    |
    |                         ANNOUNCE [MSG_TYPE = 0x0B, |
    |                    DN = DN1, SEQ_ID = Y, PRI1 = Z] |
 T1 |------------------------------------------------<<--| P1
    |                                                    |
    | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,               |
    |           SEQ_ID = A, PRI1 = Z+1]                  |
 T1 |-->>------------------------------------------------| P1
    |                                                    |
    |                  <Check L1SYNC port status - IDLE> | P1
    |                                                    |
    |                     PTP SIGNALING with L1 Sync TLV |
    |                         [MSG_TYPE = 0xC, DN = DN1, |
    |                        TLV_TYPE = 0x8001, TCR = 1, |
    |                                   RCR = 1, CR = 1] |
 T1 |------------------------------------------------<<--| P1
    |                                                    |
    | PTP SIGNALING with L1 Sync TLV                     |
    | [MSG_TYPE = 0xC, DN = DN1,                         |
    | TLV_TYPE=0x8001, TCR = 0,                          |
    | RCR = 0, CR = 0]                                   |
 T1 |---->>----------------------------------------------| P1
    |                                                    |
    |            <Check L1SYNC port status - LINK_ALIVE> | P1
    |                                                    |
    | PTP SIGNALING with L1 Sync TLV                     |
    | [MSG_TYPE = 0xC, DN = DN1,                         |
    | TLV_TYPE=0x8001, TCR = 0,                          |
    | RCR = 0, CR = 0]                                   |
 T1 |---->>----XX                                        | P1
    |                                                    |
    |                   <Wait for 3s>                    |
    |                                                    |
    |                  <Check L1SYNC port status - IDLE> | P1
    |                                                    |
    |               <Configure L1SyncReceiptTimeout = 2> |
    |                                                    |
    |                     PTP SIGNALING with L1 Sync TLV |
    |                         [MSG_TYPE = 0xC, DN = DN1, |
    |                        TLV_TYPE = 0x8001, TCR = 1, |
    |                                   RCR = 1, CR = 1] |
 T1 |------------------------------------------------<<--| P1
    |                                                    |
    | PTP SIGNALING with L1 Sync TLV                     |
    | [MSG_TYPE = 0xC, DN = DN1,                         |
    | TLV_TYPE=0x8001, TCR = 0,                          |
    | RCR = 0, CR = 0]                                   |
 T1 |---->>----------------------------------------------| P1
    |                                                    |
    |            <Check L1SYNC port status - LINK_ALIVE> | P1
    |                                                    |
    | PTP SIGNALING with L1 Sync TLV                     |
    | [MSG_TYPE = 0xC, DN = DN1,                         |
    | TLV_TYPE=0x8001, TCR = 0,                          |
```

```
    | RCR = 0, CR = 0]                                      |
 T1 |---->>----XX                                           | P1
    |                                                       |
    |                     <Wait for 2s>                     |
    |                                                       |
    |                    <Check L1SYNC port status - IDLE>  | P1
    |                                                       |
    |                <Configure L1SyncReceiptTimeout = 10>  |
    |                                                       |
    |                       PTP SIGNALING with L1 Sync TLV  |
    |                           [MSG_TYPE = 0xC, DN = DN1,  |
    |                          TLV_TYPE = 0x8001, TCR = 1,  |
    |                                     RCR = 1, CR = 1]  |
 T1 |-------------------------------------------------<<--| P1
    |                                                       |
    | PTP SIGNALING with L1 Sync TLV                        |
    | [MSG_TYPE = 0xC, DN = DN1,                            |
    | TLV_TYPE=0x8001, TCR = 0,                             |
    | RCR = 0, CR = 0]                                      |
 T1 |---->>-----------------------------------------------| P1
    |                                                       |
    |              <Check L1SYNC port status - LINK_ALIVE>  | P1
    |                                                       |
    | PTP SIGNALING with L1 Sync TLV                        |
    | [MSG_TYPE = 0xC, DN = DN1,                            |
    | TLV_TYPE=0x8001, TCR = 0,                             |
    | RCR = 0, CR = 0]                                      |
 T1 |---->>----XX                                           | P1
    |                                                       |
    |                     <Wait for 5s>                     |
    |                                                       |
    |              <Check L1SYNC port status - LINK_ALIVE>  | P1
    |                                                       |
    |                     <Wait for 5s>                     |
    |                                                       |
    |                    <Check L1SYNC port status - IDLE>  | P1
    |                                                       |
    |                 <Configure L1SyncReceiptTimeout = 3>  |
    |                                                       |
    |                       PTP SIGNALING with L1 Sync TLV  |
    |                           [MSG_TYPE = 0xC, DN = DN1,  |
    |                          TLV_TYPE = 0x8001, TCR = 1,  |
    |                                     RCR = 1, CR = 1]  |
 T1 |-------------------------------------------------<<--| P1
    |                                                       |
    | PTP SIGNALING with L1 Sync TLV                        |
    | [MSG_TYPE = 0xC, DN = DN1,                            |
    | TLV_TYPE=0x8001, TCR = 0,                             |
    | RCR = 0, CR = 0]                                      |
 T1 |---->>-----------------------------------------------| P1
    |                                                       |
    |              <Check L1SYNC port status - LINK_ALIVE>  | P1
    |                                                       |
    | PTP SIGNALING with L1 Sync TLV                        |
    | [MSG_TYPE = 0xC, DN = DN1,                            |
    | TLV_TYPE=0x8001, TCR = 0,                             |
    | RCR = 0, CR = 0]                                      |
```

```
       T1 |---->>----XX                                    | P1
          |                                                |
          |                    <Wait for 3s>               |
          |                                                |
          |                  <Check L1SYNC port status - IDLE> | P1
          |                                                |
```

```
Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile

 2. Timeout = L1SyncInterval * L1SyncReceiptTimeout



Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
     i.   Enable DUT's port P1.
    ii.   Enable PTP on port P1.
   iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
    iv.   Configure clock mode as One-step/Two-step.
     v.   Configure default values for Priority1, Priority2,
          logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
          logMinDelayReqInterval.
    vi.   Enable L1SYNC on DUT's port P1.
   vii.   Configure default values for L1SyncInterval and
          L1SyncReceiptTimeout.
  viii.   Disable L1SynOptParams on DUT.
    ix.   Enable asymmetryCorrectionPortDS.enable.
     x.   Configure default values for timestampCorrectionPortDS.
          egressLatency, timestampCorrectionPortDS.ingressLatency,
          asymmetryCorrectionPortDS.constantAsymmetry and
          asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
     i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters:

             PTP Header
                 Message Type        = 0x0B
                 Domain Number       = DN1
                 Priority1           = Z
```

```
                ANN_INT            = 1

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type       = 0x0B
                 Domain Number      = DN1
                 Priority1          = Z+1
                 ANN_INT            = 1

Step 5 : Observe that DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1

Step 7 : Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 8 : Observe that DUT's L1SYNC port status P1 is in LINK_ALIVE state.

Step 9 : Stop sending L1SYNC SIGNALLING message on the port T1.

Step 10: Wait for expiry of 3s.

Step 11: Observe that DUT's L1SYNC port status P1 is in IDLE state.

Step 12: Configure L1SyncReceiptTimeout as 2 on DUT.

Step 13: Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
```

```
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
```

Step 14: Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1 with following parameters:

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 0
            RCR           = 0
            CR            = 0
            ITC           = 0
            IRC           = 0
            IC            = 0
```

Step 15: Observe that DUT's L1SYNC port status P1 is in LINK_ALIVE state.

Step 16: Stop sending L1SYNC SIGNALLING message on the port T1.

Step 17: Wait for expiry of 2s.

Step 18: Observe that DUT's L1SYNC port status P1 is in IDLE state.

Step 19: Configure L1SyncReceiptTimeout as 10 on DUT.

Step 20: Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV on the port P1 with following parameters:

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
```

Step 21: Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1 with following parameters:

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 0
            RCR           = 0
            CR            = 0
            ITC           = 0
            IRC           = 0
            IC            = 0
```

```
Step 22: Observe that DUT's L1SYNC port status P1 is in LINK_ALIVE state.

Step 23: Stop sending L1SYNC SIGNALLING message on the port T1.

Step 24: Wait for expiry of 5s.

Step 25: Observe that DUT's L1SYNC port status P1 is in LINK_ALIVE state.

Step 26: Wait for expiry of 5s.

Step 27: Observe that DUT's L1SYNC port status P1 is in IDLE state.

Step 28: Configure L1SyncReceiptTimeout as 3 on DUT.

Step 29: Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1

Step 30: Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 31: Observe that DUT's L1SYNC port status P1 is in LINK_ALIVE state.

Step 32: Stop sending L1SYNC SIGNALLING message on the port T1.

Step 33: Wait for expiry of 3s.

Step 34: Verify that DUT's L1SYNC port status P1 is in IDLE state.
```

6.10. tc_conf_ptp-ha_pcg_012

```
Test Case         : tc_conf_ptp-ha_pcg_012
Test Case Version : 1.3
```

```
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA Configuration Group (PCG)

Title              : Port State: masterOnly - remains in master state

Purpose            : To verify that a PTP enabled device does not allow
                     PTP port state to enter into SLAVE state when the PTP
                     port state is configured as masterOnly.

Reference          : P1588/D1.3, February 2018 V3.01 Section 9.2.2.2 Page 139

Conformance Type   : SHALL
```

Topology

```
          TEE                                 DUT
      +--------------+                    +--------------+
      |              |                    |              |
      |              |                    |              |
      |              |                    |              |
      |              |                    |              |
      |              | T1              P1 |              |
      |      BC      |--------------------|    OC/BC     |
      |              |                    |              |
      |              |                    |              |
      |              |                    |              |
      |              |                    |              |
      +--------------+                    +--------------+
```

```
    Legends:

        TEE      : Test Execution Engine
        DUT      : Device Under Test
        OC       : Ordinary Clock
        BC       : Boundary Clock
        T1       : Port 1 at TEE
        P1       : Port 1 at DUT
```

```
Ladder Diagram     :

         TEE                                                     DUT
          |                                                       |
          |                                         <Enable PTP> | P1
          |                         <Enable PTP with BC/OC clock> |
          |                      <Clock mode - one-step/two-step> |
          |                       <Configure logAnnounceInterval, | P1
          |                               announceReceiptTimeout> |
          |                           <Configure logSyncInterval> | P1
          |                    <Configure logMinDelayReqInterval> | P1
          |                      <Configure Priority1, Priority2> | P1
          |                                        <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                       <Disable L1SynOptParams option> | P1
          |            <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
```

```
    |           timestampCorrectionPortDS.ingressLatency, |
    |        asymmetryCorrectionPortDS.constantAsymmetry, |
    |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
    |                                                     |
    |             <Configure PTP Port State = masterOnly> | P1
    |                                                     |
    |                        <Check Port Status = MASTER> | P1
    |                                                     |
    |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
    |                                   PRI=X , DN = DN1] |
 T1 |------------------------------------------------<<--| P1
    |                                                     |
    | ANNOUNCE [MSG_TYPE = 0x0B,                          |
    |  PRI=X-1, DN = DN1]                                 |
 T1 |-->>--------------------------------------------------| P1
    |                                                     |
    |          < Wait for 6s to complete BMCA >           |
    |                                                     |
    | PTP SIGNALING with L1 Sync TLV                      |
    | [MSG_TYPE = 0xC, DN = DN1,                          |
    | TLV_TYPE = 0x8001, TCR = 1,                         |
    | RCR = 1, CR = 1, ITC = 1,                           |
    | IRC = 1, IC = 1]                                    |
 T1 |-->>--------------------------------------------------| P1
    |                                                     |
    |                        <Check Port Status = MASTER> | P1
    |                                                     |
    |             <Disable the master Only configuration> | P1
    |                                                     |
    |          < Wait for 6s to complete BMCA >           |
    |                                                     |
    |                         <Check Port Status = SLAVE> | P1
    |                                                     |
```

Legends   :

    MSG_TYPE = Message Type
    DN   = Domain Number
    MO   = Master Only

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure   :

(Initial Part)

Step 1 : Initialization of DUT
  i. Enable DUT's port P1.
  ii. Enable PTP on port P1.
  iii. Enable PTP globally with device type as Boundary/Ordinary clock.
  iv. Configure clock mode as One-step/Two-step.
  v. Configure default values for Priority1, Priority2,

```
        logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
        logMinDelayReqInterval.
   vi.  Enable L1SYNC on DUT's port P1.
  vii.  Configure default values for L1SyncInterval and
        L1SyncReceiptTimeout.
 viii.  Disable L1SynOptParams on DUT.
   ix.  Enable asymmetryCorrectionPortDS.enable.
    x.  Configure default values for timestampCorrectionPortDS.
        egressLatency, timestampCorrectionPortDS.ingressLatency,
        asymmetryCorrectionPortDS.constantAsymmetry and
        asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.  Add port T1 at TEE.

(Part 1)

Step 3 : Configure PTP port state as masterOnly on Port P1

Step 4 : Observe that the port status of P1 in DUT is in MASTER state.

Step 5 : Observe that DUT transmits ANNOUNCE message on port P1
         with following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X

Step 6 : Send periodic ANNOUNCE message with Priority1 value decremented
         from the Priority value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type       = 0x0B
                 Domain Number      = DN1
                 Priority1          = X-1
                 ANN_INT            = 1

Step 7 : Wait for 6s for completing BMCA.

Step 8 : Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 1
                 IRC           = 1
                 IC            = 1

Step 9 : Verify that the port status of P1 in DUT is in MASTER state.
```


Step 10: Disable masteronly configuration on port P1.

Step 11: Wait for 6s for completing BMCA.

Step 12: Verify that the port status of P1 in DUT is in SLAVE state.

6.11. tc_conf_ptp-ha_pcg_013

```
Test Case          : tc_conf_ptp-ha_pcg_013
Test Case Version  : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA Configuration Group (PCG)

Title              : No-updation of data set based on Announce message when
                     portstate is masterOnly

Purpose            : To verify that a PTP enabled device does not update data
                     set from received Announce message when port state is
                     configured as masterOnly.

Reference          : P1588/D1.3, February 2018 V3.01 Section 9.2.2.2 Page 139

Conformance Type   : SHALL
```

Topology

```
          TEE                                    DUT
    +---------------+                     +--------------+
    | +----------+ | T1              P1 |              |
    | |    BC    |-+---------------------|  (Slave)     |
    | | (Master) | |                     |              |
    | +----------+ |                     |              |
    |              |                     |      BC      |
    |              |                     |              |
    | +----------+ | T2              P2 |              |
    | |    BC    |-+---------------------|  (Master)    |
    | | (Slave)  | |                     |              |
    | +----------+ |                     |              |
    +---------------+                     +--------------+

  Legends:

    TEE      : Test Execution Engine
    DUT      : Device Under Test
    OC       : Ordinary Clock
    BC       : Boundary Clock
    T1, T2   : Ports 1 and 2 at TEE
    P1, P2   : Ports 1 and 2 at DUT
```

Ladder Diagram   :

```
     TEE                                                     DUT
      |                                                       |
      |                                         <Enable PTP> | P1
      |                                         <Enable PTP> | P2
      |                          <Enable PTP with BC clock> |
      |                    <Clock mode - one-step/two-step> |
      |                     <Configure logAnnounceInterval, | P1
      |                             announceReceiptTimeout> |
      |                         <Configure logSyncInterval> | P1
      |                   <Configure logMinDelayReqInterval> | P1
      |                     <Configure Priority1, Priority2> | P1
      |                                       <Enable L1SYNC> | P1
      |                                       <Enable L1SYNC> | P2
      |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
      |                      <Disable L1SynOptParams option> | P1
      |            <Enable asymmetryCorrectionPortDS.enable> | P1
      | <Configure timestampCorrectionPortDS.egressLatency, | P1
      |            timestampCorrectionPortDS.ingressLatency, |
      |         asymmetryCorrectionPortDS.constantAsymmetry, |
      |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
      |                                                       |
      |              <Configure PTP Port State = masterOnly> | P1
      |                                                       |
      |                        <Check Port Status = MASTER>  | P1
      |                                                       |
      |                          ANNOUNCE [MSG_TYPE = 0x0B,  |
      |                        PRI1 = X, PRI2 = Y, DN = DN1] |
   T1 |--------------------------------------------------<<--| P1
      |                                                       |
      | ANNOUNCE [MSG_TYPE = 0x0B,                            |
      |  PRI1 = X-1, PRI2 = Y-1, DN = DN1]                    |
   T1 |-->>--------------------------------------------------| P1
      |                                                       |
      |          < Wait for 6s to complete BMCA >             |
      |                                                       |
      | PTP SIGNALING with L1 Sync TLV                        |
      | [MSG_TYPE = 0xC, DN = DN1,                            |
      | TLV_TYPE = 0x8001, TCR = 1,                           |
      | RCR = 1, CR = 1, ITC = 1,                             |
      | IRC = 1, IC = 1]                                      |
   T1 |-->>--------------------------------------------------| P1
      |                                                       |
      |                          ANNOUNCE [MSG_TYPE = 0x0B,  |
      |                        PRI1 = X, PRI2 = Y, DN = DN1] |
   T2 |--------------------------------------------------<<--| P2
      |                                                       |
      |              <Disable the master Only configuration> | P1
      |                                                       |
      |          < Wait for 6s to complete BMCA >             |
      |                                                       |
      |                           ANNOUNCE [MSG_TYPE = 0x0B, |
      |                    PRI1 = X-1, PRI2 = Y-1, DN = DN1] |
   T2 |--------------------------------------------------<<--| P2
      |                                                       |
```

Legends :


```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRI       = Priority
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's ports P1 and P2.
ii. Enable PTP on ports P1 and P2.
iii. Enable PTP globally with device type as Boundary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vi. Enable L1SYNC on DUT's ports P1 and P2.
vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
viii. Disable L1SynOptParams on DUT.
ix. Enable asymmetryCorrectionPortDS.enable.
x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE

i. Add ports T1 and T2 at TEE.

(Part 1)

Step 3 : Configure PTP port state as masterOnly on Port P1.

Step 4 : Observe that the port status of P1 in DUT is in MASTER state.

Step 5 : Observe that DUT transmits ANNOUNCE message on port P1 with following parameters.

```
PTP Header
    Message Type  = 0x0B
    Domain Number = DN1
    Priority1     = X
    Priority2     = Y
```

Step 6 : Send periodic ANNOUNCE message with following parameters.

```
PTP Header
    Message Type       = 0x0B
    Domain Number      = DN1
```

```
                 Priority1          = X-1
                 Priority2          = Y-1
                 ANN_INT            = 1

Step 7 : Wait for 6s for completing BMCA.

Step 8 : Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 1
                 IRC           = 1
                 IC            = 1

Step 9 : Observe that DUT transmits ANNOUNCE message on port P2 with
         following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority1     = X
                  Priority2     = Y

Step 10: Disable masteronly configuration on port P1.

Step 11: Verify that DUT transmits ANNOUNCE message on port P2 with
         following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority1     = X-1
                  Priority2     = Y-1
```

6.12. tc_conf_ptp-ha_pcg_014

```
Test Case          : tc_conf_ptp-ha_pcg_014
Test Case Version  : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA Configuration Group (PCG)

Title              : timestampCorrectionPortDS.egressLatency

Purpose            : To verify that a PTP enabled device supports to
                     configure timestampCorrectionPortDS.egressLatency
                     (allowable range: -2^63 to 2^63-1).
```

```
Reference         : P1588/D1.3, February 2018 V3.01 Clause 7.3.4.2 Page 68,
                    Clause 8.2.16.3 Page 129, Clause 16.7 Page 301,
                    Clause J.5.3 Table 150 Page 413

Conformance Type  : SHALL
```

Topology

```
                 TEE                                  DUT
           +--------------+                     +-------------+
           |              |                     |             |
           |              |                     |             |
           |              |                     |             |
           |              |                     |             |
           |              | T1               P1 |             |
           |      BC      |---------------------|    OC/BC    |
           |              |                     |             |
           |              |                     |             |
           |              |                     |             |
           |              |                     |             |
           +--------------+                     +-------------+
```

```
    Legends:

        TEE      : Test Execution Engine
        DUT      : Device Under Test
        OC       : Ordinary Clock
        BC       : Boundary Clock
        T1       : Port 1 at TEE
        P1       : Port 1 at DUT
```

Ladder Diagram :

```
          TEE                                                    DUT
           |                                                      |
           |                                        <Enable PTP> | P1
           |                         <Enable PTP with BC/OC clock> |
           |                      <Clock mode - one-step/two-step> |
           |                       <Configure logAnnounceInterval, | P1
           |                               announceReceiptTimeout> |
           |                           <Configure logSyncInterval> | P1
           |                    <Configure logMinDelayReqInterval> | P1
           |                      <Configure Priority1, Priority2> | P1
           |                                       <Enable L1SYNC> | P1
           |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
           |                       <Disable L1SynOptParams option> | P1
           |            <Enable asymmetryCorrectionPortDS.enable> | P1
           | <Configure timestampCorrectionPortDS.egressLatency, | P1
           |            timestampCorrectionPortDS.ingressLatency, |
           |         asymmetryCorrectionPortDS.constantAsymmetry, |
           |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
           |                                                      |
           |    <Check timestampCorrectionPortDS.egressLatency = | P1
           |                                             Default> |
```

```
|                                                      |
| !<Configure timestampCorrectionPortDS.egressLatency | P1
|                                   value to -2^64>  |
|                                                      |
|    <Check timestampCorrectionPortDS.egressLatency = | P1
|                                  Default or zero>  |
|                                                      |
|  <Configure timestampCorrectionPortDS.egressLatency | P1
|                                   value to -2^63>  |
|                                                      |
|    <Check timestampCorrectionPortDS.egressLatency = | P1
|                                            -2^63>  |
|                                                      |
| !<Configure timestampCorrectionPortDS.egressLatency | P1
|                                    value to 2^63>  |
|                                                      |
|    <Check timestampCorrectionPortDS.egressLatency = | P1
|                                    -2^63 or zero>  |
|                                                      |
|  <Configure timestampCorrectionPortDS.egressLatency | P1
|                                  value to 2^63-1>  |
|                                                      |
|    <Check timestampCorrectionPortDS.egressLatency = | P1
|                                           2^63-1>  |
|                                                      |
|  <Configure timestampCorrectionPortDS.egressLatency | P1
|                                 value to Default>  |
|                                                      |
|    <Check timestampCorrectionPortDS.egressLatency = | P1
|                                          Default>  |
|                                                      |
```

Legends :

    MSG_TYPE = Message Type
    DN   = Domain Number

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's port P1.
ii. Enable PTP on port P1.
iii. Enable PTP globally with device type as Boundary/Ordinary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vi. Enable L1SYNC on DUT's port P1.

```
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for egressLatency, ingressLatency,
         constantAsymmetry and scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Check whether egressLatency has default value on port P1.

Step 4 : Observe that DUT does not allow to configure out-of-range value of
         egressLatency on port P1 by trying to set egressLatency to
         - 281 474 976 710 656 ns (i.e., the value of dataset expressed
         in TimeInterval timestampCorrectionPortDS.egressLatency = -2^64).

Step 5 : If DUT allows to configure egressLatency in step 4, check whether
         egressLatency has still the default value or zero on port P1.

Step 6 : Observe that DUT allows to configure the minimum allowed value
         of the egressLatency on port P1 by setting egressLatency to
         - 140 737 488 355 328 ns (i.e., the value of dataset expressed
         in TimeInterval timestampCorrectionPortDS.egressLatency = -2^63).

Step 7 : Check whether egressLatency on port P1 is
         - 140 737 488 355 328 ns (i.e., timestampCorrectionPortDS.
         egressLatency = -2^63 expressed in TimeInterval).

Step 8 : Observe that DUT does not allow to configure out-of-range value
         of egressLatency on port P1 by trying to set egressLatency to
         140 737 488 355 328 ns (i.e., the value of dataset expressed in
         TimeInterval timestampCorrectionPortDS.egressLatency = 2^63).

Step 9 : If DUT allows to configure egressLatency in step 8, check whether
         egressLatency on port P1 is still - 140 737 488 355 328 ns (i.e.,
         (timestampCorrectionPortDS. egressLatency = -2^63 expressed in
         TimeInterval) or zero.

Step 10: Observe that DUT allows to configure maximum allowed value of the
         egressLatency on port P1 by trying to set egressLatency to
         140 737 488 355 327 ns (i.e., the value of dataset expressed
         in TimeInterval timestampCorrectionPortDS.egressLatency = 2^63-1).

Step 11: Check whether egressLatency on port P1 is
         140 737 488 355 327 ns (i.e., timestampCorrectionPortDS.
         egressLatency = 2^63-1 expressed in TimeInterval).

Step 12: Observe that DUT allows to configure egressLatency to the default
         value on port P1.

Step 13: Verify whether egressLatency has the default value on port P1.
```

6.13. tc_conf_ptp-ha_pcg_015

```
Test Case         : tc_conf_ptp-ha_pcg_015
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA Configuration Group (PCG)

Title             : timestampCorrectionPortDS.ingressLatency

Purpose           : To verify that a PTP enabled device supports to
                    configure timestampCorrectionPortDS.ingressLatency
                    (allowable range: -2^63 to 2^63-1).

Reference         : P1588/D1.3, February 2018 V3.01 Clause 7.3.4.2 Page 68,
                    Clause 16.7 Page 301, Clause J.5.3 Table 150 Page 413

Conformance Type  : SHALL
```

Topology

```
              TEE                                    DUT
        +--------------+                      +-------------+
        |              |                      |             |
        |              |                      |             |
        |              |                      |             |
        |              |                      |             |
        |              | T1                P1 |             |
        |      BC      |----------------------|    OC/BC    |
        |              |                      |             |
        |              |                      |             |
        |              |                      |             |
        |              |                      |             |
        +--------------+                      +-------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
Ladder Diagram    :


          TEE                                                    DUT
           |                                                      |
           |                                       <Enable PTP> | P1
           |                         <Enable PTP with BC/OC clock> |
           |                      <Clock mode - one-step/two-step> |
           |                       <Configure logAnnounceInterval, | P1
           |                               announceReceiptTimeout> |
           |                           <Configure logSyncInterval> | P1
```

```
           |                  <Configure logMinDelayReqInterval> | P1
           |                    <Configure Priority1, Priority2> | P1
           |                                     <Enable L1SYNC> | P1
           |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
           |                     <Disable L1SynOptParams option> | P1
           |           <Enable asymmetryCorrectionPortDS.enable> | P1
           | <Configure timestampCorrectionPortDS.egressLatency, | P1
           |           timestampCorrectionPortDS.ingressLatency, |
           |        asymmetryCorrectionPortDS.constantAsymmetry, |
           |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
           |                                                     |
           |   <Check timestampCorrectionPortDS.ingressLatency = | P1
           |                                            Default> |
           |                                                     |
           |!<Configure timestampCorrectionPortDS.ingressLatency | P1
           |                                     value to -2^64> |
           |                                                     |
           |   <Check timestampCorrectionPortDS.ingressLatency = | P1
           |                                    Default or zero> |
           |                                                     |
           | <Configure timestampCorrectionPortDS.ingressLatency | P1
           |                                     value to -2^63> |
           |                                                     |
           |   <Check timestampCorrectionPortDS.ingressLatency = | P1
           |                                              -2^63> |
           |                                                     |
           |!<Configure timestampCorrectionPortDS.ingressLatency | P1
           |                                      value to 2^63> |
           |                                                     |
           |   <Check timestampCorrectionPortDS.ingressLatency = | P1
           |                                      -2^63 or zero> |
           |                                                     |
           | <Configure timestampCorrectionPortDS.ingressLatency | P1
           |                                    value to 2^63-1> |
           |                                                     |
           |   <Check timestampCorrectionPortDS.ingressLatency = | P1
           |                                             2^63-1> |
           |                                                     |
           | <Configure timestampCorrectionPortDS.ingressLatency | P1
           |                                   value to Default> |
           |                                                     |
           |   <Check timestampCorrectionPortDS.ingressLatency = | P1
           |                                            Default> |
           |                                                     |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile
```

```
Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for egressLatency, ingressLatency,
         constantAsymmetry and scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Check whether ingressLatency has the default value on port P1.

Step 4 : Observe that DUT does not allow to configure out-of-range value
         of ingressLatency on port P1 by trying to set ingressLatency to
         - 281 474 976 710 656 ns (i.e., the value of dataset expressed in
         TimeInterval timestampCorrectionPortDS.ingressLatency = -2^64).

Step 5 : If DUT allows to configure ingressLatency in step 4, check whether
         ingressLatency has still the default value or zero on port P1.

Step 6 : Observe that DUT allows to configure the minimum allowed value of
         the ingressLatency on port P1 by setting ingressLatency to
         - 140 737 488 355 328 ns (i.e., the value of dataset expressed in
         TimeInterval timestampCorrectionPortDS.ingressLatency = -2^63).

Step 7 : Check whether ingressLatency on port P1 is
         - 140 737 488 355 328 ns (i.e., timestampCorrectionPortDS.
         ingressLatency = -2^63 expressed in TimeInterval)

Step 8 : Observe that DUT does not allow to configure out-of-range value of
         ingressLatency on port P1 by trying to set ingressLatency to
         140 737 488 355 328 ns (i.e., the value of dataset expressed in
         TimeInterval timestampCorrectionPortDS.ingressLatency = 2^63).

Step 9 : If DUT allows to configure ingressLatency in step 8, check whether
         ingressLatency on port P1 is still - 140 737 488 355 328 ns (i.e.,
         timestampCorrectionPortDS.ingressLatency = -2^63 expressed in
         TimeInterval) or zero.

Step 10: Observe that DUT allows to configure maximum allowed value of the
         ingressLatency on port P1 by trying to set ingressLatency to
         140 737 488 355 327 ns (i.e., the value of dataset expressed in
```

```
         TimeInterval timestampCorrectionPortDS.ingressLatency = 2^63-1).

Step 11: Check whether ingressLatency on port P1 is
         140 737 488 355 327 ns (i.e., timestampCorrectionPortDS.
         ingressLatency = 2^63-1 expressed in TimeInterval).

Step 12: Observe that DUT allows to configure ingressLatency to the default
         value on port P1.

Step 13: Verify whether ingressLatency has the default value on port P1.
```

6.14. tc_conf_ptp-ha_pcg_016

```
Test Case         : tc_conf_ptp-ha_pcg_016
Test Case Version : 1.4
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA Configuration Group (PCG)

Title             : asymmetryCorrectionPortDS.constantAsymmetry

Purpose           : To verify that a PTP enabled device supports to
                    configure asymmetryCorrectionPortDS.constantAsymmetry
                    (allowable range: -2^63 to 2^63-1).

Reference         : P1588/D1.3, February 2018 V3.01 Clause 7.4.2 Page 75,
                    Clause 8.2.15.4.8 Page 127, Clause J.5.3 Table 150
                    Page 413

Conformance Type  : SHALL
```

Topology

```
           TEE                                  DUT
      +---------------+                    +--------------+
      |               |                    |              |
      |               |                    |              |
      |               |                    |              |
      |               |                    |              |
      |               | T1              P1 |              |
      |      BC       |--------------------|    OC/BC     |
      |               |                    |              |
      |               |                    |              |
      |               |                    |              |
      |               |                    |              |
      +---------------+                    +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
```

```
       P1      : Port 1 at DUT


Ladder Diagram    :


         TEE                                                    DUT
          |                                                      |
          |                                        <Enable PTP> | P1
          |                         <Enable PTP with BC/OC clock> |
          |                       <Clock mode - one-step/two-step> |
          |                        <Configure logAnnounceInterval, | P1
          |                                announceReceiptTimeout> |
          |                            <Configure logSyncInterval> | P1
          |                      <Configure logMinDelayReqInterval> | P1
          |                        <Configure Priority1, Priority2> | P1
          |                                         <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                         <Disable L1SynOptParams option> | P1
          |              <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |              timestampCorrectionPortDS.ingressLatency, |
          |           asymmetryCorrectionPortDS.constantAsymmetry, |
          |    asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                      |
          |                                              <Check  | P1
          |        asymmetryCorrectionPortDS.constantAsymmetry = |
          |                                              Default> |
          |                                                      |
          |                                          !<Configure | P1
          |          asymmetryCorrectionPortDS.constantAsymmetry |
          |                                        value to -2^64> |
          |                                                      |
          |                                              <Check  | P1
          |        asymmetryCorrectionPortDS.constantAsymmetry = |
          |                                      Default or zero> |
          |                                                      |
          |                                           <Configure | P1
          |          asymmetryCorrectionPortDS.constantAsymmetry |
          |                                        value to -2^63> |
          |                                                      |
          |                                               <Check | P1
          |          asymmetryCorrectionPortDS.constantAsymmetry |
          |                                               = -2^63> |
          |                                                      |
          |                                          !<Configure | P1
          |          asymmetryCorrectionPortDS.constantAsymmetry |
          |                                         value to 2^63> |
          |                                                      |
          |                                               <Check | P1
          |          asymmetryCorrectionPortDS.constantAsymmetry |
          |                                      = -2^63 or zero> |
          |                                                      |
          |                                           <Configure | P1
          |          asymmetryCorrectionPortDS.constantAsymmetry |
          |                                       value to 2^63-1> |
          |                                                      |
```

```
|                                               <Check | P1
|         asymmetryCorrectionPortDS.constantAsymmetry |
|                                            = 2^63-1> |
|                                                      |
|                                           <Configure | P1
|         asymmetryCorrectionPortDS.constantAsymmetry |
|                                    value to Default> |
|                                                      |
|                                              <Check  | P1
|       asymmetryCorrectionPortDS.constantAsymmetry = |
|                                             Default> |
|                                                      |
```

Legends :

MSG_TYPE = Message Type
DN = Domain Number

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for egressLatency, ingressLatency, constantAsymmetry and scaledDelayCoefficient.

Step 2 : Initialization of TEE
- i. Add port T1 at TEE.

(Part 1)

Step 3 : Check whether constantAsymmetry has the default value on port P1.

Step 4 : Observe that DUT does not allow to configure out-of-range value of constantAsymmetry on port P1 by trying to set constantAsymmetry to - 281 474 976 710 656 ns (i.e., the value of dataset expressed in TimeInterval timestampCorrectionPortDS.constantAsymmetry = -2^64).

```
Step 5 : If DUT allows to configure constantAsymmetry in step 4, check
         whether constantAsymmetry has still the default value or zero on
         port P1.

Step 6 : Observe that DUT allows to configure the minimum allowed value
         of the constantAsymmetry on port P1 by setting constantAsymmetry to
         - 140 737 488 355 328 ns (i.e., the value of dataset expressed in
         TimeInterval timestampCorrectionPortDS.constantAsymmetry = -2^63).

Step 7 : Check whether constantAsymmetry on port P1 is
         - 140 737 488 355 328 ns (i.e., timestampCorrectionPortDS.
         constantAsymmetry = -2^63 expressed in TimeInterval).

Step 8 : Observe that DUT does not allow to configure out-of-range value
         of constantAsymmetry on port P1 by trying to set constantAsymmetry
         to 140 737 488 355 328 ns (i.e., the value of dataset expressed in
         TimeInterval timestampCorrectionPortDS.constantAsymmetry = 2^63).

Step 9 : If DUT allows to configure constantAsymmetry in step 8, check
         whether constantAsymmetry on port P1 is still
         - 140 737 488 355 328 ns (i.e., timestampCorrectionPortDS.
         constantAsymmetry = -2^63 expressed in TimeInterval) or zero.

Step 10: Observe that DUT allows to configure maximum allowed value of the
         constantAsymmetry on port P1 by trying to set constantAsymmetry to
         140 737 488 355 327 ns (i.e., the value of dataset expressed in
         TimeInterval timestampCorrectionPortDS.constantAsymmetry = 2^63-1).

Step 11: Check whether constantAsymmetry on port P1 is
         140 737 488 355 327 ns (i.e., timestampCorrectionPortDS.
         constantAsymmetry = 2^63-1 expressed in TimeInterval).

Step 12: Observe that DUT allows to configure constantAsymmetry to the
         default value on port P1.

Step 13: Verify whether constantAsymmetry has the default value on port P1.
```

6.15. tc_conf_ptp-ha_pcg_017

```
Test Case         : tc_conf_ptp-ha_pcg_017
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA Configuration Group (PCG)

Title             : asymmetryCorrectionPortDS.scaledDelayCoefficient

Purpose           : To verify that a PTP enabled device supports to
                    configure asymmetryCorrectionPortDS.
                    scaledDelayCoefficient (allowable range: -2^63 to
                    2^63-1).

Reference         : P1588/D1.3, February 2018 V3.01 Clause 7.4.2 Page 75,
                    Clause 8.2.17.3 Page 130, Clause J.5.3 Table 150
                    Page 413
```

```
 Conformance Type  : SHALL
```

```
Topology

            TEE                                    DUT
        +---------------+                     +--------------+
        |               |                     |              |
        |               |                     |              |
        |               |                     |              |
        |               |                     |              |
        |               | T1               P1 |              |
        |      BC       |---------------------|    OC/BC     |
        |               |                     |              |
        |               |                     |              |
        |               |                     |              |
        |               |                     |              |
        +---------------+                     +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
 Ladder Diagram    :


        TEE                                                    DUT
         |                                                      |
         |                                       <Enable PTP>   | P1
         |                         <Enable PTP with BC/OC clock> |
         |                      <Clock mode - one-step/two-step> |
         |                       <Configure logAnnounceInterval, | P1
         |                               announceReceiptTimeout> |
         |                           <Configure logSyncInterval> | P1
         |                    <Configure logMinDelayReqInterval> | P1
         |                      <Configure Priority1, Priority2> | P1
         |                                       <Enable L1SYNC> | P1
         |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
         |                       <Disable L1SynOptParams option> | P1
         |             <Enable asymmetryCorrectionPortDS.enable> | P1
         | <Configure timestampCorrectionPortDS.egressLatency, | P1
         |             timestampCorrectionPortDS.ingressLatency, |
         |          asymmetryCorrectionPortDS.constantAsymmetry, |
         |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
         |                                                      |
         |                                             <Check  | P1
         |    asymmetryCorrectionPortDS.scaledDelayCoefficient |
         |                                           = Default> |
         |                                                      |
         |                                         !<Configure | P1
```

```
|    asymmetryCorrectionPortDS.scaledDelayCoefficient |
|                                     value to -2^64> |
|                                                     |
|                                              <Check  | P1
|    asymmetryCorrectionPortDS.scaledDelayCoefficient |
|                                 = Default or zero> |
|                                                     |
|                                          <Configure | P1
|    asymmetryCorrectionPortDS.scaledDelayCoefficient |
|                                     value to -2^63> |
|                                                     |
|                                              <Check | P1
|    asymmetryCorrectionPortDS.scaledDelayCoefficient |
|                                            = -2^63> |
|                                                     |
|                                         !<Configure | P1
|    asymmetryCorrectionPortDS.scaledDelayCoefficient |
|                                      value to 2^63> |
|                                                     |
|                                              <Check | P1
|    asymmetryCorrectionPortDS.scaledDelayCoefficient |
|                                   = -2^63 or zero> |
|                                                     |
|                                          <Configure | P1
|    asymmetryCorrectionPortDS.scaledDelayCoefficient |
|                                    value to 2^63-1> |
|                                                     |
|                                              <Check | P1
|    asymmetryCorrectionPortDS.scaledDelayCoefficient |
|                                           = 2^63-1> |
|                                                     |
|                                          <Configure | P1
|    asymmetryCorrectionPortDS.scaledDelayCoefficient |
|                                   value to Default> |
|                                                     |
|                                              <Check  | P1
|    asymmetryCorrectionPortDS.scaledDelayCoefficient |
|                                          = Default> |
|                                                     |
```

Legends   :

    MSG_TYPE = Message Type
    DN   = Domain Number

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure   :

(Initial Part)

Step 1 : Initialization of DUT


```
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for egressLatency, ingressLatency,
         constantAsymmetry and scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Check whether scaledDelayCoefficient has the default value on port
         P1.

Step 4 : Observe that DUT does not allow to configure out-of-range value of
         scaledDelayCoefficient on port P1 by trying to set
         scaledDelayCoefficient to - 4 (i.e., the value of dataset expressed
         in RelativeDifference asymmetryCorrectionPortDS.
         scaledDelayCoefficient = -2^64).

Step 5 : Check whether scaledDelayCoefficient has still the default value or
         zero on port P1.

Step 6 : Observe that DUT allows to configure the minimum allowed value of
         the scaledDelayCoefficient on port P1 by setting
         scaledDelayCoefficient to - 2 (i.e., the value of dataset expressed
         in RelativeDifference asymmetryCorrectionPortDS.
         scaledDelayCoefficient = -2^63).

Step 7 : Check whether scaledDelayCoefficient on port P1 is - 2 (i.e.,
         asymmetryCorrectionPortDS.scaledDelayCoefficient = -2^63 expressed
         in RelativeDifference).

Step 8 : Observe that DUT does not allow to configure out-of-range value of
         scaledDelayCoefficient on port P1 by trying to set
         scaledDelayCoefficient to 2 (i.e., the value of dataset expressed
         in RelativeDifference asymmetryCorrectionPortDS.
         scaledDelayCoefficient = 2^63).

Step 9 : Check whether scaledDelayCoefficient on port P1 is still -2 (i.e.,
         asymmetryCorrectionPortDS.scaledDelayCoefficient = -2^63 expressed
         in RelativeDifference) or zero.

Step 10: Observe that DUT allows to configure maximum allowed value of the
         scaledDelayCoefficient on port P1 by trying to set
         scaledDelayCoefficient to 1.9999999999999999978315957 (i.e., the
         value of dataset expressed in RelativeDifference
         asymmetryCorrectionPortDS.scaledDelayCoefficient = 2^63-1).
```

```
Step 11: Check whether scaledDelayCoefficient on port P1 is
         1.9999999999999999978315957 (i.e., asymmetryCorrectionPortDS.
         scaledDelayCoefficient = 2^63-1 expressed in RelativeDifference).

Step 12: Observe that DUT allows to configure scaledDelayCoefficient to the
         default value on port P1.

Step 13: Verify whether scaledDelayCoefficient has the default value on port
         P1.
```

7. PTP-ExternalConfiguration Group (PEG)

7.1. tc_conf_ptp-ha_peg_001

```
Test Case         : tc_conf_ptp-ha_peg_001
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP ExternalPortConfiguration Group (PEG)

Title             : externalPortConfigurationPortDS.desiredState - Port
                    state remains in MASTER state

Purpose           : To verify that a PTP enabled device remains in MASTER
                    state if externalPortConfigurationPortDS.desiredState is
                    set to MASTER.

Reference         : P1588/D1.3, February 2018 V3.01 Clause 17.6.5.4
                    Page 356

Conformance Type  : SHALL
```

```
Topology

              TEE                                  DUT
           +---------------+                    +--------------+
           |               |                    |              |
           |               |                    |              |
           |               |                    |              |
           |               |                    |              |
           |               | T1              P1 |              |
           |       BC      |--------------------|    OC/BC     |
           |               |                    |              |
           |               |                    |              |
           |               |                    |              |
           |               |                    |              |
           +---------------+                    +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
```

```
BC      : Boundary Clock
T1      : Port 1 at TEE
P1      : Port 1 at DUT
```

```
Ladder Diagram    :


   TEE                                                    DUT
    |                                                      |
    |                                        <Enable PTP> | P1
    |                         <Enable PTP with BC/OC clock> |
    |                      <Clock mode - one-step/two-step> |
    |                       <Configure logAnnounceInterval, | P1
    |                               announceReceiptTimeout> |
    |                           <Configure logSyncInterval> | P1
    |                    <Configure logMinDelayReqInterval> | P1
    |                      <Configure Priority1, Priority2> | P1
    |                                       <Enable L1SYNC> | P1
    |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
    |                       <Disable L1SynOptParams option> | P1
    |            <Enable asymmetryCorrectionPortDS.enable> | P1
    | <Configure timestampCorrectionPortDS.egressLatency, | P1
    |            timestampCorrectionPortDS.ingressLatency, |
    |         asymmetryCorrectionPortDS.constantAsymmetry, |
    |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
    |                                             <Enable  |
    |          defaultDS.externalPortConfigurationEnabled> | P1
    |                                                      |
    |                                           <Configure |
    | externalPortConfigurationPortDS.desiredState=MASTER>|
    |                                                      |
    |                         <Check Port Status = MASTER> | P1
    |                                                      |
    |                          ANNOUNCE [MSG_TYPE = 0x0B,  |
    |                                      PRI=X, DN = DN1] |
 T1 |-------------------------------------------------<<--| P1
    |                                                      |
    | ANNOUNCE [MSG_TYPE = 0x0B,                           |
    |  PRI=X-1, DN = DN1]                                  |
 T1 |-->>--------------------------------------------------| P1
    |                                                      |
    |          < Wait for 6s to complete BMCA >            |
    |                                                      |
    | PTP SIGNALING with L1 Sync TLV                       |
    | [MSG_TYPE = 0xC, DN = DN1,                           |
    | TLV_TYPE = 0x8001, TCR = 1,                          |
    | RCR = 1, CR = 1, ITC = 1,                            |
    | IRC = 1, IC = 1]                                     |
 T1 |-->>--------------------------------------------------| P1
    |                                                      |
    |                         <Check Port Status = MASTER> | P1
    |                                                      |
    |                                             <Disable |
    |          defaultDS.externalPortConfigurationEnabled> | P1
    |                                                      |
    |          < Wait for 6s to complete BMCA >            |
```

```
          |                                                    |
          |                        <Check Port Status = SLAVE> | P1
          |                                                    |
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

```
Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.
   xi.   Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Configure externalPortConfigurationPortDS.desiredState as MASTER

Step 4 : Observe that DUT transmits ANNOUNCE message on port P1
         with following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X

Step 5 : Send periodic ANNOUNCE message on port T1 with following parameters

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X-1

Step 6: Wait for 6s for completing BMCA.
```



```
Step 7 : Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 1
                 IRC           = 1
                 IC            = 1

Step 8 : Observe that the port status of P1 in DUT is in MASTER state.

Step 9 : Disable defaultDS.externalPortConfigurationEnabled on port P1.

Step 10: Wait for 6s for completing BMCA.

Step 11: Verify that the port status of P1 in DUT is in SLAVE state.
```

7.2. tc_conf_ptp-ha_peg_002

```
Test Case         : tc_conf_ptp-ha_peg_002
Test Case Version : 1.2
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP ExternalPortConfiguration Group (PEG)

Title             : Default value of portDS.portState is PASSIVE

Purpose           : To verify that a PTP enabled device sets
                    portDS.portState to PASSIVE state when
                    defaultDS.externalPortConfigurationEnabled is set to
                    TRUE unless otherwise specified.

Reference         : P1588/D1.3, February 2018 V3.01 Clause 17.6.3.2 Page 354

Conformance Type  : SHALL
```

Topology

```
                  TEE                                    DUT
            +---------------+                     +--------------+
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               | T1               P1 |              |
            |       BC      |---------------------|    OC/BC     |
            |               |                     |              |
```

```
        |              |                      |             |
        |              |                      |             |
        |              |                      |             |
        +--------------+                      +-------------+

   Legends:

       TEE      : Test Execution Engine
       DUT      : Device Under Test
       OC       : Ordinary Clock
       BC       : Boundary Clock
       T1       : Port 1 at TEE
       P1       : Port 1 at DUT


Ladder Diagram    :

         TEE                                                    DUT
          |                                                      |
          |                                       <Enable PTP> | P1
          |                     <Enable PTP with BC/OC clock> |
          |                  <Clock mode - one-step/two-step> |
          |                   <Configure logAnnounceInterval, | P1
          |                           announceReceiptTimeout> |
          |                       <Configure logSyncInterval> | P1
          |                <Configure logMinDelayReqInterval> | P1
          |              <Configure Priority1 (X), Priority2> | P1
          |                                     <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                   <Disable L1SynOptParams option> | P1
          |             <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |            timestampCorrectionPortDS.ingressLatency, |
          |         asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                            <Enable  |
          |        <defaultDS.externalPortConfigurationEnabled> |
          |                                                      |
          |                       <Check Port Status = PASSIVE> | P1
          |                                                      |
          | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
          |           SEQ_ID = A, PRI1 = X+1]                    |
       T1 |-->>--------------------------------------------------| P1
          |                                                      |
          |         < Wait for 6s to complete BMCA >             |
          |                                                      |
          |                       <Check Port Status = PASSIVE> | P1
          |                                                      |
          |                                           <Disable  |
          |        <defaultDS.externalPortConfigurationEnabled> |
          |                                                      |
          |                          ANNOUNCE [MSG_TYPE = 0x0B, |
          |                     DN = DN1, SEQ_ID = Y, PRI1 = X] |
       T1 |------------------------------------------------<<--| P1
          |                                                      |
          | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
          |           SEQ_ID = A, PRI1 = X+1]                    |
```

```
       T1 |-->>-------------------------------------------------| P1
          |                                                     |
          |          < Wait for 6s to complete BMCA >           |
          |                                                     |
          |                          <Check port state MASTER>| P1
          |                                                     |
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1 (X), Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.
- xi. Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
- i. Add port T1 at TEE.

(Part 1)

Step 3 : Verify that the port status of P1 in DUT is in PASSIVE state.

Step 4 : Send periodic ANNOUNCE message on port T1 with following parameters.

```
PTP Header
    Message Type  = 0x0B
    Domain Number = DN1
    Sequence ID   = A
    Priority1     = X+1
```

Step 5: Wait for 6s for completing BMCA.

Step 6 : Verify that the port status of P1 in DUT is in PASSIVE state.


```
Step 7 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
         DUT.

Step 8 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 9 : Send periodic ANNOUNCE message on port T1 with following
         parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 10 : Wait for 6s for completing BMCA.

Step 11 : Verify that the port status of P1 in DUT is in MASTER state.
```

7.3. tc_conf_ptp-ha_peg_003

```
Test Case          : tc_conf_ptp-ha_peg_003
Test Case Version  : 1.2
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP ExternalPortConfiguration Group (PEG)

Title              : External Configuration: portDS.portState is SLAVE

Purpose            : To verify that a PTP enabled device sets
                     portDS.portState to SLAVE state when
                     defaultDS.externalPortConfigurationEnabled is set to
                     TRUE and externalPortConfigurationPortDS.desiredState is
                     set to SLAVE.

Reference          : P1588/D1.3, February 2018 V3.01 Clause 17.6.3.2 Page 354

Conformance Type   : SHALL
```

Topology

```
            TEE                                  DUT
     +---------------+                    +--------------+
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |               | T1             P1  |              |
```

```
        |       BC      |---------------------|    OC/BC     |
        |               |                     |              |
        |               |                     |              |
        |               |                     |              |
        |               |                     |              |
        +---------------+                     +--------------+

   Legends:

       TEE      : Test Execution Engine
       DUT      : Device Under Test
       OC       : Ordinary Clock
       BC       : Boundary Clock
       T1       : Port 1 at TEE
       P1       : Port 1 at DUT


 Ladder Diagram    :

         TEE                                                    DUT
          |                                                      |
          |                                       <Enable PTP> | P1
          |                        <Enable PTP with BC/OC clock> |
          |                     <Clock mode - one-step/two-step> |
          |                     <Configure logAnnounceInterval, | P1
          |                             announceReceiptTimeout> |
          |                         <Configure logSyncInterval> | P1
          |                  <Configure logMinDelayReqInterval> | P1
          |                <Configure Priority1 (X), Priority2> | P1
          |                                     <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                      <Disable L1SynOptParams option> | P1
          |            <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |           timestampCorrectionPortDS.ingressLatency, |
          |        asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                             <Enable  |
          |        <defaultDS.externalPortConfigurationEnabled> |
          |                                                      |
          |                                          <Configure |
          | externalPortConfigurationPortDS.desiredState=SLAVE> |
          |                                                      |
          |                         <Check Port Status = SLAVE> | P1
          |                                                      |
          | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
          |           SEQ_ID = A, PRI1 = X+1]                    |
       T1 |-->>--------------------------------------------------| P1
          |                                                      |
          |          < Wait for 6s to complete BMCA >            |
          |                                                      |
          |                         <Check Port Status = SLAVE> | P1
          |                                                      |
          |                                            <Disable  |
          |        <defaultDS.externalPortConfigurationEnabled> |
          |                                                      |
          |  <Wait for the expiry of AnnounceReceipt timeout>   |
```

```
      |                                                       |
      |                          ANNOUNCE [MSG_TYPE = 0x0B, |
      |                     DN = DN1, SEQ_ID = Y, PRI1 = X] |
   T1 |-------------------------------------------------<<--| P1
      |                                                       |
      | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                  |
      |           SEQ_ID = A, PRI1 = X+1]                     |
   T1 |-->>-------------------------------------------------| P1
      |                                                       |
      |          < Wait for 6s to complete BMCA >             |
      |                                                       |
      |                         <Check port state =  MASTER>| P1
      |                                                       |
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1 (X), Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.
- xi. Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
- i. Add port T1 at TEE.

(Part 1)

Step 3 : Configure externalPortConfigurationPortDS.desiredState as SLAVE

Step 4 : Verify that the port status of P1 in DUT is in SLAVE state.

Step 5 : Send periodic ANNOUNCE message with Priority1 value on port T1 with following parameters.

PTP Header

```
                Message Type  = 0x0B
                Domain Number = DN1
                Sequence ID   = A
                Priority1     = X+1

Step 6: Wait for 6s for completing BMCA.

Step 7 : Verify that the port status of P1 in DUT is in SLAVE state.

Step 8 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
         DUT.

Step 9 : Wait for the expiry of AnnounceReceiptTimeout.

Step 10: Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 11: Send periodic ANNOUNCE message with Priority1 value on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 12: Wait for 6s for completing BMCA.

Step 13: Verify that the port status of P1 in DUT is in MASTER state.
```

7.4. tc_conf_ptp-ha_peg_004

```
Test Case          : tc_conf_ptp-ha_peg_004
Test Case Version  : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP ExternalPortConfiguration Group (PEG)

Title              : External Configuration: portDS.portState is LISTENING

Purpose            : To verify that a PTP enabled device sets
                     portDS.portState to LISTENING state when
                     defaultDS.externalPortConfigurationEnabled is set to
                     TRUE and externalPortConfigurationPortDS.desiredState
                     is set to LISTENING.

Reference          : P1588/D1.3, February 2018 V3.01 Clause 17.6.3.2 Page 354

Conformance Type   : SHALL
```

```
Topology

                  TEE                                    DUT
            +---------------+                     +--------------+
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               | T1               P1 |              |
            |      BC       |---------------------|    OC/BC     |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            +---------------+                     +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT


 Ladder Diagram    :

          TEE                                                      DUT
           |                                                        |
           |                                         <Enable PTP>  | P1
           |                        <Enable PTP with BC/OC clock>  |
           |                     <Clock mode - one-step/two-step>  |
           |                      <Configure logAnnounceInterval,  | P1
           |                              announceReceiptTimeout>  |
           |                          <Configure logSyncInterval>  | P1
           |                   <Configure logMinDelayReqInterval>  | P1
           |                 <Configure Priority1 (X), Priority2>  | P1
           |                                      <Enable L1SYNC>  | P1
           |    <Configure L1SyncInterval, L1SyncReceiptTimeout>   | P1
           |                      <Disable L1SynOptParams option>  | P1
           |            <Enable asymmetryCorrectionPortDS.enable>  | P1
           | <Configure timestampCorrectionPortDS.egressLatency,   | P1
           |            timestampCorrectionPortDS.ingressLatency,  |
           |         asymmetryCorrectionPortDS.constantAsymmetry,  |
           |   asymmetryCorrectionPortDS.scaledDelayCoefficient>   |
           |                                             <Enable   |
           |        <defaultDS.externalPortConfigurationEnabled>   |
           |                                                        |
           |                                           <Configure  |
           | externalPortConfigurationPortDS.desiredState=          |
           |                                           LISTENING>|
           |                                                        |
           |                      <Check Port Status = LISTENING>  |
           |                                                        |
```

```
     | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                    |
     |           SEQ_ID = A, PRI1 = X+1]                       |
  T1 |-->>-----------------------------------------------------| P1
     |                                                         |
     |          < Wait for 6s to complete BMCA >               |
     |                                                         |
     |                     <Check Port Status = LISTENING>     |
     |                                                         |
     |                                            <Disable     |
     |        <defaultDS.externalPortConfigurationEnabled>     |
     |                                                         |
     |  <Wait for the expiry of AnnounceReceipt timeout>       |
     |                                                         |
     |                          ANNOUNCE [MSG_TYPE = 0x0B,     |
     |                     DN = DN1, SEQ_ID = Y, PRI1 = X]     |
  T1 |-------------------------------------------------<<--| P1
     |                                                         |
     | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                    |
     |           SEQ_ID = A, PRI1 = X+1]                       |
  T1 |-->>-----------------------------------------------------| P1
     |                                                         |
     |          < Wait for 6s to complete BMCA >               |
     |                                                         |
     |                          <Check port state = MASTER>| P1
     |                                                         |
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's port P1.
ii. Enable PTP on port P1.
iii. Enable PTP globally with device type as Boundary/Ordinary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure default values for Priority1 (X), Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vi. Enable L1SYNC on DUT's port P1.
vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
viii. Disable L1SynOptParams on DUT.
ix. Enable asymmetryCorrectionPortDS.enable.
x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.
xi. Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE

```
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Configure externalPortConfigurationPortDS.desiredState as LISTENING

Step 4 : Observe that the port status of P1 in DUT is in LISTENING state.

Step 5 : Send periodic ANNOUNCE message on port T1 with following parameters

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 6: Wait for 6s for completing BMCA.

Step 7 : Verify that the port status of P1 in DUT is in LISTENING state.

Step 8 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
         DUT.

Step 9 : Wait for the expiry of AnnounceReceiptTimeout.

Step 10: Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 11: Send periodic ANNOUNCE message on port T1 with following parameters

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 12: Wait for 6s for completing BMCA.

Step 13: Verify that the port status of P1 in DUT is in MASTER state.
```

7.5. tc_conf_ptp-ha_peg_005

```
Test Case         : tc_conf_ptp-ha_peg_005
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP ExternalPortConfiguration Group (PEG)

Title             : External Configuration: portDS.portState is UNCALIBRATED
```

```
Purpose           : To verify that a PTP enabled device sets
                    portDS.portState to UNCALIBRATED state when
                    defaultDS.externalPortConfigurationEnabled is set to
                    TRUE and externalPortConfigurationPortDS.desiredState is
                    set to UNCALIBRATED.

Reference         : P1588/D1.3, February 2018 V3.01 Clause 17.6.3.2 Page 354

Conformance Type  : SHALL
```

```
Topology

          TEE                                   DUT
    +--------------+                     +--------------+
    |              |                     |              |
    |              |                     |              |
    |              |                     |              |
    |              |                     |              |
    |              | T1               P1 |              |
    |      BC      |---------------------|    OC/BC     |
    |              |                     |              |
    |              |                     |              |
    |              |                     |              |
    |              |                     |              |
    +--------------+                     +--------------+

   Legends:

       TEE      : Test Execution Engine
       DUT      : Device Under Test
       OC       : Ordinary Clock
       BC       : Boundary Clock
       T1       : Port 1 at TEE
       P1       : Port 1 at DUT
```

```
Ladder Diagram    :

     TEE                                                    DUT
      |                                                      |
      |                                        <Enable PTP> | P1
      |                         <Enable PTP with BC/OC clock> |
      |                      <Clock mode - one-step/two-step> |
      |                       <Configure logAnnounceInterval, | P1
      |                               announceReceiptTimeout> |
      |                           <Configure logSyncInterval> | P1
      |                    <Configure logMinDelayReqInterval> | P1
      |                  <Configure Priority1 (X), Priority2> | P1
      |                                     <Enable L1SYNC> | P1
      |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
      |                       <Disable L1SynOptParams option> | P1
      |             <Enable asymmetryCorrectionPortDS.enable> | P1
      | <Configure timestampCorrectionPortDS.egressLatency, | P1
      |             timestampCorrectionPortDS.ingressLatency, |
      |         asymmetryCorrectionPortDS.constantAsymmetry, |
```

```
        |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
        |                                             <Enable  |
        |        <defaultDS.externalPortConfigurationEnabled> |
        |                                                      |
        |                                           <Configure |
        | externalPortConfigurationPortDS.desiredState=        |
        |                                        UNCALIBRATED>|
        |                                                      |
        |                  <Check Port Status = UNCALIBRATED> | P1
        |                                                      |
        | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
        |           SEQ_ID = A, PRI1 = X+1]                    |
     T1 |-->>-----------------------------------------------| P1
        |                                                      |
        |          < Wait for 6s to complete BMCA >            |
        |                                                      |
        |                  <Check Port Status = UNCALIBRATED> | P1
        |                                                      |
        |                                            <Disable  |
        |        <defaultDS.externalPortConfigurationEnabled> |
        |                                                      |
        |  <Wait for the expiry of AnnounceReceipt timeout>    |
        |                                                      |
        |                          ANNOUNCE [MSG_TYPE = 0x0B, |
        |                     DN = DN1, SEQ_ID = Y, PRI1 = X] |
     T1 |------------------------------------------------<<--| P1
        |                                                      |
        | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
        |           SEQ_ID = A, PRI1 = X+1]                    |
     T1 |-->>-----------------------------------------------| P1
        |                                                      |
        |          < Wait for 6s to complete BMCA >            |
        |                                                      |
        |                          <Check port state = MASTER>| P1
        |                                                      |
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's port P1.
ii. Enable PTP on port P1.
iii. Enable PTP globally with device type as Boundary/Ordinary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure default values for Priority1 (X), Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vi. Enable L1SYNC on DUT's port P1.
vii. Configure default values for L1SyncInterval and

```
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.
   xi.   Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Configure externalPortConfigurationPortDS.desiredState as
         UNCALIBRATED

Step 4 : Observe that the port status of P1 in DUT is in UNCALIBRATED
         state.

Step 5 : Send periodic ANNOUNCE message on port T1 with following parameters

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 6: Wait for 6s for completing BMCA.

Step 7 : Verify that the port status of P1 in DUT continues to be in
          UNCALIBRATED state.

Step 8 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
         DUT.

Step 9 : Wait for the expiry of AnnounceReceiptTimeout.

Step 10: Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 11: Send periodic ANNOUNCE message on port T1 with following parameters

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 12: Wait for 6s for completing BMCA.
```

Step 13: Verify that the port status of P1 in DUT is in MASTER state.

7.6. tc_conf_ptp-ha_peg_006

```
Test Case         : tc_conf_ptp-ha_peg_006
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP ExternalPortConfiguration Group (PEG)

Title             : External Configuration: portDS.portState is PRE-MASTER

Purpose           : To verify that a PTP enabled device sets
                    portDS.portState to PRE-MASTER state when
                    defaultDS.externalPortConfigurationEnabled is set to
                    TRUE and externalPortConfigurationPortDS.desiredState is
                    set to PRE-MASTER.

Reference         : P1588/D1.3, February 2018 V3.01 Clause 17.6.3.2 Page 354

Conformance Type  : SHALL
```

Topology

```
           TEE                                  DUT
      +---------------+                  +--------------+
      |               |                  |              |
      |               |                  |              |
      |               |                  |              |
      |               |                  |              |
      |               | T1            P1 |              |
      |       BC      |------------------|    OC/BC     |
      |               |                  |              |
      |               |                  |              |
      |               |                  |              |
      |               |                  |              |
      +---------------+                  +--------------+

   Legends:

       TEE      : Test Execution Engine
       DUT      : Device Under Test
       OC       : Ordinary Clock
       BC       : Boundary Clock
       T1       : Port 1 at TEE
       P1       : Port 1 at DUT
```

```
Ladder Diagram    :

         TEE                                                      DUT
          |                                                        |
          |                                          <Enable PTP> | P1
          |                            <Enable PTP with BC/OC clock> |
```

```
    |                      <Clock mode - one-step/two-step> |
    |                       <Configure logAnnounceInterval, | P1
    |                               announceReceiptTimeout> |
    |                           <Configure logSyncInterval> | P1
    |                    <Configure logMinDelayReqInterval> | P1
    |                  <Configure Priority1 (X), Priority2> | P1
    |                                       <Enable L1SYNC> | P1
    |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
    |                       <Disable L1SynOptParams option> | P1
    |             <Enable asymmetryCorrectionPortDS.enable> | P1
    | <Configure timestampCorrectionPortDS.egressLatency,   | P1
    |           timestampCorrectionPortDS.ingressLatency,   |
    |        asymmetryCorrectionPortDS.constantAsymmetry,   |
    |  asymmetryCorrectionPortDS.scaledDelayCoefficient>    |
    |                                              <Enable  |
    |        <defaultDS.externalPortConfigurationEnabled> |
    |                                                       |
    |                                            <Configure |
    | externalPortConfigurationPortDS.desiredState=         |
    |                                           PRE_MASTER>|
    |                                                       |
    |                      <Check Port Status = PRE_MASTER> | P1
    |                                                       |
    | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                  |
    |           SEQ_ID = A, PRI1 = X+1]                     |
 T1 |-->>---------------------------------------------------| P1
    |                                                       |
    |          < Wait for 6s to complete BMCA >             |
    |                                                       |
    |                      <Check Port Status = PRE_MASTER> | P1
    |                                                       |
    |                                             <Disable  |
    |        <defaultDS.externalPortConfigurationEnabled> |
    |                                                       |
    |     <Wait for the expiry of                           |
    |                qualificationTimeoutInterval>          |
    |                                                       |
    |                            ANNOUNCE [MSG_TYPE = 0x0B, |
    |                       DN = DN1, SEQ_ID = Y, PRI1 = X] |
 T1 |-------------------------------------------------<<--| P1
    |                                                       |
    | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                  |
    |           SEQ_ID = A, PRI1 = X+1]                     |
 T1 |-->>---------------------------------------------------| P1
    |                                                       |
    |          < Wait for 6s to complete BMCA >             |
    |                                                       |
    |                            <Check port state = MASTER>| P1
    |                                                       |
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

```
Procedure        :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1 (X), Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.
   xi.   Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Configure externalPortConfigurationPortDS.desiredState as
         PRE_MASTER.

Step 4 : Observe that the port status of P1 in DUT is in PRE_MASTER
         state.

Step 5 : Send periodic ANNOUNCE message on port T1 with following parameters

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 6: Wait for 6s for completing BMCA.

Step 7 : Verify that the port status of P1 in DUT continues to be in
         PRE_MASTER state.

Step 8 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
         DUT.

Step 9 : Wait for the expiry of qualificationTimeoutInterval.

Step 10: Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
```

```
                  Domain Number = DN1
                  Sequence ID   = Y
                  Priority1     = X

 Step 11: Send periodic ANNOUNCE message on port T1 with following parameters

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Sequence ID   = A
                  Priority1     = X+1

 Step 12: Wait for 6s for completing BMCA.

 Step 13: Verify that the port status of P1 in DUT is in MASTER state.
```

7.7. tc_conf_ptp-ha_peg_007

```
 Test Case         : tc_conf_ptp-ha_peg_007
 Test Case Version : 1.3
 Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
 Module Name       : PTP ExternalPortConfiguration Group (PEG)

 Title             : External Configuration: portDS.portState is FAULTY

 Purpose           : To verify that a PTP enabled device sets
                     portDS.portState to FAULTY state when
                     defaultDS.externalPortConfigurationEnabled is set to
                     TRUE and externalPortConfigurationPortDS.desiredState is
                     set to FAULTY.

 Reference         : P1588/D1.3, February 2018 V3.01 Clause 17.6.3.2 Page 354

 Conformance Type  : SHALL
```

Topology

```
                  TEE                                    DUT
            +---------------+                    +--------------+
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               | T1             P1  |              |
            |       BC      |--------------------|    OC/BC     |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            +---------------+                    +--------------+
```

    Legends:

```
       TEE     : Test Execution Engine
       DUT     : Device Under Test
       OC      : Ordinary Clock
       BC      : Boundary Clock
       T1      : Port 1 at TEE
       P1      : Port 1 at DUT


Ladder Diagram    :

         TEE                                                    DUT
          |                                                      |
          |                                      <Enable PTP> | P1
          |                      <Enable PTP with BC/OC clock> |
          |                   <Clock mode - one-step/two-step> |
          |                    <Configure logAnnounceInterval, | P1
          |                            announceReceiptTimeout> |
          |                        <Configure logSyncInterval> | P1
          |                 <Configure logMinDelayReqInterval> | P1
          |               <Configure Priority1 (X), Priority2> | P1
          |                                     <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                    <Disable L1SynOptParams option> | P1
          |          <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |           timestampCorrectionPortDS.ingressLatency, |
          |        asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                            <Enable  |
          |        <defaultDS.externalPortConfigurationEnabled> |
          |                                                      |
          |                                          <Configure |
          | externalPortConfigurationPortDS.desiredState=FAULTY>|
          |                                                      |
          |                        <Check Port Status = FAULTY> | P1
          |                                                      |
          |                                      <Disable port> | P1
          |                                                      |
          |                                       <Enable port> | P1
          |                                                      |
          | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
          |           SEQ_ID = A, PRI1 = X+1]                    |
       T1 |-->>---------------------------------------------------| P1
          |                                                      |
          |          < Wait for 6s to complete BMCA >            |
          |                                                      |
          |                         <Check Port Status = FAULTY>| P1
          |                                                      |
          |                                            <Disable  |
          |        <defaultDS.externalPortConfigurationEnabled> |
          |                                                      |
          |                          ANNOUNCE [MSG_TYPE = 0x0B, |
          |                    DN = DN1, SEQ_ID = Y, PRI1 = X] |
       T1 |------------------------------------------------<<--| P1
          |                                                      |
          | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
          |           SEQ_ID = A, PRI1 = X+1]                    |
```

```
  T1 |-->>-------------------------------------------------| P1
     |                                                     |
     |          < Wait for 6s to complete BMCA >           |
     |                                                     |
     |                         <Check port state =  MASTER>| P1
     |                                                     |
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

```
Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1 (X), Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.
   xi.   Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Configure externalPortConfigurationPortDS.desiredState as FAULTY.

Step 4 : Verify that the port status of P1 in DUT is in FAULTY state.

Step 5 : Send periodic ANNOUNCE message with Priority1 value on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 6 : Wait for 6s for completing BMCA.
```

```
Step 7 : Verify that the port status of P1 in DUT is in FAULTY state.

Step 8 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
         DUT.

Step 9 : Disable DUT's port P1.

Step 10: Enable DUT's port P1.

Step 11: Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 12: Send periodic ANNOUNCE message with Priority1 value on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 13: Wait for 6s for completing BMCA.

Step 14: Verify that the port status of P1 in DUT is in MASTER state.
```

7.8. tc_conf_ptp-ha_peg_008

```
Test Case         : tc_conf_ptp-ha_peg_008
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP ExternalPortConfiguration Group (PEG)

Title             : portDS.portState remains in passive state - expiry of
                    Announcereceipttimeout

Purpose           : To verify that a PTP enabled device remains in PASSIVE
                    state even after the expiry of Announcereceipttimeout
                    when defaultDS.externalPortConfigurationEnabled is set
                    to TRUE and externalPortConfigurationPortDS.desiredState
                    is set to PASSIVE.

Reference         : P1588/D1.3,February 2018 V3.01 Clause 17.6.5.3 Page 355

Conformance Type  : SHALL
```

Topology

```
      TEE                                    DUT
+---------------+                     +--------------+
|               |                     |              |
|               |                     |              |
|               |                     |              |
|               |                     |              |
|               | T1              P1  |              |
|       BC      |---------------------|    OC/BC     |
|               |                     |              |
|               |                     |              |
|               |                     |              |
|               |                     |              |
+---------------+                     +--------------+
```

```
Legends:

    TEE      : Test Execution Engine
    DUT      : Device Under Test
    OC       : Ordinary Clock
    BC       : Boundary Clock
    T1       : Port 1 at TEE
    P1       : Port 1 at DUT
```

```
Ladder Diagram    :
```

```
  TEE                                                      DUT
   |                                                        |
   |                                         <Enable PTP>  | P1
   |                      <Enable PTP with BC/OC clock>    |
   |                   <Clock mode - one-step/two-step>    |
   |                    <Configure logAnnounceInterval,    | P1
   |                            announceReceiptTimeout>    |
   |                        <Configure logSyncInterval>    | P1
   |                 <Configure logMinDelayReqInterval>    | P1
   |                   <Configure Priority1, Priority2>    | P1
   |                                     <Enable L1SYNC>   | P1
   |    <Configure L1SyncInterval, L1SyncReceiptTimeout>   | P1
   |                    <Disable L1SynOptParams option>    | P1
   |          <Enable asymmetryCorrectionPortDS.enable>    | P1
   | <Configure timestampCorrectionPortDS.egressLatency,   | P1
   |           timestampCorrectionPortDS.ingressLatency,   |
   |        asymmetryCorrectionPortDS.constantAsymmetry,   |
   |   asymmetryCorrectionPortDS.scaledDelayCoefficient>   |
   |                                            <Enable    |
   |         defaultDS.externalPortConfigurationEnabled>   | P1
   |                                                        |
   |                                          <Configure   |
   |externalPortConfigurationPortDS.desiredState=PASSIVE>|
   |                                                        |
   | < Wait for the expiry of AnnounceReceipt timeout>     |
   |                                                        |
   |                         <Check Port Status = PASSIVE>| P1
   |                                                        |
   |                                            <Disable   |
   |         defaultDS.externalPortConfigurationEnabled>   | P1
```

```
          |                                                    |
          | < Wait for the expiry of AnnounceReceipt timeout>  |
          |                                                    |
          |                        <Check Port Status = MASTER> | P1
          |                                                    |
```

Legends :

PRI = Priority

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.
- xi. Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
- i. Add port T1 at TEE.

(Part 1)

Step 3 : Configure externalPortConfigurationPortDS.desiredState as PASSIVE

Step 4 : Wait for the expiry of AnnounceReceiptTimeout

Step 5 : Observe that the port status of P1 in DUT is in PASSIVE state.

Step 6 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in DUT.

Step 7 : Wait for the expiry of AnnounceReceiptTimeout

```
Step 8 : Verify that the port status of P1 in DUT is in MASTER state.
```

7.9. tc_conf_ptp-ha_peg_009

```
Test Case          : tc_conf_ptp-ha_peg_009
Test Case Version  : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP ExternalPortConfiguration Group (PEG)

Title              : portDS.portState remains in slave state - expiry of
                     Announcereceipttimeout

Purpose            : To verify that a PTP enabled device remains in SLAVE
                     state even after the expiry of Announcereceipttimeout
                     when defaultDS.externalPortConfigurationEnabled is set
                     to TRUE and externalPortConfigurationPortDS.desiredState
                     is set to SLAVE.

Reference          : P1588/D1.3,February 2018 V3.01 Clause 17.6.5.3 Page 355

Conformance Type   : SHALL
```

```
Topology

             TEE                                    DUT
        +--------------+                     +--------------+
        |              |                     |              |
        |              |                     |              |
        |              |                     |              |
        |              |                     |              |
        |              | T1               P1 |              |
        |      BC      |---------------------|    OC/BC     |
        |              |                     |              |
        |              |                     |              |
        |              |                     |              |
        |              |                     |              |
        +--------------+                     +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
Ladder Diagram    :


         TEE                                                    DUT
          |                                                      |
```

```
|                                        <Enable PTP> | P1
|                          <Enable PTP with BC/OC clock> |
|                       <Clock mode - one-step/two-step> |
|                        <Configure logAnnounceInterval, | P1
|                                announceReceiptTimeout> |
|                            <Configure logSyncInterval> | P1
|                    <Configure logMinDelayReqInterval> | P1
|                      <Configure Priority1, Priority2> | P1
|                                        <Enable L1SYNC> | P1
|    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
|                       <Disable L1SynOptParams option> | P1
|             <Enable asymmetryCorrectionPortDS.enable> | P1
| <Configure timestampCorrectionPortDS.egressLatency, | P1
|           timestampCorrectionPortDS.ingressLatency, |
|        asymmetryCorrectionPortDS.constantAsymmetry, |
|   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
|                                             <Enable  |
|         defaultDS.externalPortConfigurationEnabled> | P1
|                                                      |
|                                           <Configure |
| externalPortConfigurationPortDS.desiredState=SLAVE> |
|                                                      |
| < Wait for the expiry of AnnounceReceipt timeout>   |
|                                                      |
|                           <Check Port Status = SLAVE>  | P1
|                                                      |
|                                            <Disable |
|         defaultDS.externalPortConfigurationEnabled> | P1
|                                                      |
| < Wait for the expiry of AnnounceReceipt timeout>   |
|                                                      |
|                          <Check Port Status = MASTER> | P1
|                                                      |
```

Legends :

PRI = Priority

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.

```
    vi.   Enable L1SYNC on DUT's port P1.
   vii.   Configure default values for L1SyncInterval and
          L1SyncReceiptTimeout.
  viii.   Disable L1SynOptParams on DUT.
    ix.   Enable asymmetryCorrectionPortDS.enable.
     x.   Configure default values for timestampCorrectionPortDS.
          egressLatency, timestampCorrectionPortDS.egressLatency,
          asymmetryCorrectionPortDS.constantAsymmetry and
          asymmetryCorrectionPortDS.scaledDelayCoefficient.
    xi.   Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
     i.   Add port T1 at TEE.

(Part 1)

Step 3 : Configure externalPortConfigurationPortDS.desiredState as SLAVE

Step 4 : Wait for the expiry of AnnounceReceiptTimeout

Step 5 : Observe that the port status of P1 in DUT is in SLAVE state.

Step 6 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
          DUT.

Step 7 : Wait for the expiry of AnnounceReceiptTimeout

Step 8 : Verify that the port status of P1 in DUT is in MASTER state.
```

7.10. tc_conf_ptp-ha_peg_010

```
Test Case          : tc_conf_ptp-ha_peg_010
Test Case Version  : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP ExternalPortConfiguration Group (PEG)

Title              : portDS.portState remains in uncalibrated - expiry of
                     Announcereceipttimeout

Purpose            : To verify that a PTP enabled device remains in
                     UNCALIBRATED state even after the expiry of
                     Announcereceipttimeout when
                     defaultDS.externalPortConfigurationEnabled is set
                     to TRUE and externalPortConfigurationPortDS.desiredState
                     is set to UNCALIBRATED.

Reference          : P1588/D1.3,February 2018 V3.01 Clause 17.6.5.3 Page 355

Conformance Type   : SHALL
```

```
Topology

                  TEE                                   DUT
```

```
   +--------------+                     +-------------+
   |              |                     |             |
   |              |                     |             |
   |              |                     |             |
   |              |                     |             |
   |              | T1               P1 |             |
   |      BC      |---------------------|    OC/BC    |
   |              |                     |             |
   |              |                     |             |
   |              |                     |             |
   |              |                     |             |
   +--------------+                     +-------------+

Legends:

    TEE     : Test Execution Engine
    DUT     : Device Under Test
    OC      : Ordinary Clock
    BC      : Boundary Clock
    T1      : Port 1 at TEE
    P1      : Port 1 at DUT
```

Ladder Diagram   :

```
   TEE                                                     DUT
    |                                                       |
    |                                         <Enable PTP> | P1
    |                       <Enable PTP with BC/OC clock> |
    |                    <Clock mode - one-step/two-step> |
    |                     <Configure logAnnounceInterval, | P1
    |                             announceReceiptTimeout> |
    |                         <Configure logSyncInterval> | P1
    |                  <Configure logMinDelayReqInterval> | P1
    |                    <Configure Priority1, Priority2> | P1
    |                                      <Enable L1SYNC> | P1
    |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
    |                     <Disable L1SynOptParams option> | P1
    |           <Enable asymmetryCorrectionPortDS.enable> | P1
    | <Configure timestampCorrectionPortDS.egressLatency, | P1
    |           timestampCorrectionPortDS.ingressLatency, |
    |        asymmetryCorrectionPortDS.constantAsymmetry, |
    |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
    |                                             <Enable  |
    |         defaultDS.externalPortConfigurationEnabled> | P1
    |                                                       |
    |                                           <Configure |
    |       externalPortConfigurationPortDS.desiredState= |
    |                                       UNCALIBRATED> |
    |                                                       |
    | < Wait for the expiry of AnnounceReceipt timeout>   |
    |                                                       |
    |                 <Check Port Status = UNCALIBRATED>  | P1
    |                                                       |
    |                                             <Disable |
    |         defaultDS.externalPortConfigurationEnabled> | P1
```

```
          |                                                     |
          | < Wait for the expiry of AnnounceReceipt timeout>   |
          |                                                     |
          |                       <Check Port Status = MASTER> | P1
          |                                                     |
```

Legends :

PRI = Priority

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.
- xi. Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
- i. Add port T1 at TEE.

(Part 1)

Step 3 : Configure externalPortConfigurationPortDS.desiredState as UNCALIBRATED.

Step 4 : Wait for the expiry of AnnounceReceiptTimeout

Step 5 : Observe that the port status of P1 in DUT is in UNCALIBRATED.

Step 6 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in DUT.

Step 7 : Wait for the expiry of AnnounceReceiptTimeout

```
Step 8 : Verify that the port status of P1 in DUT is in MASTER state.
```

7.11. tc_conf_ptp-ha_peg_011

```
Test Case          : tc_conf_ptp-ha_peg_011
Test Case Version  : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP ExternalPortConfiguration Group (PEG)

Title              : portDS.portState remains in listening - expiry of
                     Announcereceipttimeout

Purpose            : To verify that a PTP enabled device remains in
                     LISTENING state even after the expiry of
                     Announcereceipttimeout when
                     defaultDS.externalPortConfigurationEnabled is set to
                     TRUE and externalPortConfigurationPortDS.desiredState is
                     set to LISTENING.

Reference          : P1588/D1.3,February 2018 V3.01 Clause 17.6.5.3 Page 355

Conformance Type   : SHALL
```

```
Topology

                TEE                                     DUT
           +--------------+                      +--------------+
           |              |                      |              |
           |              |                      |              |
           |              |                      |              |
           |              |                      |              |
           |              | T1                P1 |              |
           |      BC      |----------------------|    OC/BC     |
           |              |                      |              |
           |              |                      |              |
           |              |                      |              |
           |              |                      |              |
           +--------------+                      +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
Ladder Diagram     :


         TEE                                                    DUT
```



```
|                                                     |
|                                       <Enable PTP> | P1
|                         <Enable PTP with BC/OC clock> |
|                      <Clock mode - one-step/two-step> |
|                       <Configure logAnnounceInterval, | P1
|                               announceReceiptTimeout> |
|                           <Configure logSyncInterval> | P1
|                    <Configure logMinDelayReqInterval> | P1
|                      <Configure Priority1, Priority2> | P1
|                                        <Enable L1SYNC> | P1
|    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
|                       <Disable L1SynOptParams option> | P1
|             <Enable asymmetryCorrectionPortDS.enable> | P1
| <Configure timestampCorrectionPortDS.egressLatency, | P1
|           timestampCorrectionPortDS.ingressLatency, |
|        asymmetryCorrectionPortDS.constantAsymmetry, |
|   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
|                                              <Enable  |
|          defaultDS.externalPortConfigurationEnabled> | P1
|                                                       |
|                                            <Configure |
|       externalPortConfigurationPortDS.desiredState= |
|                                            LISTENING> |
|                                                       |
| < Wait for the expiry of AnnounceReceipt timeout>   |
|                                                       |
|                      <Check Port Status = LISTENING>  | P1
|                                                       |
|                                              <Disable |
|          defaultDS.externalPortConfigurationEnabled> | P1
|                                                       |
| < Wait for the expiry of AnnounceReceipt timeout>   |
|                                                       |
|                          <Check Port Status = MASTER> | P1
|                                                       |
```

```
Legends          :

    PRI       = Priority

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile



Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
```

```
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
    vi.  Enable L1SYNC on DUT's port P1.
   vii.  Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
  viii.  Disable L1SynOptParams on DUT.
    ix.  Enable asymmetryCorrectionPortDS.enable.
     x.  Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.
    xi.  Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
     i.  Add port T1 at TEE.

(Part 1)

Step 3 : Configure externalPortConfigurationPortDS.desiredState as
         LISTENING.

Step 4 : Wait for the expiry of AnnounceReceiptTimeout

Step 5 : Observe that the port status of P1 in DUT is in LISTENING.

Step 6 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
         DUT.

Step 7 : Wait for the expiry of AnnounceReceiptTimeout

Step 8 : Verify that the port status of P1 in DUT is in MASTER state.
```

7.12. tc_conf_ptp-ha_peg_012

```
Test Case         : tc_conf_ptp-ha_peg_012
Test Case Version : 1.2
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP ExternalPortConfiguration Group (PEG)

Title             : Data set updation based on Announce message
                    portDS.portState is in UNCALIBRATED

Purpose           : To verify that a PTP enabled device updates data set
                    from most recently received Announce message when port
                    state is in UNCALIBRATED state and
                    defaultDS.externalPortConfigurationEnabled is set
                    to TRUE.

Reference         : P1588/D1.3, February 2018 V3.01 Clause 17.6.5.4
                    Page 356

Conformance Type  : SHALL
```

Topology

```
           TEE                                   DUT
      +---------------+                      +--------------+
      | +----------+ | T1              P1 |              |
      | |    BC    |-+-----------------------| (Master)     |
      | | (Slave)  | |                      |              |
      | +----------+ |                      |              |
      |              |                      |      BC      |
      |              |                      |              |
      | +----------+ | T2              P2 |              |
      | |    BC    |-+-----------------------| (Slave)      |
      | | (Master) | |                      |              |
      | +----------+ |                      |              |
      +---------------+                      +--------------+
```

Legends:

```
TEE      : Test Execution Engine
DUT      : Device Under Test
OC       : Ordinary Clock
BC       : Boundary Clock
T1, T2   : Ports 1 and 2 at TEE
P1, P2   : Ports 1 and 2 at DUT
```

Ladder Diagram :

```
 TEE                                                    DUT
  |                                                      |
  |                                       <Enable PTP> | P1
  |                                       <Enable PTP> | P2
  |                          <Enable PTP with BC clock> |
  |                    <Clock mode - one-step/two-step> |
  |                     <Configure logAnnounceInterval, | P1
  |                             announceReceiptTimeout> |
  |                         <Configure logSyncInterval> | P1
  |                  <Configure logMinDelayReqInterval> | P1
  |                    <Configure Priority1, Priority2> | P1
  |                                     <Enable L1SYNC> | P1
  |                                     <Enable L1SYNC> | P2
  |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
  |                     <Disable L1SynOptParams option> | P1
  |           <Enable asymmetryCorrectionPortDS.enable> | P1
  | <Configure timestampCorrectionPortDS.egressLatency, | P1
  |           timestampCorrectionPortDS.ingressLatency, |
  |        asymmetryCorrectionPortDS.constantAsymmetry, |
  |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
  |                                             <Enable |
  |         defaultDS.externalPortConfigurationEnabled> | P1
  |                                                      |
  |                                          <Configure |
  |       externalPortConfigurationPortDS.desiredState= |
  |                                      UNCALIBRATED> |
  |                                                      |
  |                 <Check Port Status = UNCALIBRATED>  | P1
  |                                                      |
```

```
       |                                     <Enable  |
       |         defaultDS.externalPortConfigurationEnabled> | P2
       |                                                     |
       |                <Configure.externalPortConfiguration.|
       |                  desiredstate = MASTER>             | P2
       |                                                     |
       |                         <Check Port Status = MASTER>| P2
       |                                                     |
       | ANNOUNCE [MSG_TYPE = 0x0B,                          |
       |  PRI=X+1, DN = DN1, PR2 = Y]                        |
    T1 |-->>-------------------------------------------------| P1
       |                                                     |
       |                          ANNOUNCE [MSG_TYPE = 0x0B, |
       |                           PRI=X+1, DN = DN1, PR2=Y] |
    T2 |-------------------------------------------------<<--| P2
       |                                                     |
       | ANNOUNCE [MSG_TYPE = 0x0B,                          |
       |  PRI=X+2, DN = DN1, PR2 = Y+1]                      |
    T1 |-->>-------------------------------------------------| P1
       |                                                     |
       |                          ANNOUNCE [MSG_TYPE = 0x0B, |
       |                         PRI=X+2, DN = DN1, PR2=Y+1] |
    T2 |-------------------------------------------------<<--| P2
       |                                                     |
       | ANNOUNCE [MSG_TYPE = 0x0B,                          |
       |  PRI=X+3, DN = DN1, PR2 = Y+2]                      |
    T1 |-->>-------------------------------------------------| P1
       |                                                     |
       |                          ANNOUNCE [MSG_TYPE = 0x0B, |
       |                         PRI=X+3, DN = DN1, PR2=Y+2] |
    T2 |-------------------------------------------------<<--| P2
       |                                                     |
```

Legends :

MSG_TYPE = Message Type
DN = Domain Number
PRI = Priority

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's ports P1 and P2.
ii. Enable PTP on ports P1 and P2.
iii. Enable PTP globally with device type as Boundary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and

```
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's ports P1 and P2.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.
   xi.   Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
    i.   Add ports T1 and T2 at TEE.

(Part 1)

Step 3 : Configure externalPortConfigurationPortDS.desiredState as
         UNCALIBRATED at Port P1.

Step 4 : Observe that the port status of P1 in DUT is in UNCALIBRATED
         state.

Step 5 : Configure externalPortConfigurationPortDS.desiredState as MASTER
         at Port P2.

Step 6 : Observe that the port status of P2 in DUT is in MASTER state.

Step 7 : Send ANNOUNCE message on port T1 with following parameters:

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority1     = X+1
                  Priority2     = Y

Step 8 : Verify that DUT transmits ANNOUNCE message on port P2
         with following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority1     = X+1
                  Priority2     = Y

Step 9 : Send ANNOUNCE message on port T1 with following parameters:

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority1     = X+2
                  Priority2     = Y+1

Step 10: Verify that DUT transmits ANNOUNCE message on port P2
         with following parameters.

              PTP Header
```

```
                   Message Type  = 0x0B
                   Domain Number = DN1
                   Priority1     = X+2
                   Priority2     = Y+1

Step 11: Send ANNOUNCE message on port T1 with following parameters:

               PTP Header
                   Message Type  = 0x0B
                   Domain Number = DN1
                   Priority1     = X+3
                   Priority2     = Y+2

Step 12: Verify that DUT transmits ANNOUNCE message on port P2
         with following parameters.

               PTP Header
                   Message Type  = 0x0B
                   Domain Number = DN1
                   Priority1     = X+3
                   Priority2     = Y+2
```

7.13. tc_conf_ptp-ha_peg_013

```
Test Case          : tc_conf_ptp-ha_peg_013
Test Case Version  : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP ExternalPortConfiguration Group (PEG)

Title              : Data set updation based on Announce message
                     portDS.portState is in SLAVE

Purpose            : To verify that a PTP enabled device updates data set
                     from most recently received Announce message when port
                     state is in SLAVE state and
                     defaultDS.externalPortConfigurationEnabled is set
                     to TRUE.

Reference          : P1588/D1.3, February 2018 V3.01 Clause 17.6.5.4
                     Page 356

Conformance Type   : SHALL
```

Topology

```
                 TEE                                 DUT
            +---------------+                     +-------------+
            | +-----------+ | T1               P1 |             |
            | |    BC     |-+---------------------| (Slave)     |
            | | (Master) | |                      |             |
            | +-----------+ |                     |             |
            |               |                     |      BC     |
            |               |                     |             |
```

```
        | +----------+ | T2                P2 |              |
        | |    BC    |-+----------------------|  (Master)    |
        | | (Slave)  | |                      |              |
        | +----------+ |                      |              |
        +--------------+                      +--------------+

Legends:

    TEE     : Test Execution Engine
    DUT     : Device Under Test
    OC      : Ordinary Clock
    BC      : Boundary Clock
    T1, T2  : Ports 1 and 2 at TEE
    P1, P2  : Ports 1 and 2 at DUT


Ladder Diagram    :

       TEE                                                   DUT
        |                                                     |
        |                                       <Enable PTP> | P1
        |                                       <Enable PTP> | P2
        |                         <Enable PTP with BC clock> |
        |                   <Clock mode - one-step/two-step> |
        |                    <Configure logAnnounceInterval, | P1
        |                            announceReceiptTimeout> |
        |                        <Configure logSyncInterval> | P1
        |                 <Configure logMinDelayReqInterval> | P1
        |                   <Configure Priority1, Priority2> | P1
        |                                    <Enable L1SYNC> | P1
        |                                    <Enable L1SYNC> | P2
        |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
        |                    <Disable L1SynOptParams option> | P1
        |          <Enable asymmetryCorrectionPortDS.enable> | P1
        | <Configure timestampCorrectionPortDS.egressLatency, | P1
        |           timestampCorrectionPortDS.ingressLatency, |
        |        asymmetryCorrectionPortDS.constantAsymmetry, |
        |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
        |                                            <Enable  |
        |         defaultDS.externalPortConfigurationEnabled> | P1
        |                                                     |
        |              <Configure.externalPortConfiguration.|
        |                desiredstate = SLAVE >              | P1
        |                                                     |
        |                       <Check Port Status = SLAVE> | P1
        |                                                     |
        |                                            <Enable  |
        |         defaultDS.externalPortConfigurationEnabled> | P2
        |                                                     |
        |              <Configure.externalPortConfiguration.|
        |                desiredstate = MASTER>              | P2
        |                                                     |
        |                       <Check Port Status = MASTER>| P2
        |                                                     |
        | ANNOUNCE [MSG_TYPE = 0x0B,                          |
        |  PRI=X+1, DN = DN1, PR2 = Y]                        |
     T1 |-->>-----------------------------------------------| P1
```

```
       |                                                    |
       |                          ANNOUNCE [MSG_TYPE = 0x0B, |
       |                           PRI=X+1, DN = DN1, PR2=Y] |
    T2 |-----------------------------------------------<<--| P2
       |                                                    |
       | ANNOUNCE [MSG_TYPE = 0x0B,                          |
       |  PRI=X+2, DN = DN1, PR2 = Y+1]                      |
    T1 |-->>-----------------------------------------------| P1
       |                                                    |
       |                          ANNOUNCE [MSG_TYPE = 0x0B, |
       |                         PRI=X+2, DN = DN1, PR2=Y+1] |
    T2 |-----------------------------------------------<<--| P2
       |                                                    |
       | ANNOUNCE [MSG_TYPE = 0x0B,                          |
       |  PRI=X+3, DN = DN1, PR2 = Y+2]                      |
    T1 |-->>-----------------------------------------------| P1
       |                                                    |
       |                          ANNOUNCE [MSG_TYPE = 0x0B, |
       |                         PRI=X+3, DN = DN1, PR2=Y+2] |
    T2 |-----------------------------------------------<<--| P2
       |                                                    |
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's ports P1 and P2.
- ii. Enable PTP on ports P1 and P2.
- iii. Enable PTP globally with device type as Boundary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's ports P1 and P2.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.
- xi. Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
- i. Add ports T1 and T2 at TEE.

(Part 1)

```
Step 3 : Configure externalPortConfigurationPortDS.desiredState as SLAVE
         at Port P1.

Step 4 : Observe that the port status of P1 in DUT is in SLAVE state.

Step 5 : Configure externalPortConfigurationPortDS.desiredState as MASTER
         at Port P2.

Step 6 : Observe that the port status of P2 in DUT is in MASTER state.

Step 7 : Send ANNOUNCE message on port T1 with following parameters:

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority1     = X+1
                  Priority2     = Y

Step 8 : Verify that DUT transmits ANNOUNCE message on port P2
         with following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority1     = X+1
                  Priority2     = Y

Step 9 : Send ANNOUNCE message on port T1 with following parameters:

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority1     = X+2
                  Priority2     = Y+1

Step 10: Verify that DUT transmits ANNOUNCE message on port P2
         with following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority1     = X+2
                  Priority2     = Y+1

Step 11: Send ANNOUNCE message on port T1 with following parameters:

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority1     = X+3
                  Priority2     = Y+2

Step 12: Verify that DUT transmits ANNOUNCE message on port P2
         with following parameters.

              PTP Header
                  Message Type  = 0x0B
```

```
                    Domain Number = DN1
                    Priority1     = X+3
                    Priority2     = Y+2
```

7.14. tc_conf_ptp-ha_peg_014

```
 Test Case          : tc_conf_ptp-ha_peg_014
 Test Case Version  : 1.0
 Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
 Module Name        : PTP ExternalPortConfiguration Group (PEG)

 Title              : slaveOnly is FALSE when defaultDS.
                      externalPortConfigurationEnabled is TRUE.

 Purpose            : To verify that an Ordinary Clock does not allow to set
                      slaveOnly to TRUE when defaultDS.
                      externalPortConfigurationEnabled is set to TRUE.

 Reference          : P1588/D1.4, July 2018 Clause 17.6.5.3 Page 361

 Conformance Type   : SHALL
```

Topology

```
              TEE                                     DUT
           +---------------+                      +--------------+
           |               |                      |              |
           |               |                      |              |
           |               |                      |              |
           |               |                      |              |
           |       BC      | T1                P1 |    OC/BC     |
           |    (Slave)    |----------------------|   (Master)   |
           |               |                      |              |
           |               |                      |              |
           |               |                      |              |
           |               |                      |              |
           +---------------+                      +--------------+
```

```
    Legends:

        TEE      : Test Execution Engine
        DUT      : Device Under Test
        OC       : Ordinary Clock
        BC       : Boundary Clock
        T1       : Port 1 at TEE
        P1       : Port 1 at DUT
```

```
 Ladder Diagram     :

         TEE                                                      DUT
          |                                                        |
          |                                         <Enable PTP> | P1
```

```
          |                        <Enable PTP with OC clock> |
          |                  <Clock mode - one-step/two-step> |
          |                   <Configure logAnnounceInterval, | P1
          |                           announceReceiptTimeout> |
          |                       <Configure logSyncInterval> | P1
          |                 <Configure logMinDelayReqInterval> | P1
          |               <Configure Priority1 (X), Priority2> | P1
          |                                     <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                  <Disable L1SynOptParams option> | P1
          |            <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |           timestampCorrectionPortDS.ingressLatency, |
          |        asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                     |
          |                                             <Enable |
          |         defaultDS.externalPortConfigurationEnabled> |
          |                                                     |
          |             !<Configure defaultDS.slaveOnly = TRUE> |
          |                                                     |
          |                 <Check defaultDS.slaveOnly = FALSE> |
          |                                                     |
```

Legends :

MSG_TYPE = Message Type
DN = Domain Number
OC = Ordinary Clock

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1 (X), Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and

```
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Enable defaultDS.externalPortConfigurationEnabled on DUT.

Step 4 : Verify that DUT does not allow to configure defaultDS.slaveOnly
         = TRUE.

Step 5 : If DUT allows to configure in Step 4, verify that
         defaultDS.slaveOnly is set to FALSE.
```

7.15. tc_conf_ptp-ha_peg_015

```
Test Case         : tc_conf_ptp-ha_peg_015
Test Case Version : 1.0
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP ExternalPortConfiguration Group (PEG)

Title             : masterOnly is FALSE when defaultDS.
                    externalPortConfigurationEnabled is TRUE.

Purpose           : To verify that an Ordinary Clock does not allow to set
                    masterOnly to TRUE when defaultDS.
                    externalPortConfigurationEnabled is set to TRUE.

Reference         : P1588/D1.4, July 2018 Clause 17.6.5.3 Page 361

Conformance Type  : SHALL
```

Topology

```
              TEE                                   DUT
       +---------------+                     +--------------+
       |               |                     |              |
       |               |                     |              |
       |               |                     |              |
       |               |                     |              |
       |      BC       | T1               P1 |    OC/BC     |
       |    (Slave)    |---------------------|   (Master)   |
       |               |                     |              |
       |               |                     |              |
       |               |                     |              |
       |               |                     |              |
       +---------------+                     +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
```

```
       OC      : Ordinary Clock
       BC      : Boundary Clock
       T1      : Port 1 at TEE
       P1      : Port 1 at DUT
```

Ladder Diagram :

```
         TEE                                                     DUT
          |                                                       |
          |                                         <Enable PTP> | P1
          |                         <Enable PTP with BC/OC clock> |
          |                      <Clock mode - one-step/two-step> |
          |                       <Configure logAnnounceInterval, | P1
          |                               announceReceiptTimeout> |
          |                           <Configure logSyncInterval> | P1
          |                    <Configure logMinDelayReqInterval> | P1
          |                  <Configure Priority1 (X), Priority2> | P1
          |                                       <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                       <Disable L1SynOptParams option> | P1
          |             <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |             timestampCorrectionPortDS.ingressLatency, |
          |          asymmetryCorrectionPortDS.constantAsymmetry, |
          |    asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                       |
          |                                               <Enable |
          |          defaultDS.externalPortConfigurationEnabled> |
          |                                                       |
          |                !<Configure portDS.masterOnly = TRUE> | P1
          |                                                       |
          |                    <Check portDS.masterOnly = FALSE> | P1
          |                                                       |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.

```
    iv.   Configure clock mode as One-step/Two-step.
     v.   Configure default values for Priority1 (X), Priority2,
          logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
          logMinDelayReqInterval.
    vi.   Enable L1SYNC on DUT's port P1.
   vii.   Configure default values for L1SyncInterval and
          L1SyncReceiptTimeout.
  viii.   Disable L1SynOptParams on DUT.
    ix.   Enable asymmetryCorrectionPortDS.enable.
     x.   Configure default values for timestampCorrectionPortDS.
          egressLatency, timestampCorrectionPortDS.egressLatency,
          asymmetryCorrectionPortDS.constantAsymmetry and
          asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
     i.   Add port T1 at TEE.

(Part 1)

Step 3 : Enable defaultDS.externalPortConfigurationEnabled on DUT.

Step 4 : Verify that DUT does not allow to configure portDS.masterOnly
         = TRUE on port P1.

Step 5 : If DUT allows to configure in Step 4, verify that
         portDS.masterOnly is set to FALSE on port P1.
```

7.16. tc_conf_ptp-ha_peg_016

```
Test Case         : tc_conf_ptp-ha_peg_016
Test Case Version : 1.1
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP ExternalPortConfiguration Group (PEG)

Title             : portDS.portState remains in SLAVE state

Purpose           : To verify that a PTP enabled device remains in SLAVE
                    state by setting externalPortConfigurationPortDS.
                    desiredState to SLAVE, even if fault condition occur.
                    (This test is applicable only if Peer to Peer Delay
                    mechanism is supported.)

Reference         : P1588/D1.3,February 2018 V3.01 Clause 17.6.1 Page 353,
                    Clause 17.6.3.2 Page 354.

Conformance Type  : SHALL
```

```
Topology

                 TEE                                  DUT
            +--------------+                    +-------------+
            |              |                    |             |
            |              |                    |             |
            |              |                    |             |
```

```
          |              |                      |             |
          |      BC      | T1                P1 |    OC/BC    |
          |    (Slave)   |----------------------|   (Master)  |
          |              |                      |             |
          |              |                      |             |
          |              |                      |             |
          |              |                      |             |
          +--------------+                      +-------------+

  Legends:

      TEE      : Test Execution Engine
      DUT      : Device Under Test
      OC       : Ordinary Clock
      BC       : Boundary Clock
      T1       : Port 1 at TEE
      P1       : Port 1 at DUT


 Ladder Diagram    :


        TEE                                                  DUT
         |                                                    |
         |                                     <Enable PTP>  | P1
         |                       <Enable PTP with BC/OC clock> |
         |                    <Clock mode - one-step/two-step> |
         |                        <Set delay mechanism as P2P> |
         |                     <Configure logAnnounceInterval, | P1
         |                             announceReceiptTimeout> |
         |                         <Configure logSyncInterval> | P1
         |                   <Configure logMinDelayReqInterval> | P1
         |                     <Configure Priority1, Priority2> | P1
         |                                     <Enable L1SYNC> | P1
         |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
         |                     <Disable L1SynOptParams option> | P1
         |           <Enable asymmetryCorrectionPortDS.enable> | P1
         | <Configure timestampCorrectionPortDS.egressLatency, | P1
         |           timestampCorrectionPortDS.ingressLatency, |
         |        asymmetryCorrectionPortDS.constantAsymmetry, |
         |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
         |                                            <Disable |
         |         defaultDS.externalPortConfigurationEnabled> | P1
         |                                                     |
         |                           ANNOUNCE [MSG_TYPE = 0x0B, |
         |                                     PRI=X, DN = DN1] |
      T1 |-------------------------------------------------<<--| P1
         |                                                     |
         | ANNOUNCE [MSG_TYPE = 0x0B,                          |
         | PRI=X+1, DN = DN1]                                  |
      T1 |-->>-------------------------------------------------| P1
         |                                                     |
         |                        <Check Port Status = MASTER> | P1
         |                                                     |
      T1 | <Enable auto responder to Pdelay_Req messages>      | P1
         |                                                     |
         |                                            <Enable  |
```

```
    |         defaultDS.externalPortConfigurationEnabled> | P1
    |                                                     |
    |                                          <Configure |
    | externalPortConfigurationPortDS.desiredState=SLAVE> | P1
    |                                                     |
    |                        <Check Port Status = SLAVE> | P1
    |                                                     |
    |               PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
    |                          SRC_PRT_ID = E, SEQ_ID = D] |
 T1 |------------------------------------------------<<--| P1
    |                                                     |
    | PDELAY_RESP [SRC_MAC = SRC1,CLK_ID = CLK1,          |
    | REQ_PRT_ID = E, SEQ_ID = D                          |
    | MSG_TYPE = 0x03, DN = DN1]                          |
 T1 |-->>--------------------------------------------------| P1
    |                                                     |
    | PDELAY_RESP [SRC_MAC = SRC2,CLK_ID = CLK2,          |
    | REQ_PRT_ID = E, SEQ_ID = D                          |
    | MSG_TYPE = 0x03, DN = DN1]                          |
 T1 |-->>--------------------------------------------------| P1
    |                                                     |
    |                        <Check Port Status = SLAVE> | P1
    |                                                     |
    |                                           <Disable  |
    |         defaultDS.externalPortConfigurationEnabled> | P1
    |                                                     |
    |               PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
    |                          SRC_PRT_ID = E, SEQ_ID = D] |
 T1 |------------------------------------------------<<--| P1
    |                                                     |
    | PDELAY_RESP [SRC_MAC = SRC1,CLK_ID = CLK1,          |
    | REQ_PRT_ID = E, SEQ_ID = D                          |
    | MSG_TYPE = 0x03, DN = DN1]                          |
 T1 |-->>--------------------------------------------------| P1
    |                                                     |
    | PDELAY_RESP [SRC_MAC = SRC2,CLK_ID = CLK2,          |
    | REQ_PRT_ID = E, SEQ_ID = D                          |
    | MSG_TYPE = 0x03, DN = DN1]                          |
 T1 |-->>--------------------------------------------------| P1
    |                                                     |
    |                       <Check Port Status = FAULTY> | P1
    |                                                     |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRI       = Priority
    P2P       = Peer to Peer
    SEQ_ID    = Sequence ID
    SRC_MAC   = Source mac address
    CLK_ID    = Clock Identity
    SRC_PRT_ID= Source Port Identity
    REQ_PRT_ID= Requesting Port Identity

NOTE :
```

1. This objective is verified using the High Accuracy Peer to Peer Default PTP Profile

```
Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure delaymechanism as Peer to peer.
   vi.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
  vii.   Enable L1SYNC on DUT's port P1.
 viii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
   ix.   Disable L1SynOptParams on DUT.
    x.   Enable asymmetryCorrectionPortDS.enable.
   xi.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.
  xii.   Disable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on port P1 with
         following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X

Step 4 : Send periodic ANNOUNCE messages on port T1 with following
         parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X+1

Step 5 : Observe that the port status of P1 in DUT is in MASTER state.

Step 6 : Enable auto responder to respond every Pdelay_Req messages received
         on port T1.

Step 7 : Enable defaultDS.externalPortConfigurationEnabled on port P1.
```

```
Step 8 : Configure externalPortConfigurationPortDS.desiredState as SLAVE.

Step 9 : Observe that the port status of P1 in DUT is in SLAVE state.

Step 10: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

             PTP Header
                 Message Type               = 0x02
                 Domain Number              = DN1
                 Sequence ID                = D
                 Source Port Identity       = E

Step 10a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac               = SRC1
                 Clock ID                 = CLK1
                 Message Type             = 0x03
                 Domain Number            = DN1
                 Sequence Id              = D
                 Requesting Port Identity = E

Step 10b:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac               = SRC2
                 Clock ID                 = CLK2
                 Message Type             = 0x03
                 Domain Number            = DN1
                 Sequence Id              = D
                 Requesting Port Identity = E

Step 11 : Verify that the port status of P1 in DUT continues to be in SLAVE
          state.

Step 12 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
          DUT.

Step 13: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

             PTP Header
                 Message Type               = 0x02
                 Domain Number              = DN1
                 Sequence ID                = D
                 Source Port Identity       = E

Step 13a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac               = SRC1
                 Clock ID                 = CLK1
                 Message Type             = 0x03
```

```
                 Domain Number            = DN1
                 Sequence Id              = D
                 Requesting Port Identity = E

Step 13b:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac               = SRC2
                 Clock ID                 = CLK2
                 Message Type             = 0x03
                 Domain Number            = DN1
                 Sequence Id              = D
                 Requesting Port Identity = E

Step 14 : Verify that the port status of P1 in DUT is in FAULTY state.
```

7.17. tc_conf_ptp-ha_peg_017

```
Test Case          : tc_conf_ptp-ha_peg_017
Test Case Version  : 1.1
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP ExternalPortConfiguration Group (PEG)

Title              : portDS.portState remains in PASSIVE state

Purpose            : To verify that a PTP enabled device remains in PASSIVE
                     state by setting externalPortConfigurationPortDS.
                     desiredState to PASSIVE, even if fault condition occur.
                     (This test is applicable only if Peer to Peer Delay
                     mechanism is supported.)

Reference          : P1588/D1.3, February 2018 V3.01 Clause 17.6.1 Page 353,
                     Clause 17.6.3.2 Page 354.

Conformance Type   : SHALL
```

Topology

```
            TEE                                    DUT
      +---------------+                     +--------------+
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      |      BC       | T1               P1 |    OC/BC     |
      |    (Slave)    |---------------------|   (Master)   |
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      +---------------+                     +--------------+
```

```
   Legends:

       TEE     : Test Execution Engine
       DUT     : Device Under Test
       OC      : Ordinary Clock
       BC      : Boundary Clock
       T1      : Port 1 at TEE
       P1      : Port 1 at DUT


 Ladder Diagram    :


        TEE                                                     DUT
         |                                                       |
         |                                         <Enable PTP> | P1
         |                          <Enable PTP with BC/OC clock> |
         |                       <Clock mode - one-step/two-step> |
         |                           <Set delay mechanism as P2P> |
         |                         <Configure logAnnounceInterval, | P1
         |                                 announceReceiptTimeout> |
         |                            <Configure logSyncInterval> | P1
         |                      <Configure logMinDelayReqInterval> | P1
         |                         <Configure Priority1, Priority2> | P1
         |                                         <Enable L1SYNC> | P1
         |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
         |                        <Disable L1SynOptParams option> | P1
         |              <Enable asymmetryCorrectionPortDS.enable> | P1
         | <Configure timestampCorrectionPortDS.egressLatency, | P1
         |           timestampCorrectionPortDS.ingressLatency, |
         |        asymmetryCorrectionPortDS.constantAsymmetry, |
         |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
         |                                                <Disable |
         |         defaultDS.externalPortConfigurationEnabled> | P1
         |                                                       |
         |                             ANNOUNCE [MSG_TYPE = 0x0B, |
         |                                       PRI=X, DN = DN1] |
      T1 |------------------------------------------------<<--| P1
         |                                                       |
         | ANNOUNCE [MSG_TYPE = 0x0B,                            |
         |  PRI=X+1, DN = DN1]                                   |
      T1 |-->>---------------------------------------------------| P1
         |                                                       |
         |                           <Check Port Status = MASTER> | P1
         |                                                       |
      T1 | <Enable auto responder to Pdelay_Req messages>        | P1
         |                                                       |
         |                                                <Enable  |
         |         defaultDS.externalPortConfigurationEnabled> | P1
         |                                                       |
         |                          <Check Port Status = PASSIVE> | P1
         |                                                       |
         |                 PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,|
         |                           SRC_PRT_ID = E, SEQ_ID = D] |
      T1 |------------------------------------------------<<--| P1
         |                                                       |
         | PDELAY_RESP [SRC_MAC = SRC1,CLK_ID = CLK1,            |
```

```
     | REQ_PRT_ID = E, SEQ_ID = D                         |
     | MSG_TYPE = 0x03, DN = DN1]                         |
  T1 |-->>------------------------------------------------| P1
     |                                                    |
     | PDELAY_RESP [SRC_MAC = SRC2,CLK_ID = CLK2,         |
     | REQ_PRT_ID = E, SEQ_ID = D                         |
     | MSG_TYPE = 0x03, DN = DN1]                         |
  T1 |-->>------------------------------------------------| P1
     |                                                    |
     |                     <Check Port Status = PASSIVE>  | P1
     |                                                    |
     |                                          <Disable  |
     |         defaultDS.externalPortConfigurationEnabled> | P1
     |                                                    |
     |               PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,|
     |                         SRC_PRT_ID = E, SEQ_ID = D] |
  T1 |------------------------------------------------<<--| P1
     |                                                    |
     | PDELAY_RESP [SRC_MAC = SRC1,CLK_ID = CLK1,         |
     | REQ_PRT_ID = E, SEQ_ID = D                         |
     | MSG_TYPE = 0x03, DN = DN1]                         |
  T1 |-->>------------------------------------------------| P1
     |                                                    |
     | PDELAY_RESP [SRC_MAC = SRC2,CLK_ID = CLK2,         |
     | REQ_PRT_ID = E, SEQ_ID = D                         |
     | MSG_TYPE = 0x03, DN = DN1]                         |
  T1 |-->>------------------------------------------------| P1
     |                                                    |
     |                      <Check Port Status = FAULTY>  | P1
     |                                                    |
```

Legends :

    MSG_TYPE = Message Type
    DN   = Domain Number
    PRI   = Priority
    P2P   = Peer to Peer
    SEQ_ID   = Sequence ID
    SRC_MAC   = Source mac address
    CLK_ID   = Clock Identity
    SRC_PRT_ID= Source Port Identity
    REQ_PRT_ID= Requesting Port Identity

NOTE :

1. This objective is verified using the High Accuracy Peer to Peer Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
  i. Enable DUT's port P1.
  ii. Enable PTP on port P1.

```
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure delaymechanism as Peer to peer.
   vi.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
  vii.   Enable L1SYNC on DUT's port P1.
 viii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
   ix.   Disable L1SynOptParams on DUT.
    x.   Enable asymmetryCorrectionPortDS.enable.
   xi.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.
  xii.   Disable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on port P1 with
         following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X

Step 4 : Send periodic ANNOUNCE messages on port T1 with following
         parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X+1

Step 5 : Observe that the port status of P1 in DUT is in MASTER state.

Step 6 : Enable auto responder to respond every Pdelay_Req messages received
         on port T1.

Step 7 : Enable defaultDS.externalPortConfigurationEnabled on port P1.
NOTE   : Default state of externalPortConfigurationPortDS.desiredState is
         PASSIVE.

Step 8 : Observe that the port status of P1 in DUT is in PASSIVE state.

Step 9 : Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

             PTP Header
                 Message Type               = 0x02
                 Domain Number              = DN1
                 Sequence ID                = D
                 Source Port Identity       = E
```

```
Step 9a: Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac                = SRC1
                 Clock ID                  = CLK1
                 Message Type              = 0x03
                 Domain Number             = DN1
                 Sequence Id               = D
                 Requesting Port Identity = E

Step 9b: Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac                = SRC2
                 Clock ID                  = CLK2
                 Message Type              = 0x03
                 Domain Number             = DN1
                 Sequence Id               = D
                 Requesting Port Identity = E

Step 10 : Verify that the port status of P1 in DUT continues to be in
          PASSIVE state.

Step 11 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
          DUT.

Step 12: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

             PTP Header
                 Message Type               = 0x02
                 Domain Number              = DN1
                 Sequence ID                = D
                 Source Port Identity       = E

Step 12a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac                = SRC1
                 Clock ID                  = CLK1
                 Message Type              = 0x03
                 Domain Number             = DN1
                 Sequence Id               = D
                 Requesting Port Identity = E

Step 12b:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac                = SRC2
                 Clock ID                  = CLK2
                 Message Type              = 0x03
                 Domain Number             = DN1
```

```
                 Sequence Id              = D
                 Requesting Port Identity = E

Step 13 : Verify that the port status of P1 in DUT is in FAULTY state.
```

7.18. tc_conf_ptp-ha_peg_018

```
Test Case          : tc_conf_ptp-ha_peg_018
Test Case Version  : 1.1
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP ExternalPortConfiguration Group (PEG)

Title              : portDS.portState remains in LISTENING state

Purpose            : To verify that a PTP enabled device remains in
                     LISTENING state by setting
                     externalPortConfigurationPortDS.desiredState to
                     LISTENING, even if fault condition occur.
                     (This test is applicable only if Peer to Peer Delay
                     mechanism is supported.)

Reference          : P1588/D1.3,February 2018 V3.01 Clause 17.6.1 Page 353
                     Clause 17.6.3.2 Page 354.

Conformance Type   : SHALL
```

```
Topology

                  TEE                                   DUT
            +--------------+                     +-------------+
            |              |                     |             |
            |              |                     |             |
            |              |                     |             |
            |              |                     |             |
            |      BC      | T1               P1 |    OC/BC    |
            |    (Slave)   |---------------------|   (Master)  |
            |              |                     |             |
            |              |                     |             |
            |              |                     |             |
            |              |                     |             |
            +--------------+                     +-------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT


 Ladder Diagram    :
```

```
     TEE                                                    DUT
      |                                                      |
      |                                      <Enable PTP> | P1
      |                        <Enable PTP with BC/OC clock> |
      |                     <Clock mode - one-step/two-step> |
      |                         <Set delay mechanism as P2P> |
      |                      <Configure logAnnounceInterval, | P1
      |                              announceReceiptTimeout> |
      |                          <Configure logSyncInterval> | P1
      |                   <Configure logMinDelayReqInterval> | P1
      |                     <Configure Priority1, Priority2> | P1
      |                                      <Enable L1SYNC> | P1
      |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
      |                      <Disable L1SynOptParams option> | P1
      |            <Enable asymmetryCorrectionPortDS.enable> | P1
      | <Configure timestampCorrectionPortDS.egressLatency, | P1
      |            timestampCorrectionPortDS.ingressLatency, |
      |         asymmetryCorrectionPortDS.constantAsymmetry, |
      |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
      |                                             <Disable |
      |         defaultDS.externalPortConfigurationEnabled> | P1
      |                                                      |
      |                         ANNOUNCE [MSG_TYPE = 0x0B, |
      |                                   PRI=X, DN = DN1] |
   T1 |------------------------------------------------<<--| P1
      |                                                      |
      | ANNOUNCE [MSG_TYPE = 0x0B,                          |
      |  PRI=X+1, DN = DN1]                                 |
   T1 |-->>------------------------------------------------| P1
      |                                                      |
      |                        <Check Port Status = MASTER> | P1
      |                                                      |
   T1 | <Enable auto responder to Pdelay_Req messages>      | P1
      |                                                      |
      |                                             <Enable  |
      |         defaultDS.externalPortConfigurationEnabled> | P1
      |                                                      |
      |                                          <Configure |
      | externalPortConfigurationPortDS.desiredState=       |
      |                                          LISTENING> | P1
      |                                                      |
      |                     <Check Port Status = LISTENING> | P1
      |                                                      |
      |                PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,|
      |                          SRC_PRT_ID = E, SEQ_ID = D] |
   T1 |------------------------------------------------<<--| P1
      |                                                      |
      | PDELAY_RESP [SRC_MAC = SRC1,CLK_ID = CLK1,          |
      | REQ_PRT_ID = E, SEQ_ID = D                           |
      | MSG_TYPE = 0x03, DN = DN1]                          |
   T1 |-->>------------------------------------------------| P1
      |                                                      |
      | PDELAY_RESP [SRC_MAC = SRC2,CLK_ID = CLK2,          |
      | REQ_PRT_ID = E, SEQ_ID = D                           |
      | MSG_TYPE = 0x03, DN = DN1]                          |
```

```
T1 |-->>-----------------------------------------------| P1
   |                                                   |
   |                <Check Port Status = LISTENING>    | P1
   |                                                   |
   |                                          <Disable |
   |          defaultDS.externalPortConfigurationEnabled> | P1
   |                                                   |
   |              PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,|
   |                    SRC_PRT_ID = E, SEQ_ID = D]    |
T1 |-----------------------------------------------<<--| P1
   |                                                   |
   | PDELAY_RESP [SRC_MAC = SRC1,CLK_ID = CLK1,        |
   | REQ_PRT_ID = E, SEQ_ID = D                        |
   | MSG_TYPE = 0x03, DN = DN1]                        |
T1 |-->>-----------------------------------------------| P1
   |                                                   |
   | PDELAY_RESP [SRC_MAC = SRC2,CLK_ID = CLK2,        |
   | REQ_PRT_ID = E, SEQ_ID = D                        |
   | MSG_TYPE = 0x03, DN = DN1]                        |
T1 |-->>-----------------------------------------------| P1
   |                                                   |
   |                   <Check Port Status = FAULTY>    | P1
   |                                                   |
```

Legends :

```
MSG_TYPE  = Message Type
DN        = Domain Number
PRI       = Priority
P2P       = Peer to Peer
SEQ_ID    = Sequence ID
SRC_MAC   = Source mac address
CLK_ID    = Clock Identity
SRC_PRT_ID= Source Port Identity
REQ_PRT_ID= Requesting Port Identity
```

NOTE :

1. This objective is verified using the High Accuracy Peer to Peer Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's port P1.
ii. Enable PTP on port P1.
iii. Enable PTP globally with device type as Boundary/Ordinary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure delaymechanism as Peer to peer.
vi. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vii. Enable L1SYNC on DUT's port P1.

```
 viii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
   ix.   Disable L1SynOptParams on DUT.
    x.   Enable asymmetryCorrectionPortDS.enable.
   xi.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.
  xii.   Disable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on port P1 with
         following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X

Step 4 : Send periodic ANNOUNCE messages on port T1 with following
         parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X+1

Step 5 : Observe that the port status of P1 in DUT is in MASTER state.

Step 6 : Enable auto responder to respond every Pdelay_Req messages received
         on port T1.

Step 7 : Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 8 : Configure externalPortConfigurationPortDS.desiredState as LISTENING

Step 9 : Observe that the port status of P1 in DUT is in LISTENING state.

Step 10: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

             PTP Header
                 Message Type              = 0x02
                 Domain Number             = DN1
                 Sequence ID               = D
                 Source Port Identity      = E

Step 10a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac               = SRC1
                 Clock ID                 = CLK1
```

```
                Message Type             = 0x03
                Domain Number            = DN1
                Sequence Id              = D
                Requesting Port Identity = E

Step 10b:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

            PTP Header
                Source Mac               = SRC2
                Clock ID                 = CLK2
                Message Type             = 0x03
                Domain Number            = DN1
                Sequence Id              = D
                Requesting Port Identity = E

Step 11 : Verify that the port status of P1 in DUT continues to be in
          LISTENING state.

Step 12 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
          DUT.

Step 13: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

            PTP Header
                Message Type              = 0x02
                Domain Number             = DN1
                Sequence ID               = D
                Source Port Identity      = E

Step 13a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

            PTP Header
                Source Mac               = SRC1
                Clock ID                 = CLK1
                Message Type             = 0x03
                Domain Number            = DN1
                Sequence Id              = D
                Requesting Port Identity = E

Step 13b:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

            PTP Header
                Source Mac               = SRC2
                Clock ID                 = CLK2
                Message Type             = 0x03
                Domain Number            = DN1
                Sequence Id              = D
                Requesting Port Identity = E

Step 14 : Verify that the port status of P1 in DUT is in FAULTY state.
```

7.19. tc_conf_ptp-ha_peg_019

```
Test Case         : tc_conf_ptp-ha_peg_019
Test Case Version : 1.1
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP ExternalPortConfiguration Group (PEG)

Title             : portDS.portState remains in UNCALIBRATED

Purpose           : To verify that a PTP enabled device remains in
                    UNCALIBRATED state by setting
                    externalPortConfigurationPortDS.desiredState to
                    UNCALIBRATED, even if fault condition occur.
                    (This test is applicable only if Peer to Peer Delay
                    mechanism is supported.)

Reference         : P1588/D1.3,February 2018 V3.01 Clause 17.6.1 Page 353
                    Clause 17.6.3.2 Page 354.

Conformance Type  : SHALL
```

Topology

```
            TEE                                  DUT
       +---------------+                     +--------------+
       |               |                     |              |
       |               |                     |              |
       |               |                     |              |
       |               |                     |              |
       |       BC      | T1               P1 |    OC/BC     |
       |    (Slave)    |---------------------|   (Master)   |
       |               |                     |              |
       |               |                     |              |
       |               |                     |              |
       |               |                     |              |
       +---------------+                     +--------------+
```

```
    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

Ladder Diagram   :

```
     TEE                                                     DUT
      |                                                       |
      |                                        <Enable PTP>  | P1
      |                         <Enable PTP with BC/OC clock> |
      |                      <Clock mode - one-step/two-step> |
```

```
    |                       <Set delay mechanism as P2P> |
    |                    <Configure logAnnounceInterval, | P1
    |                            announceReceiptTimeout> |
    |                        <Configure logSyncInterval> | P1
    |                 <Configure logMinDelayReqInterval> | P1
    |                   <Configure Priority1, Priority2> | P1
    |                                    <Enable L1SYNC> | P1
    |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
    |                    <Disable L1SynOptParams option> | P1
    |          <Enable asymmetryCorrectionPortDS.enable> | P1
    | <Configure timestampCorrectionPortDS.egressLatency, | P1
    |          timestampCorrectionPortDS.ingressLatency, |
    |       asymmetryCorrectionPortDS.constantAsymmetry, |
    |  asymmetryCorrectionPortDS.scaledDelayCoefficient> |
    |                                           <Disable |
    |        defaultDS.externalPortConfigurationEnabled> | P1
    |                                                    |
    |                       ANNOUNCE [MSG_TYPE = 0x0B,   |
    |                                 PRI=X, DN = DN1]   |
T1  |-------------------------------------------------<<--| P1
    |                                                    |
    | ANNOUNCE [MSG_TYPE = 0x0B,                         |
    |  PRI=X+1, DN = DN1]                                |
T1  |-->>------------------------------------------------| P1
    |                                                    |
    |                      <Check Port Status = MASTER> | P1
    |                                                    |
T1  | <Enable auto responder to Pdelay_Req messages>     | P1
    |                                                    |
    |                                           <Enable  |
    |        defaultDS.externalPortConfigurationEnabled> | P1
    |                                                    |
    |                                         <Configure |
    |      externalPortConfigurationPortDS.desiredState= |
    |                                     UNCALIBRATED> | P1
    |                                                    |
    |                <Check Port Status = UNCALIBRATED> | P1
    |                                                    |
    |            PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,  |
    |                       SRC_PRT_ID = E, SEQ_ID = D]  |
T1  |-------------------------------------------------<<--| P1
    |                                                    |
    | PDELAY_RESP [SRC_MAC = SRC1,CLK_ID = CLK1,         |
    | REQ_PRT_ID = E, SEQ_ID = D                         |
    | MSG_TYPE = 0x03, DN = DN1]                         |
T1  |-->>------------------------------------------------| P1
    |                                                    |
    | PDELAY_RESP [SRC_MAC = SRC2,CLK_ID = CLK2,         |
    | REQ_PRT_ID = E, SEQ_ID = D                         |
    | MSG_TYPE = 0x03, DN = DN1]                         |
T1  |-->>------------------------------------------------| P1
    |                                                    |
    |                <Check Port Status = UNCALIBRATED> | P1
    |                                                    |
    |                                          <Disable  |
    |        defaultDS.externalPortConfigurationEnabled> | P1
    |                                                    |
```

```
       |             PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, |
       |                        SRC_PRT_ID = E, SEQ_ID = D] |
    T1 |------------------------------------------------<<--| P1
       |                                                    |
       | PDELAY_RESP [SRC_MAC = SRC1,CLK_ID = CLK1,         |
       | REQ_PRT_ID = E, SEQ_ID = D                         |
       | MSG_TYPE = 0x03, DN = DN1]                         |
    T1 |-->>------------------------------------------------| P1
       |                                                    |
       | PDELAY_RESP [SRC_MAC = SRC2,CLK_ID = CLK2,         |
       | REQ_PRT_ID = E, SEQ_ID = D                         |
       | MSG_TYPE = 0x03, DN = DN1]                         |
    T1 |-->>------------------------------------------------| P1
       |                                                    |
       |                      <Check Port Status = FAULTY> | P1
       |                                                    |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRI       = Priority
    P2P       = Peer to Peer
    SEQ_ID    = Sequence ID
    SRC_MAC   = Source mac address
    CLK_ID    = Clock Identity
    SRC_PRT_ID= Source Port Identity
    REQ_PRT_ID= Requesting Port Identity
```

NOTE :

1. This objective is verified using the High Accuracy Peer to Peer Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's port P1.
ii. Enable PTP on port P1.
iii. Enable PTP globally with device type as Boundary/Ordinary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure delaymechanism as Peer to peer.
vi. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vii. Enable L1SYNC on DUT's port P1.
viii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
ix. Disable L1SynOptParams on DUT.
x. Enable asymmetryCorrectionPortDS.enable.
xi. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and

```
        asymmetryCorrectionPortDS.scaledDelayCoefficient.
  xii.  Disable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
    i.  Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on port P1 with
         following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X

Step 4 : Send periodic ANNOUNCE messages on port T1 with following
         parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X+1

Step 5 : Observe that the port status of P1 in DUT is in MASTER state.

Step 6 : Enable auto responder to respond every Pdelay_Req messages received
         on port T1.

Step 7 : Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 8 : Configure externalPortConfigurationPortDS.desiredState as
         UNCALIBRATED.

Step 9 : Observe that the port status of P1 in DUT is in UNCALIBRATED state.

Step 10: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

             PTP Header
                 Message Type              = 0x02
                 Domain Number             = DN1
                 Sequence ID               = D
                 Source Port Identity      = E

Step 10a:Send periodic PDELAY_RESP on the port P1 and with following
         parameters:

             PTP Header
                 Source Mac               = SRC1
                 Clock ID                 = CLK1
                 Message Type             = 0x03
                 Domain Number            = DN1
                 Sequence Id              = D
                 Requesting Port Identity = E

Step 10b:Send periodic PDELAY_RESP on the port P1 and with following
```

```
         parameters:

             PTP Header
                 Source Mac                = SRC2
                 Clock ID                  = CLK2
                 Message Type              = 0x03
                 Domain Number             = DN1
                 Sequence Id               = D
                 Requesting Port Identity = E

Step 11 : Verify that the port status of P1 in DUT continues to be in
          UNCALIBRATED state.

Step 12 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
          DUT.

Step 13: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

             PTP Header
                 Message Type               = 0x02
                 Domain Number              = DN1
                 Sequence ID                = D
                 Source Port Identity       = E

Step 13a:Send periodic PDELAY_RESP on the port P1 and with following
         parameters:

             PTP Header
                 Source Mac                = SRC1
                 Clock ID                  = CLK1
                 Message Type              = 0x03
                 Domain Number             = DN1
                 Sequence Id               = D
                 Requesting Port Identity = E

Step 13b:Send periodic PDELAY_RESP on the port P1 and with following
         parameters:

             PTP Header
                 Source Mac                = SRC2
                 Clock ID                  = CLK2
                 Message Type              = 0x03
                 Domain Number             = DN1
                 Sequence Id               = D
                 Requesting Port Identity = E

Step 14 : Verify that the port status of P1 in DUT is in FAULTY state.
```

7.20. tc_conf_ptp-ha_peg_020

```
Test Case         : tc_conf_ptp-ha_peg_020
Test Case Version : 1.1
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
```

```
Module Name        : PTP ExternalPortConfiguration Group (PEG)

Title              : portDS.portState remains in PRE-MASTER

Purpose            : To verify that a PTP enabled device remains in
                     PRE-MASTER state by setting
                     externalPortConfigurationPortDS.desiredState to
                     PRE-MASTER, even if fault condition occur.
                     (This test is applicable only if Peer to Peer Delay
                     mechanism is supported.)

Reference          : P1588/D1.3,February 2018 V3.01 Clause 17.6.1 Page 353
                     Clause 17.6.3.2 Page 354.

Conformance Type   : SHALL
```

```
Topology

                  TEE                                   DUT
            +---------------+                     +--------------+
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |      BC       | T1              P1  |    OC/BC     |
            |    (Slave)    |---------------------|   (Master)   |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            +---------------+                     +--------------+

    Legends:

        TEE      : Test Execution Engine
        DUT      : Device Under Test
        OC       : Ordinary Clock
        BC       : Boundary Clock
        T1       : Port 1 at TEE
        P1       : Port 1 at DUT
```

```
 Ladder Diagram    :


          TEE                                                   DUT
           |                                                     |
           |                                       <Enable PTP> | P1
           |                         <Enable PTP with BC/OC clock> |
           |                      <Clock mode - one-step/two-step> |
           |                          <Set delay mechanism as P2P> |
           |                       <Configure logAnnounceInterval, | P1
           |                               announceReceiptTimeout> |
           |                           <Configure logSyncInterval> | P1
           |                    <Configure logMinDelayReqInterval> | P1
           |                      <Configure Priority1, Priority2> | P1
```

```
   |                                      <Enable L1SYNC> | P1
   |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
   |                     <Disable L1SynOptParams option> | P1
   |           <Enable asymmetryCorrectionPortDS.enable> | P1
   | <Configure timestampCorrectionPortDS.egressLatency, | P1
   |           timestampCorrectionPortDS.ingressLatency, |
   |        asymmetryCorrectionPortDS.constantAsymmetry, |
   |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
   |                                            <Disable |
   |         defaultDS.externalPortConfigurationEnabled> | P1
   |                                                     |
   |                          ANNOUNCE [MSG_TYPE = 0x0B, |
   |                                    PRI=X, DN = DN1] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   | ANNOUNCE [MSG_TYPE = 0x0B,                          |
   |  PRI=X+1, DN = DN1]                                 |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   |                        <Check Port Status = MASTER> | P1
   |                                                     |
T1 | <Enable auto responder to Pdelay_Req messages>      | P1
   |                                                     |
   |                                            <Enable  |
   |         defaultDS.externalPortConfigurationEnabled> | P1
   |                                                     |
   |                                          <Configure |
   |       externalPortConfigurationPortDS.desiredState= |
   |                                         PRE-MASTER> | P1
   |                                                     |
   |                    <Check Port Status = PRE-MASTER> | P1
   |                                                     |
   |               PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,|
   |                         SRC_PRT_ID = E, SEQ_ID = D] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   | PDELAY_RESP [SRC_MAC = SRC1,CLK_ID = CLK1,          |
   | REQ_PRT_ID = E, SEQ_ID = D                          |
   | MSG_TYPE = 0x03, DN = DN1]                          |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   | PDELAY_RESP [SRC_MAC = SRC2,CLK_ID = CLK2,          |
   | REQ_PRT_ID = E, SEQ_ID = D                          |
   | MSG_TYPE = 0x03, DN = DN1]                          |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   |                    <Check Port Status = PRE-MASTER> | P1
   |                                                     |
   |                                           <Disable  |
   |         defaultDS.externalPortConfigurationEnabled> | P1
   |                                                     |
   |               PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,|
   |                         SRC_PRT_ID = E, SEQ_ID = D] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   | PDELAY_RESP [SRC_MAC = SRC1,CLK_ID = CLK1,          |
   | REQ_PRT_ID = E, SEQ_ID = D                          |
```

```
          | MSG_TYPE = 0x03, DN = DN1]                            |
       T1 |-->>---------------------------------------------------| P1
          |                                                       |
          | PDELAY_RESP [SRC_MAC = SRC2,CLK_ID = CLK2,            |
          | REQ_PRT_ID = E, SEQ_ID = D                            |
          | MSG_TYPE = 0x03, DN = DN1]                            |
       T1 |-->>---------------------------------------------------| P1
          |                                                       |
          |                       <Check Port Status = FAULTY>    | P1
          |                                                       |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRI       = Priority
    P2P       = Peer to Peer
    SEQ_ID    = Sequence ID
    SRC_MAC   = Source mac address
    CLK_ID    = Clock Identity
    SRC_PRT_ID= Source Port Identity
    REQ_PRT_ID= Requesting Port Identity
```

NOTE :

1. This objective is verified using the High Accuracy Peer to Peer Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure delaymechanism as Peer to peer.
- vi. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vii. Enable L1SYNC on DUT's port P1.
- viii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- ix. Disable L1SynOptParams on DUT.
- x. Enable asymmetryCorrectionPortDS.enable.
- xi. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.
- xii. Disable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE
- i. Add port T1 at TEE.

```
(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on port P1 with
         following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X

Step 4 : Send periodic ANNOUNCE messages on port T1 with following
         parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X+1

Step 5 : Observe that the port status of P1 in DUT is in MASTER state.

Step 6 : Enable auto responder to respond every Pdelay_Req messages received
         on port T1.

Step 7 : Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 8 : Configure externalPortConfigurationPortDS.desiredState as
         PRE_MASTER.

Step 9 : Observe that the port status of P1 in DUT is in PRE-MASTER
         state.

Step 10: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

             PTP Header
                 Message Type              = 0x02
                 Domain Number             = DN1
                 Sequence ID               = D
                 Source Port Identity      = E

Step 10a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac               = SRC1
                 Clock ID                 = CLK1
                 Message Type             = 0x03
                 Domain Number            = DN1
                 Sequence Id              = D
                 Requesting Port Identity = E

Step 10a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac               = SRC2
                 Clock ID                 = CLK2
```

```
                Message Type            = 0x03
                Domain Number           = DN1
                Sequence Id             = D
                Requesting Port Identity = E

Step 11 : Verify that the port status of P1 in DUT continues to be in
          PRE_MASTER state.

Step 12 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
          DUT.

Step 13: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

             PTP Header
                 Message Type             = 0x02
                 Domain Number            = DN1
                 Sequence ID              = D
                 Source Port Identity     = E

Step 13a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac              = SRC1
                 Clock ID                = CLK1
                 Message Type            = 0x03
                 Domain Number           = DN1
                 Sequence Id             = D
                 Requesting Port Identity = E

Step 13a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac              = SRC2
                 Clock ID                = CLK2
                 Message Type            = 0x03
                 Domain Number           = DN1
                 Sequence Id             = D
                 Requesting Port Identity = E

Step 14 : Verify that the port status of P1 in DUT is in FAULTY state.
```

7.21. tc_conf_ptp-ha_peg_021

```
Test Case         : tc_conf_ptp-ha_peg_021
Test Case Version : 1.1
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP ExternalPortConfiguration Group (PEG)

Title             : portDS.portState remains in MASTER state

Purpose           : To verify that a PTP enabled device remains in MASTER
```

```
                    state by setting externalPortConfigurationPortDS
                    desiredState to MASTER, even if fault condition occur.
                    (This test is applicable only if Peer to Peer Delay
                    mechanism is supported.)

Reference         : P1588/D1.3,February 2018 V3.01 Clause 17.6.1 Page 353
                    Clause 17.6.3.2 Page 354.

Conformance Type  : SHALL
```

Topology

```
            TEE                                 DUT
      +---------------+                  +--------------+
      |               |                  |              |
      |               |                  |              |
      |               |                  |              |
      |               |                  |              |
      |      BC       | T1            P1 |    OC/BC     |
      |    (Master)   |------------------|    (Slave)   |
      |               |                  |              |
      |               |                  |              |
      |               |                  |              |
      |               |                  |              |
      +---------------+                  +--------------+
```

```
  Legends:

      TEE      : Test Execution Engine
      DUT      : Device Under Test
      OC       : Ordinary Clock
      BC       : Boundary Clock
      T1       : Port 1 at TEE
      P1       : Port 1 at DUT
```

```
Ladder Diagram    :


        TEE                                                      DUT
         |                                                        |
         |                                          <Enable PTP>  | P1
         |                           <Enable PTP with BC/OC clock> |
         |                        <Clock mode - one-step/two-step> |
         |                            <Set delay mechanism as P2P> |
         |                         <Configure logAnnounceInterval, | P1
         |                                 announceReceiptTimeout> |
         |                             <Configure logSyncInterval> | P1
         |                      <Configure logMinDelayReqInterval> | P1
         |                        <Configure Priority1, Priority2> | P1
         |                                          <Enable L1SYNC> | P1
         |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
         |                       <Disable L1SynOptParams option> | P1
         |              <Enable asymmetryCorrectionPortDS.enable> | P1
         | <Configure timestampCorrectionPortDS.egressLatency, | P1
         |           timestampCorrectionPortDS.ingressLatency, |
```

```
   |        asymmetryCorrectionPortDS.constantAsymmetry, |
   |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
   |                                            <Disable |
   |         defaultDS.externalPortConfigurationEnabled> | P1
   |                                                     |
   |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
   |                                   PRI=X, DN = DN1]  |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   | ANNOUNCE [MSG_TYPE = 0x0B,                          |
   |  PRI=X-1, DN = DN1]                                 |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   |         < Wait for 6s to complete BMCA >            |
   |                                                     |
   | PTP SIGNALING with L1 Sync TLV                      |
   | [MSG_TYPE = 0xC, DN = DN1,                          |
   | TLV_TYPE = 0x8001, TCR = 1,                         |
   | RCR = 1, CR = 1, ITC = 1,                           |
   | IRC = 1, IC = 1]                                    |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   |                       <Check Port Status = SLAVE>   | P1
   |                                                     |
T1 | <Enable auto responder to Pdelay_Req messages>      | P1
   |                                                     |
   |                                             <Enable |
   |         defaultDS.externalPortConfigurationEnabled> | P1
   |                                                     |
   |                                          <Configure |
   | externalPortConfigurationPortDS.desiredState=MASTER>| P1
   |                                                     |
   |                       <Check Port Status = MASTER>  | P1
   |                                                     |
   |               PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,|
   |                         SRC_PRT_ID = E, SEQ_ID = D] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   | PDELAY_RESP [SRC_MAC = SRC1,CLK_ID = CLK1,          |
   | REQ_PRT_ID = E, SEQ_ID = D                          |
   | MSG_TYPE = 0x03, DN = DN1]                          |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   | PDELAY_RESP [SRC_MAC = SRC2,CLK_ID = CLK2,          |
   | REQ_PRT_ID = E, SEQ_ID = D                          |
   | MSG_TYPE = 0x03, DN = DN1]                          |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   |                       <Check Port Status = MASTER>  | P1
   |                                                     |
   |                                           <Disable  |
   |         defaultDS.externalPortConfigurationEnabled> | P1
   |                                                     |
   |               PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1,|
   |                         SRC_PRT_ID = E, SEQ_ID = D] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
```

```
          | PDELAY_RESP [SRC_MAC = SRC1,CLK_ID = CLK1,          |
          | REQ_PRT_ID = E, SEQ_ID = D                          |
          | MSG_TYPE = 0x03, DN = DN1]                          |
       T1 |-->>-------------------------------------------------| P1
          |                                                     |
          | PDELAY_RESP [SRC_MAC = SRC2,CLK_ID = CLK2,          |
          | REQ_PRT_ID = E, SEQ_ID = D                          |
          | MSG_TYPE = 0x03, DN = DN1]                          |
       T1 |-->>-------------------------------------------------| P1
          |                                                     |
          |                        <Check Port Status = FAULTY> | P1
          |                                                     |
```

```
Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    PRI       = Priority
    P2P       = Peer to Peer
    SEQ_ID    = Sequence ID
    SRC_MAC   = Source mac address
    CLK_ID    = Clock Identity
    SRC_PRT_ID= Source Port Identity
    REQ_PRT_ID= Requesting Port Identity
```

NOTE :

1. This objective is verified using the High Accuracy Peer to Peer Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure delaymechanism as Peer to peer.
- vi. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vii. Enable L1SYNC on DUT's port P1.
- viii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- ix. Disable L1SynOptParams on DUT.
- x. Enable asymmetryCorrectionPortDS.enable.
- xi. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.
- xii. Disable defaultDS.externalPortConfigurationEnabled on port P1.

Step 2 : Initialization of TEE

```
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on port P1 with
         following parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X

Step 4 : Send periodic ANNOUNCE messages on port T1 with following
         parameters.

              PTP Header
                  Message Type  = 0x0B
                  Domain Number = DN1
                  Priority      = X-1

Step 5 : Wait for 6s for completing BMCA.

Step 6 : Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 1
                 IRC           = 1
                 IC            = 1

Step 7 : Observe that the port status of P1 in DUT is in SLAVE state.

Step 8 : Enable auto responder to respond every Pdelay_Req messages received
         on port T1.

Step 9 : Enable defaultDS.externalPortConfigurationEnabled on port P1.

Step 10: Configure externalPortConfigurationPortDS.desiredState as MASTER.

Step 11: Observe that the port status of P1 in DUT is in MASTER state.

Step 12: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

             PTP Header
                 Message Type             = 0x02
                 Domain Number            = DN1
                 Sequence ID              = D
                 Source Port Identity     = E
```

```
Step 12a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac                = SRC1
                 Clock ID                  = CLK1
                 Message Type              = 0x03
                 Domain Number             = DN1
                 Sequence Id               = D
                 Requesting Port Identity = E

Step 12a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac                = SRC2
                 Clock ID                  = CLK2
                 Message Type              = 0x03
                 Domain Number             = DN1
                 Sequence Id               = D
                 Requesting Port Identity = E

Step 13 : Verify that the port status of P1 in DUT continues to be in MASTER
          state.

Step 14 : Disable defaultDS.externalPortConfigurationEnabled on port P1 in
          DUT.

Step 15: Observe that DUT transmits PDELAY_REQ message on the port P1 with
         following parameters :

             PTP Header
                 Message Type               = 0x02
                 Domain Number              = DN1
                 Sequence ID                = D
                 Source Port Identity       = E

Step 15a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac                = SRC1
                 Clock ID                  = CLK1
                 Message Type              = 0x03
                 Domain Number             = DN1
                 Sequence Id               = D
                 Requesting Port Identity = E

Step 15a:Send PDELAY_RESP to every PDELAY_REQ on the port P1 and with
         following parameters:

             PTP Header
                 Source Mac                = SRC2
                 Clock ID                  = CLK2
                 Message Type              = 0x03
                 Domain Number             = DN1
                 Sequence Id               = D
```

```
                 Requesting Port Identity = E

Step 16 : Verify that the port status of P1 in DUT is in FAULTY state.
```

7.22. tc_conf_ptp-ha_peg_022

```
Test Case         : tc_conf_ptp-ha_peg_022
Test Case Version : 1.0
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP ExternalPortConfiguration Group (PEG)

Title             : Transition of slaveOnly from TRUE to FALSE when
                    defaultDS.externalPortConfigurationEnabled is set to
                    TRUE

Purpose           : To verify that an Ordinary Clock transits slaveOnly from
                    TRUE to FALSE when defaultDS.
                    externalPortConfigurationEnabled is set to TRUE.

Reference         : P1588/D1.4, July 2018 Clause 17.6.5.3 Page 361

Conformance Type  : SHALL
```

```
Topology

                  TEE                                   DUT
            +--------------+                      +--------------+
            |              |                      |              |
            |              |                      |              |
            |              |                      |              |
            |              |                      |              |
            |      BC      | T1                P1 |    OC/BC     |
            |   (Master)   |----------------------|   (Slave)    |
            |              |                      |              |
            |              |                      |              |
            |              |                      |              |
            |              |                      |              |
            +--------------+                      +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT


 Ladder Diagram    :

          TEE                                                    DUT
           |                                                      |
```

```
          |                                          <Enable PTP> | P1
          |                            <Enable PTP with OC clock> |
          |                      <Clock mode - one-step/two-step> |
          |                       <Configure logAnnounceInterval, | P1
          |                               announceReceiptTimeout> |
          |                           <Configure logSyncInterval> | P1
          |                    <Configure logMinDelayReqInterval> | P1
          |                  <Configure Priority1 (X), Priority2> | P1
          |                                       <Enable L1SYNC> | P1
          |     <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                       <Disable L1SynOptParams option> | P1
          |             <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |             timestampCorrectionPortDS.ingressLatency, |
          |          asymmetryCorrectionPortDS.constantAsymmetry, |
          |    asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                       |
          |                <Configure defaultDS.slaveOnly = TRUE> |
          |                                                       |
          |                                              !<Enable |
          |           defaultDS.externalPortConfigurationEnabled> |
          |                                                       |
          |                   <Check defaultDS.slaveOnly = FALSE> |
          |                                                       |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    OC        = Ordinary Clock
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's port P1.
ii. Enable PTP on port P1.
iii. Enable PTP globally with device type as Ordinary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure default values for Priority1 (X), Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vi. Enable L1SYNC on DUT's port P1.
vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
viii. Disable L1SynOptParams on DUT.
ix. Enable asymmetryCorrectionPortDS.enable.
x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency,

```
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Configure defaultDS.slaveOnly = TRUE on DUT.

Step 4 : Verify that DUT does not allow to enable defaultDS.
         externalPortConfigurationEnabled on DUT.

Step 5 : If DUT allows to enable in Step 4, verify that defaultDS.slaveOnly
         is set to FALSE.
```

7.23. tc_conf_ptp-ha_peg_023

```
Test Case          : tc_conf_ptp-ha_peg_023
Test Case Version  : 1.0
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP ExternalPortConfiguration Group (PEG)

Title              : Transition of masterOnly from TRUE to FALSE when
                     defaultDS.externalPortConfigurationEnabled is set to
                     TRUE

Purpose            : To verify that an Ordinary Clock transits masterOnly
                     from TRUE to FALSE when defaultDS.
                     externalPortConfigurationEnabled is set to TRUE.

Reference          : P1588/D1.4, July 2018 Clause 17.6.5.3 Page 361

Conformance Type   : SHALL
```

Topology

```
              TEE                                   DUT
          +--------------+                     +--------------+
          |              |                     |              |
          |              |                     |              |
          |              |                     |              |
          |              |                     |              |
          |      BC      | T1               P1 |    OC/BC     |
          |    (Slave)   |---------------------|   (Master)   |
          |              |                     |              |
          |              |                     |              |
          |              |                     |              |
          |              |                     |              |
          +--------------+                     +--------------+

    Legends:
```

```
       TEE      : Test Execution Engine
       DUT      : Device Under Test
       OC       : Ordinary Clock
       BC       : Boundary Clock
       T1       : Port 1 at TEE
       P1       : Port 1 at DUT
```

Ladder Diagram :

```
         TEE                                                     DUT
          |                                                       |
          |                                         <Enable PTP> | P1
          |                           <Enable PTP with OC clock> |
          |                     <Clock mode - one-step/two-step> |
          |                      <Configure logAnnounceInterval, | P1
          |                              announceReceiptTimeout> |
          |                          <Configure logSyncInterval> | P1
          |                   <Configure logMinDelayReqInterval> | P1
          |                 <Configure Priority1 (X), Priority2> | P1
          |                                      <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                      <Disable L1SynOptParams option> | P1
          |            <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |            timestampCorrectionPortDS.ingressLatency, |
          |         asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                       |
          |                 <Configure portDS.masterOnly = TRUE> | P1
          |                                                       |
          |                     <Check portDS.masterOnly = TRUE> | P1
          |                                                       |
          |                                              !<Enable |
          |          defaultDS.externalPortConfigurationEnabled> |
          |                                                       |
          |                    <Check portDS.masterOnly = FALSE> | P1
          |                                                       |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    OC        = Ordinary Clock
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

```
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1 (X), Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Configure portDS.masterOnly = TRUE on port P1.

Step 4 : Check whether portDS.masterOnly is set to TRUE on port P1.

Step 5 : Verify that DUT does not allow to enable defaultDS.
         externalPortConfigurationEnabled on DUT.

Step 6 : If DUT allows to enable in Step 4, verify that portDS.masterOnly
         is set to FALSE on port P1.
```

8. State Machine Group (SMG)

8.1. tc_conf_ptp-ha_smg_001

```
Test Case          : tc_conf_ptp-ha_smg_001
Test Case Version  : 1.0
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA State Machine Group (SMG)

Title              : L1SYNC port in DISABLED state

Purpose            : To verify that the PTP enabled port does not transmit
                     PTP signaling message with L1 Sync TLV when L1Sync
                     port is disabled by setting the data set
                     L1SyncBasicPortDS.L1SyncEnabled to FALSE via
                     configuration.

Reference          : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                     Clause O.7.3 Figure 70 Page 450

Conformance Type   : MUST
```

```
Topology

                  TEE                                  DUT
           +---------------+                     +--------------+
           |               |                     |              |
           |               |                     |              |
           |               |                     |              |
           |               |                     |              |
           |      BC       | T1               P1 |    OC/BC     |
           |    (Slave)    |---------------------|   (Master)   |
           |               |                     |              |
           |               |                     |              |
           |               |                     |              |
           |               |                     |              |
           +---------------+                     +--------------+

    Legends:

        TEE      : Test Execution Engine
        DUT      : Device Under Test
        OC       : Ordinary Clock
        BC       : Boundary Clock
        T1       : Port 1 at TEE
        P1       : Port 1 at DUT


 Ladder Diagram    :

             TEE                                                     DUT
           [slave]                                                [master]
              |                                                      |
              |                        <Enable PTP with BC/OC clock> |
              |                     <Clock mode - one-step/two-step> |
              |                               <Disable TCR, RCR, CR> |
              |                      <Disable L1SynOptParams option> |
              |      <Configure L1SyncInterval, L1SyncReceiptTimeout> |
              |                            <Configure Priority1 - X> |
              |                                         <Enable PTP> | P1
              |                                      <Enable L1SYNC> | P1
              |                                                      |
              |                           ANNOUNCE [MSG_TYPE = 0x0B, |
              |                      DN = DN1, SEQ_ID = Y, PRI1 = X] |
           T1 |--------------------------------------------------<<--| P1
              |                                                      |
              | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
              |           SEQ_ID = A, PRI1 = X+1]                    |
           T1 |-->>--------------------------------------------------| P1
              |                                                      |
              |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,  |
              |     DN = DN1,TLV_TYPE=0x8001]                        |
           T1 |--------------------------------------------------<<--| P1
              |                                                      |
              |                                     <Disable L1SYNC> | P1
              |                                                      |
              |                <Check L1SYNC port status - DISABLED> | P1
              |                                                      |
```

```
            |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC, |
            |     DN = DN1,TLV_TYPE=0x8001]                       |
         T1 |                           XX-------------------<<--| P1
            |                                                     |
            |                                                     |
Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    TCR       = txCoherentIsRequired
    RCR       = rxCoherentIsRequired
    CR        = congruentIsRequired

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile



Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP globally with device type as Boundary/Ordinary clock.
  iii.   Configure clock mode as One-step/Two-step.
   iv.   Disable txcoherentisRequired, rxcoherentisRequired,
         congruentIsRequired.
    v.   Disable L1SynOptParams on DUT.
   vi.   Configure L1SyncInterval and L1SyncReceiptTimeout value.
  vii.   Enable PTP on port P1.
 viii.   Enable L1SYNC on DUT's port P1.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
```

```
                Domain Number = DN1
                Sequence ID   = A
                Priority1     = X+1

Step 5 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 6 : Disable L1SYNC on DUT's port P1.

Step 7 : Verify that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 8 : Verify that DUT does not transmit PTP SIGNALING message with L1
         Sync TLV on the port P1 for a duration of expiry of L1 sync
         receipt timeout interval(L1SyncReceiptTimeout * L1SyncInterval)
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
```

8.2. tc_conf_ptp-ha_smg_002

```
Test Case         : tc_conf_ptp-ha_smg_002
Test Case Version : 1.0
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA State Machine Group (SMG)

Title             : L1SYNC port state changes from DISABLED to IDLE

Purpose           : To verify that L1 SYNC port changes its state from
                    DISABLED to IDLE when L1_SYNC is enabled by setting
                    dataset L1SyncBasicPortDS.L1SyncEnabled to TRUE via
                    configuration.

Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                    Clause O.7.3 Figure 70 Page 450

Conformance Type  : MUST
```

Topology

```
                TEE                                  DUT
         +--------------+                     +-------------+
         |              |                     |             |
         |              |                     |             |
```

```
         |              |                      |             |
         |              |                      |             |
         |      BC      | T1                P1 |   OC/BC     |
         |    (Slave)   |----------------------|  (Master)   |
         |              |                      |             |
         |              |                      |             |
         |              |                      |             |
         |              |                      |             |
         +--------------+                      +-------------+
```

Legends:

```
    TEE     : Test Execution Engine
    DUT     : Device Under Test
    OC      : Ordinary Clock
    BC      : Boundary Clock
    T1      : Port 1 at TEE
    P1      : Port 1 at DUT
```

Ladder Diagram :

```
      TEE                                                    DUT
    [slave]                                                [master]
       |                                                      |
       |                        <Enable PTP with BC/OC clock> |
       |                     <Clock mode - one-step/two-step> |
       |                               <Disable TCR, RCR, CR> |
       |                      <Disable L1SynOptParams option> |
       |    <Configure L1SyncInterval, L1SyncReceiptTimeout>  |
       |                            <Configure Priority1 - X> |
       |                                         <Enable PTP> | P1
       |                                      <Enable L1SYNC> | P1
       |                                                      |
       |                          ANNOUNCE [MSG_TYPE = 0x0B,  |
       |                     DN = DN1, SEQ_ID = Y, PRI1 = X]  |
    T1 |-------------------------------------------------<<--| P1
       |                                                      |
       | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
       |           SEQ_ID = A, PRI1 = X+1]                    |
    T1 |-->>--------------------------------------------------| P1
       |                                                      |
       |                                     <Disable L1SYNC> | P1
       |                                                      |
       |                 <Check L1SYNC port status - DISABLED> | P1
       |                                                      |
       |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,  |
       |     DN = DN1,TLV_TYPE=0x8001]                        |
    T1 |                            XX-------------------<<--| P1
       |                                                      |
       |                                      <Enable L1SYNC> | P1
       |                                                      |
       |                     <Check L1SYNC port status - IDLE> | P1
       |                                                      |
       |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,  |
       |     DN = DN1,TLV_TYPE=0x8001]                        |
    T1 |-------------------------------------------------<<--| P1
```

```
              |                                                      |

Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    TCR       = txCoherentIsRequired
    RCR       = rxCoherentIsRequired
    CR        = congruentIsRequired

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile



Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP globally with device type as Boundary/Ordinary clock.
  iii.   Configure clock mode as One-step/Two-step.
   iv.   Disable txcoherentisRequired, rxcoherentisRequired,
         congruentIsRequired.
    v.   Disable L1SynOptParams on DUT.
   vi.   Configure L1SyncInterval and L1SyncReceiptTimeout value.
  vii.   Enable PTP on port P1.
 viii.   Enable L1SYNC on DUT's port P1.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1
```

```
Step 5 : Disable L1SYNC on DUT's port P1.

Step 6 : Observe that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 7 : Observe that DUT does not transmit PTP SIGNALING message with L1
         Sync TLV on the port P1 for a duration of expiry of L1 sync
         receipt timeout interval(L1SyncReceiptTimeout * L1SyncInterval)
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 8 : Enable L1SYNC on DUT's port P1.

Step 9 : Verify that the DUT's L1SYNC port status P1 is in IDLE state.

Step 10: Verify that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
```

8.3. tc_conf_ptp-ha_smg_003

```
Test Case         : tc_conf_ptp-ha_smg_003
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA State Machine Group (SMG)

Title             : L1SYNC port state continues to be in IDLE State

Purpose           : To verify that L1 SYNC port continues to be in IDLE
                    state if no L1 Sync TLV is received.

Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                    Clause O.7.3 Figure 70 Page 450

Conformance Type  : MUST
```

Topology

```
              TEE                                  DUT
         +---------------+                    +--------------+
         |               |                    |              |
         |               |                    |              |
         |               |                    |              |
```

```
          |              |                      |              |
          |      BC      | T1                P1 |    OC/BC     |
          |    (Slave)   |----------------------|   (Master)   |
          |              |                      |              |
          |              |                      |              |
          |              |                      |              |
          |              |                      |              |
          +--------------+                      +--------------+
```

```
   Legends:

       TEE      : Test Execution Engine
       DUT      : Device Under Test
       OC       : Ordinary Clock
       BC       : Boundary Clock
       T1       : Port 1 at TEE
       P1       : Port 1 at DUT
```

```
Ladder Diagram    :

         TEE                                                    DUT
       [slave]                                                [master]
          |                                                      |
          |                                        <Enable PTP> | P1
          |                         <Enable PTP with BC/OC clock> |
          |                      <Clock mode - one-step/two-step> |
          |                       <Configure logAnnounceInterval, | P1
          |                               announceReceiptTimeout> |
          |                           <Configure logSyncInterval> | P1
          |                   <Configure logMinDelayReqInterval> | P1
          |                      <Configure Priority1, Priority2> | P1
          |                                      <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                       <Disable L1SynOptParams option> | P1
          |             <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |             timestampCorrectionPortDS.ingressLatency, |
          |          asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                      |
          |                          ANNOUNCE [MSG_TYPE = 0x0B,|
          |                                   PRI=X, DN = DN1] |
       T1 |-------------------------------------------------<<--| P1
          |                                                      |
          | ANNOUNCE [MSG_TYPE = 0x0B,                           |
          | PRI=X+1, DN = DN1]                                   |
       T1 |-->>-------------------------------------------------| P1
          |                                                      |
          |                     <Check L1SYNC port status - IDLE> | P1
          |                                                      |
          |                        PTP SIGNALING with L1 Sync TLV |
          |                            [MSG_TYPE = 0xC, DN = DN1, |
          |                                    TLV_TYPE = 0x8001] |
       T1 |-------------------------------------------------<<--| P1
          |                                                      |
          |          <Wait for L1Sync Receipt Timeout Interval  |
```



```
      |            (L1SyncReceiptTimeout * L1SyncInterval)> |
      |                                                     |
      |                   <Check L1SYNC port status - IDLE> | P1
      |                                                     |
      |                      PTP SIGNALING with L1 Sync TLV |
      |                          [MSG_TYPE = 0xC, DN = DN1, |
      |                                  TLV_TYPE = 0x8001] |
   T1 |--------------------------------------------------<<--| P1
      |                                                     |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
- i. Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with following parameters.

PTP Header

```
                Message Type  = 0x0B
                Domain Number = DN1
                Sequence ID   = Y
                Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Wait for expiry of L1 sync receipt timeout interval
        (L1SyncReceiptTimeout * L1SyncInterval).

Step 8 : Verify that the DUT's L1SYNC port status P1 continues to be in
         IDLE state.

Step 9 : Verify that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
```

8.4. tc_conf_ptp-ha_smg_004

```
Test Case          : tc_conf_ptp-ha_smg_004
Test Case Version  : 1.2
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA State Machine Group (SMG)

Title              : L1 SYNC port changes from IDLE To LINK_ALIVE

Purpose            : To verify that L1 SYNC port changes its state from IDLE
                     to LINK_ALIVE when L1 Sync TLV is received.

Reference          : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
```

```
                    Clause O.7.3 Figure 70 Page 450

 Conformance Type  : MUST


Topology

                 TEE                                    DUT
            +--------------+                     +--------------+
            |              |                     |              |
            |              |                     |              |
            |              |                     |              |
            |              |                     |              |
            |      BC      | T1               P1 |    OC/BC     |
            |    (Slave)   |---------------------|   (Master)   |
            |              |                     |              |
            |              |                     |              |
            |              |                     |              |
            |              |                     |              |
            +--------------+                     +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT


 Ladder Diagram    :

         TEE                                                      DUT
       [slave]                                                  [master]
          |                                                        |
          |                                          <Enable PTP>  | P1
          |                          <Enable PTP with BC/OC clock> |
          |                        <Clock mode - one-step/two-step> |
          |                        <Configure logAnnounceInterval, | P1
          |                                announceReceiptTimeout> |
          |                            <Configure logSyncInterval> | P1
          |                     <Configure logMinDelayReqInterval> | P1
          |                       <Configure Priority1, Priority2> | P1
          |                                        <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                       <Disable L1SynOptParams option> | P1
          |             <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency,   | P1
          |            timestampCorrectionPortDS.ingressLatency,  |
          |         asymmetryCorrectionPortDS.constantAsymmetry,  |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient>   |
          |                                                        |
          |                      <Check L1SYNC port status - IDLE> | P1
          |                                                        |
          |                           ANNOUNCE [MSG_TYPE = 0x0B,   |
          |                      DN = DN1, SEQ_ID = Y, PRI1 = X]   |
```

```
   T1 |-------------------------------------------------<<--| P1
      |                                                     |
      | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                |
      | SEQ_ID = A, PRI1 = X+1]                             |
   T1 |-->>-------------------------------------------------| P1
      |                                                     |
      |                     PTP SIGNALING with L1 Sync TLV |
      |                         [MSG_TYPE = 0xC, DN = DN1, |
      |                                 TLV_TYPE = 0x8001] |
   T1 |-------------------------------------------------<<--| P1
      |                                                     |
      | PTP SIGNALING with L1 Sync TLV                      |
      | [MSG_TYPE = 0xC, DN = DN1,                          |
      | TLV_TYPE = 0x8001, TCR = 0,                         |
      | RCR = 0, CR = 0]                                    |
   T1 |-->>-------------------------------------------------| P1
      |                                                     |
      |            <Check L1SYNC port status - LINK_ALIVE> | P1
      |                                                     |
      |                     PTP SIGNALING with L1 Sync TLV |
      |                         [MSG_TYPE = 0xC, DN = DN1, |
      |                                 TLV_TYPE = 0x8001] |
   T1 |-------------------------------------------------<<--| P1
      |                                                     |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's port P1.
ii. Enable PTP on port P1.
iii. Enable PTP globally with device type as Boundary/Ordinary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vi. Enable L1SYNC on DUT's port P1.
vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
viii. Disable L1SynOptParams on DUT.

```
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 4 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 5 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port T1 with
         following parameters:
             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 8 : Verify that the DUT's L1SYNC port status P1 is in LINK_ALIVE state.
```

```
Step 9 : Verify that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
```

8.5. tc_conf_ptp-ha_smg_005

```
Test Case          : tc_conf_ptp-ha_smg_005
Test Case Version  : 1.2
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA State Machine Group (SMG)

Title              : L1 SYNC port changes from LINK_ALIVE to CONFIG_MATCH

Purpose            : To verify that L1 SYNC port changes its state from
                     LINK_ALIVE to CONFIG_MATCH when configuration of the
                     communicating L1Sync ports is compatible.

Reference          : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                     Clause O.7.3 Figure 70 Page 450

Conformance Type   : MUST
```

Topology

```
              TEE                                  DUT
        +---------------+                     +--------------+
        |               |                     |              |
        |               |                     |              |
        |               |                     |              |
        |               |                     |              |
        |      BC       | T1               P1 |    OC/BC     |
        |    (Slave)    |---------------------|   (Master)   |
        |               |                     |              |
        |               |                     |              |
        |               |                     |              |
        |               |                     |              |
        +---------------+                     +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
Ladder Diagram    :

         TEE                                                  DUT
        [slave]                                            [master]
           |                                                   |
           |                                    <Enable PTP> | P1
           |                      <Enable PTP with BC/OC clock> |
           |                   <Clock mode - one-step/two-step> |
           |                    <Configure logAnnounceInterval, | P1
           |                            announceReceiptTimeout> |
           |                        <Configure logSyncInterval> | P1
           |                  <Configure logMinDelayReqInterval> | P1
           |                    <Configure Priority1, Priority2> | P1
           |                                     <Enable L1SYNC> | P1
           |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
           |                     <Disable L1SynOptParams option> | P1
           |           <Enable asymmetryCorrectionPortDS.enable> | P1
           | <Configure timestampCorrectionPortDS.egressLatency, | P1
           |           timestampCorrectionPortDS.ingressLatency, |
           |        asymmetryCorrectionPortDS.constantAsymmetry, |
           |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
           |                                                     |
           |                        ANNOUNCE [MSG_TYPE = 0x0B, |
           |                     DN = DN1, SEQ_ID = Y, PRI1 = X] |
        T1 |------------------------------------------------<<--| P1
           |                                                     |
           | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                |
           | SEQ_ID = A, PRI1 = X+1]                             |
        T1 |-->>-------------------------------------------------| P1
           |                                                     |
           |                  <Check L1SYNC port status - IDLE> | P1
           |                                                     |
           |                     PTP SIGNALING with L1 Sync TLV |
           |                        [MSG_TYPE = 0xC, DN = DN1, |
           |                               TLV_TYPE = 0x8001] |
        T1 |------------------------------------------------<<--| P1
           |                                                     |
           | PTP SIGNALING with L1 Sync TLV                      |
           | [MSG_TYPE = 0xC, DN = DN1,                          |
           | TLV_TYPE = 0x8001, TCR = 0,                         |
           | RCR = 0, CR = 0, ITC = 0,                           |
           | IRC = 0, IC = 0]                                    |
        T1 |-->>-------------------------------------------------| P1
           |                                                     |
           |            <Check L1SYNC port status - LINK_ALIVE> | P1
           |                                                     |
           |                     PTP SIGNALING with L1 Sync TLV |
           |                        [MSG_TYPE = 0xC, DN = DN1, |
           |                       TLV_TYPE = 0x8001, TCR = 1, |
           |                                 RCR = 1, CR = 1] |
        T1 |------------------------------------------------<<--| P1
           |                                                     |
           | PTP SIGNALING with L1 Sync TLV                      |
           | [MSG_TYPE = 0xC, DN = DN1,                          |
           | TLV_TYPE = 0x8001, TCR = 1,                         |
           | RCR = 1, CR = 1, ITC = 0,                           |
           | IRC = 0, IC = 0]                                    |
```

```
       T1 |-->>-------------------------------------------------| P1
          |                                                     |
          |           <Check L1SYNC port status - CONFIG_MATCH> | P1
          |                                                     |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
    TCR       = txCoherentIsRequired
    RCR       = rxCoherentIsRequired
    CR        = congruentIsRequired
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
- i. Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with following parameters.

```
            PTP Header
                Message Type  = 0x0B
                Domain Number = DN1
                Sequence ID   = Y
                Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

            PTP Header
                Message Type  = 0x0B
                Domain Number = DN1
                Sequence ID   = A
                Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 0
                RCR           = 0
                CR            = 0
                ITC           = 0
                IRC           = 0
                IC            = 0

Step 8 : Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1

Step 10: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
```

```
          following parameters:

              PTP Header
                  Message Type  = 0xC
                  Domain Number = DN1
              L1_SYNC TLV
                  TLV_TYPE      = 0x8001
                  TCR           = 1
                  RCR           = 1
                  CR            = 1
                  ITC           = 0
                  IRC           = 0
                  IC            = 0

 Step 11: Verify that the DUT's L1SYNC port status P1 is in CONFIG_MATCH
          state.
```

8.6. tc_conf_ptp-ha_smg_006

```
 Test Case         : tc_conf_ptp-ha_smg_006
 Test Case Version : 1.3
 Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
 Module Name       : PTP-HA State Machine Group (SMG)

 Title             : L1 SYNC port state changes from CONFIG_MATCH to
                     LINK_ALIVE

 Purpose           : To verify that L1_SYNC port moves back to LINK_ALIVE
                     from CONFIG_MATCH when configuration of the
                     communicating L1Sync ports is incompatible.

 Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                     Clause O.7.3 Figure 70 Page 450

 Conformance Type  : MUST
```

Topology

```
              TEE                                  DUT
          +--------------+                     +--------------+
          |              |                     |              |
          |              |                     |              |
          |              |                     |              |
          |              |                     |              |
          |      BC      | T1               P1 |    OC/BC     |
          |    (Slave)   |---------------------|   (Master)   |
          |              |                     |              |
          |              |                     |              |
          |              |                     |              |
          |              |                     |              |
          +--------------+                     +--------------+
```

    Legends:

```
TEE     : Test Execution Engine
DUT     : Device Under Test
OC      : Ordinary Clock
BC      : Boundary Clock
T1      : Port 1 at TEE
P1      : Port 1 at DUT
```

```
Ladder Diagram    :

  TEE                                                   DUT
[slave]                                              [master]
   |                                                     |
   |                                        <Enable PTP> | P1
   |                       <Enable PTP with BC/OC clock> |
   |                    <Clock mode - one-step/two-step> |
   |                     <Configure logAnnounceInterval, | P1
   |                             announceReceiptTimeout> |
   |                         <Configure logSyncInterval> | P1
   |                  <Configure logMinDelayReqInterval> | P1
   |                    <Configure Priority1, Priority2> | P1
   |                                     <Enable L1SYNC> | P1
   |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
   |                     <Disable L1SynOptParams option> | P1
   |           <Enable asymmetryCorrectionPortDS.enable> | P1
   | <Configure timestampCorrectionPortDS.egressLatency, | P1
   |           timestampCorrectionPortDS.ingressLatency, |
   |        asymmetryCorrectionPortDS.constantAsymmetry, |
   |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
   |                                                     |
   |                          ANNOUNCE [MSG_TYPE = 0x0B, |
   |                     DN = DN1, SEQ_ID = Y, PRI1 = X] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                |
   | SEQ_ID = A, PRI1 = X+1]                             |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   |                       PTP SIGNALING with L1 Sync TLV |
   |                           [MSG_TYPE = 0xC, DN = DN1, |
   |                                   TLV_TYPE = 0x8001] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   |                  <Check L1SYNC port status - IDLE> | P1
   |                                                     |
   | PTP SIGNALING with L1 Sync TLV                      |
   | [MSG_TYPE = 0xC, DN = DN1,                          |
   | TLV_TYPE = 0x8001, TCR = 0,                         |
   | RCR = 0, CR = 0, ITC = 0,                           |
   | IRC = 0, IC = 0]                                    |
T1 |---->>-----------------------------------------------| P1
   |                                                     |
   |            <Check L1SYNC port status - LINK_ALIVE> | P1
   |                                                     |
   |                       PTP SIGNALING with L1 Sync TLV |
   |                           [MSG_TYPE = 0xC, DN = DN1, |
```

```
     |                         TLV_TYPE = 0x8001, TCR = 1, |
     |                                    RCR = 1, CR = 1] |
  T1 |------------------------------------------------<<--| P1
     |                                                     |
     | PTP SIGNALING with L1 Sync TLV                      |
     | [MSG_TYPE = 0xC, DN = DN1,                          |
     | TLV_TYPE = 0x8001, TCR = 1,                         |
     | RCR = 1, CR = 1, ITC = 0,                           |
     | IRC = 0, IC = 0]                                    |
  T1 |-->>-------------------------------------------------| P1
     |                                                     |
     |           <Check L1SYNC port status - CONFIG_MATCH> | P1
     |                                                     |
     | PTP SIGNALING with L1 Sync TLV                      |
     | [MSG_TYPE = 0xC, DN = DN1,                          |
     | TLV_TYPE = 0x8001, TCR = 0,                         |
     | RCR = 0, CR = 0, ITC = 0,                           |
     | IRC = 0, IC = 0]                                    |
  T1 |-->>-------------------------------------------------| P1
     |                                                     |
     |             <Check L1SYNC port status - LINK_ALIVE> | P1
     |                                                     |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
    TCR       = peerIsTxCoherent
    RCR       = peerIsRxCoherent
    CR        = peerIsCongruent
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.

```
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
```

```
                IRC           = 0
                IC            = 0

Step 8 : Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1

Step 10: Send PTP SIGNALING message with L1 Sync TLV on the port T1 with
         following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1
                ITC           = 0
                IRC           = 0
                IC            = 0


Step 11 : Observe that the DUT's L1SYNC port status P1 is in CONFIG_MATCH
          state

Step 12: Send PTP SIGNALING message with L1 Sync TLV on the port T1 with
         following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 0
                RCR           = 0
                CR            = 0
                ITC           = 0
                IRC           = 0
                IC            = 0

Step 13 : Verify that the DUT's L1SYNC port status P1 is in LINK_ALIVE state
```

8.7. tc_conf_ptp-ha_smg_007

```
Test Case         : tc_conf_ptp-ha_smg_007
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA State Machine Group (SMG)

Title             : L1 SYNC port changes from CONFIG_MATCH to L1_SYNC_UP
                    [DUT port state - Master]

Purpose           : To verify that L1 SYNC port changes its state from
                    CONFIG_MATCH to L1_SYNC_UP when communicating L1 sync
                    ports has the relationship required by configuration
                    in place [DUT port state - Master].

Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                    Clause O.7.3 Figure 70 Page 450

Conformance Type  : MUST
```

```
Topology

              TEE                                    DUT
        +---------------+                    +--------------+
        |               |                    |              |
        |               |                    |              |
        |               |                    |              |
        |               |                    |              |
        |      BC       | T1              P1 |    OC/BC     |
        |    (Slave)    |--------------------|   (Master)   |
        |               |                    |              |
        |               |                    |              |
        |               |                    |              |
        |               |                    |              |
        +---------------+                    +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
Ladder Diagram    :

          TEE                                                     DUT
        [slave]                                                [master]
           |                                                       |
           |                                        <Enable PTP> | P1
           |                             <Enable PTP with BC/OC clock> |
           |                          <Clock mode - one-step/two-step> |
           |                           <Configure logAnnounceInterval, | P1
```

```
    |                               announceReceiptTimeout> |
    |                           <Configure logSyncInterval> | P1
    |                    <Configure logMinDelayReqInterval> | P1
    |                      <Configure Priority1, Priority2> | P1
    |                                       <Enable L1SYNC> | P1
    |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
    |                       <Disable L1SynOptParams option> | P1
    |             <Enable asymmetryCorrectionPortDS.enable> | P1
    | <Configure timestampCorrectionPortDS.egressLatency, | P1
    |           timestampCorrectionPortDS.ingressLatency, |
    |        asymmetryCorrectionPortDS.constantAsymmetry, |
    |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
    |                                                       |
    |                            ANNOUNCE [MSG_TYPE = 0x0B, |
    |                       DN = DN1, SEQ_ID = Y, PRI1 = X] |
 T1 |----------------------------------------------------<<--| P1
    |                                                       |
    | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                  |
    | SEQ_ID = A, PRI1 = X+1]                               |
 T1 |-->>----------------------------------------------------| P1
    |                                                       |
    |                    <Check L1SYNC port status - IDLE> | P1
    |                                                       |
    |                       PTP SIGNALING with L1 Sync TLV |
    |                           [MSG_TYPE = 0xC, DN = DN1, |
    |                                   TLV_TYPE = 0x8001] |
 T1 |----------------------------------------------------<<--| P1
    |                                                       |
    | PTP SIGNALING with L1 Sync TLV                        |
    | [MSG_TYPE = 0xC, DN = DN1,                            |
    | TLV_TYPE = 0x8001, TCR = 0,                           |
    | RCR = 0, CR = 0, ITC = 0,                             |
    | IRC = 0, IC = 0]                                      |
 T1 |---->>--------------------------------------------------| P1
    |                                                       |
    |              <Check L1SYNC port status - LINK_ALIVE> | P1
    |                                                       |
    |                       PTP SIGNALING with L1 Sync TLV |
    |                           [MSG_TYPE = 0xC, DN = DN1, |
    |                          TLV_TYPE = 0x8001, TCR = 1, |
    |                                    RCR = 1, CR = 1] |
 T1 |----------------------------------------------------<<--| P1
    |                                                       |
    | PTP SIGNALING with L1 Sync TLV                        |
    | [MSG_TYPE = 0xC, DN = DN1,                            |
    | TLV_TYPE = 0x8001, TCR = 1,                           |
    | RCR = 1, CR = 1, ITC = 0,                             |
    | IRC = 0, IC = 0]                                      |
 T1 |-->>----------------------------------------------------| P1
    |                                                       |
    |            <Check L1SYNC port status - CONFIG_MATCH> | P1
    |                                                       |
    |                       PTP SIGNALING with L1 Sync TLV |
    |                           [MSG_TYPE = 0xC, DN = DN1, |
    |                          TLV_TYPE = 0x8001, TCR = 1, |
    |                            RCR = 1, CR = 1, ITC = 1, |
    |                                    IRC = 1, IC = 1] |
```

```
       T1 |-->>----------------------------------------------------| P1
          |                                                        |
          | <Wait for 60 s>                                        |
          |                                                        |
          |                       PTP SIGNALING with L1 Sync TLV |
          |                           [MSG_TYPE = 0xC, DN = DN1, |
          |                          TLV_TYPE = 0x8001, TCR = 1, |
          |                            RCR = 1, CR = 1, ITC = 1, |
          |                                     IRC = 1, IC = 1] |
       T1 |----------------------------------------------------<<--| P1
          |                                                        |
          |             <Check L1SYNC port status - L1_SYNC_UP> | P1
```

Legends   :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
    TCR       = peerIsTxCoherent
    RCR       = peerIsRxCoherent
    CR        = peerIsCongruent
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure   :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.

```
Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 8 : Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
```



```
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
```

Step 10: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with following parameters:

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 0
            IRC           = 0
            IC            = 0
```

Step 11: Observe that the DUT's L1SYNC port status P1 is in CONFIG_MATCH state

Step 12 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with following parameters:

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 1
            IRC           = 1
            IC            = 1
```

Step 13 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV on the port P1 after duration of 60s with following parameters:

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 1
            IRC           = 1
            IC            = 1
```

Step 14 : Verify that the DUT's L1SYNC port status P1 is in L1_SYNC_UP state

8.8. tc_conf_ptp-ha_smg_008

```
Test Case          : tc_conf_ptp-ha_smg_008
Test Case Version : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA State Machine Group (SMG)

Title              : L1_SYNC port state changes from L1_SYNC_UP to
                     CONFIG_MATCH [DUT port state - Master]

Purpose            : To verify that L1Sync port moves back to CONFIG_MATCH
                     from L1_SYNC_UP state, if communicating L1 sync ports do
                     not have relationship required by configuration in place
                     [DUT port state - Master].

Reference          : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                     Clause O.7.3 Figure 70 Page 450

Conformance Type   : MUST
```

Topology

```
          TEE                                   DUT
    +---------------+                    +--------------+
    |               |                    |              |
    |               |                    |              |
    |               |                    |              |
    |               |                    |              |
    |      BC       | T1              P1 |    OC/BC     |
    |    (Slave)    |--------------------|   (Master)   |
    |               |                    |              |
    |               |                    |              |
    |               |                    |              |
    |               |                    |              |
    +---------------+                    +--------------+
```

```
    Legends:

        TEE      : Test Execution Engine
        DUT      : Device Under Test
        OC       : Ordinary Clock
        BC       : Boundary Clock
        T1       : Port 1 at TEE
        P1       : Port 1 at DUT
```

```
Ladder Diagram     :

      TEE                                                      DUT
    [slave]                                                 [master]
       |                                                        |
       |                                          <Enable PTP> | P1
       |                          <Enable PTP with BC/OC clock> |
```

```
    |                    <Clock mode - one-step/two-step> |
    |                     <Configure logAnnounceInterval, | P1
    |                             announceReceiptTimeout> |
    |                         <Configure logSyncInterval> | P1
    |                  <Configure logMinDelayReqInterval> | P1
    |                    <Configure Priority1, Priority2> | P1
    |                                      <Enable L1SYNC> | P1
    |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
    |                     <Disable L1SynOptParams option> | P1
    |          <Enable asymmetryCorrectionPortDS.enable> | P1
    | <Configure timestampCorrectionPortDS.egressLatency, | P1
    |          timestampCorrectionPortDS.ingressLatency, |
    |       asymmetryCorrectionPortDS.constantAsymmetry, |
    |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
    |                                                     |
    |                        ANNOUNCE [MSG_TYPE = 0x0B, |
    |                  DN = DN1, SEQ_ID = Y, PRI1 = X] |
 T1 |-------------------------------------------------<<--| P1
    |                                                     |
    | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                |
    | SEQ_ID = A, PRI1 = X+1]                             |
 T1 |-->>-------------------------------------------------| P1
    |                                                     |
    |                   <Check L1SYNC port status - IDLE> | P1
    |                                                     |
    |                     PTP SIGNALING with L1 Sync TLV |
    |                         [MSG_TYPE = 0xC, DN = DN1, |
    |                                 TLV_TYPE = 0x8001] |
 T1 |-------------------------------------------------<<--| P1
    |                                                     |
    | PTP SIGNALING with L1 Sync TLV                      |
    | [MSG_TYPE = 0xC, DN = DN1,                          |
    | TLV_TYPE = 0x8001, TCR = 0,                         |
    | RCR = 0, CR = 0, ITC = 0,                           |
    | IRC = 0, IC = 0]                                    |
 T1 |-->>-------------------------------------------------| P1
    |                                                     |
    |             <Check L1SYNC port status - LINK_ALIVE> | P1
    |                                                     |
    |                     PTP SIGNALING with L1 Sync TLV |
    |                         [MSG_TYPE = 0xC, DN = DN1, |
    |                        TLV_TYPE = 0x8001, TCR = 1, |
    |                                   RCR = 1, CR = 1] |
 T1 |-------------------------------------------------<<--| P1
    |                                                     |
    | PTP SIGNALING with L1 Sync TLV                      |
    | [MSG_TYPE = 0xC, DN = DN1,                          |
    | TLV_TYPE = 0x8001, TCR = 1,                         |
    | RCR = 1, CR = 1, ITC = 0,                           |
    | IRC = 0, IC = 0]                                    |
 T1 |-->>-------------------------------------------------| P1
    |                                                     |
    |           <Check L1SYNC port status - CONFIG_MATCH> | P1
    |                                                     |
    | PTP SIGNALING with L1 Sync TLV                      |
    | [MSG_TYPE = 0xC, DN = DN1,                          |
    | TLV_TYPE = 0x8001, TCR = 1,                         |
```

```
       | RCR = 1, CR = 1, ITC = 1,                           |
       | IRC = 1, IC = 1]                                    |
    T1 |-->>-------------------------------------------------| P1
       |                                                     |
       | <Wait for 60 s>                                     |
       |                                                     |
       |                                                     |
       |                      PTP SIGNALING with L1 Sync TLV |
       |                          [MSG_TYPE = 0xC, DN = DN1, |
       |                         TLV_TYPE = 0x8001, TCR = 1, |
       |                           RCR = 1, CR = 1, ITC = 1, |
       |                                    IRC = 1, IC = 1] |
    T1 |-------------------------------------------------<<--| P1
       |                                                     |
       |            <Check L1SYNC port status - L1_SYNC_UP>  | P1
       |                                                     |
       |                                                     |
       | PTP SIGNALING with L1 Sync TLV                      |
       | [MSG_TYPE = 0xC, DN = DN1,                          |
       | TLV_TYPE = 0x8001, TCR = 1,                         |
       | RCR = 1, CR = 1, ITC = 0,                           |
       | IRC = 0, IC = 0]                                    |
    T1 |-->>-------------------------------------------------| P1
       |                                                     |
       |          <Check L1SYNC port status - CONFIG_MATCH>  | P1
       |                                                     |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
    TCR       = peerIsTxCoherent
    RCR       = peerIsRxCoherent
    CR        = peerIsCongruent
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.

```
    iv.   Configure clock mode as One-step/Two-step.
     v.   Configure default values for Priority1, Priority2,
          logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
          logMinDelayReqInterval.
    vi.   Enable L1SYNC on DUT's port P1.
   vii.   Configure default values for L1SyncInterval and
          L1SyncReceiptTimeout.
  viii.   Disable L1SynOptParams on DUT.
    ix.   Enable asymmetryCorrectionPortDS.enable.
     x.   Configure default values for timestampCorrectionPortDS.
          egressLatency, timestampCorrectionPortDS.egressLatency,
          asymmetryCorrectionPortDS.constantAsymmetry and
          asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
     i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1


Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
```



```
            TLV_TYPE      = 0x8001
            TCR           = 0
            RCR           = 0
            CR            = 0
            ITC           = 0
            IRC           = 0
            IC            = 0

Step 8 : Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1

Step 10: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 0
            IRC           = 0
            IC            = 0

Step 11: Observe that the DUT's L1SYNC port status P1 is in CONFIG_MATCH
         state.

Step 12: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 1
            IRC           = 1
            IC            = 1

Step 13: Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 after duration of 60s with following parameters:
```

```
            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1
                ITC           = 1
                IRC           = 1
                IC            = 1

Step 14 : Observe that the DUT's L1SYNC port status P1 is in L1_SYNC_UP
          state.

Step 15 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
          following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1
                ITC           = 0
                IRC           = 0
                IC            = 0

Step 16: Verify that the DUT's L1SYNC port status P1 is in CONFIG_MATCH
         state.
```

8.9. tc_conf_ptp-ha_smg_009

```
Test Case         : tc_conf_ptp-ha_smg_009
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA State Machine Group (SMG)

Title             : L1 SYNC port changes from CONFIG_MATCH to L1_SYNC_UP
                    [DUT port state - Slave]

Purpose           : To verify that L1 SYNC port changes its state from
                    CONFIG_MATCH to L1_SYNC_UP when communicating L1 sync
                    ports has the relationship required by configuration
                    in place. [DUT port state - Slave].

Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                    Clause O.7.3 Figure 70 Page 450

Conformance Type  : MUST
```

```
Topology

                  TEE                                  DUT
            +---------------+                    +--------------+
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |      BC       | T1              P1 |    OC/BC     |
            |   (Master)    |--------------------|   (Slave)    |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            +---------------+                    +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT


 Ladder Diagram    :

          TEE                                                  DUT
        [master]                                             [slave]
           |                                                    |
           |                                      <Enable PTP>  | P1
           |                     <Enable PTP with BC/OC clock>  |
           |                  <Clock mode - one-step/two-step>  |
           |                   <Configure logAnnounceInterval,  | P1
           |                           announceReceiptTimeout>  |
           |                       <Configure logSyncInterval>  | P1
           |                 <Configure logMinDelayReqInterval>  | P1
           |                  <Configure Priority1, Priority2>  | P1
           |                                    <Enable L1SYNC>  | P1
           |    <Configure L1SyncInterval, L1SyncReceiptTimeout>  | P1
           |                   <Disable L1SynOptParams option>  | P1
           |             <Enable asymmetryCorrectionPortDS.enable>  | P1
           | <Configure timestampCorrectionPortDS.egressLatency,  | P1
           |            timestampCorrectionPortDS.ingressLatency,  |
           |         asymmetryCorrectionPortDS.constantAsymmetry,  |
           |   asymmetryCorrectionPortDS.scaledDelayCoefficient>  |
           |                                                    |
           |                         ANNOUNCE [MSG_TYPE = 0x0B,  |
           |                    DN = DN1, SEQ_ID = Y, PRI1 = X]  |
        T1 |-------------------------------------------------<<--| P1
           |                                                    |
           | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
           | SEQ_ID = A, PRI1 = X-1]                             |
        T1 |-->>-------------------------------------------------| P1
           |                                                    |
```

```
     |                  <Check L1SYNC port status - IDLE> | P1
     |                                                    |
     |                      PTP SIGNALING with L1 Sync TLV |
     |                          [MSG_TYPE = 0xC, DN = DN1, |
     |                                  TLV_TYPE = 0x8001] |
  T1 |-----------------------------------------------<<--| P1
     |                                                    |
     | PTP SIGNALING with L1 Sync TLV                     |
     | [MSG_TYPE = 0xC, DN = DN1,                         |
     | TLV_TYPE = 0x8001, TCR = 0,                        |
     | RCR = 0, CR = 0, ITC = 0,                          |
     | IRC = 0, IC = 0]                                   |
  T1 |-->>------------------------------------------------| P1
     |                                                    |
     |            <Check L1SYNC port status - LINK_ALIVE> | P1
     |                                                    |
     |                      PTP SIGNALING with L1 Sync TLV |
     |                          [MSG_TYPE = 0xC, DN = DN1, |
     |                         TLV_TYPE = 0x8001, TCR = 1, |
     |                                    RCR = 1, CR = 1] |
  T1 |-----------------------------------------------<<--| P1
     |                                                    |
     | PTP SIGNALING with L1 Sync TLV                     |
     | [MSG_TYPE = 0xC, DN = DN1,                         |
     | TLV_TYPE = 0x8001, TCR = 1,                        |
     | RCR = 1, CR = 1, ITC = 0,                          |
     | IRC = 0, IC = 0]                                   |
  T1 |-->>------------------------------------------------| P1
     |                                                    |
     |          <Check L1SYNC port status - CONFIG_MATCH> | P1
     |                                                    |
     | <Wait for 60 s>                                    |
     |                                                    |
     |                      PTP SIGNALING with L1 Sync TLV |
     |                          [MSG_TYPE = 0xC, DN = DN1, |
     |                         TLV_TYPE = 0x8001, TCR = 1, |
     |                           RCR = 1, CR = 1, ITC = 1, |
     |                                    IRC = 1, IC = 1] |
  T1 |-----------------------------------------------<<--| P1
     |                                                    |
     | PTP SIGNALING with L1 Sync TLV                     |
     | [MSG_TYPE = 0xC, DN = DN1,                         |
     | TLV_TYPE = 0x8001, TCR = 1,                        |
     | RCR = 1, CR = 1, ITC = 1,                          |
     | IRC = 1, IC = 1]                                   |
  T1 |-->>------------------------------------------------| P1
     |                                                    |
     |            <Check L1SYNC port status - L1_SYNC_UP> | P1
     |                                                    |
```

Legends :

MSG_TYPE = Message Type
DN = Domain Number
BC = Boundary Clock
OC = Ordinary Clock
ITC = peerIsTxCoherent

```
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile



Procedure        :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value decremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X-1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.
```

```
Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 8 : Verify that the DUT's L1SYNC port status P1 is in LINK_ALIVE state.

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1

Step 10: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 11: Observe that the DUT's L1SYNC port status P1 is in CONFIG_MATCH
          state
```

```
Step 12: Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 after duration of 60s with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 1
                 IRC           = 1
                 IC            = 1

Step 13: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 1
                 IRC           = 1
                 IC            = 1

Step 14 : Verify that the DUT's L1SYNC port status P1 is in L1_SYNC_UP state
```

8.10. tc_conf_ptp-ha_smg_010

```
Test Case         : tc_conf_ptp-ha_smg_010
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA State Machine Group (SMG)

Title             : L1_SYNC port state changes from L1_SYNC_UP to
                    CONFIG_MATCH [DUT port state - Slave]

Purpose           : To verify that L1Sync port moves back to CONFIG_MATCH
                    from L1_SYNC_UP state if communicating L1 sync ports
                    do not have relationship required by configuration in
                    place. [DUT port state - Slave]

Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                    Clause O.7.3 Figure 70 Page 450

Conformance Type  : MUST
```

Topology


```
       TEE                                  DUT
 +--------------+                     +-------------+
 |              |                     |             |
 |              |                     |             |
 |              |                     |             |
 |              |                     |             |
 |      BC      | T1               P1 |    OC/BC    |
 |   (Master)   |---------------------|   (Slave)   |
 |              |                     |             |
 |              |                     |             |
 |              |                     |             |
 |              |                     |             |
 +--------------+                     +-------------+
```

```
Legends:

    TEE      : Test Execution Engine
    DUT      : Device Under Test
    OC       : Ordinary Clock
    BC       : Boundary Clock
    T1       : Port 1 at TEE
    P1       : Port 1 at DUT
```

```
Ladder Diagram    :

       TEE                                                  DUT
    [Master]                                              [slave]
       |                                                     |
       |                                      <Enable PTP> | P1
       |                     <Enable PTP with BC/OC clock> |
       |                    <Clock mode - one-step/two-step> |
       |                     <Configure logAnnounceInterval, | P1
       |                             announceReceiptTimeout> |
       |                         <Configure logSyncInterval> | P1
       |                  <Configure logMinDelayReqInterval> | P1
       |                    <Configure Priority1, Priority2> | P1
       |                                     <Enable L1SYNC> | P1
       |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
       |                     <Disable L1SynOptParams option> | P1
       |           <Enable asymmetryCorrectionPortDS.enable> | P1
       | <Configure timestampCorrectionPortDS.egressLatency, | P1
       |           timestampCorrectionPortDS.ingressLatency, |
       |        asymmetryCorrectionPortDS.constantAsymmetry, |
       |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
       |                                                     |
       |                          ANNOUNCE [MSG_TYPE = 0x0B, |
       |                     DN = DN1, SEQ_ID = Y, PRI1 = X] |
    T1 |-------------------------------------------------<<--| P1
       |                                                     |
       | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                |
       | SEQ_ID = A, PRI1 = X-1]                             |
    T1 |-->>-------------------------------------------------| P1
       |                                                     |
       |                <Check L1SYNC port status - IDLE> | P1
       |                                                     |
```

```
    |                  PTP SIGNALING with L1 Sync TLV |
    |                      [MSG_TYPE = 0xC, DN = DN1, |
    |                              TLV_TYPE = 0x8001] |
 T1 |-------------------------------------------<<--| P1
    |                                                 |
    | PTP SIGNALING with L1 Sync TLV                  |
    | [MSG_TYPE = 0xC, DN = DN1,                      |
    | TLV_TYPE = 0x8001, TCR = 0,                     |
    | RCR = 0, CR = 0, ITC = 0,                       |
    | IRC = 0, IC = 0]                                |
 T1 |---->>-------------------------------------------| P1
    |                                                 |
    |            <Check L1SYNC port status - LINK_ALIVE> | P1
    |                                                 |
    |                  PTP SIGNALING with L1 Sync TLV |
    |                      [MSG_TYPE = 0xC, DN = DN1, |
    |                     TLV_TYPE = 0x8001, TCR = 1, |
    |                                RCR = 1, CR = 1] |
 T1 |-------------------------------------------<<--| P1
    |                                                 |
    | PTP SIGNALING with L1 Sync TLV                  |
    | [MSG_TYPE = 0xC, DN = DN1,                      |
    | TLV_TYPE = 0x8001, TCR = 1,                     |
    | RCR = 1, CR = 1, ITC = 0,                       |
    | IRC = 0, IC = 0]                                |
 T1 |-->>---------------------------------------------| P1
    |                                                 |
    |          <Check L1SYNC port status - CONFIG_MATCH> | P1
    |                                                 |
    | <Wait for 60 s>                                 |
    |                                                 |
    |                  PTP SIGNALING with L1 Sync TLV |
    |                      [MSG_TYPE = 0xC, DN = DN1, |
    |                     TLV_TYPE = 0x8001, TCR = 1, |
    |                       RCR = 1, CR = 1, ITC = 1, |
    |                                IRC = 1, IC = 1] |
 T1 |-------------------------------------------<<--| P1
    |                                                 |
    | PTP SIGNALING with L1 Sync TLV                  |
    | [MSG_TYPE = 0xC, DN = DN1,                      |
    | TLV_TYPE = 0x8001, TCR = 1,                     |
    | RCR = 1, CR = 1, ITC = 1,                       |
    | IRC = 1, IC = 1]                                |
 T1 |-->>---------------------------------------------| P1
    |                                                 |
    |            <Check L1SYNC port status - L1_SYNC_UP> | P1
    |                                                 |
    | PTP SIGNALING with L1 Sync TLV                  |
    | [MSG_TYPE = 0xC, DN = DN1,                      |
    | TLV_TYPE = 0x8001, TCR = 1,                     |
    | RCR = 1, CR = 1, ITC = 0,                       |
    | IRC = 0, IC = 0]                                |
 T1 |-->>---------------------------------------------| P1
    |                                                 |
    |          <Check L1SYNC port status - CONFIG_MATCH> | P1
    |                                                 |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile



Procedure        :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value decremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.
```

```
            PTP Header
                Message Type  = 0x0B
                Domain Number = DN1
                Sequence ID   = A
                Priority1     = X-1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 0
                RCR           = 0
                CR            = 0
                ITC           = 0
                IRC           = 0
                IC            = 0

Step 8 : Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1

Step 10: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1
```

```
            ITC           = 0
            IRC           = 0
            IC            = 0
```

Step 11: Observe that the DUT's L1SYNC port status P1 is in CONFIG_MATCH state

Step 12: Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV on the port P1 after duration of 60s with following parameters:

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 1
            IRC           = 1
            IC            = 1
```

Step 13: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with following parameters:

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 1
            IRC           = 1
            IC            = 1
```

Step 14: Observe that the DUT's L1SYNC port status P1 is in L1_SYNC_UP state

Step 15: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with following parameters:

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 0
            IRC           = 0
            IC            = 0
```

Step 16: Verify that the DUT's L1SYNC port status P1 is in CONFIG_MATCH state.

8.11. tc_conf_ptp-ha_smg_011

```
Test Case         : tc_conf_ptp-ha_smg_011
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA State Machine Group (SMG)

Title             : L1 Sync Port state changes from L1_SYNC_UP to
                    LINK_ALIVE when configuration of the L1Sync ports is
                    not compatible

Purpose           : To verify that L1Sync port changes its state from
                    L1_SYNC_UP to LINK_ALIVE when configuration of the
                    communicating L1Sync ports is not compatible.

Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                    Clause O.7.3 Figure 70 Page 450

Conformance Type  : MUST
```

Topology

```
           TEE                                  DUT
     +---------------+                    +--------------+
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |      BC       | T1              P1 |    OC/BC     |
     |    (Slave)    |--------------------|   (Master)   |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     +---------------+                    +--------------+
```

```
    Legends:

        TEE      : Test Execution Engine
        DUT      : Device Under Test
        OC       : Ordinary Clock
        BC       : Boundary Clock
        T1       : Port 1 at TEE
        P1       : Port 1 at DUT
```

```
 Ladder Diagram     :

        TEE                                                    DUT
      [slave]                                               [master]
         |                                                      |
         |                                       <Enable PTP> | P1
```

```
    |                   <Enable PTP with BC/OC clock> |
    |                <Clock mode - one-step/two-step> |
    |                 <Configure logAnnounceInterval, | P1
    |                         announceReceiptTimeout> |
    |                     <Configure logSyncInterval> | P1
    |              <Configure logMinDelayReqInterval> | P1
    |                <Configure Priority1, Priority2> | P1
    |                                  <Enable L1SYNC> | P1
    |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
    |                 <Disable L1SynOptParams option> | P1
    |           <Enable asymmetryCorrectionPortDS.enable> | P1
    | <Configure timestampCorrectionPortDS.egressLatency, | P1
    |           timestampCorrectionPortDS.ingressLatency, |
    |        asymmetryCorrectionPortDS.constantAsymmetry, |
    |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
    |                                                 |
    |                      ANNOUNCE [MSG_TYPE = 0x0B, |
    |                 DN = DN1, SEQ_ID = Y, PRI1 = X] |
 T1 |-----------------------------------------------<<--| P1
    |                                                 |
    | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,            |
    | SEQ_ID = A, PRI1 = X-1]                         |
 T1 |-->>----------------------------------------------| P1
    |                                                 |
    |                <Check L1SYNC port status - IDLE> | P1
    |                                                 |
    |                   PTP SIGNALING with L1 Sync TLV |
    |                       [MSG_TYPE = 0xC, DN = DN1, |
    |                               TLV_TYPE = 0x8001] |
 T1 |-----------------------------------------------<<--| P1
    |                                                 |
    | PTP SIGNALING with L1 Sync TLV                  |
    | [MSG_TYPE = 0xC, DN = DN1,                      |
    | TLV_TYPE = 0x8001, TCR = 0,                     |
    | RCR = 0, CR = 0]                                |
 T1 |-->>----------------------------------------------| P1
    |                                                 |
    |                   PTP SIGNALING with L1 Sync TLV |
    |                       [MSG_TYPE = 0xC, DN = DN1, |
    |                      TLV_TYPE = 0x8001, TCR = 1, |
    |                                 RCR = 1, CR = 1] |
 T1 |-----------------------------------------------<<--| P1
    |                                                 |
    |                   PTP SIGNALING with L1 Sync TLV |
    |                       [MSG_TYPE = 0xC, DN = DN1, |
    |                      TLV_TYPE = 0x8001, TCR = 1, |
    |                        RCR = 1, CR = 1, ITC = 0, |
    |                                 IRC = 0, IC = 0] |
 T1 |-->>----------------------------------------------| P1
    |                                                 |
    |        <Check L1SYNC port status - CONFIG_MATCH> | P1
    |                                                 |
    | <Wait for 60 s>                                 |
    |                                                 |
    |                   PTP SIGNALING with L1 Sync TLV |
    |                       [MSG_TYPE = 0xC, DN = DN1, |
    |                      TLV_TYPE = 0x8001, TCR = 1, |
```

```
     |                          RCR = 1, CR = 1, ITC = 1, |
     |                                   IRC = 1, IC = 1] |
  T1 |-------------------------------------------------<<--| P1
     |                                                    |
     | PTP SIGNALING with L1 Sync TLV                     |
     | [MSG_TYPE = 0xC, DN = DN1,                         |
     | TLV_TYPE = 0x8001, TCR = 1,                        |
     | RCR = 1, CR = 1, ITC = 1,                          |
     | IRC = 1, IC = 1]                                   |
  T1 |-->>------------------------------------------------| P1
     |                                                    |
     |             <Check L1SYNC port status - L1_SYNC_UP> | P1
     |                                                    |
     | PTP SIGNALING with L1 Sync TLV                     |
     | [MSG_TYPE = 0xC, DN = DN1,                         |
     | TLV_TYPE = 0x8001, TCR = 0,                        |
     | RCR = 0, CR = 0, ITC = 0,                          |
     | IRC = 0, IC = 0]                                   |
  T1 |-->>------------------------------------------------| P1
     |                                                    |
     |             <Check L1SYNC port status - LINK_ALIVE> | P1
     |                                                    |
```

Legends :

MSG_TYPE = Message Type
DN = Domain Number
BC = Boundary Clock
OC = Ordinary Clock
ITC = peerIsTxCoherent
IRC = peerIsRxCoherent
IC = peerIsCongruent

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.

```
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value decremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X-1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 8 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:
```

```
            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1

Step 9 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1
                ITC           = 0
                IRC           = 0
                IC            = 0

Step 10 : Observe that the DUT's L1SYNC port status P1 is in CONFIG_MATCH
          state

Step 11 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
          on the port P1 after duration of 60s with following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1
                ITC           = 1
                IRC           = 1
                IC            = 1

Step 12 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1
                ITC           = 1
                IRC           = 1
                IC            = 1
```



```
Step 13 : Observe that the DUT's L1SYNC port status P1 is in L1_SYNC_UP
          state

Step 14 : Send L1SYNC SIGNALLING message on the port T1 with following
         parameters:
             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 15 : Verify that the DUT's L1SYNC port status P1 is in LINK_ALIVE
          state
```

8.12. tc_conf_ptp-ha_smg_012

```
Test Case          : tc_conf_ptp-ha_smg_012
Test Case Version  : 1.4
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA State Machine Group (SMG)

Title              : L1 Sync Port state changes from LINK_ALIVE to IDLE
                     when L1SyncLinkAlive is FALSE

Purpose            : To verify that L1 SYNC port changes its state to IDLE
                     from LINK_ALIVE when L1SyncLinkAlive is FALSE.

Reference          : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                     Clause O.7.3 Figure 70 Page 450

Conformance Type   : MUST
```

Topology

```
                  TEE                                  DUT
            +---------------+                     +--------------+
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |       BC      | T1               P1 |    OC/BC     |
            |    (Slave)    |---------------------|   (Master)   |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
```

```
        +--------------+                     +-------------+

   Legends:

       TEE     : Test Execution Engine
       DUT     : Device Under Test
       OC      : Ordinary Clock
       BC      : Boundary Clock
       T1      : Port 1 at TEE
       P1      : Port 1 at DUT


Ladder Diagram    :

       TEE                                                    DUT
     [slave]                                               [master]
        |                                                      |
        |                                        <Enable PTP> | P1
        |                          <Enable PTP with BC/OC clock> |
        |                       <Clock mode - one-step/two-step> |
        |                        <Configure logAnnounceInterval, | P1
        |                                announceReceiptTimeout> |
        |                            <Configure logSyncInterval> | P1
        |                     <Configure logMinDelayReqInterval> | P1
        |                       <Configure Priority1, Priority2> | P1
        |                                        <Enable L1SYNC> | P1
        |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
        |                        <Disable L1SynOptParams option> | P1
        |             <Enable asymmetryCorrectionPortDS.enable> | P1
        | <Configure timestampCorrectionPortDS.egressLatency,   | P1
        |           timestampCorrectionPortDS.ingressLatency,   |
        |         asymmetryCorrectionPortDS.constantAsymmetry,  |
        |   asymmetryCorrectionPortDS.scaledDelayCoefficient>   |
        |                                                      |
        |                          ANNOUNCE [MSG_TYPE = 0x0B,  |
        |                     DN = DN1, SEQ_ID = Y, PRI1 = X]  |
     T1 |--------------------------------------------------<<--| P1
        |                                                      |
        | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
        | SEQ_ID = A, PRI1 = X+1]                              |
     T1 |-->>--------------------------------------------------| P1
        |                                                      |
        |                    <Check L1SYNC port status - IDLE> | P1
        |                                                      |
        |                       PTP SIGNALING with L1 Sync TLV |
        |                           [MSG_TYPE = 0xC, DN = DN1, |
        |                                   TLV_TYPE = 0x8001] |
     T1 |--------------------------------------------------<<--| P1
        |                                                      |
        | PTP SIGNALING with L1 Sync TLV                       |
        | [MSG_TYPE = 0xC, DN = DN1,                           |
        | TLV_TYPE = 0x8001, TCR = 0,                          |
        | RCR = 0, CR = 0, ITC = 0,                            |
        | IRC = 0, IC = 0]                                     |
     T1 |-->>--------------------------------------------------| P1
        |                                                      |
        |              <Check L1SYNC port status - LINK_ALIVE> | P1
```

```
    |                                                      |
    |                        PTP SIGNALING with L1 Sync TLV |
    |                            [MSG_TYPE = 0xC, DN = DN1, |
    |                                    TLV_TYPE = 0x8001] |
 T1 |--------------------------------------------------<<--| P1
    |                                                      |
    | PTP SIGNALING with L1 Sync TLV                       |
    | [MSG_TYPE = 0xC, DN = DN1,                           |
    | TLV_TYPE = 0x8001, TCR = 0,                          |
    | RCR = 0, CR = 0, ITC = 0,                            |
    | IRC = 0, IC = 0]                                     |
 T1 |-->>----------------XX                                | P1
    |                                                      |
    |          <Wait for L1Sync Receipt Timeout Interval>  |
    |                                                      |
    |                   <Check L1SYNC port status - IDLE>  | P1
    |                                                      |
    |                        PTP SIGNALING with L1 Sync TLV |
    |                            [MSG_TYPE = 0xC, DN = DN1, |
    |                                    TLV_TYPE = 0x8001] |
 T1 |--------------------------------------------------<<--| P1
    |                                                      |
```

Legends :

MSG_TYPE	= Message Type
DN	= Domain Number
BC	= Boundary Clock
OC	= Ordinary Clock
SEQ_ID	= Sequence ID
PRI	= Priority
ITC	= peerIsTxCoherent
IRC	= peerIsRxCoherent
IC	= peerIsCongruent
TCR	= peerIsTxCoherent
RCR	= peerIsRxCoherent
CR	= peerIsCongruent

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.

```
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
```

```
                IRC           = 0
                IC            = 0

Step 8 : Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 10: Stop sending PTP SIGNALING message with L1 Sync TLV on the port T1
         with following parameters:
             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 11: Wait for expiry of L1 sync receipt timeout interval.

Step 12: Verify that the DUT's L1SYNC port status P1 is in IDLE state.

Step 13: Verify that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
```

8.13. tc_conf_ptp-ha_smg_013

```
Test Case         : tc_conf_ptp-ha_smg_013
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA State Machine Group (SMG)

Title             : L1 Sync Port state changes from CONFIG_MATCH to IDLE
                    when when L1SyncLinkAlive is FALSE

Purpose           : To verify that L1Sync port changes its state from
                    CONFIG_MATCH to IDLE when no L1_SYNC TLV has been
                    received for L1_SYNC TLV reception timeout.

Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                    Clause O.7.3 Figure 70 Page 450

Conformance Type  : MUST
```

Topology

```
                  TEE                                    DUT
            +---------------+                     +--------------+
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |      BC       | T1               P1 |    OC/BC     |
            |    (Slave)    |---------------------|   (Master)   |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            +---------------+                     +--------------+
```

```
    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

Ladder Diagram :

```
        TEE                                                     DUT
      [slave]                                                 [master]
         |                                                       |
         |                                         <Enable PTP> | P1
         |                          <Enable PTP with BC/OC clock> |
         |                       <Clock mode - one-step/two-step> |
         |                        <Configure logAnnounceInterval, | P1
         |                                announceReceiptTimeout> |
         |                            <Configure logSyncInterval> | P1
         |                    <Configure logMinDelayReqInterval> | P1
         |                     <Configure Priority1, Priority2> | P1
         |                                      <Enable L1SYNC> | P1
         |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
         |                     <Disable L1SynOptParams option> | P1
         |            <Enable asymmetryCorrectionPortDS.enable> | P1
         | <Configure timestampCorrectionPortDS.egressLatency, | P1
         |            timestampCorrectionPortDS.ingressLatency, |
         |         asymmetryCorrectionPortDS.constantAsymmetry, |
         |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
         |                                                       |
         |                           ANNOUNCE [MSG_TYPE = 0x0B, |
         |                     DN = DN1, SEQ_ID = Y, PRI1 = X] |
      T1 |-------------------------------------------------<<--| P1
         |                                                       |
         | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
         | SEQ_ID = A, PRI1 = X+1]                               |
      T1 |-->>---------------------------------------------------| P1
         |                                                       |
```

```
    |                 <Check L1SYNC port status - IDLE> | P1
    |                                                   |
    |                      PTP SIGNALING with L1 Sync TLV |
    |                          [MSG_TYPE = 0xC, DN = DN1, |
    |                                  TLV_TYPE = 0x8001] |
 T1 |-------------------------------------------------<<--| P1
    |                                                   |
    | PTP SIGNALING with L1 Sync TLV                    |
    | [MSG_TYPE = 0xC, DN = DN1,                        |
    | TLV_TYPE = 0x8001, TCR = 0,                       |
    | RCR = 0, CR = 0, ITC = 0,                         |
    | IRC = 0, IC = 0]                                  |
 T1 |-->>-------------------------------------------------| P1
    |                                                   |
    |           <Check L1SYNC port status - LINK_ALIVE> | P1
    |                                                   |
    |                      PTP SIGNALING with L1 Sync TLV |
    |                          [MSG_TYPE = 0xC, DN = DN1, |
    |                         TLV_TYPE = 0x8001, TCR = 1, |
    |                           RCR = 1, CR = 1, ITC = X, |
    |                                     IRC = Y, IC = Z] |
 T1 |-------------------------------------------------<<--| P1
    |                                                   |
    | PTP SIGNALING with L1 Sync TLV                    |
    | [MSG_TYPE = 0xC, DN = DN1,                        |
    | TLV_TYPE = 0x8001, TCR = 1,                       |
    | RCR = 1, CR = 1, ITC = !X,                        |
    | IRC = !Y, IC = !Z]                                |
 T1 |-->>-------------------------------------------------| P1
    |                                                   |
    |         <Check L1SYNC port status - CONFIG_MATCH> | P1
    |                                                   |
    | PTP SIGNALING with L1 Sync TLV                    |
    | [MSG_TYPE = 0xC, DN = DN1,                        |
    | TLV_TYPE = 0x8001]                                |
 T1 |-->>-------XX                                      | P1
    |                                                   |
    |          <Wait for L1Sync Receipt Timeout Interval> |
    |                                                   |
    |                 <Check L1SYNC port status - IDLE> | P1
    |                                                   |
    |                      PTP SIGNALING with L1 Sync TLV |
    |                          [MSG_TYPE = 0xC, DN = DN1, |
    |                                  TLV_TYPE = 0x8001] |
 T1 |-------------------------------------------------<<--| P1
    |                                                   |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
```

```
    IC        = peerIsCongruent
    TCR       = peerIsTxCoherent
    RCR       = peerIsRxCoherent
    CR        = peerIsCongruent
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's port P1.
ii. Enable PTP on port P1.
iii. Enable PTP globally with device type as Boundary/Ordinary clock.
iv. Configure clock mode as One-step/Two-step.
v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
vi. Enable L1SYNC on DUT's port P1.
vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
viii. Disable L1SynOptParams on DUT.
ix. Enable asymmetryCorrectionPortDS.enable.
x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE

i. Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with following parameters.

```
PTP Header
    Message Type  = 0x0B
    Domain Number = DN1
    Sequence ID   = Y
    Priority1     = X
```

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented from the Priority1 value of received Announce message on port T1 with following parameters.

```
PTP Header
    Message Type  = 0x0B
    Domain Number = DN1
    Sequence ID   = A
    Priority1     = X+1
```

```
Step 5 : Verify that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 8 : Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = X
                 IRC           = Y
                 IC            = Z

Step 10 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = !X
                 IRC           = !Y
                 IC            = !Z
```

```
Step 11: Observe that the DUT's L1SYNC port status P1 is in CONFIG_MATCH
         state.

Step 12: Stop sending PTP SIGNALING message with L1 Sync TLV on the port T1
         with following parameters:
             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 13 : Wait for expiry of L1 sync receipt timeout interval.

Step 14 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 15 : Verify that DUT transmits PTP SIGNALING message with L1 Sync TLV
          on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
```

8.14. tc_conf_ptp-ha_smg_014

```
Test Case          : tc_conf_ptp-ha_smg_014
Test Case Version  : 1.3
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA State Machine Group (SMG)

Title              : L1 Sync Port state changes from L1_SYNC_UP to IDLE when
                     L1SyncLinkAlive is FALSE

Purpose            : To verify that L1Sync port changes its state from
                     L1_SYNC_UP to IDLE when no L1_SYNC TLV has been
                     received for L1_SYNC TLV reception timeout

Reference          : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                     Clause O.7.3 Figure 70 Page 450

Conformance Type   : MUST
```

Topology

```
             TEE                                    DUT
      +---------------+                     +--------------+
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      |               |                     |              |
      |       BC      | T1               P1 |    OC/BC     |
```

```
        |    (Slave)    |---------------------|   (Master)   |
        |               |                     |              |
        |               |                     |              |
        |               |                     |              |
        |               |                     |              |
        +---------------+                     +--------------+

   Legends:

       TEE      : Test Execution Engine
       DUT      : Device Under Test
       OC       : Ordinary Clock
       BC       : Boundary Clock
       T1       : Port 1 at TEE
       P1       : Port 1 at DUT


Ladder Diagram    :

         TEE                                                  DUT
       [slave]                                             [master]
          |                                                     |
          |                                       <Enable PTP> | P1
          |                        <Enable PTP with BC/OC clock> |
          |                     <Clock mode - one-step/two-step> |
          |                      <Configure logAnnounceInterval, | P1
          |                              announceReceiptTimeout> |
          |                          <Configure logSyncInterval> | P1
          |                   <Configure logMinDelayReqInterval> | P1
          |                     <Configure Priority1, Priority2> | P1
          |                                     <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                      <Disable L1SynOptParams option> | P1
          |            <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |            timestampCorrectionPortDS.ingressLatency, |
          |         asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                     |
          |                          ANNOUNCE [MSG_TYPE = 0x0B, |
          |                      DN = DN1, SEQ_ID = Y, PRI1 = X] |
       T1 |-------------------------------------------------<<--| P1
          |                                                     |
          | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                |
          | SEQ_ID = A, PRI1 = X+1]                             |
       T1 |-->>-------------------------------------------------| P1
          |                                                     |
          |                  <Check L1SYNC port status - IDLE> | P1
          |                                                     |
          |                       PTP SIGNALING with L1 Sync TLV |
          |                           [MSG_TYPE = 0xC, DN = DN1, |
          |                                   TLV_TYPE = 0x8001] |
       T1 |-------------------------------------------------<<--| P1
          |                                                     |
          | PTP SIGNALING with L1 Sync TLV                      |
          | [MSG_TYPE = 0xC, DN = DN1,                          |
          | TLV_TYPE = 0x8001, TCR = 0,                         |
```

```
    | RCR = 0, CR = 0, ITC = 0,                             |
    | IRC = 0, IC = 0]                                      |
 T1 |-->>---------------------------------------------------| P1
    |                                                       |
    |            <Check L1SYNC port status - LINK_ALIVE>    | P1
    |                                                       |
    |                      PTP SIGNALING with L1 Sync TLV   |
    |                          [MSG_TYPE = 0xC, DN = DN1,   |
    |                         TLV_TYPE = 0x8001, TCR = 1,   |
    |                                    RCR = 1, CR = 1]   |
 T1 |------------------------------------------------<<--| P1
    |                                                       |
    | PTP SIGNALING with L1 Sync TLV                        |
    | [MSG_TYPE = 0xC, DN = DN1,                            |
    | TLV_TYPE = 0x8001, TCR = 1,                           |
    | RCR = 1, CR = 1, ITC = 0,                             |
    | IRC = 0, IC = 0]                                      |
 T1 |-->>---------------------------------------------------| P1
    |                                                       |
    |          <Check L1SYNC port status - CONFIG_MATCH>    | P1
    |                                                       |
    | PTP SIGNALING with L1 Sync TLV                        |
    | [MSG_TYPE = 0xC, DN = DN1,                            |
    | TLV_TYPE = 0x8001, TCR = 1,                           |
    | RCR = 1, CR = 1, ITC = 1,                             |
    | IRC = 1, IC = 1]                                      |
 T1 |-->>---------------------------------------------------| P1
    |                                                       |
    | <Wait for 60 s>                                       |
    |                                                       |
    |                      PTP SIGNALING with L1 Sync TLV   |
    |                          [MSG_TYPE = 0xC, DN = DN1,   |
    |                         TLV_TYPE = 0x8001, TCR = 1,   |
    |                           RCR = 1, CR = 1, ITC = 1,   |
    |                                    IRC = 1, IC = 1]   |
 T1 |------------------------------------------------<<--| P1
    |                                                       |
    |            <Check L1SYNC port status - L1_SYNC_UP>    | P1
    |                                                       |
    | PTP SIGNALING with L1 Sync TLV                        |
    | [MSG_TYPE = 0xC, DN = DN1,                            |
    | TLV_TYPE = 0x8001]                                    |
 T1 |-->>-----------------XX                                | P1
    |                                                       |
    |         <Wait for L1Sync Receipt Timeout Interval>    |
    |                                                       |
    |           (L1SyncReceiptTimeout * L1SyncInterval)     |
    |                                                       |
    |                  <Check L1SYNC port status - IDLE>    | P1
    |                                                       |
    |                      PTP SIGNALING with L1 Sync TLV   |
    |                          [MSG_TYPE = 0xC, DN = DN1,   |
    |                                  TLV_TYPE = 0x8001]   |
 T1 |------------------------------------------------<<--| P1
    |                                                       |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
    TCR       = peerIsTxCoherent
    RCR       = peerIsRxCoherent
    CR        = peerIsCongruent
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
- i. Add port T1 at TEE.

(Part 1)
Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with following parameters.

```
    PTP Header
        Message Type  = 0x0B
        Domain Number = DN1
        Sequence ID   = Y
        Priority1     = X
```

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented

```
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 8 : Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1

Step 10: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
```

```
              TCR           = 1
              RCR           = 1
              CR            = 1
              ITC           = 0
              IRC           = 0
              IC            = 0

Step 11: Observe that the DUT's L1SYNC port status P1 is in CONFIG_MATCH
         state

Step 12: Send periodic PTP SIGNALING message with L1 Sync TLV on the port P1
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 1
                 IRC           = 1
                 IC            = 1

Step 13: Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 after duration of 60s with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 1
                 IRC           = 1
                 IC            = 1

Step 14: Observe that the DUT's L1SYNC port status P1 is in L1_SYNC_UP
         state.

Step 15: Stop sending PTP SIGNALING message with L1 Sync TLV on the port T1
         with following parameters:
             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 16: Wait for expiry of L1 sync receipt timeout interval.
         (L1SyncReceiptTimeout * L1SyncInterval)

Step 17: Verify that the DUT's L1SYNC port status P1 is in IDLE state.

Step 18: Verify that DUT transmits PTP SIGNALING message with L1 Sync TLV
```

```
        on the port P1 with following parameters:

            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
```

8.15. tc_conf_ptp-ha_smg_015

```
Test Case         : tc_conf_ptp-ha_smg_015
Test Case Version : 1.0
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA State Machine Group (SMG)

Title             : L1 Sync Port state changes from IDLE to DISABLED
                    when L1Sync is disabled

Purpose           : To verify that L1Sync port changes its state from IDLE
                    to DISABLED when L1Sync is disabled by setting the data
                    set L1SyncBasicPortDS.L1SyncEnabled to FALSE via
                    configuration.

Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                    Clause O.7.3 Figure 70 Page 450

Conformance Type  : MUST
```

Topology

```
              TEE                                  DUT
         +---------------+                     +--------------+
         |               |                     |              |
         |               |                     |              |
         |               |                     |              |
         |               |                     |              |
         |      BC       | T1               P1 |    OC/BC     |
         |    (Slave)    |---------------------|   (Master)   |
         |               |                     |              |
         |               |                     |              |
         |               |                     |              |
         |               |                     |              |
         +---------------+                     +--------------+

    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```



```
Ladder Diagram    :

         TEE                                                     DUT
       [slave]                                                 [master]
          |                                                       |
          |                                         <Enable PTP> | P1
          |                          <Enable PTP with BC/OC clock> |
          |                       <Clock mode - one-step/two-step> |
          |                        <Configure logAnnounceInterval, | P1
          |                                announceReceiptTimeout> |
          |                            <Configure logSyncInterval> | P1
          |                     <Configure logMinDelayReqInterval> | P1
          |                       <Configure Priority1, Priority2> | P1
          |                                      <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                        <Disable L1SynOptParams option> | P1
          |             <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |            timestampCorrectionPortDS.ingressLatency, |
          |         asymmetryCorrectionPortDS.constantAsymmetry, |
          |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                       |
          |                            ANNOUNCE [MSG_TYPE = 0x0B, |
          |                       DN = DN1, SEQ_ID = Y, PRI1 = X] |
       T1 |-------------------------------------------------<<--| P1
          |                                                       |
          | ANNOUNCE [MSG_TYPE = 0x0B,                            |
          | DN = DN1, SEQ_ID = A, PRI1 = X+1]                     |
       T1 |-->>-------------------------------------------------| P1
          |                                                       |
          |                     <Check L1SYNC port status - IDLE> | P1
          |                                                       |
          |                        PTP SIGNALING with L1 Sync TLV |
          |                            [MSG_TYPE = 0xC, DN = DN1, |
          |                                    TLV_TYPE = 0x8001] |
       T1 |-------------------------------------------------<<--| P1
          |                                                       |
          |                                     <Disable L1SYNC> | P1
          |                                                       |
          |                 <Check L1SYNC port status - DISABLED> | P1
          |                                                       |
          |                        PTP SIGNALING with L1 Sync TLV |
          |                            [MSG_TYPE = 0xC, DN = DN1, |
          |                                    TLV_TYPE = 0x8001] |
       T1 |                              XX----------------<<--| P1
          |                                                       |
          | PTP SIGNALING with L1 Sync TLV                        |
          | [MSG_TYPE = 0xC, DN = DN1]                            |
          | TLV_TYPE = 0x8001]                                    |
       T1 |---->>-----------------------------------------------| P1
          |                                                       |
          |                 <Check L1SYNC port status - DISABLED> | P1
          |                                                       |
          |                        PTP SIGNALING with L1 Sync TLV |
          |                            [MSG_TYPE = 0xC, DN = DN1, |
          |                                    TLV_TYPE = 0x8001] |
```

```
       T1 |                               XX----------------<<--| P1
          |                                                     |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
    TCR       = peerIsTxCoherent
    RCR       = peerIsRxCoherent
    CR        = peerIsCongruent
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE

- i. Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with following parameters.

```
        PTP Header
            Message Type  = 0x0B
```

```
                Domain Number = DN1
                Sequence ID   = Y
                Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Disable L1SYNC on DUT's port P1.

Step 8 : Verify that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 9  :Observe that DUT does not transmit PTP SIGNALING message with L1
         Sync TLV on the port P1 for a duration of expiry of L1 sync
         receipt timeout interval(L1SyncReceiptTimeout * L1SyncInterval)
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 10 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 11 : Verify that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 12 : Verify that DUT does not transmit PTP SIGNALING message with L1
         Sync TLV on the port P1 for a duration of expiry of L1 sync
         receipt timeout interval(L1SyncReceiptTimeout * L1SyncInterval)
         with following parameters:

             PTP Header
```

```
        Message Type  = 0xC
        Domain Number = DN1
    L1_SYNC TLV
        TLV_TYPE      = 0x8001
```

8.16. tc_conf_ptp-ha_smg_016

```
Test Case          : tc_conf_ptp-ha_smg_016
Test Case Version  : 1.0
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA State Machine Group (SMG)

Title              : L1Sync Port state changes from LINK_ALIVE to DISABLED
                     when L1Sync is disabled

Purpose            : To verify that L1Sync port changes its state from
                     LINK_ALIVE to DISABLED when L1Sync is disabled by
                     setting the data set L1SyncBasicPortDS.L1SyncEnabled to
                     FALSE via configuration.

Reference          : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                     Clause O.7.3 Figure 70 Page 450

Conformance Type   : MUST
```

Topology

```
            TEE                                    DUT
     +---------------+                     +--------------+
     |               |                     |              |
     |               |                     |              |
     |               |                     |              |
     |               |                     |              |
     |      BC       | T1               P1 |    OC/BC     |
     |    (Slave)    |---------------------|   (Master)   |
     |               |                     |              |
     |               |                     |              |
     |               |                     |              |
     |               |                     |              |
     +---------------+                     +--------------+

Legends:

    TEE      : Test Execution Engine
    DUT      : Device Under Test
    OC       : Ordinary Clock
    BC       : Boundary Clock
    T1       : Port 1 at TEE
    P1       : Port 1 at DUT
```

Ladder Diagram :

```
  TEE                                                  DUT
[slave]                                             [master]
   |                                                     |
   |                                        <Enable PTP> | P1
   |                       <Enable PTP with BC/OC clock> |
   |                    <Clock mode - one-step/two-step> |
   |                     <Configure logAnnounceInterval, | P1
   |                             announceReceiptTimeout> |
   |                         <Configure logSyncInterval> | P1
   |                  <Configure logMinDelayReqInterval> | P1
   |                    <Configure Priority1, Priority2> | P1
   |                                     <Enable L1SYNC> | P1
   |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
   |                     <Disable L1SynOptParams option> | P1
   |           <Enable asymmetryCorrectionPortDS.enable> | P1
   | <Configure timestampCorrectionPortDS.egressLatency, | P1
   |           timestampCorrectionPortDS.ingressLatency, |
   |        asymmetryCorrectionPortDS.constantAsymmetry, |
   |  asymmetryCorrectionPortDS.scaledDelayCoefficient> |
   |                                                     |
   |                          ANNOUNCE [MSG_TYPE = 0x0B, |
   |                     DN = DN1, SEQ_ID = Y, PRI1 = X] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   | ANNOUNCE [MSG_TYPE = 0x0B,                          |
   | DN = DN1, SEQ_ID = A, PRI1 = X+1]                   |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   |                   <Check L1SYNC port status - IDLE> | P1
   |                                                     |
   |                      PTP SIGNALING with L1 Sync TLV |
   |                          [MSG_TYPE = 0xC, DN = DN1, |
   |                                  TLV_TYPE = 0x8001] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   | PTP SIGNALING with L1 Sync TLV                      |
   | [MSG_TYPE = 0xC, DN = DN1,                          |
   | TLV_TYPE = 0x8001, TCR = 0, RCR = 0,                |
   | CR = 0, ITC = 0, IRC = 0, IC = 0]                   |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   |             <Check L1SYNC port status - LINK_ALIVE> | P1
   |                                                     |
   |                                    <Disable L1SYNC> | P1
   |                                                     |
   |               <Check L1SYNC port status - DISABLED> | P1
   |                                                     |
   |                      PTP SIGNALING with L1 Sync TLV |
   |                          [MSG_TYPE = 0xC, DN = DN1, |
   |                                  TLV_TYPE = 0x8001] |
T1 |                               XX----------------<<--| P1
   |                                                     |
   | PTP SIGNALING with L1 Sync TLV                      |
   | [MSG_TYPE = 0xC, DN = DN1,                          |
   | TLV_TYPE = 0x8001, TCR = 0, RCR = 0,                |
   | CR = 0, ITC = 0, IRC = 0, IC = 0]                   |
T1 |-->>-------------------------------------------------| P1
```

```
         |                                                  |
         |               <Check L1SYNC port status - DISABLED> | P1
         |                                                  |
         |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC, |
         |     DN = DN1,TLV_TYPE=0x8001]                    |
      T1 |                           XX----------------<<--| P1
         |                                                  |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
    TCR       = peerIsTxCoherent
    RCR       = peerIsRxCoherent
    CR        = peerIsCongruent

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
    Response Default PTP Profile



Procedure        :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)
```

```
Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port T1 with
         following parameters:
             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 0
                 RCR           = 0
                 CR            = 0
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 8 : Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 9 : Disable L1SYNC on DUT's port P1.

Step 10: Verify that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 11: Observe that DUT does not transmit PTP SIGNALING message with L1
         Sync TLV on the port P1 for a duration of expiry of L1 sync
         receipt timeout interval(L1SyncReceiptTimeout * L1SyncInterval)
         with following parameters:

             PTP Header
                 Message Type  = 0xC
```

```
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001

Step 12: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 0
            RCR           = 0
            CR            = 0
            ITC           = 0
            IRC           = 0
            IC            = 0

Step 13: Verify that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 14: Verify that DUT does not transmit PTP SIGNALING message with L1
         Sync TLV on the port P1 for a duration of expiry of L1 sync
         receipt timeout interval(L1SyncReceiptTimeout * L1SyncInterval)
         with following parameters:

        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
```

8.17. tc_conf_ptp-ha_smg_017

```
Test Case          : tc_conf_ptp-ha_smg_017
Test Case Version  : 1.0
Component Name     : ATTEST PTP_HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA State Machine Group (SMG)

Title              : L1SYNC port state changes from CONFIG_MATCH to DISABLED
                     when L1Sync is disabled

Purpose            : To verify that L1Sync port changes its state from
                     CONFIG_MATCH to DISABLED when L1SYNC is disabled by
                     setting the data set L1SyncBasicPortDS.L1SyncEnabled to
                     FALSE via configuration.

Reference          : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                     Clause O.7.3 Figure 70 Page 450

Conformance Type   : MUST
```

Topology

```
           TEE                                  DUT
     +---------------+                    +--------------+
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |      BC       | T1              P1 |    OC/BC     |
     |    (Slave)    |--------------------|   (Master)   |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     +---------------+                    +--------------+

 Legends:

     TEE     : Test Execution Engine
     DUT     : Device Under Test
     OC      : Ordinary Clock
     BC      : Boundary Clock
     T1      : Port 1 at TEE
     P1      : Port 1 at DUT


Ladder Diagram    :

          TEE                                                  DUT
        [slave]                                              [master]
           |                                                     |
           |                      <Enable PTP with BC/OC clock> |
           |                    <Clock mode -one-step/two-step> |
           |                               <Disable TCR,RCR,CR> |
           |                     <Disable L1SynOptParams option>|
           |     <Configure L1SyncInterval,L1SyncReceiptTimeout>|
           |                          <Configure Priority1 - X> |
           |                                       <Enable PTP> | P1
           |                                    <Enable L1SYNC> | P1
           |                                                     |
           |                        ANNOUNCE [MSG_TYPE = 0x0B,  |
           |                    DN = DN1, SEQ_ID = Y, PRI1 = X] |
        T1 |------------------------------------------------<<--| P1
           |                                                     |
           | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,               |
           |           SEQ_ID = A, PRI1 = X+1]                  |
        T1 |-->>------------------------------------------------| P1
           |                                                     |
           |                  <Check L1SYNC port status - IDLE> | P1
           |                                                     |
           |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC, |
           |     DN = DN1,TLV_TYPE=0x8001]                      |
        T1 |------------------------------------------------<<--| P1
           |                                                     |
           |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC, |
           |     DN = DN1,TLV_TYPE=0x8001,TCR=1,RCR=1,CR=1      |
           |     ITC=0,IRC=0,IC=0]                              |
        T1 |---->>----------------------------------------------| P1
```

```
             |                                                      |
             |  <Enable txCoherentIsRequired,rxCoherentIsRequired   |  P1
             |                              congruentIsRequired>    |  P1
             |                                                      |
             |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC   |
             |     DN=DN1,TLV_TYPE=0X8001,TCR=1,RCR=1,CR=1]         |
          T1 |-------------------------------------------------<<--|  P1
             |                                                      |
             |   PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,    |
             |   DN=DN1,TLV_TYPE=0x8001,TCR=1,RCR=1,CR=1,ITC=0      |
             |   IRC=0,IC=0]                                        |
          T1 |-->>--------------------------------------------------|  P1
             |                                                      |
             |         <Check L1SYNC port status - CONFIG_MATCH>    |  P1
             |                                                      |
             |                                    <Disable L1SYNC>  |  P1
             |                                                      |
             |             <Check L1SYNC port status - DISABLED>    |  P1
             |                                                      |
             |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,  |
             |     DN = DN1,TLV_TYPE=0x8001]                        |
          T1 |          XX-------------------------------------<<--|  P1
             |                                                      |
             |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,  |
             |     DN = DN1,TLV_TYPE=0x8001]                        |
          T1 |---->>------------------------------------------------|  P1
             |                                                      |
             |             <Check L1SYNC port status - DISABLED>    |  P1
             |                                                      |
             |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,  |
             |     DN = DN1,TLV_TYPE=0x8001]                        |
          T1 |          XX-------------------------------------<<--|  P1
             |                                                      |
```

Legends :

    MSG_TYPE = Message Type
    DN   = Domain Number
    BC   = Boundary Clock
    OC   = Ordinary Clock
    TCR   = txCoherentIsRequired
    RCR   = rxCoherentIsRequired
    CR   = congruentIsRequired
    ITC   = peerIsTxCoherent
    IRC   = peerIsRxCoherent
    IC   = peerIsCongruent

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)


```
Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP globally with device type as Boundary/Ordinary clock.
  iii.   Configure clock mode as One-step/Two-step.
   iv.   Disable txcoherentisRequired, rxcoherentisRequired,
         congruentIsRequired.
    v.   Disable L1SynOptParams on DUT.
   vi.   Configure L1SyncInterval and L1SyncReceiptTimeout value.
  vii.   Enable PTP on port P1.
 viii.   Enable L1SYNC on DUT's port P1.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
```

```
                ITC           = 0
                IRC           = 0
                IC            = 0

Step 8 : Enable txCoherentIsRequired,rxCoherentIsRequired and
         congruentIsRequired on DUT's port P1.

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1

Step 10 : Send PTP SIGNALING message with L1 Sync TLV on the port T1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 0
                 IRC           = 0
                 IC            = 0


Step 11 : Observe that the DUT's L1SYNC port status P1 is in CONFIG_MATCH
          state

Step 12: Disable L1SYNC on DUT's port P1.

Step 13: Observe that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 14: Observe that DUT does not transmit PTP SIGNALING message with L1
         Sync TLV on the port P1 for a duration of expiry of L1 sync
         receipt timeout interval(L1SyncReceiptTimeout * L1SyncInterval)
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001


Step 15: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:
```

```
            PTP Header
                Message Type  = 0xC
                Domain Number = DN1
            L1_SYNC TLV
                TLV_TYPE      = 0x8001

Step 16: Observe that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 17: Verify that DUT does not transmit PTP SIGNALING message with L1
         Sync TLV on the port P1 for a duration of expiry of L1 sync
         receipt timeout interval(L1SyncReceiptTimeout * L1SyncInterval)
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
```

8.18. tc_conf_ptp-ha_smg_018

```
Test Case         : tc_conf_ptp-ha_smg_018
Test Case Version : 1.0
Component Name    : ATTEST PTP_HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA State Machine Group (SMG)

Title             : L1Sync Port state changes from L1_SYNC_UP to DISABLED
                    when L1Sync is disabled

Purpose           : To verify that L1Sync port changes its state from
                    L1_SYNC_UP to DISABLED when L1Sync is disabled by
                    setting the data set L1SyncBasicPortDS.L1SyncEnabled
                    to FALSE via configuration.

Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                    Clause O.7.3 Figure 70 Page 450

Conformance Type  : MUST
```

Topology

```
                TEE                                 DUT
           +--------------+                    +-------------+
           |              |                    |             |
           |              |                    |             |
           |              |                    |             |
           |              |                    |             |
           |      BC      | T1              P1 |    OC/BC    |
           |    (Slave)   |--------------------|   (Master)  |
           |              |                    |             |
           |              |                    |             |
           |              |                    |             |
           |              |                    |             |
```

```
        +--------------+                 +-------------+

   Legends:

       TEE     : Test Execution Engine
       DUT     : Device Under Test
       OC      : Ordinary Clock
       BC      : Boundary Clock
       T1      : Port 1 at TEE
       P1      : Port 1 at DUT


Ladder Diagram    :

          TEE                                                    DUT
        [slave]                                               [master]
           |                                                      |
           |                         <Enable PTP with BC/OC clock> |
           |                        <Clock mode one-step/two-step> |
           |                                  <Disable TCR,RCR,CR> |
           |                       <Disable L1SynOptParams option> |
           |     <Configure L1SyncInterval,L1SyncReceiptTimeout> |
           |                             <Configure Priority1 - X> |
           |                                          <Enable PTP> | P1
           |                                       <Enable L1SYNC> | P1
           |                                                      |
           |                           ANNOUNCE [MSG_TYPE = 0x0B, |
           |                      DN = DN1, SEQ_ID = Y, PRI1 = X] |
        T1 |-------------------------------------------------<<--| P1
           |                                                      |
           | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                 |
           |           SEQ_ID = A, PRI1 = X+1]                    |
        T1 |-->>-------------------------------------------------| P1
           |                                                      |
           |                     <Check L1SYNC port status - IDLE> | P1
           |                                                      |
           |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC, |
           |                            DN = DN1,TLV_TYPE=0x8001] |
        T1 |-------------------------------------------------<<--| P1
           |                                                      |
           | PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,      |
           | DN = DN1,TLV_TYPE=0x8001,TCR=1,RCR=1,CR=1            |
           | ITC=0,IRC=0,IC=0]                                    |
        T1 |---->>-----------------------------------------------| P1
           |                                                      |
           |  <Enable txCoherentIsRequired,rxCoherentIsRequired   | P1
           |                                congruentIsRequired> |
           |                                                      |
           |     PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC, |
           |           DN=DN1,TLV_TYPE=0X8001,TCR=1,RCR=1,CR=1] |
        T1 |-------------------------------------------------<<--| P1
           |                                                      |
           | PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,      |
           | DN=DN1,TLV_TYPE=0x8001,TCR=1,RCR=1,CR=1,ITC=0,       |
           | IRC=0,IC=0]                                          |
        T1 |-->>-------------------------------------------------| P1
           |                                                      |
```

```
     | PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,     |
     | DN=DN1,TLV_TYPE=0x8001,TCR=1,RCR=1,CR=1,ITC=1,      |
     | IRC=1,IC=1]                                         |
  T1 |-->>-------------------------------------------------| P1
     |                                                     |
     |                   <Wait for 60s>                    |
     |                                                     |
     |    PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,  |
     |     DN=DN1,TLV_TYPE=0x8001,TCR=1,RCR=1,CR=1,ITC=1,  |
     |                                        IRC=1,IC=1]  |
  T1 |-------------------------------------------------<<--| P1
     |                                                     |
     |             <Check L1SYNC port status - L1_SYNC_UP> | P1
     |                                                     |
     |                                     <Disable L1SYNC> | P1
     |                                                     |
     |               <Check L1SYNC port status - DISABLED> | P1
     |                                                     |
     |    PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC,  |
     |                          DN = DN1,TLV_TYPE=0x8001]  |
  T1 |          XX-------------------------------------<<--| P1
     |                                                     |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    TCR       = txCoherentIsRequired
    RCR       = rxCoherentIsRequired
    CR        = congruentIsRequired
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

i. Enable DUT's port P1.
ii. Enable PTP globally with device type as Boundary/Ordinary clock.
iii. Configure clock mode as One-step/Two-step.
iv. Disable txcoherentisRequired, rxcoherentisRequired, congruentIsRequired.
v. Disable L1SynOptParams on DUT.
vi. Configure L1SyncInterval and L1SyncReceiptTimeout value.
vii. Enable PTP on port P1.

```
 viii.   Enable L1SYNC on DUT's port P1.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
                 TCR           = 1
                 RCR           = 1
                 CR            = 1
                 ITC           = 0
                 IRC           = 0
                 IC            = 0

Step 8 : Enable txCoherentIsRequired,rxCoherentIsRequired and
         congruentIsRequired on DUT's port P1.

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:
```

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
```

Step 10 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with following parameters:

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 0
            IRC           = 0
            IC            = 0
```

Step 11: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with following parameters:

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 1
            IRC           = 1
            IC            = 1
```

Step 12 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV on the port P1 after duration of 60s with following parameters:

```
        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 1
            IRC           = 1
            IC            = 1
```

Step 13 : Observe that the DUT's L1SYNC port status P1 is in L1_SYNC_UP state

```
Step 14 : Disable L1SYNC on DUT's port P1.

Step 15 : Observe that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 16 : Verify that DUT does not transmit PTP SIGNALING message with
         L1 Sync TLV on Port P1.

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 17: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 18: Observe that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 19: Verify that DUT does not transmit PTP SIGNALING message with
         L1 Sync TLV on Port P1.

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
```

8.19. tc_conf_ptp-ha_smg_019

```
Test Case         : tc_conf_ptp-ha_smg_019
Test Case Version : 1.2
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA State Machine Group (SMG)

Title             : L1 Sync Port state changes from IDLE to DISABLED when
                    L1SYNC_RESET occurs.

Purpose           : To verify that L1Sync port changes its state from IDLE
                    to DISABLED when L1SYNC_RESET event occurs.

Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                    Clause O.7.3 Figure 70 Page 450

Conformance Type  : MUST
```

Topology

```
          TEE                                  DUT
     +---------------+                    +--------------+
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |      BC       | T1              P1 |    OC/BC     |
     |    (Slave)    |--------------------|   (Master)   |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     |               |                    |              |
     +---------------+                    +--------------+

   Legends:

       TEE     : Test Execution Engine
       DUT     : Device Under Test
       OC      : Ordinary Clock
       BC      : Boundary Clock
       T1      : Port 1 at TEE
       P1      : Port 1 at DUT
```

```
Ladder Diagram    :

        TEE                                                   DUT
      [slave]                                              [master]
         |                                                     |
         |                                      <Enable PTP> | P1
         |                     <Enable PTP with BC/OC clock> |
         |                  <Clock mode - one-step/two-step> |
         |                   <Configure logAnnounceInterval, | P1
         |                           announceReceiptTimeout> |
         |                       <Configure logSyncInterval> | P1
         |                 <Configure logMinDelayReqInterval> | P1
         |                  <Configure Priority1, Priority2> | P1
         |                                    <Enable L1SYNC> | P1
         |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
         |                   <Disable L1SynOptParams option> | P1
         |            <Enable asymmetryCorrectionPortDS.enable> | P1
         | <Configure timestampCorrectionPortDS.egressLatency, | P1
         |            timestampCorrectionPortDS.ingressLatency, |
         |         asymmetryCorrectionPortDS.constantAsymmetry, |
         |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
         |                                                     |
         |                          ANNOUNCE [MSG_TYPE = 0x0B, |
         |                    DN = DN1, SEQ_ID = Y, PRI1 = X] |
      T1 |-------------------------------------------------<<--| P1
         |                                                     |
         | ANNOUNCE [MSG_TYPE = 0x0B,                          |
         | DN = DN1, SEQ_ID = A, PRI1 = X+1]                   |
      T1 |-->>-------------------------------------------------| P1
         |                                                     |
         |                  <Check L1SYNC port status - IDLE> | P1
         |                                                     |
```

```
         |                      PTP SIGNALING with L1 Sync TLV |
         |                          [MSG_TYPE = 0xC, DN = DN1, |
         |                                  TLV_TYPE = 0x8001] |
      T1 |-------------------------------------------------<<--| P1
         |                                                     |
      T1 | <Disable TEE's port>                                | P1
         |                                                     |
         |               <Check L1SYNC port status - DISABLED> | P1
         |                                                     |
```

```
Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
    TCR       = peerIsTxCoherent
    RCR       = peerIsRxCoherent
    CR        = peerIsCongruent
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.
- iii. Enable PTP globally with device type as Boundary/Ordinary clock.
- iv. Configure clock mode as One-step/Two-step.
- v. Configure default values for Priority1, Priority2, logAnnounceInterval, announceReceiptTimeout, logSyncInterval and logMinDelayReqInterval.
- vi. Enable L1SYNC on DUT's port P1.
- vii. Configure default values for L1SyncInterval and L1SyncReceiptTimeout.
- viii. Disable L1SynOptParams on DUT.
- ix. Enable asymmetryCorrectionPortDS.enable.
- x. Configure default values for timestampCorrectionPortDS. egressLatency, timestampCorrectionPortDS.egressLatency, asymmetryCorrectionPortDS.constantAsymmetry and asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE

- i. Add port T1 at TEE.

(Part 1)


```
Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Disable TEE's port T1.

Step 8 : Verify that the DUT's L1SYNC port status P1 is in DISABLED state.
```

8.20. tc_conf_ptp-ha_smg_020

```
Test Case          : tc_conf_ptp-ha_smg_020
Test Case Version  : 1.2
Component Name     : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name        : PTP-HA State Machine Group (SMG)

Title              : L1Sync Port state changes from LINK_ALIVE to DISABLED
                     when L1SYNC_RESET is occurred.

Purpose            : To verify that L1Sync port changes its state from
                     LINK_ALIVE to DISABLED when L1SYNC_RESET event occurs.

Reference          : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                     Clause O.7.3 Figure 70 Page 450

Conformance Type   : MUST
```

Topology

```
                  TEE                                    DUT
            +---------------+                     +--------------+
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |      BC       | T1               P1 |    OC/BC     |
            |    (Slave)    |---------------------|   (Master)   |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            |               |                     |              |
            +---------------+                     +--------------+
```

Legends:

```
TEE      : Test Execution Engine
DUT      : Device Under Test
OC       : Ordinary Clock
BC       : Boundary Clock
T1       : Port 1 at TEE
P1       : Port 1 at DUT
```

Ladder Diagram   :

```
       TEE                                                      DUT
     [slave]                                                  [master]
        |                                                        |
        |                                          <Enable PTP> | P1
        |                            <Enable PTP with BC/OC clock> |
        |                         <Clock mode - one-step/two-step> |
        |                          <Configure logAnnounceInterval, | P1
        |                                  announceReceiptTimeout> |
        |                              <Configure logSyncInterval> | P1
        |                       <Configure logMinDelayReqInterval> | P1
        |                         <Configure Priority1, Priority2> | P1
        |                                           <Enable L1SYNC> | P1
        |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
        |                          <Disable L1SynOptParams option> | P1
        |               <Enable asymmetryCorrectionPortDS.enable> | P1
        | <Configure timestampCorrectionPortDS.egressLatency, | P1
        |            timestampCorrectionPortDS.ingressLatency, |
        |         asymmetryCorrectionPortDS.constantAsymmetry, |
        |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
        |                                                        |
        |                      <Check L1SYNC port status - IDLE> | P1
        |                                                        |
        |                            ANNOUNCE [MSG_TYPE = 0x0B, |
        |                       DN = DN1, SEQ_ID = Y, PRI1 = X] |
     T1 |-------------------------------------------------<<--| P1
        |                                                        |
        | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                   |
        |           SEQ_ID = A, PRI1 = X+1]                      |
     T1 |-->>---------------------------------------------------| P1
```

```
       |                                                    |
       |                     PTP SIGNALING with L1 Sync TLV |
       |                         [MSG_TYPE = 0xC, DN = DN1, |
       |                                 TLV_TYPE = 0x8001] |
    T1 |-------------------------------------------------<<--| P1
       |                                                    |
       | PTP SIGNALING with L1 Sync TLV                     |
       | [MSG_TYPE = 0xC, DN = DN1,                         |
       | TLV_TYPE = 0x8001, TCR = 0,                        |
       | RCR = 0, CR = 0, ITC = 0,                          |
       | IRC = 0, IC = 0]                                   |
    T1 |-->>-------------------------------------------------| P1
       |                                                    |
       |            <Check L1SYNC port status - LINK_ALIVE> | P1
       |                                                    |
       |                     PTP SIGNALING with L1 Sync TLV |
       |                         [MSG_TYPE = 0xC, DN = DN1, |
       |                                 TLV_TYPE = 0x8001] |
    T1 |-------------------------------------------------<<--| P1
       |                                                    |
    T1 | <Disable TEE's port>                               | P1
       |                                                    |
       |              <Check L1SYNC port status - DISABLED> | P1
       |                                                    |
       |                     PTP SIGNALING with L1 Sync TLV |
       |                         [MSG_TYPE = 0xC, DN = DN1, |
       |                                 TLV_TYPE = 0x8001] |
    T1 |                              XX----------------<<--| P1
       |                                                    |
```

Legends :

```
    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
    TCR       = peerIsTxCoherent
    RCR       = peerIsRxCoherent
    CR        = peerIsCongruent
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT

```
     i.   Enable DUT's port P1.
    ii.   Enable PTP on port P1.
   iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
    iv.   Configure clock mode as One-step/Two-step.
     v.   Configure default values for Priority1, Priority2,
          logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
          logMinDelayReqInterval.
    vi.   Enable L1SYNC on DUT's port P1.
   vii.   Configure default values for L1SyncInterval and
          L1SyncReceiptTimeout.
  viii.   Disable L1SynOptParams on DUT.
    ix.   Enable asymmetryCorrectionPortDS.enable.
     x.   Configure default values for timestampCorrectionPortDS.
          egressLatency, timestampCorrectionPortDS.ingressLatency,
          asymmetryCorrectionPortDS.constantAsymmetry and
          asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
     i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 4 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 5 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port T1 with
         following parameters:
             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
```

```
            L1_SYNC TLV
                TLV_TYPE      = 0x8001
                TCR           = 0
                RCR           = 0
                CR            = 0
                ITC           = 0
                IRC           = 0
                IC            = 0

Step 8 : Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 10: Disable TEE's port T1.

Step 11: Verify that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 12: Verify that DUT does not transmit PTP SIGNALING message with L1
         Sync TLV on the port P1 for a duration of expiry of L1 sync
         receipt timeout interval(L1SyncReceiptTimeout * L1SyncInterval)
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
```

8.21. tc_conf_ptp-ha_smg_021

```
Test Case         : tc_conf_ptp-ha_smg_021
Test Case Version : 1.3
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA State Machine Group (SMG)

Title             : L1SYNC port state changes from CONFIG_MATCH to DISABLED
                    when L1SYNC_RESET is occurred.

Purpose           : To verify that L1Sync port changes its state from
                    CONFIG_MATCH to DISABLED when L1SYNC_RESET event occurs.

Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                    Clause O.7.3 Figure 70 Page 450

Conformance Type  : MUST
```

```
Topology

                  TEE                                 DUT
            +---------------+                    +--------------+
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |       BC      | T1              P1 |    OC/BC     |
            |    (Slave)    |---------------------|   (Master)   |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            |               |                    |              |
            +---------------+                    +--------------+

    Legends:

        TEE      : Test Execution Engine
        DUT      : Device Under Test
        OC       : Ordinary Clock
        BC       : Boundary Clock
        T1       : Port 1 at TEE
        P1       : Port 1 at DUT


 Ladder Diagram    :

          TEE                                                    DUT
        [slave]                                               [master]
           |                                        <Enable PTP> | P1
           |                       <Enable PTP with BC/OC clock> |
           |                    <Clock mode - one-step/two-step> |
           |                     <Configure logAnnounceInterval, | P1
           |                             announceReceiptTimeout> |
           |                         <Configure logSyncInterval> | P1
           |                  <Configure logMinDelayReqInterval> | P1
           |                    <Configure Priority1, Priority2> | P1
           |                                      <Enable L1SYNC> | P1
           |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
           |                     <Disable L1SynOptParams option> | P1
           |           <Enable asymmetryCorrectionPortDS.enable> | P1
           | <Configure timestampCorrectionPortDS.egressLatency, | P1
           |           timestampCorrectionPortDS.ingressLatency, |
           |        asymmetryCorrectionPortDS.constantAsymmetry, |
           |   asymmetryCorrectionPortDS.scaledDelayCoefficient> |
           |                                                     |
           |                          ANNOUNCE [MSG_TYPE = 0x0B, |
           |                     DN = DN1, SEQ_ID = Y, PRI1 = X] |
        T1 |------------------------------------------------<<--| P1
           |                                                     |
           | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,                |
           | SEQ_ID = A, PRI1 = X+1]                             |
        T1 |-->>-------------------------------------------------| P1
           |                                                     |
           |                   <Check L1SYNC port status - IDLE> | P1
           |                                                     |
```

```
   |                      PTP SIGNALING with L1 Sync TLV |
   |                          [MSG_TYPE = 0xC, DN = DN1, |
   |                                  TLV_TYPE = 0x8001] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   | PTP SIGNALING with L1 Sync TLV                      |
   | [MSG_TYPE = 0xC, DN = DN1,                          |
   | TLV_TYPE = 0x8001, TCR = 0,                         |
   | RCR = 0, CR = 0, ITC = 0,                           |
   | IRC = 0, IC = 0]                                    |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   |             <Check L1SYNC port status - LINK_ALIVE> | P1
   |                                                     |
   |                      PTP SIGNALING with L1 Sync TLV |
   |                          [MSG_TYPE = 0xC, DN = DN1, |
   |                         TLV_TYPE = 0x8001, TCR = 1, |
   |                                    RCR = 1, CR = 1] |
T1 |-------------------------------------------------<<--| P1
   |                                                     |
   | PTP SIGNALING with L1 Sync TLV                      |
   | [MSG_TYPE = 0xC, DN = DN1,                          |
   | TLV_TYPE = 0x8001, TCR = 1,                         |
   | RCR = 1, CR = 1, ITC = 0,                           |
   | IRC = 0, IC = 0]                                    |
T1 |-->>-------------------------------------------------| P1
   |                                                     |
   |           <Check L1SYNC port status - CONFIG_MATCH> | P1
   |                                                     |
T1 | <Disable TEE's port>                                | P1
   |                                                     |
   |               <Check L1SYNC port status - DISABLED> | P1
   |                                                     |
   |                      PTP SIGNALING with L1 Sync TLV |
   |                          [MSG_TYPE = 0xC, DN = DN1, |
   |                                  TLV_TYPE = 0x8001] |
T1 |                               XX----------------<<--| P1
   |                                                     |
```

```
Legends          :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
    TCR       = peerIsTxCoherent
    RCR       = peerIsRxCoherent
    CR        = peerIsCongruent

NOTE :

 1. This objective is verified using the High Accuracy Delay Request-
```

```
    Response Default PTP Profile



Procedure         :

(Initial Part)

Step 1 : Initialization of DUT
    i.   Enable DUT's port P1.
   ii.   Enable PTP on port P1.
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
```



```
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 0
            RCR           = 0
            CR            = 0
            ITC           = 0
            IRC           = 0
            IC            = 0

Step 8 : Observe that the DUT's L1SYNC port status P1 is in LINK_ALIVE state

Step 9 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1

Step 10: Send PTP SIGNALING message with L1 Sync TLV on the port T1 with
         following parameters:

        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 0
            IRC           = 0
            IC            = 0

Step 11: Observe that the DUT's L1SYNC port status P1 is in CONFIG_MATCH
         state.

Step 12: Disable TEE's port T1.

Step 13: Verify that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 14: Verify that DUT does not transmit PTP SIGNALING message with L1
         Sync TLV on the port P1 for a duration of expiry of L1 sync
```



```
receipt timeout interval(L1SyncReceiptTimeout * L1SyncInterval)
with following parameters:

    PTP Header
        Message Type  = 0xC
        Domain Number = DN1
    L1_SYNC TLV
        TLV_TYPE      = 0x8001
```

8.22. tc_conf_ptp-ha_smg_022

```
Test Case         : tc_conf_ptp-ha_smg_022
Test Case Version : 1.2
Component Name    : ATTEST PTP-HA CONFORMANCE TEST SUITE
Module Name       : PTP-HA State Machine Group (SMG)

Title             : L1Sync Port state changes from L1_SYNC_UP to DISABLED
                    when L1SYNC_RESET is occurred.

Purpose           : To verify that L1Sync port changes its state from
                    L1_SYNC_UP to DISABLED when L1SYNC_RESET event occurs.

Reference         : IEEE 1588-2017 Clause O.7.2 Table 157 Page 449,
                    Clause O.7.3 Figure 70 Page 450

Conformance Type  : MUST
```

Topology

```
            TEE                                  DUT
      +---------------+                    +--------------+
      |               |                    |              |
      |               |                    |              |
      |               |                    |              |
      |               |                    |              |
      |      BC       | T1              P1 |    OC/BC     |
      |    (Slave)    |--------------------|   (Master)   |
      |               |                    |              |
      |               |                    |              |
      |               |                    |              |
      |               |                    |              |
      +---------------+                    +--------------+
```

```
    Legends:

        TEE     : Test Execution Engine
        DUT     : Device Under Test
        OC      : Ordinary Clock
        BC      : Boundary Clock
        T1      : Port 1 at TEE
        P1      : Port 1 at DUT
```

```
Ladder Diagram    :

         TEE                                                  DUT
       [slave]                                              [master]
          |                                                     |
          |                                       <Enable PTP> | P1
          |                     <Enable PTP with BC/OC clock> |
          |                  <Clock mode - one-step/two-step> |
          |                   <Configure logAnnounceInterval, | P1
          |                           announceReceiptTimeout> |
          |                       <Configure logSyncInterval> | P1
          |                <Configure logMinDelayReqInterval> | P1
          |                  <Configure Priority1, Priority2> | P1
          |                                     <Enable L1SYNC> | P1
          |    <Configure L1SyncInterval, L1SyncReceiptTimeout> | P1
          |                   <Disable L1SynOptParams option> | P1
          |         <Enable asymmetryCorrectionPortDS.enable> | P1
          | <Configure timestampCorrectionPortDS.egressLatency, | P1
          |         timestampCorrectionPortDS.ingressLatency, |
          |      asymmetryCorrectionPortDS.constantAsymmetry, |
          |  asymmetryCorrectionPortDS.scaledDelayCoefficient> |
          |                                                     |
          |                          ANNOUNCE [MSG_TYPE = 0x0B, |
          |                     DN = DN1, SEQ_ID = Y, PRI1 = X] |
       T1 |------------------------------------------------<<--| P1
          |                                                     |
          | ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1,               |
          | SEQ_ID = A, PRI1 = X+1]                            |
       T1 |-->>------------------------------------------------| P1
          |                                                     |
          |                 <Check L1SYNC port status - IDLE> | P1
          |                                                     |
          |                       PTP SIGNALING with L1 Sync TLV |
          |                           [MSG_TYPE = 0xC, DN = DN1, |
          |                                   TLV_TYPE = 0x8001] |
       T1 |------------------------------------------------<<--| P1
          |                                                     |
          | PTP SIGNALING with L1 Sync TLV                      |
          | [MSG_TYPE = 0xC, DN = DN1,                          |
          | TLV_TYPE = 0x8001, TCR = 0,                         |
          | RCR = 0, CR = 0, ITC = 0,                           |
          | IRC = 0, IC = 0]                                    |
       T1 |-->>------------------------------------------------| P1
          |                                                     |
          |                       PTP SIGNALING with L1 Sync TLV |
          |                           [MSG_TYPE = 0xC, DN = DN1, |
          |                          TLV_TYPE = 0x8001, TCR = 1, |
          |                                     RCR = 1, CR = 1] |
       T1 |------------------------------------------------<<--| P1
          |                                                     |
          | PTP SIGNALING with L1 Sync TLV                      |
          | [MSG_TYPE = 0xC, DN = DN1,                          |
          | TLV_TYPE = 0x8001, TCR = 1,                         |
          | RCR = 1, CR = 1, ITC = 0,                           |
          | IRC = 0, IC = 0]                                    |
       T1 |-->>------------------------------------------------| P1
          |                                                     |
```

```
          | PTP SIGNALING with L1 Sync TLV                      |
          | [MSG_TYPE = 0xC, DN = DN1,                          |
          | TLV_TYPE = 0x8001, TCR = 1,                         |
          | RCR = 1, CR = 1, ITC = 1,                           |
          | IRC = 1, IC = 1]                                    |
       T1 |-->>-------------------------------------------------| P1
          |                                                     |
          | <Wait for 60 s>                                     |
          |                                                     |
          |                      PTP SIGNALING with L1 Sync TLV |
          |                          [MSG_TYPE = 0xC, DN = DN1, |
          |                         TLV_TYPE = 0x8001, TCR = 1, |
          |                           RCR = 1, CR = 1, ITC = 1, |
          |                                    IRC = 1, IC = 1] |
       T1 |-------------------------------------------------<<--| P1
          |                                                     |
          |             <Check L1SYNC port status - L1_SYNC_UP> | P1
          |                                                     |
       T1 | <Disable TEE's port>                                | P1
          |                                                     |
          |               <Check L1SYNC port status - DISABLED> | P1
          |                                                     |
          |                      PTP SIGNALING with L1 Sync TLV |
          |                          [MSG_TYPE = 0xC, DN = DN1, |
          |                                  TLV_TYPE = 0x8001] |
       T1 |                               XX----------------<<--| P1
          |                                                     |
```

```
Legends           :

    MSG_TYPE  = Message Type
    DN        = Domain Number
    BC        = Boundary Clock
    OC        = Ordinary Clock
    SEQ_ID    = Sequence ID
    PRI       = Priority
    ITC       = peerIsTxCoherent
    IRC       = peerIsRxCoherent
    IC        = peerIsCongruent
    TCR       = peerIsTxCoherent
    RCR       = peerIsRxCoherent
    CR        = peerIsCongruent
```

NOTE :

1. This objective is verified using the High Accuracy Delay Request-Response Default PTP Profile

Procedure :

(Initial Part)

Step 1 : Initialization of DUT
- i. Enable DUT's port P1.
- ii. Enable PTP on port P1.

```
  iii.   Enable PTP globally with device type as Boundary/Ordinary clock.
   iv.   Configure clock mode as One-step/Two-step.
    v.   Configure default values for Priority1, Priority2,
         logAnnounceInterval, announceReceiptTimeout, logSyncInterval and
         logMinDelayReqInterval.
   vi.   Enable L1SYNC on DUT's port P1.
  vii.   Configure default values for L1SyncInterval and
         L1SyncReceiptTimeout.
 viii.   Disable L1SynOptParams on DUT.
   ix.   Enable asymmetryCorrectionPortDS.enable.
    x.   Configure default values for timestampCorrectionPortDS.
         egressLatency, timestampCorrectionPortDS.egressLatency,
         asymmetryCorrectionPortDS.constantAsymmetry and
         asymmetryCorrectionPortDS.scaledDelayCoefficient.

Step 2 : Initialization of TEE
    i.   Add port T1 at TEE.

(Part 1)

Step 3 : Observe that DUT transmits ANNOUNCE message on the port P1 with
         following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = Y
                 Priority1     = X

Step 4 : Send periodic ANNOUNCE message with Priority1 value incremented
         from the Priority1 value of received Announce message on port T1
         with following parameters.

             PTP Header
                 Message Type  = 0x0B
                 Domain Number = DN1
                 Sequence ID   = A
                 Priority1     = X+1

Step 5 : Observe that the DUT's L1SYNC port status P1 is in IDLE state.

Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001

Step 7 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
```

```
            TLV_TYPE      = 0x8001
            TCR           = 0
            RCR           = 0
            CR            = 0
            ITC           = 0
            IRC           = 0
            IC            = 0

Step 8 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
         on the port P1 with following parameters:

        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1

Step 9 : Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 0
            IRC           = 0
            IC            = 0

Step 10: Send PTP SIGNALING message with L1 Sync TLV on the port P1 with
         following parameters:

        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
            TLV_TYPE      = 0x8001
            TCR           = 1
            RCR           = 1
            CR            = 1
            ITC           = 1
            IRC           = 1
            IC            = 1

Step 11 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV
          on the port P1 after duration of 60s with following parameters:

        PTP Header
            Message Type  = 0xC
            Domain Number = DN1
        L1_SYNC TLV
```

```
                TLV_TYPE      = 0x8001
                TCR           = 1
                RCR           = 1
                CR            = 1
                ITC           = 1
                IRC           = 1
                IC            = 1

Step 12 : Observe that the DUT's L1SYNC port status P1 is in L1_SYNC_UP
          state

Step 13: Disable TEE's port T1.

Step 14: Verify that the DUT's L1SYNC port status P1 is in DISABLED state.

Step 15: Verify that DUT does not transmit PTP SIGNALING message with L1
         Sync TLV on the port P1 for a duration of expiry of L1 sync
         receipt timeout interval(L1SyncReceiptTimeout * L1SyncInterval)
         with following parameters:

             PTP Header
                 Message Type  = 0xC
                 Domain Number = DN1
             L1_SYNC TLV
                 TLV_TYPE      = 0x8001
```