

ATTEST™

Conformance Test Suite Precision Time Protocol – High Accuracy Version 1.1

Test Plan

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

Table of Contents

Introduction	1
Test Plans	2
1. Inter Operation with Default PTP profiles (IDP)	2
1.1. tc_conf_ptp-ha_idp_001	2
1.2. tc_conf_ptp-ha_idp_002	5
1.3. tc_conf_ptp-ha_idp_003	9
1.4. tc_conf_ptp-ha_idp_004	12
2. Message Format Group (MFG)	16
2.1. tc_conf_ptp-ha_mfg_001	16
2.2. tc_conf_ptp-ha_mfg_002	19
2.3. tc_conf_ptp-ha_mfg_003	22
2.4. tc_conf_ptp-ha_mfg_004	25
3. Message Handling Group (MHG)	28
3.1. tc_conf_ptp-ha_mhg_001	28
3.2. tc_conf_ptp-ha_mhg_002	31
3.3. tc_conf_ptp-ha_mhg_003	35
4. Optional Parameters Verification (OPV)	40
4.1. tc_conf_ptp-ha_opv_001	40
5. PTP Accuracy Group (PAG)	43
5.1. tc_conf_ptp-ha_pag_002	43
5.2. tc_conf_ptp-ha_pag_003	48
5.3. tc_conf_ptp-ha_pag_004	53
5.4. tc_conf_ptp-ha_pag_005	61
5.5. tc_conf_ptp-ha_pag_006	69
5.6. tc_conf_ptp-ha_pag_007	76
5.7. tc_conf_ptp-ha_pag_008	81
5.8. tc_conf_ptp-ha_pag_009	89
5.9. tc_conf_ptp-ha_pag_010	95
5.10. tc_conf_ptp-ha_pag_011	101
6. PTP-HA Configuration Group (PCG)	105
6.1. tc_conf_ptp-ha_pcg_001	105

6.2.	tc_conf_ptp-ha_pcg_002.....	113
6.3.	tc_conf_ptp-ha_pcg_003.....	116
6.4.	tc_conf_ptp-ha_pcg_004.....	120
6.5.	tc_conf_ptp-ha_pcg_005.....	124
6.6.	tc_conf_ptp-ha_pcg_006.....	129
6.7.	tc_conf_ptp-ha_pcg_007.....	136
6.8.	tc_conf_ptp-ha_pcg_008.....	139
6.9.	tc_conf_ptp-ha_pcg_009.....	143
6.10.	tc_conf_ptp-ha_pcg_012.....	150
6.11.	tc_conf_ptp-ha_pcg_013.....	154
6.12.	tc_conf_ptp-ha_pcg_014.....	157
6.13.	tc_conf_ptp-ha_pcg_015.....	161
6.14.	tc_conf_ptp-ha_pcg_016.....	164
6.15.	tc_conf_ptp-ha_pcg_017.....	167
7.	PTP-ExternalConfiguration Group (PEG).....	171
7.1.	tc_conf_ptp-ha_peg_001.....	171
7.2.	tc_conf_ptp-ha_peg_002.....	174
7.3.	tc_conf_ptp-ha_peg_003.....	177
7.4.	tc_conf_ptp-ha_peg_004.....	180
7.5.	tc_conf_ptp-ha_peg_005.....	183
7.6.	tc_conf_ptp-ha_peg_006.....	187
7.7.	tc_conf_ptp-ha_peg_007.....	190
7.8.	tc_conf_ptp-ha_peg_008.....	193
7.9.	tc_conf_ptp-ha_peg_009.....	196
7.10.	tc_conf_ptp-ha_peg_010.....	198
7.11.	tc_conf_ptp-ha_peg_011.....	201
7.12.	tc_conf_ptp-ha_peg_012.....	203
7.13.	tc_conf_ptp-ha_peg_013.....	207
7.14.	tc_conf_ptp-ha_peg_014.....	211
7.15.	tc_conf_ptp-ha_peg_015.....	213
7.16.	tc_conf_ptp-ha_peg_016.....	215
7.17.	tc_conf_ptp-ha_peg_017.....	220
7.18.	tc_conf_ptp-ha_peg_018.....	225

7.19.	tc_conf_ptp-ha_peg_019.....	230
7.20.	tc_conf_ptp-ha_peg_020.....	234
7.21.	tc_conf_ptp-ha_peg_021.....	239
7.22.	tc_conf_ptp-ha_peg_022.....	245
7.23.	tc_conf_ptp-ha_peg_023.....	247
8.	State Machine Group (SMG).....	249
8.1.	tc_conf_ptp-ha_smg_001.....	249
8.2.	tc_conf_ptp-ha_smg_002.....	252
8.3.	tc_conf_ptp-ha_smg_003.....	255
8.4.	tc_conf_ptp-ha_smg_004.....	258
8.5.	tc_conf_ptp-ha_smg_005.....	262
8.6.	tc_conf_ptp-ha_smg_006.....	266
8.7.	tc_conf_ptp-ha_smg_007.....	271
8.8.	tc_conf_ptp-ha_smg_008.....	276
8.9.	tc_conf_ptp-ha_smg_009.....	281
8.10.	tc_conf_ptp-ha_smg_010.....	286
8.11.	tc_conf_ptp-ha_smg_011.....	292
8.12.	tc_conf_ptp-ha_smg_012.....	297
8.13.	tc_conf_ptp-ha_smg_013.....	301
8.14.	tc_conf_ptp-ha_smg_014.....	306
8.15.	tc_conf_ptp-ha_smg_015.....	312
8.16.	tc_conf_ptp-ha_smg_016.....	316
8.17.	tc_conf_ptp-ha_smg_017.....	320
8.18.	tc_conf_ptp-ha_smg_018.....	325
8.19.	tc_conf_ptp-ha_smg_019.....	330
8.20.	tc_conf_ptp-ha_smg_020.....	333
8.21.	tc_conf_ptp-ha_smg_021.....	337
8.22.	tc_conf_ptp-ha_smg_022.....	342

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)

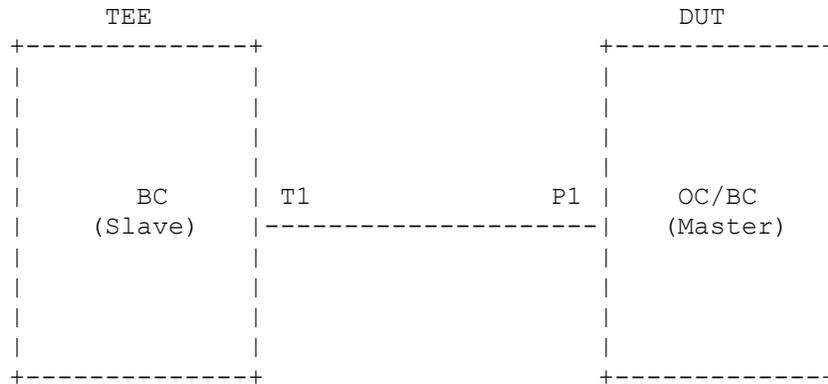
Title : Inter-operation with the Delay Request-Response Default PTP profile when DUT is master

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



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

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

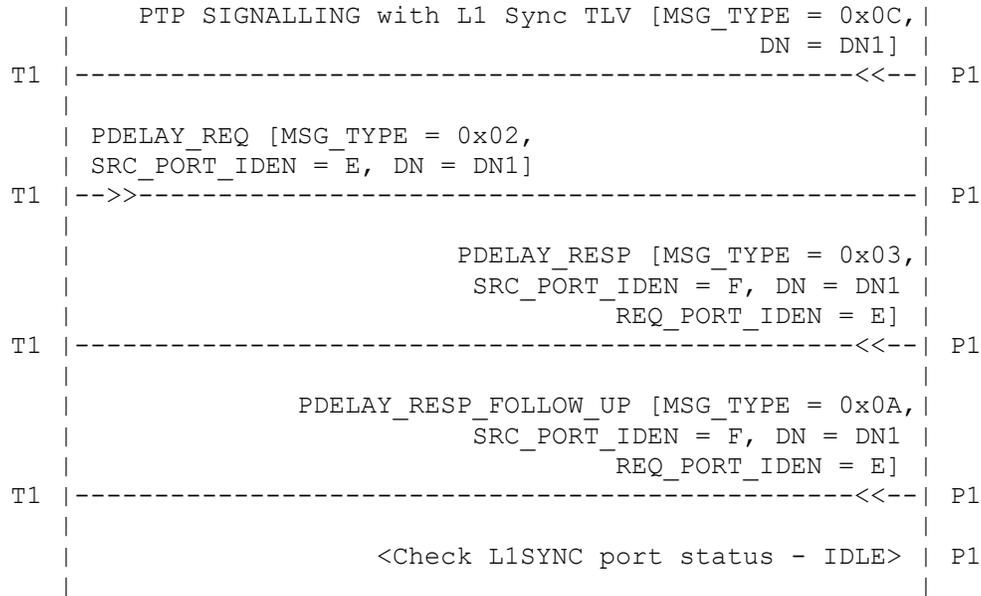
Title : Inter-operation with the Peer-to-peer Default PTP profile when DUT is master

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



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)

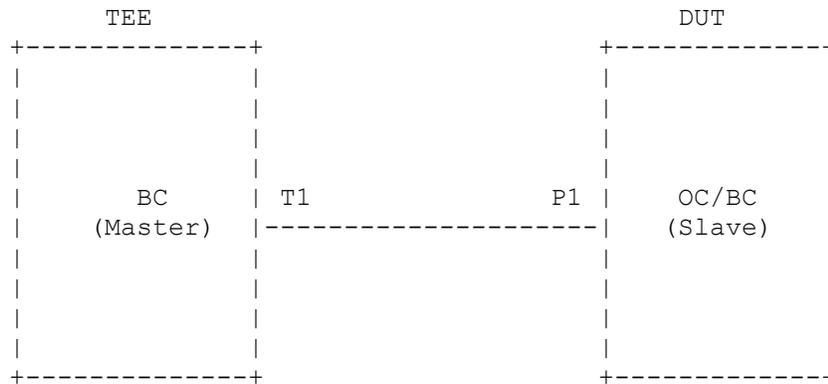
Title : Inter-operation with the Delay Request-Response Default PTP profile when DUT is slave

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



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

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
```

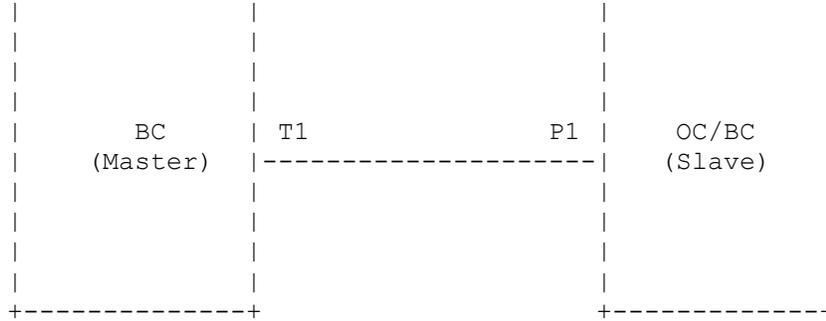
```
Purpose               : To verify that a PTP enabled device using Peer to Peer
                    : Delay mechanism synchronizes its High Accuracy
                    : Peer to Peer Delay PTP profile to Peer to Peer
                    : Default PTP profile when it is slave.
```

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

```
Conformance Type   : SHALL
```

Topology



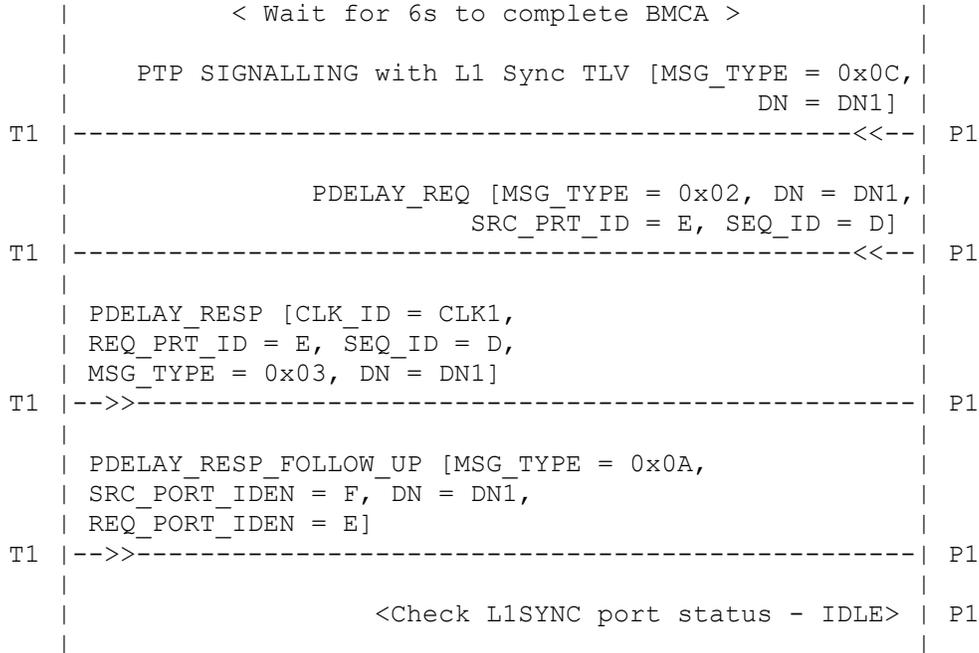


Legends:

- 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 :





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)

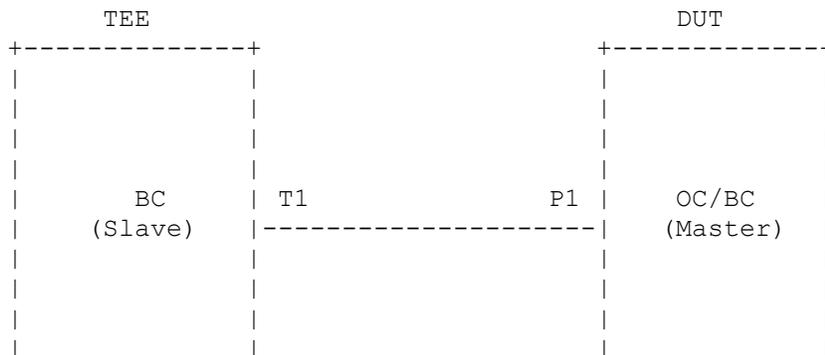
Title               : L1SYNC Message with optParamsEnabled is set to FALSE
                    - transport UDP over IP

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 0.6.1 Page 447,
                    Clause 0.6.2 Page 447, Clause 0.6.4 Pages 448 and 449,
                    Clause 13.12.2 Page 225

Conformance Type    : SHALL
    
```

Topology



(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)

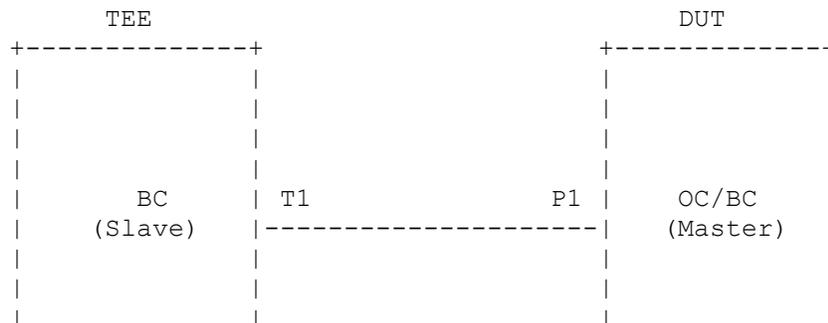
Title : L1Sync message with optParamsEnabled is set to TRUE
 - transport UDP over IP

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 0.6.1 Page 447, Clause 0.6.2 Page 447, Clause 0.6.4 Pages 448 and 449, Clause 0.8.5 Page 455 and 456, Clause 13.12.2 Page 225

Conformance Type : SHALL

Topology

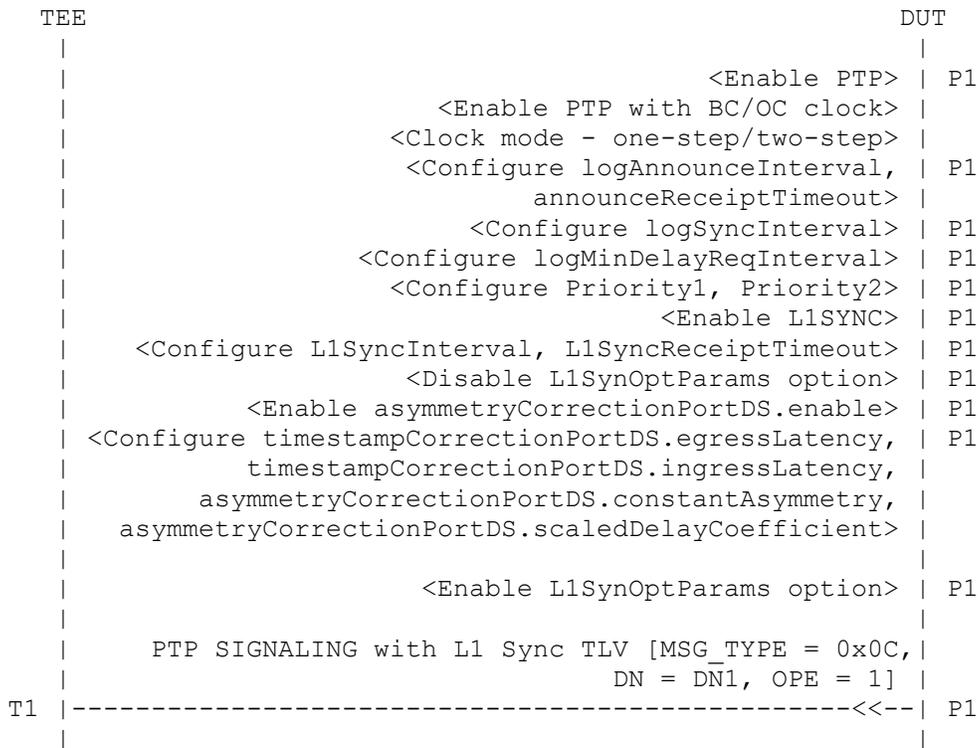




Legends:

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 :



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 0.6.1 Page 447, Clause 0.6.2 Page 447, Clause 0.6.4 Pages 448 and 449, Clause 13.12.2 Page 225

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

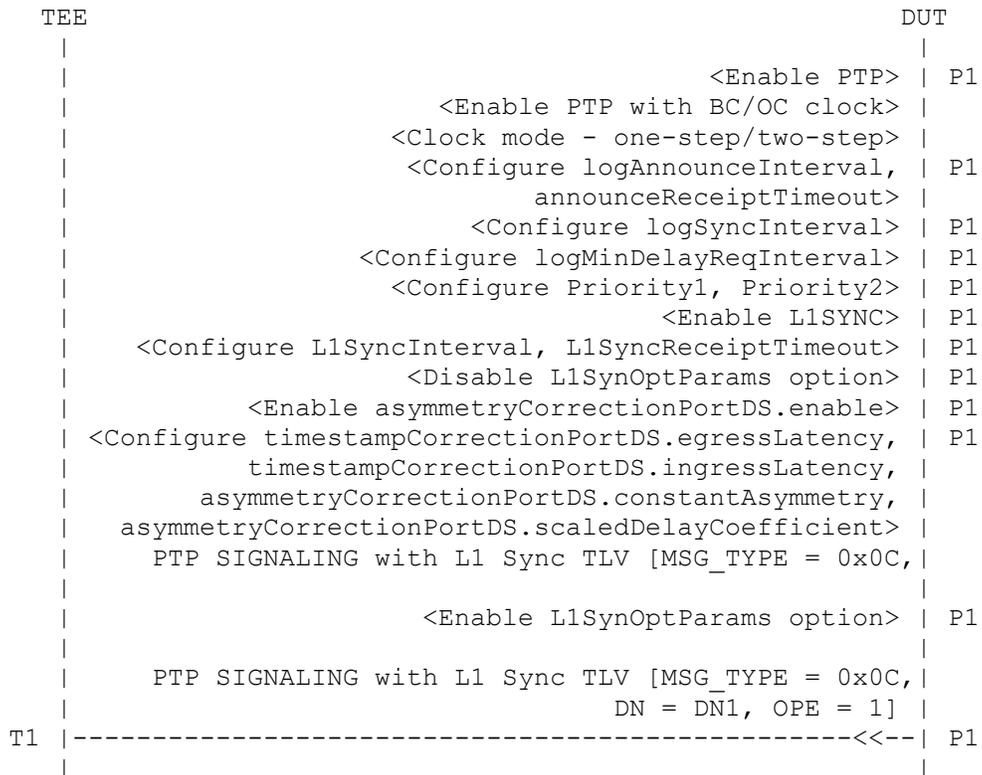
- 4) messageType = 0xC (Signaling message) (4 bits)
- 5) majorSdoId = 0x000 (4 bits)
- 6) versionPTP = 2 (4 bits)
- 7) minorVersionPTP = 1 (4 bits)
- 8) messageLength = non-zero (2 octets)
- 9) domainNumber = 0 - 127 (1 octet)



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 :



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 0.6.1 Page 447

Conformance Type : SHALL

Topology




```

|      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)

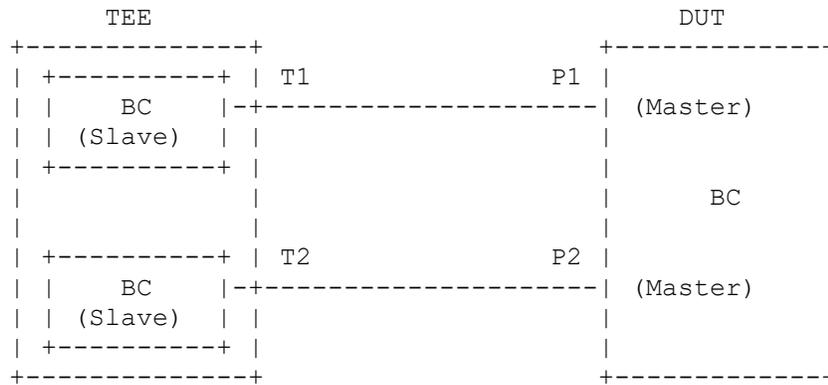
Title : Non-forwarding of L1Sync messages with non-forwardable address on transport over IEEE 802.3/Ethernet

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 0.6.1 Page 447

Conformance Type : SHALL

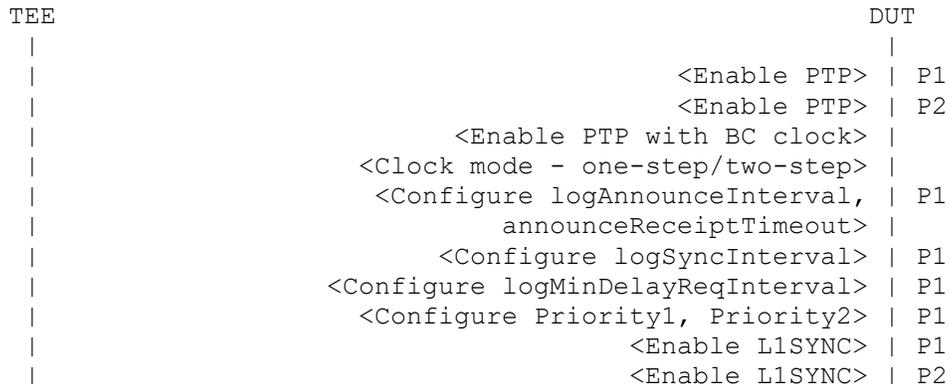
Topology

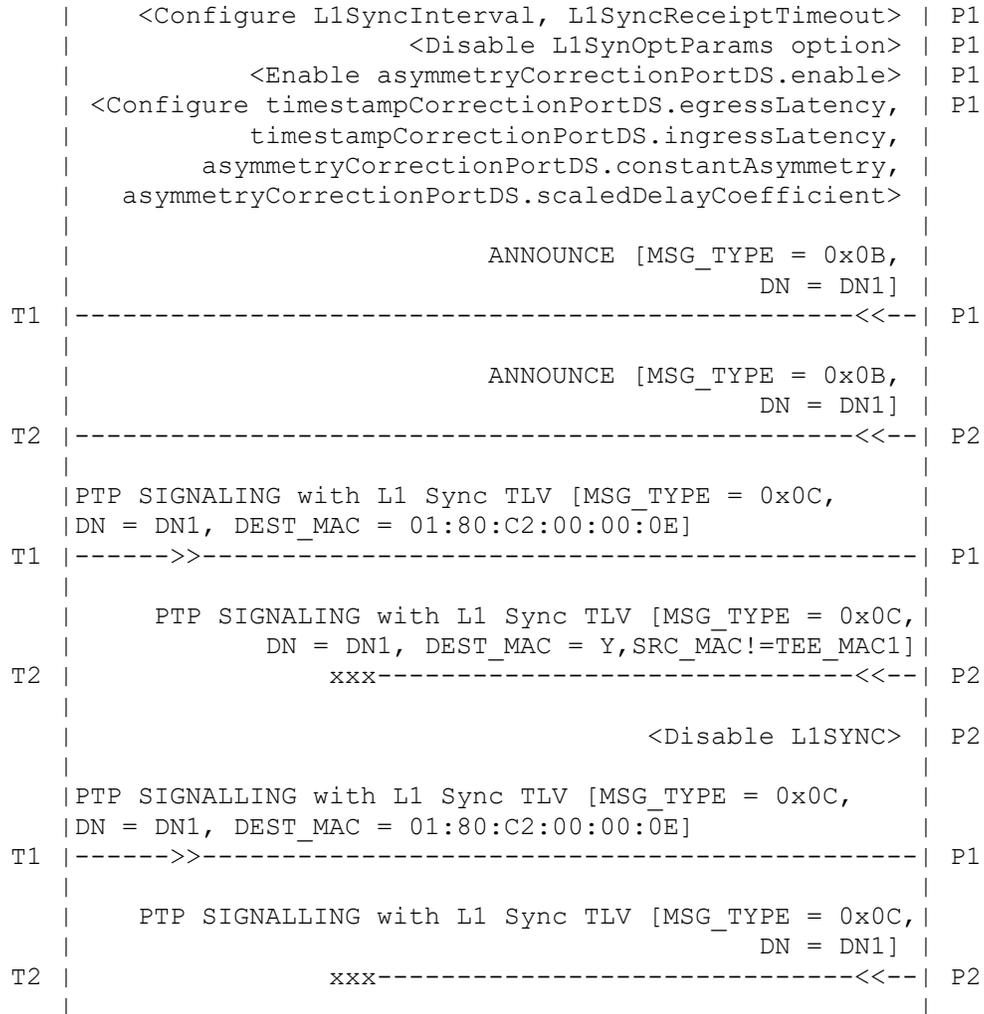


Legends:

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 :





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)
```

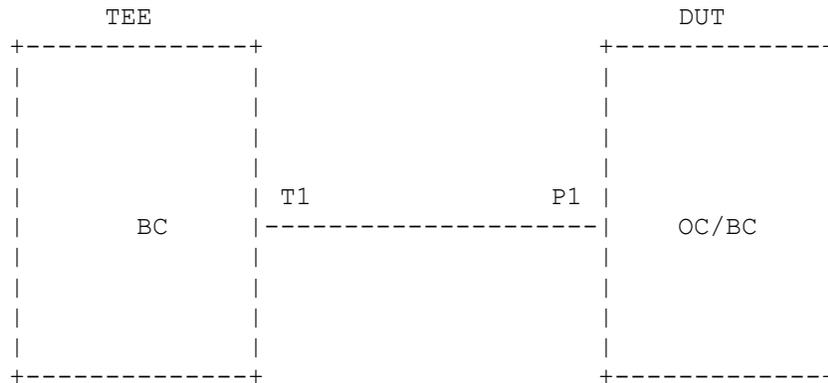
```
Title          : Discarding of PTP signaling message with L1 Sync TLV
                with invalid domain number.
```

```
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 0.7.2 Page 449
                Clause J.5.2 Page 412.
```

```
Conformance Type : SHALL
```

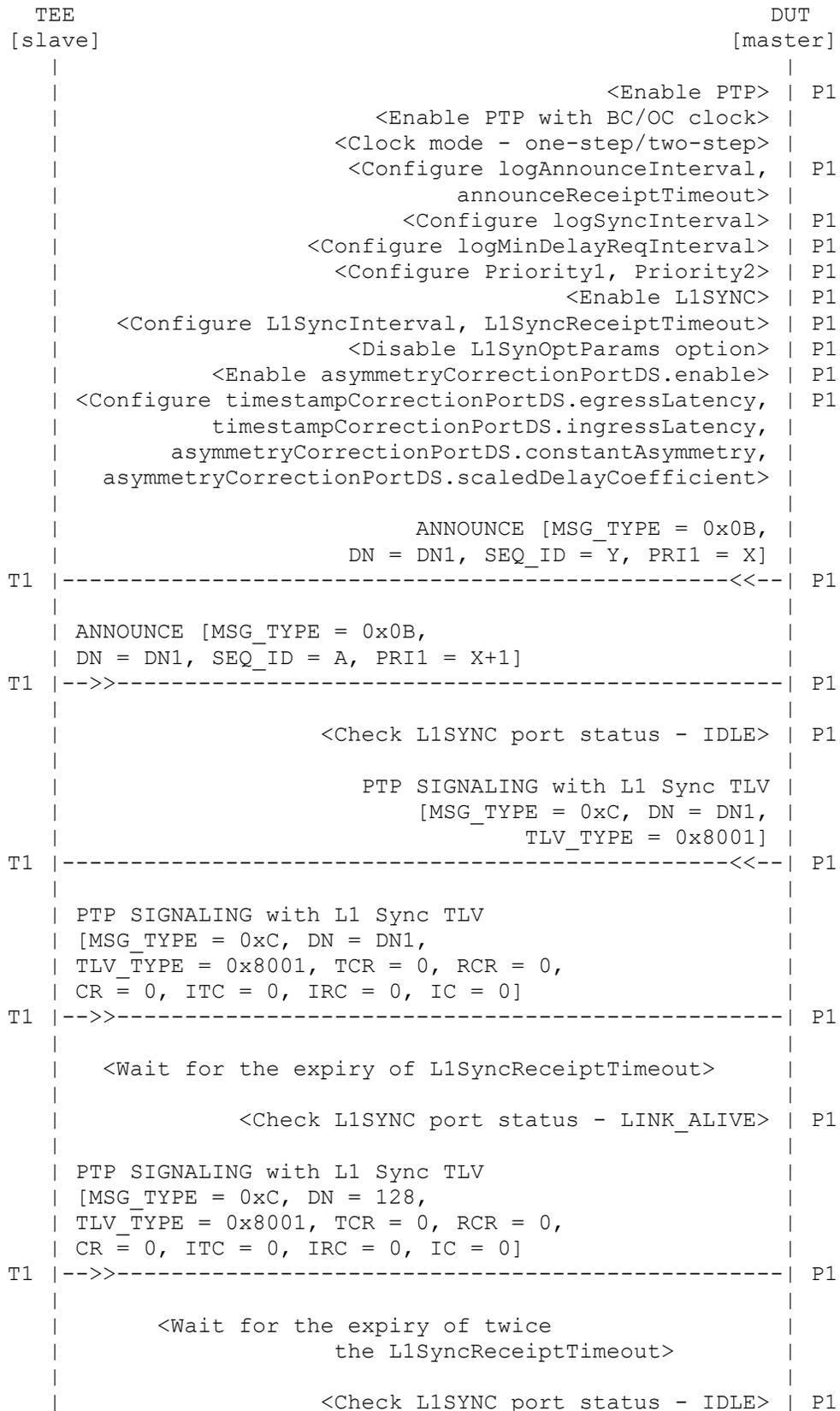
Topology



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 :



- 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
```

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)

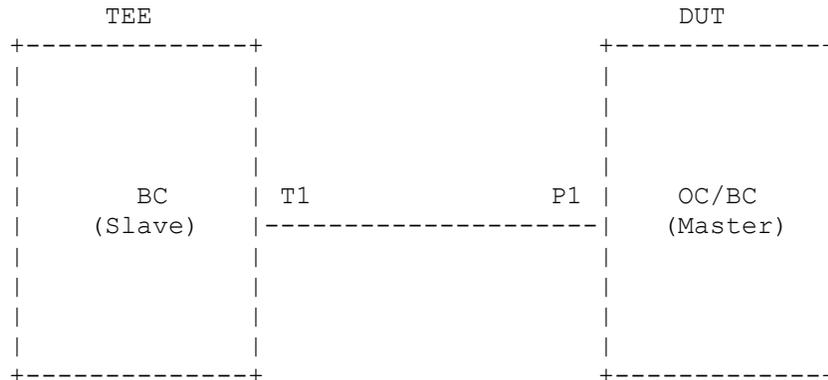
Title : L1SyncOptParamsPortDS.timestampsCorrectedTx

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 0.8.4.2.1
 Page 453

Conformance Type : SHALL

Topology



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, announceReceiptTimeout>	P1
	<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, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry, asymmetryCorrectionPortDS.scaledDelayCoefficient>	P1
	!<Enable L1SynOptParamsPortDS.timestampsCorrectedTx>	
	PTP SIGNALING with L1 Sync TLV	
	[MSG_TYPE = 0x0C, DN = DN1, OPE = 0]	
T1	-----<<-----	P1
	<Enable L1SyncBasicPortDS.optParamsEnabled>	
	<Enable L1SynOptParamsPortDS.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)

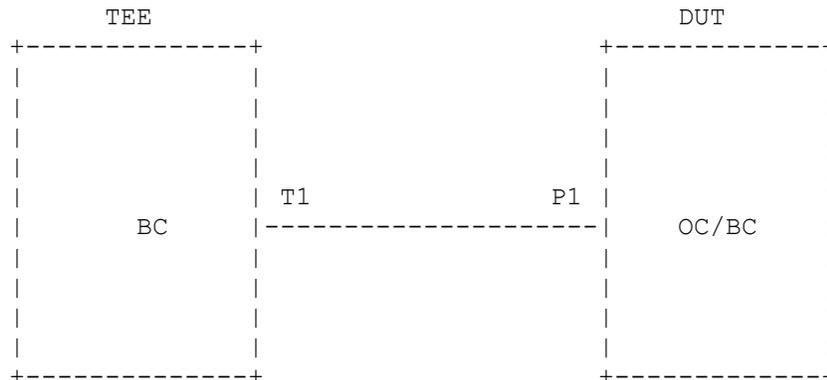
Title : Egress timestamp in Delay_Req message

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



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 :



	<Enable PTP>	P1
	<Enable PTP with BC/OC clock>	
	<Clock mode - one-step/two-step>	
	<Configure logAnnounceInterval, announceReceiptTimeout>	P1
	<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, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry, asymmetryCorrectionPortDS.scaledDelayCoefficient>	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 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

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)

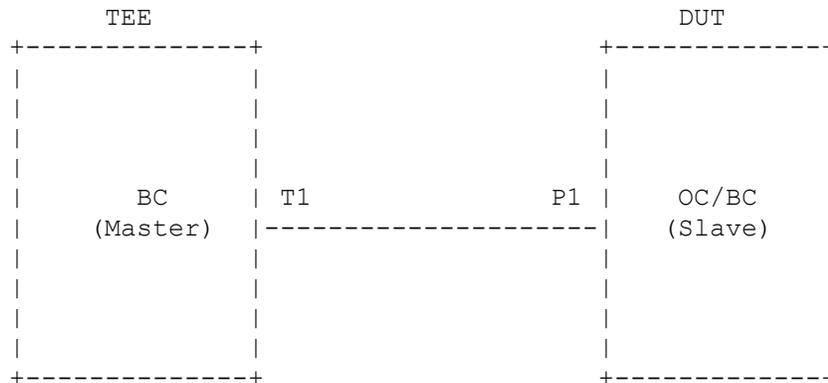
Title : Egress timestamp in Pdelay_Req message

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



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

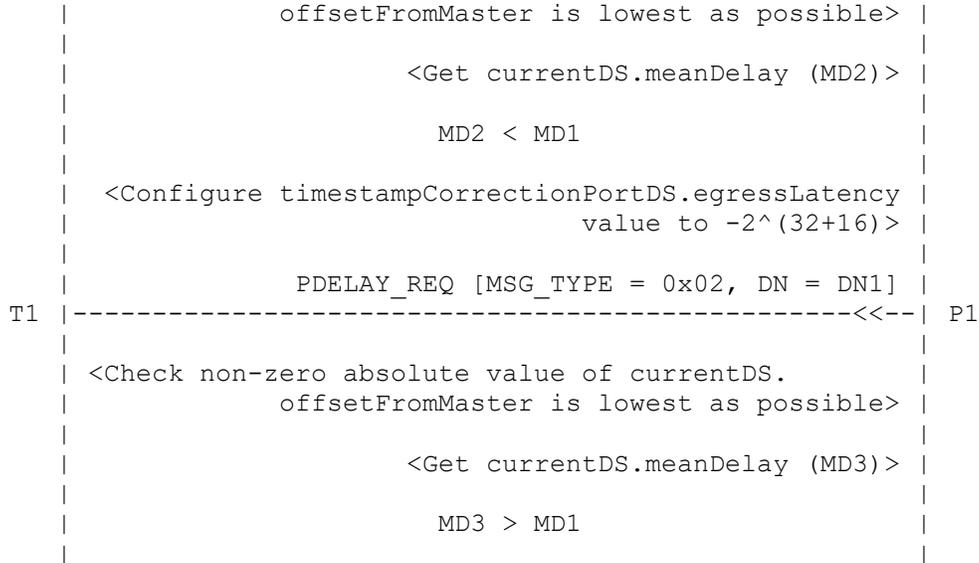
Ladder Diagram :



```

|         <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
|
| <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. |

```



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)

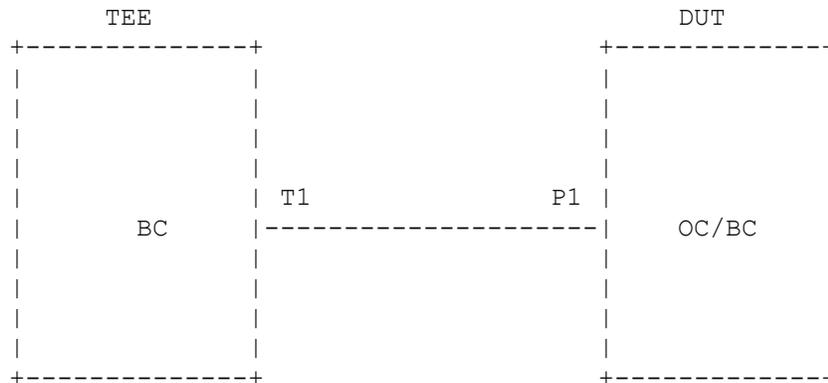
Title : Calculation of delayAsymmetry in Delay Request-Response mechanism

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



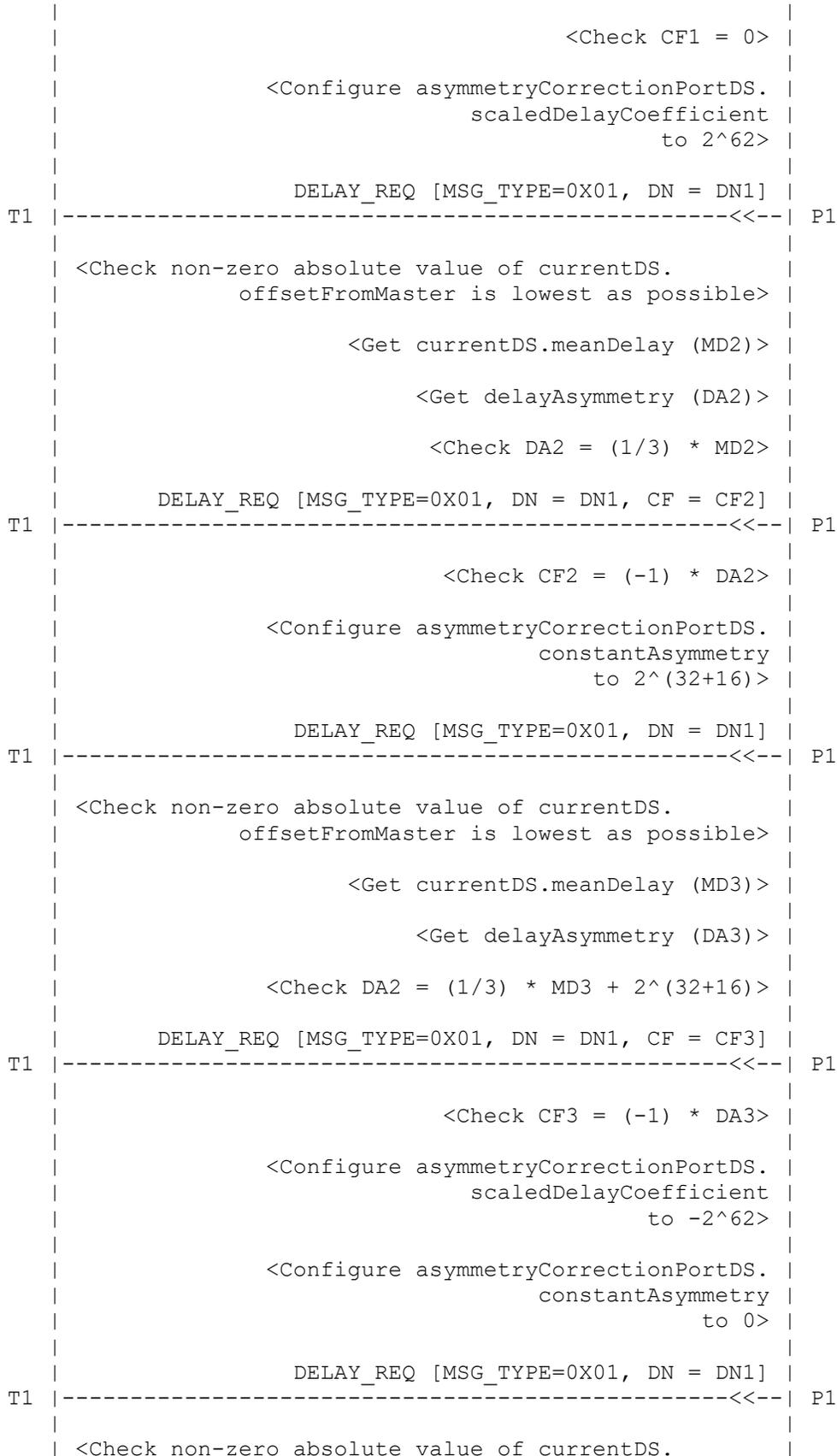
Legends:

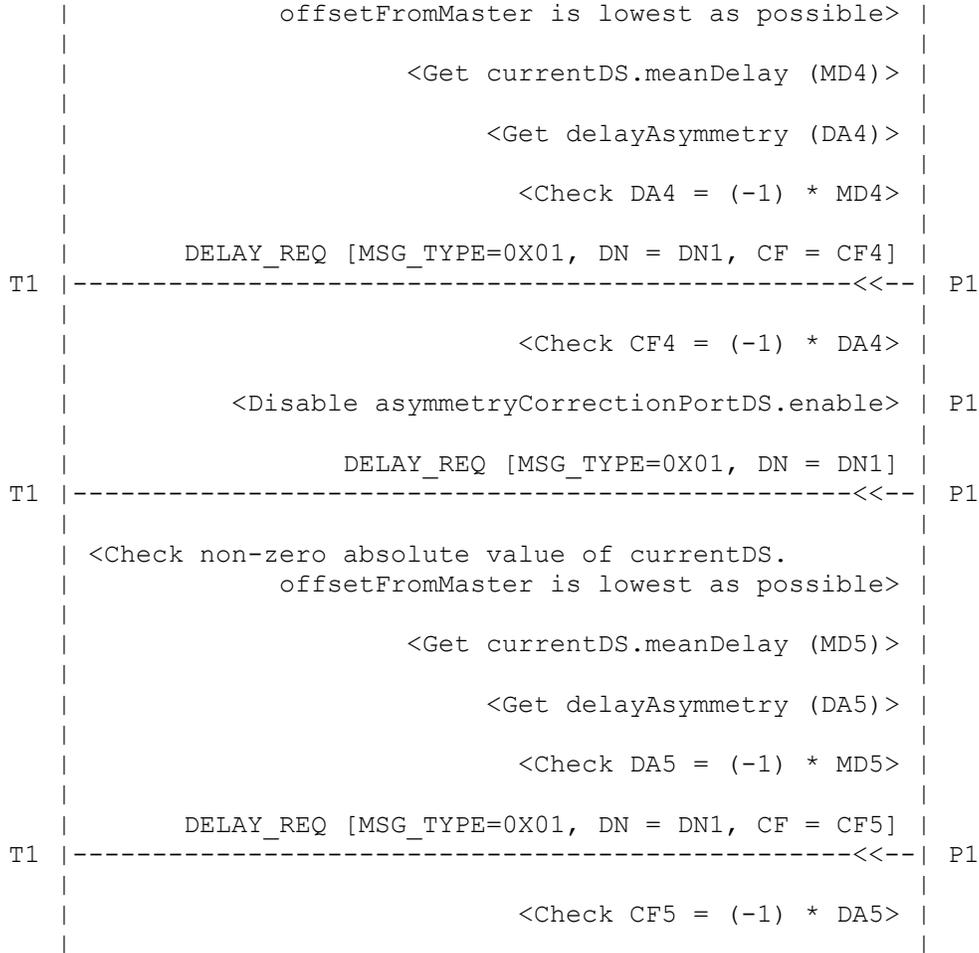
TEE : Test Execution Engine
 DUT : Device Under Test
 OC : Ordinary Clock
 BC : Boundary Clock
 T1 : Port 1 at TEE
 P1 : Port 1 at DUT

Ladder Diagram :



	<Clock mode - one-step/two-step>	
	<Configure logAnnounceInterval, announceReceiptTimeout>	P1
	<Configure logSyncInterval>	P1
	<Configure logMinDelayReqInterval>	P1
	<Configure Priority1, Priority2>	P1
	<Enable L1SYNC>	P1
	<Configure L1SyncInterval, L1SyncReceiptTimeout>	P1
	<Disable L1SynOptParams option>	P1
	<Configure timestampCorrectionPortDS.egressLatency, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry, asymmetryCorrectionPortDS.scaledDelayCoefficient>	P1
	<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





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)

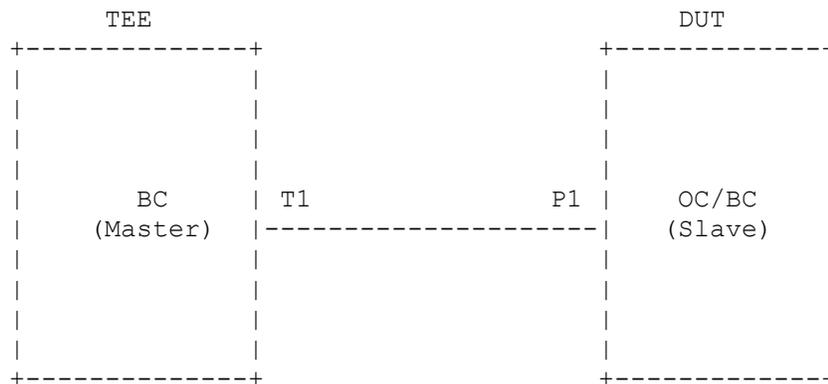
Title          : Calculation of delayAsymmetry in Peer to Peer Delay
                mechanism when DUT is slave

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



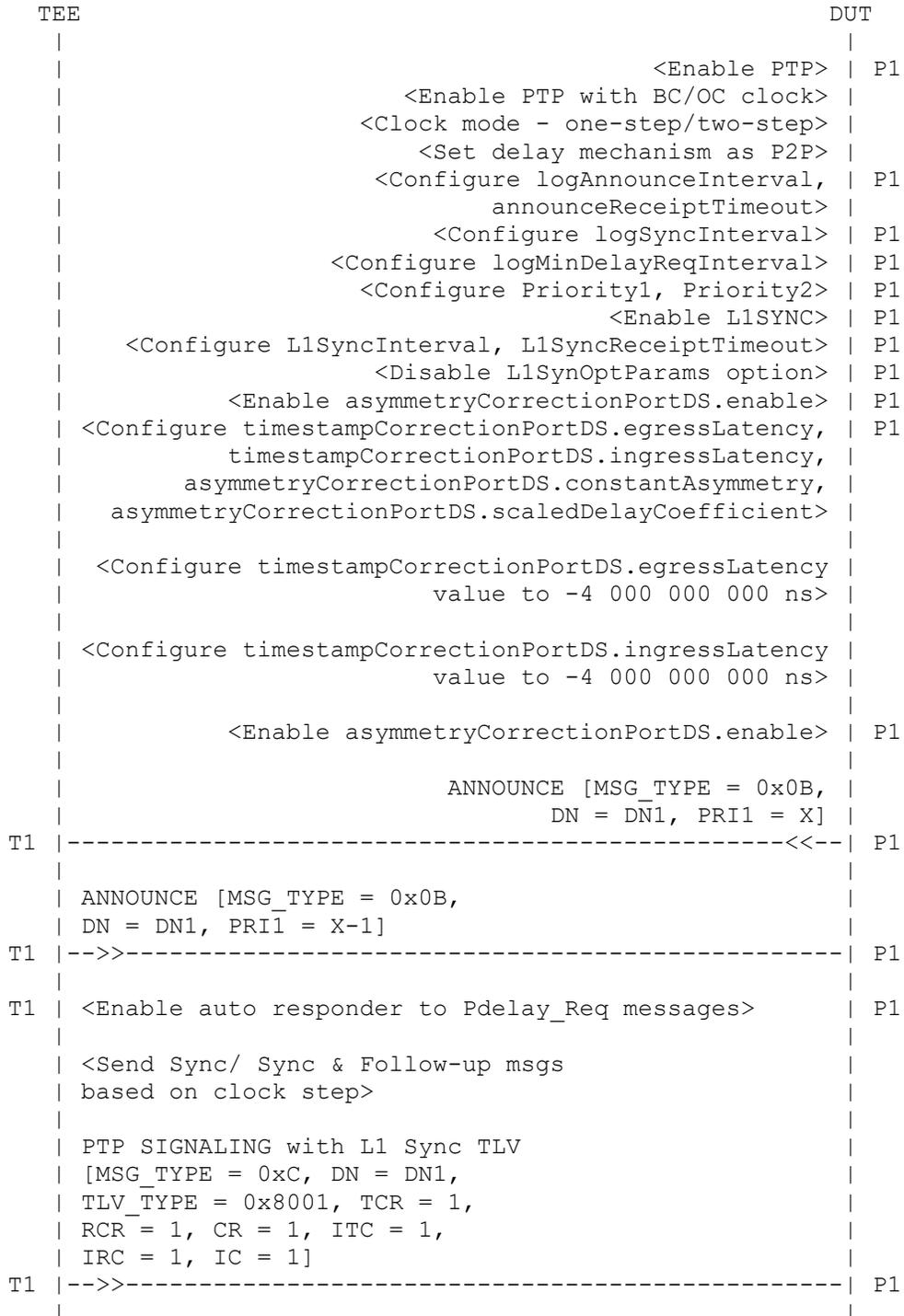
Legends:

```

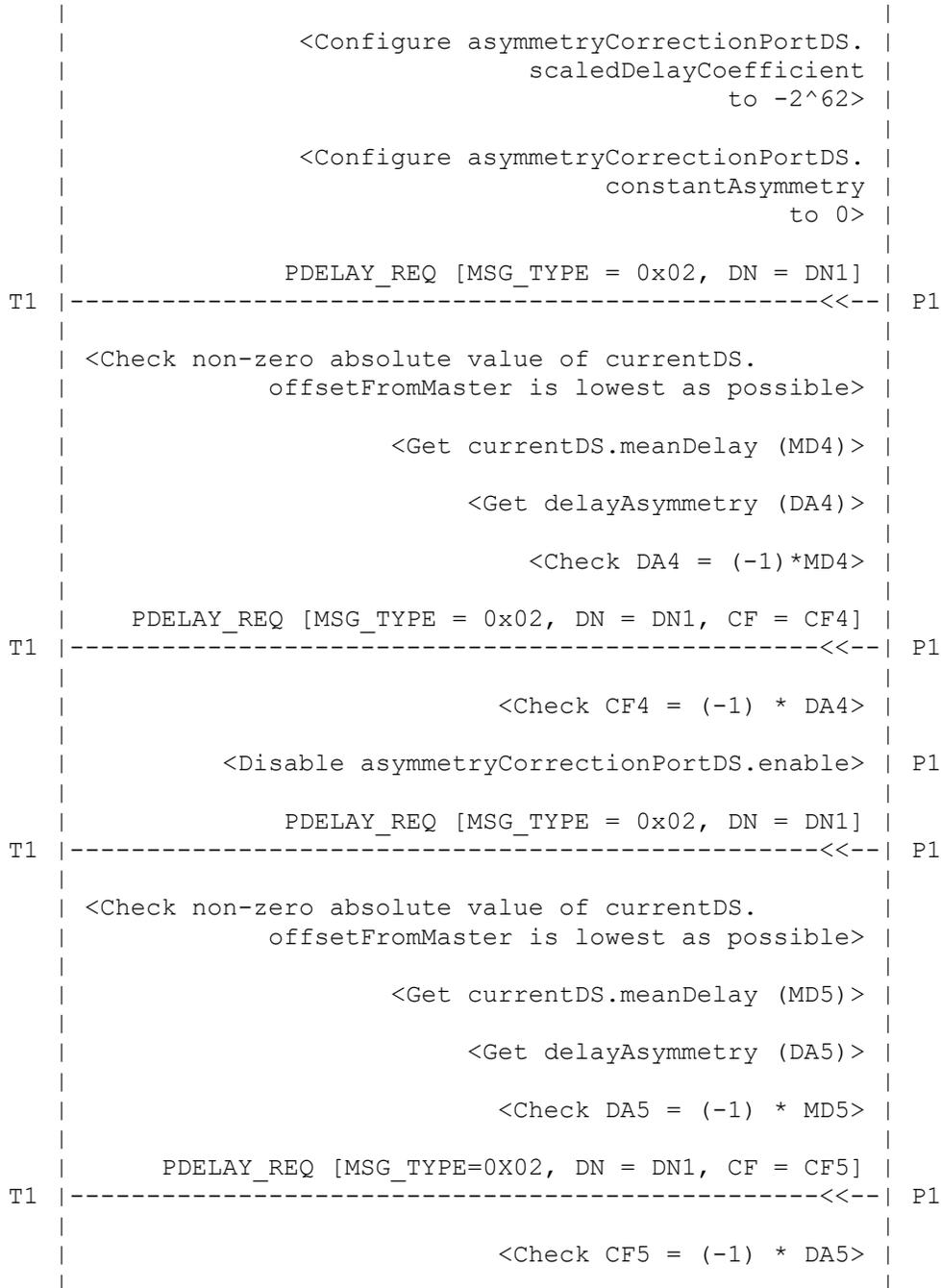
TEE      : Test Execution Engine
DUT      : Device Under Test
OC       : Ordinary Clock
  
```

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

Ladder Diagram :



	<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>	
T1	PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, CF = CF1]	P1
	<Check CF1 = 0>	
	<Configure asymmetryCorrectionPortDS. scaledDelayCoefficient to 2^62>	
T1	PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1]	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>	
T1	PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, CF = CF2]	P1
	<Check CF2 = (-1) * DA2>	
	<Configure asymmetryCorrectionPortDS. constantAsymmetry to 2^(32+16)>	
T1	PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1]	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)>	
T1	PDELAY_REQ [MSG_TYPE = 0x02, DN = DN1, CF = CF3]	P1
	<Check CF3 = (-1) * DA3>	



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 its 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.
    
```

```

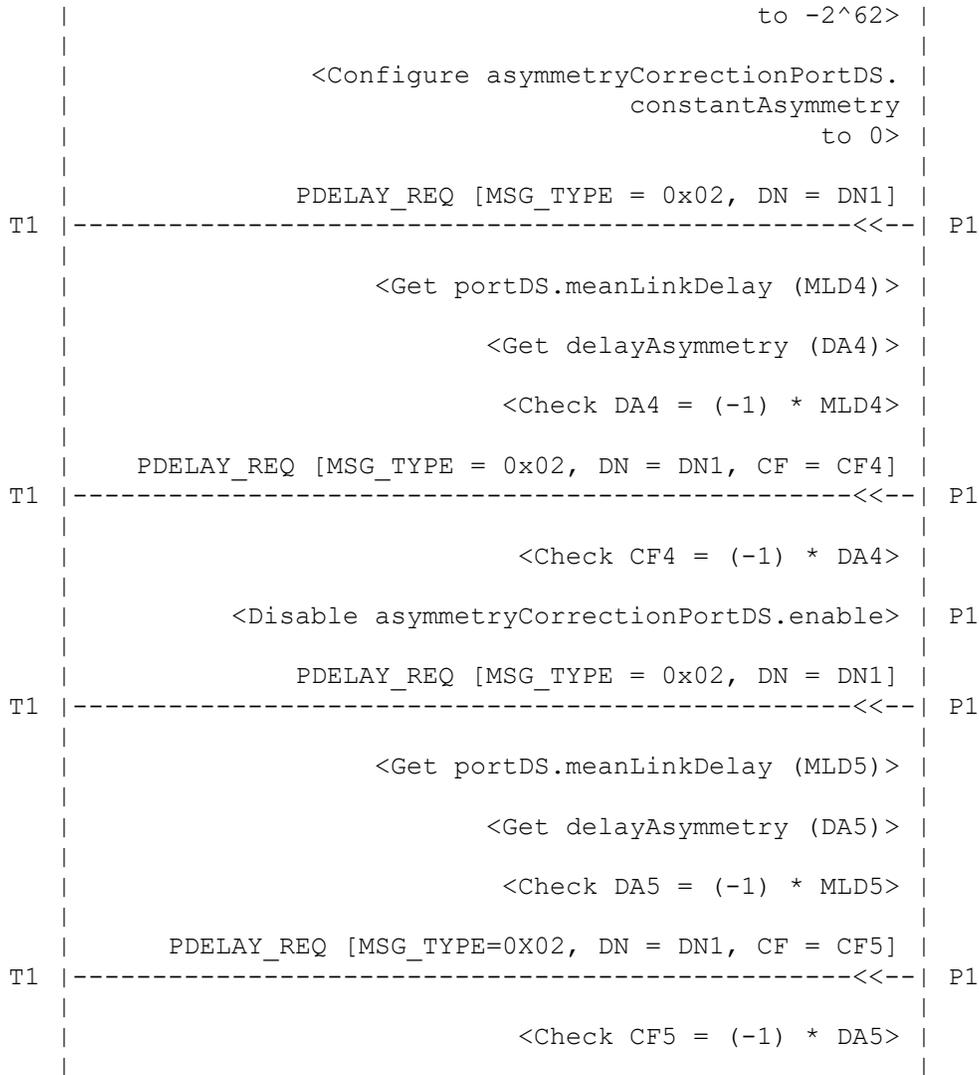
Reference           : P1588/D1.3, February 2018 V3.01 clause 16.8.3 page 302
                    : Clause 7.4.2 Page 73
    
```

```

Conformance Type    : SHALL
    
```

Topology





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

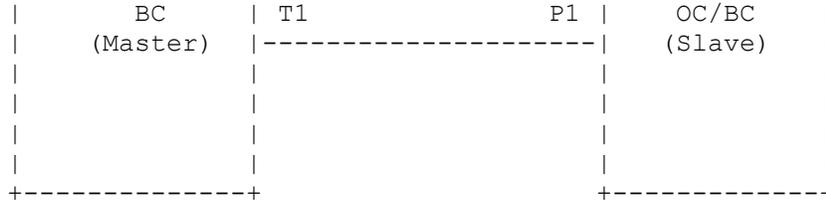
Purpose        : To verify that a PTP enabled device generates Egress
                timestamp in Pdelay_Resp (event) messages from
                timestampCorrectionPortDS.egressLatency when using
                Peer to Peer Delay mechanism.

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

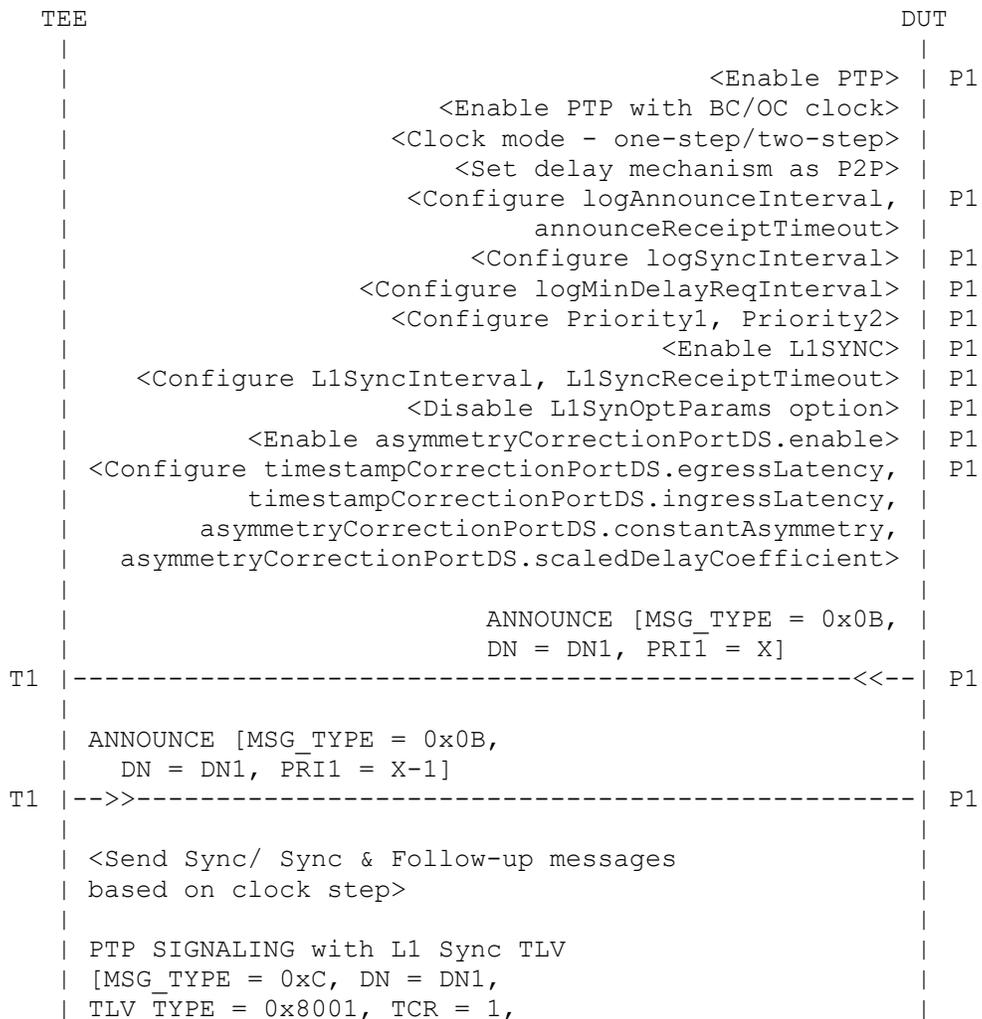




Legends:

- 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 :



```

| 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:

$$[(t4 - t1) - \langle \text{correctedPdelayRespCorrectionField} \rangle] / 2$$

* For two-step clock:

$$[(t4 - t1) - (\text{responseOriginTimestamp} - \text{requestReceiptTimestamp}) - \langle \text{correctedPdelayRespCorrectionField} \rangle - \text{correctionField of Pdelay_Resp_Follow_Up}] / 2$$

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 = 2⁴⁸).

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 = -2⁴⁸).

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)

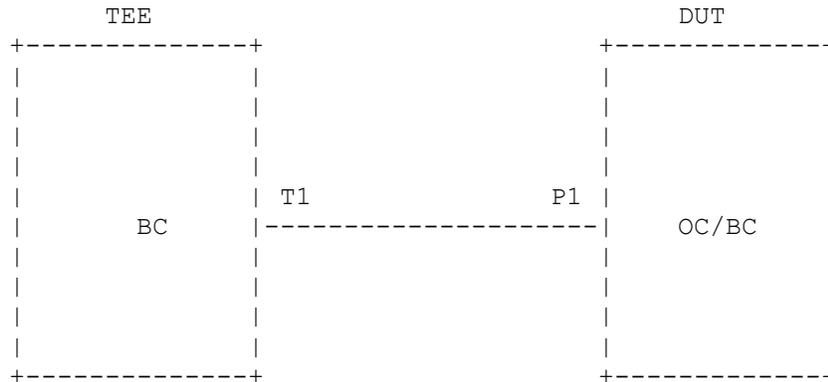
Title          : Ingress timestamp in Sync message

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

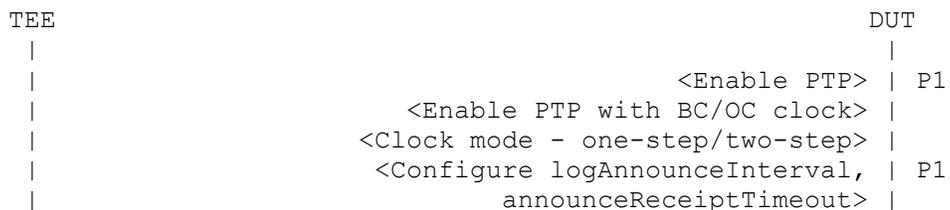


Legends:

```

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 :



	<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, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry, asymmetryCorrectionPortDS.scaledDelayCoefficient>	P1
	ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1, PRI1 = X]	P1
T1	-----<<-----	P1
	ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1, PRI1 = X-1]	P1
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

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)

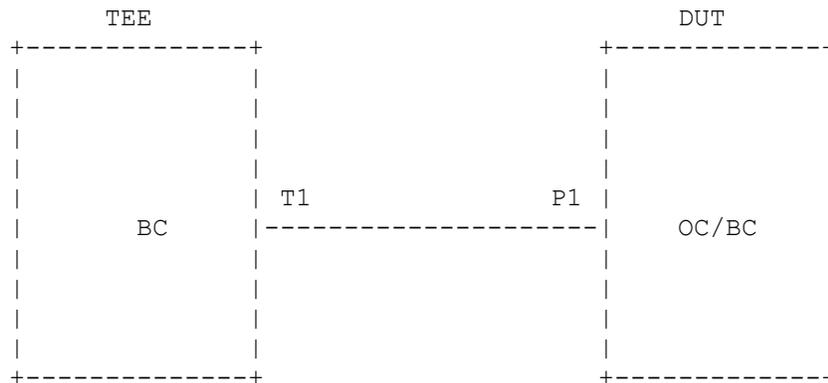
Title : Ingress timestamp in Delay_Req message

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

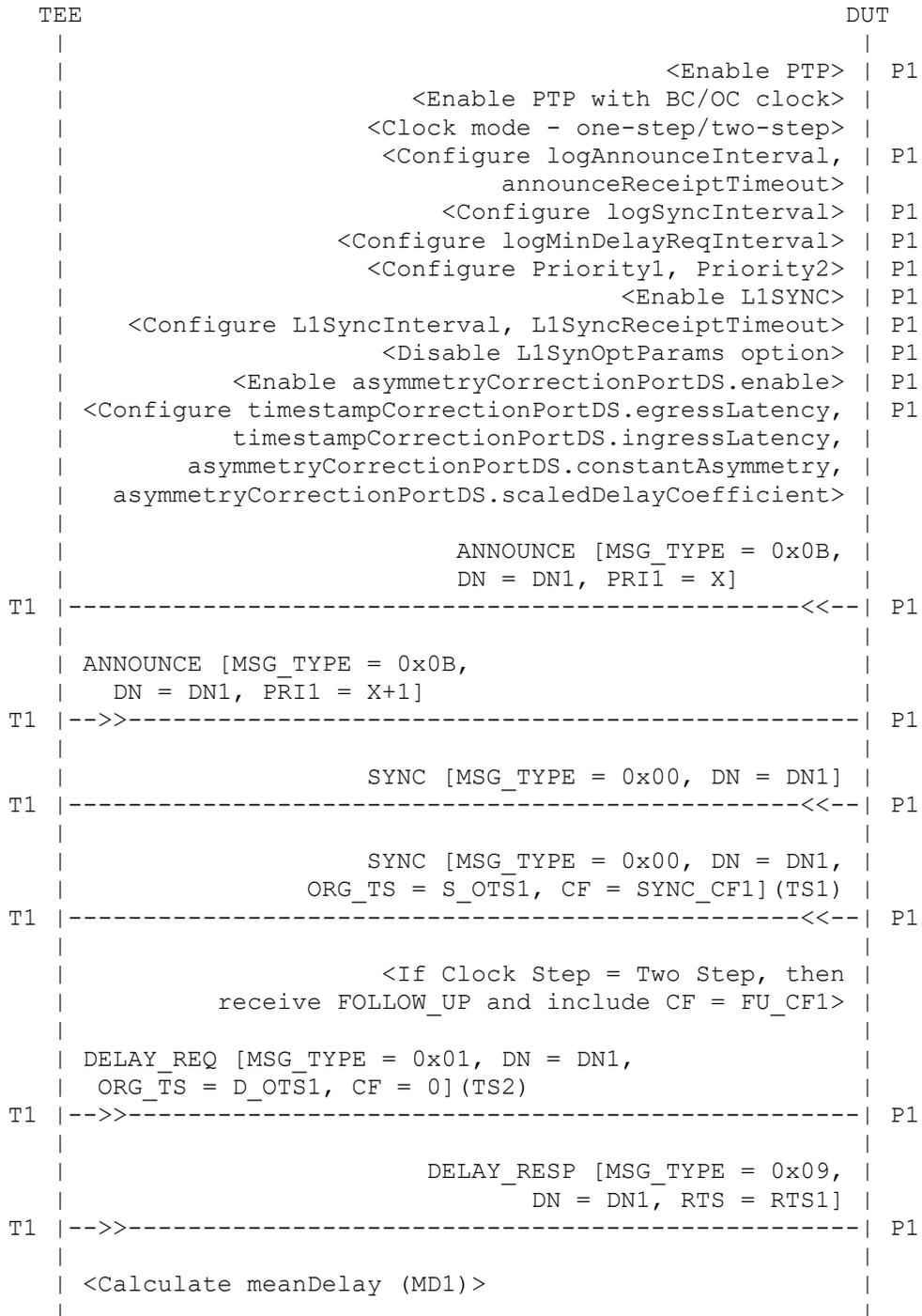


Legends:

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 :



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:

$$[(t2 - t3) + (\text{receiveTimestamp of Delay_Resp message} - \text{originTimestamp of Sync message}) - \langle \text{correctedSyncCorrectionField} \rangle - \text{correctionField of Delay_Resp message}] / 2.$$

* For two-step clock:

$$[(t2 - t3) + (\text{receiveTimestamp of Delay_Resp message} - \text{preciseOriginTimestamp of Follow_Up message}) - \langle \text{correctedSyncCorrectionField} \rangle - \text{correctionField of Follow_Up message} - \text{correctionField of Delay_Resp message}] / 2.$$

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_OTTS2
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_OTTS3
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_OT3
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)
    
```

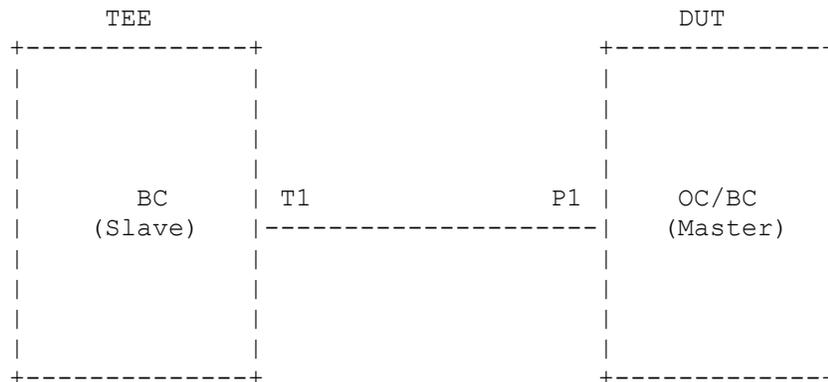
Title : Ingress timestamp in Pdelay_Req message

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

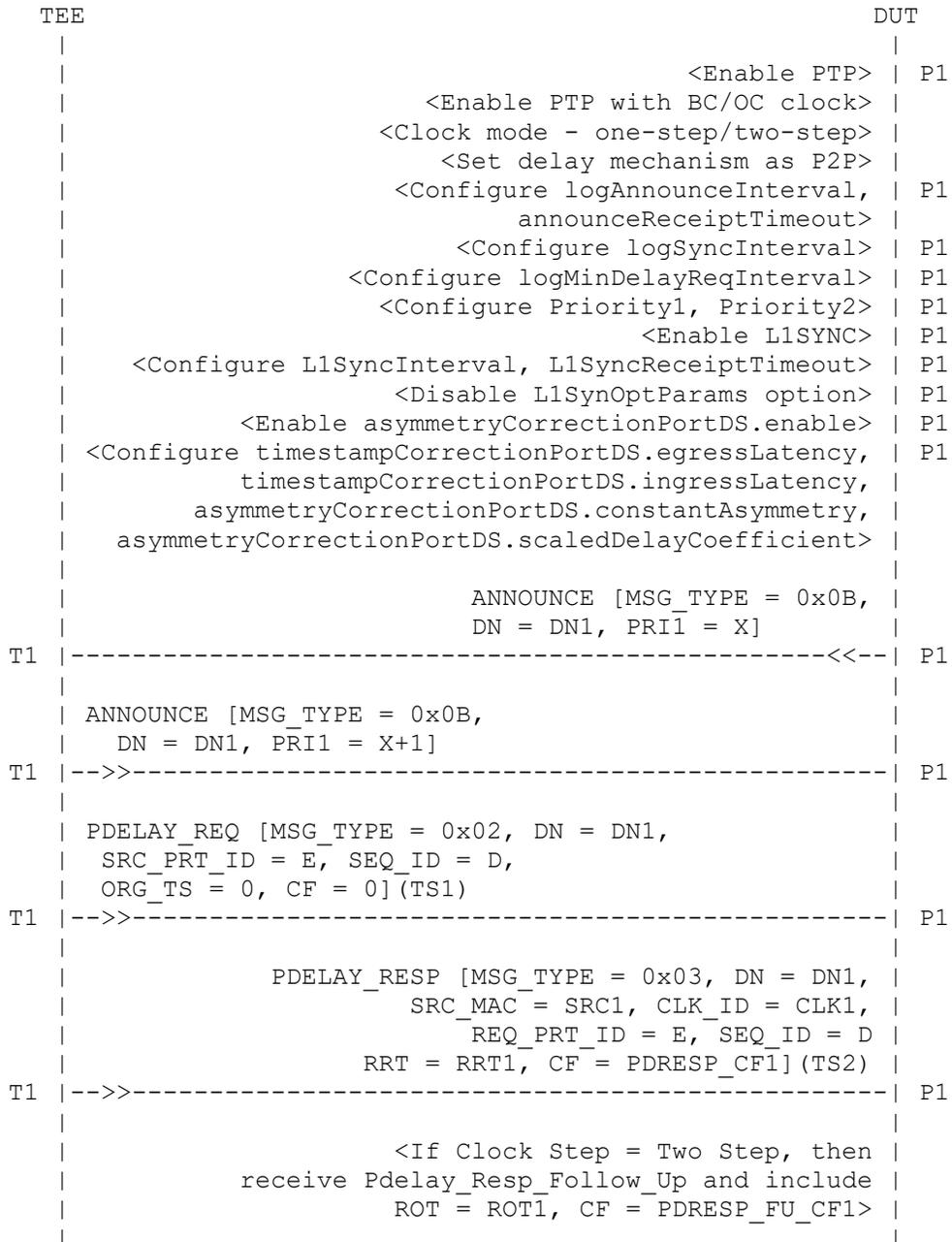
Topology

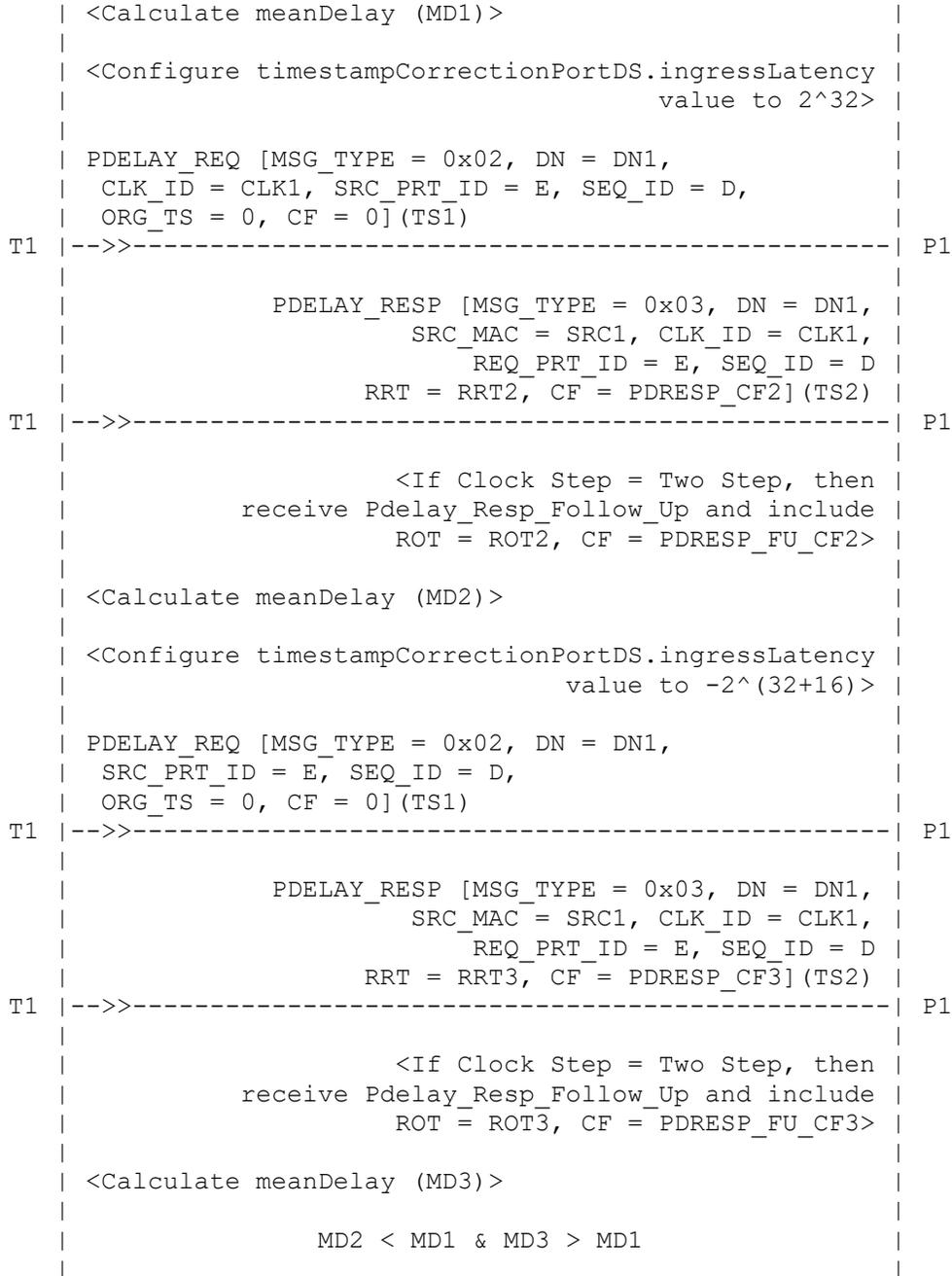


Legends:

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 :





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:

$$[(t4 - t1) - \langle \text{correctedPdelayRespCorrectionField} \rangle] / 2$$

* For two-step clock:

$$[(t4 - t1) - (\text{responseOriginTimestamp} - \text{requestReceiptTimestamp}) - \langle \text{correctedPdelayRespCorrectionField} \rangle - \text{correctionField of Pdelay_Resp_Follow_Up}] / 2$$

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)

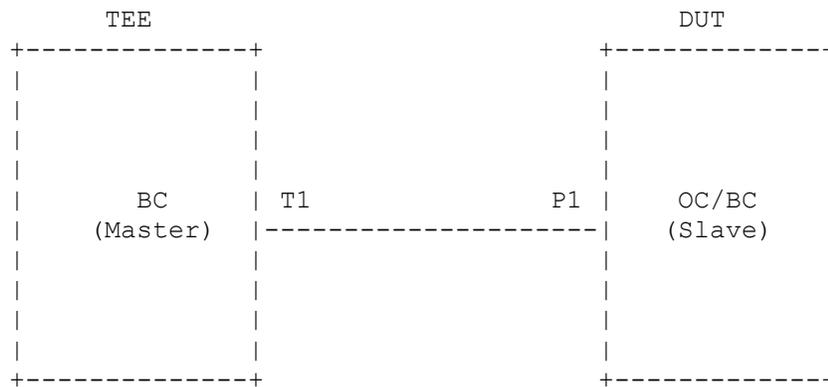
Title : Ingress timestamp in Pdelay_Resp message

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

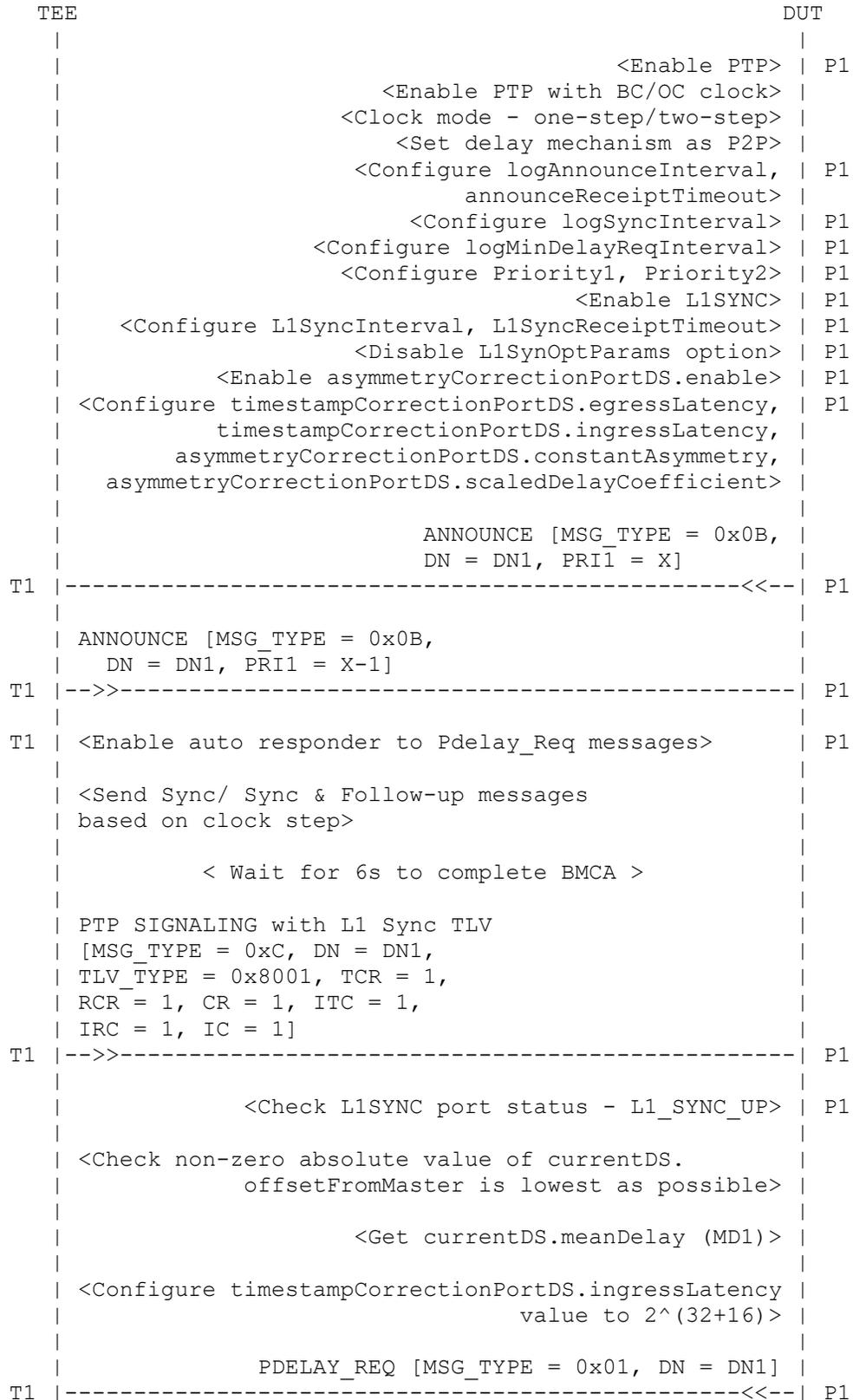
Topology



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 :



```

| <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 its 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 its 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 its 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-Response 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

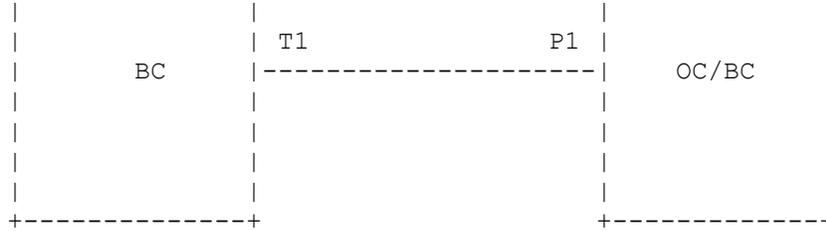
Note: The default values of these attributes can be changed through ATTEST GUI (Go to Configuration Manager and select desired configuration, go to Protocol Options > PTP-HA > PTP-HA Attributes).

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

Conformance Type : MUST

Topology

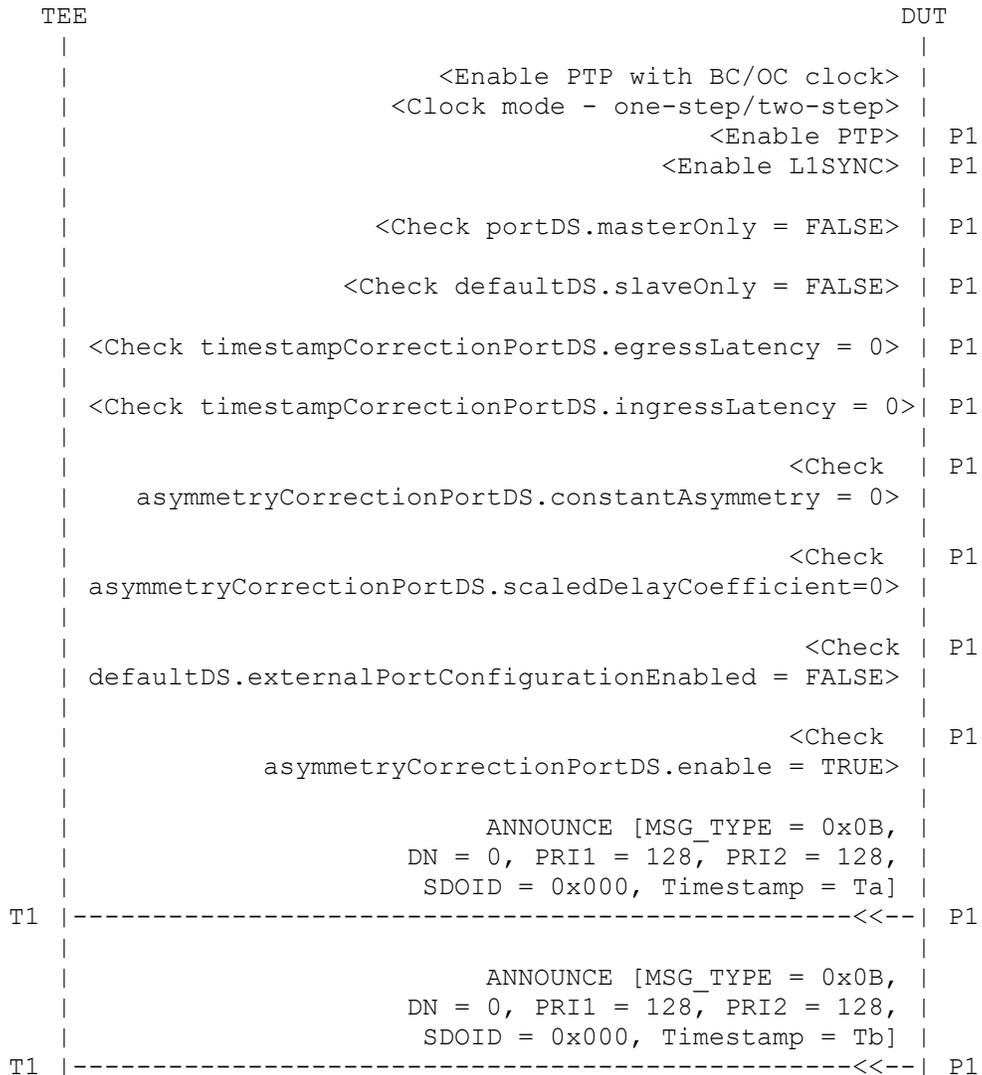


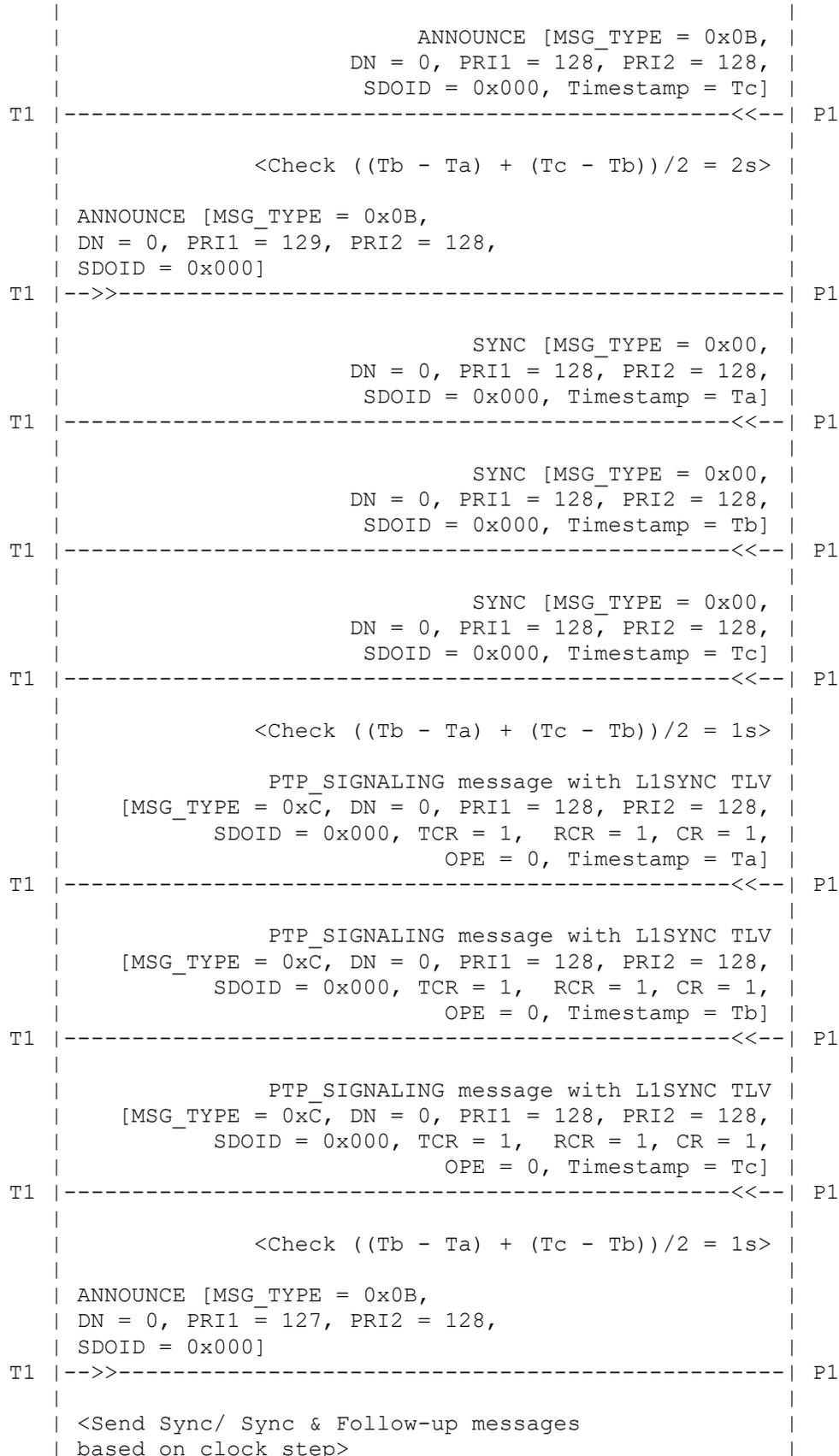


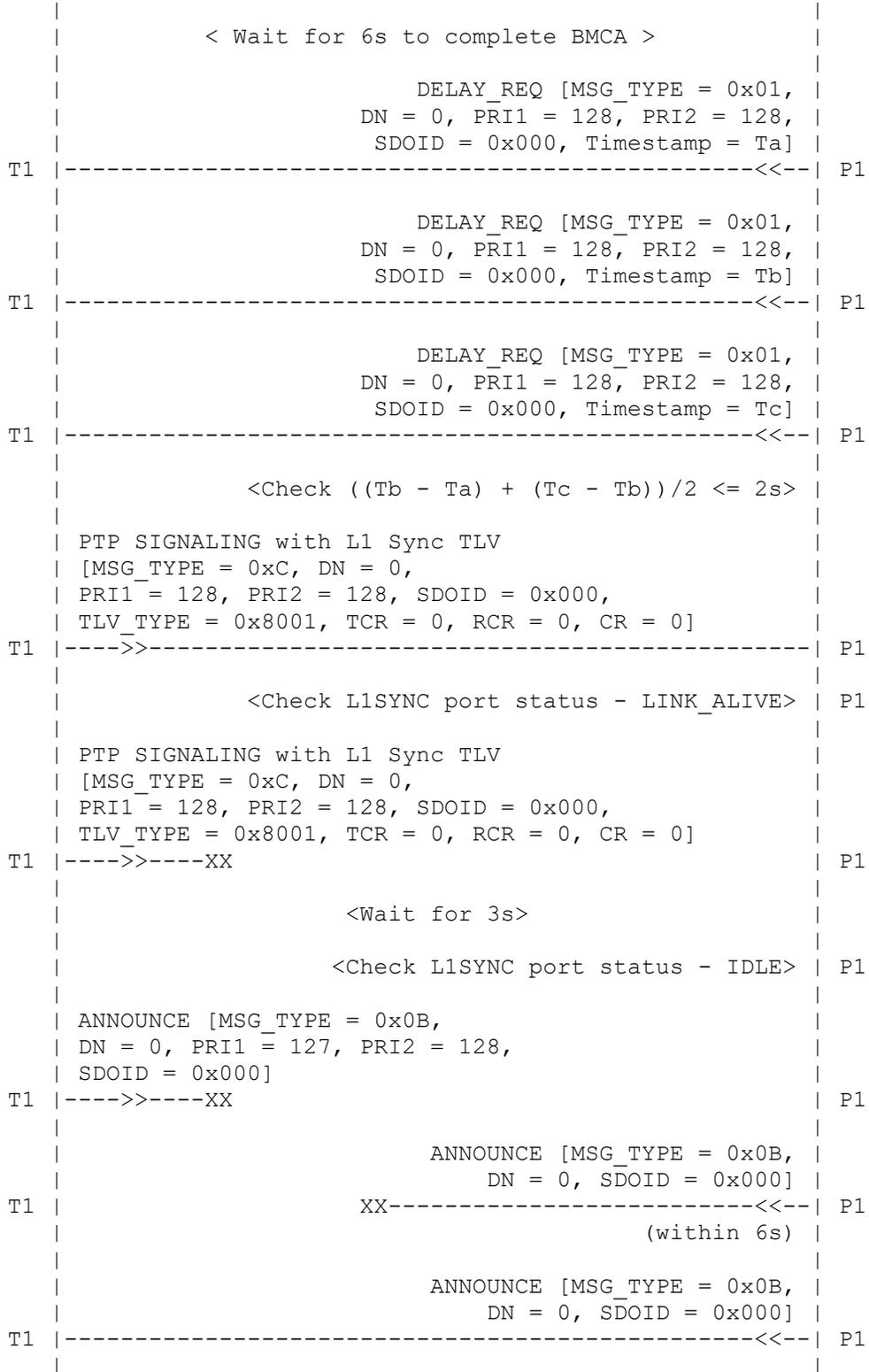
Legends:

- 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 :







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 $((T_b - T_a) + (T_c - T_b))/2 = 2s$

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 T_a , T_b and T_c for messages respectively.

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

Step 15: Verify whether $((T_b - T_a) + (T_c - T_b))/2 = 1s$

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 T_a , T_b and T_c 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 $((T_b - T_a) + (T_c - T_b))/2 = 1s$

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 $((T_b - T_a) + (T_c - T_b)) / 2 \leq 2s$

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 SIGNALING message on the port T1.

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

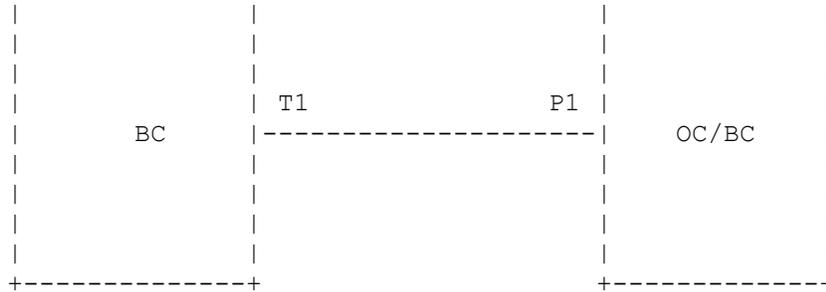
Purpose : To verify that a PTP enabled device transmits Announce messages at configured logAnnounceInterval (allowable range: 0 to 4).

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

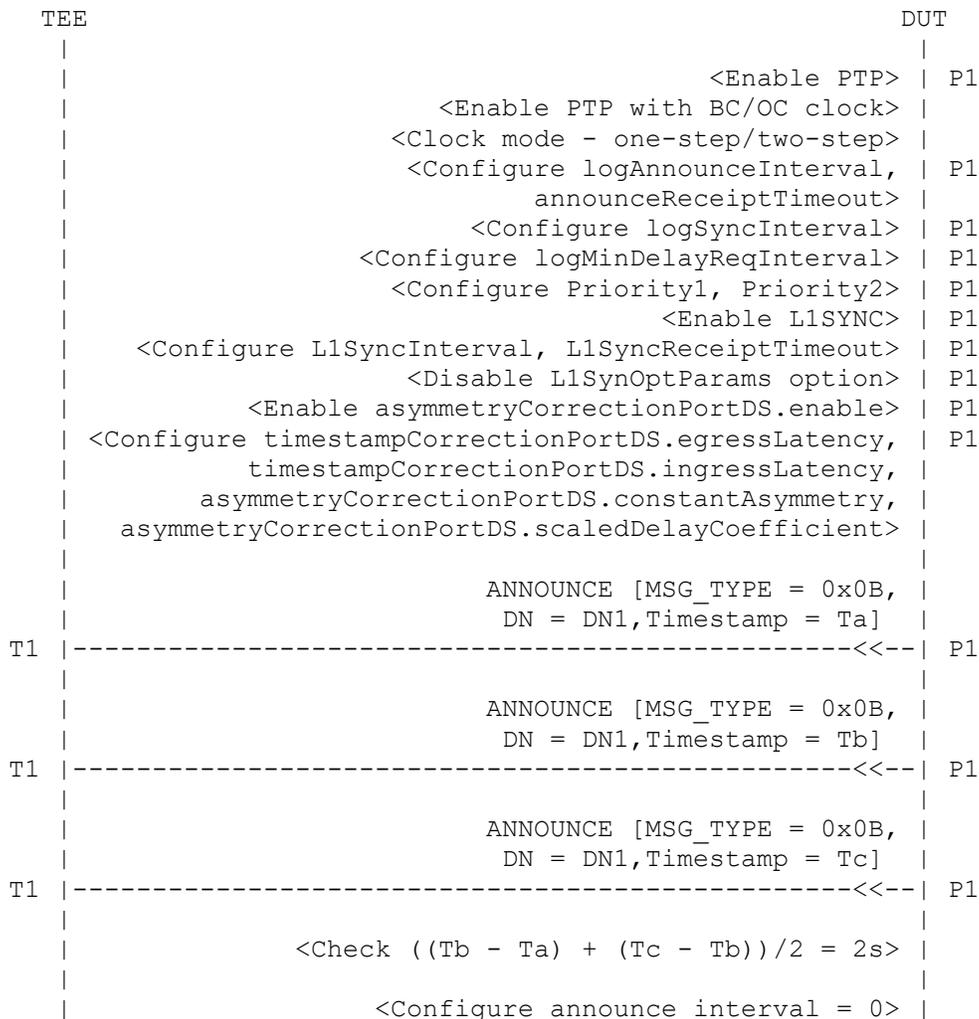


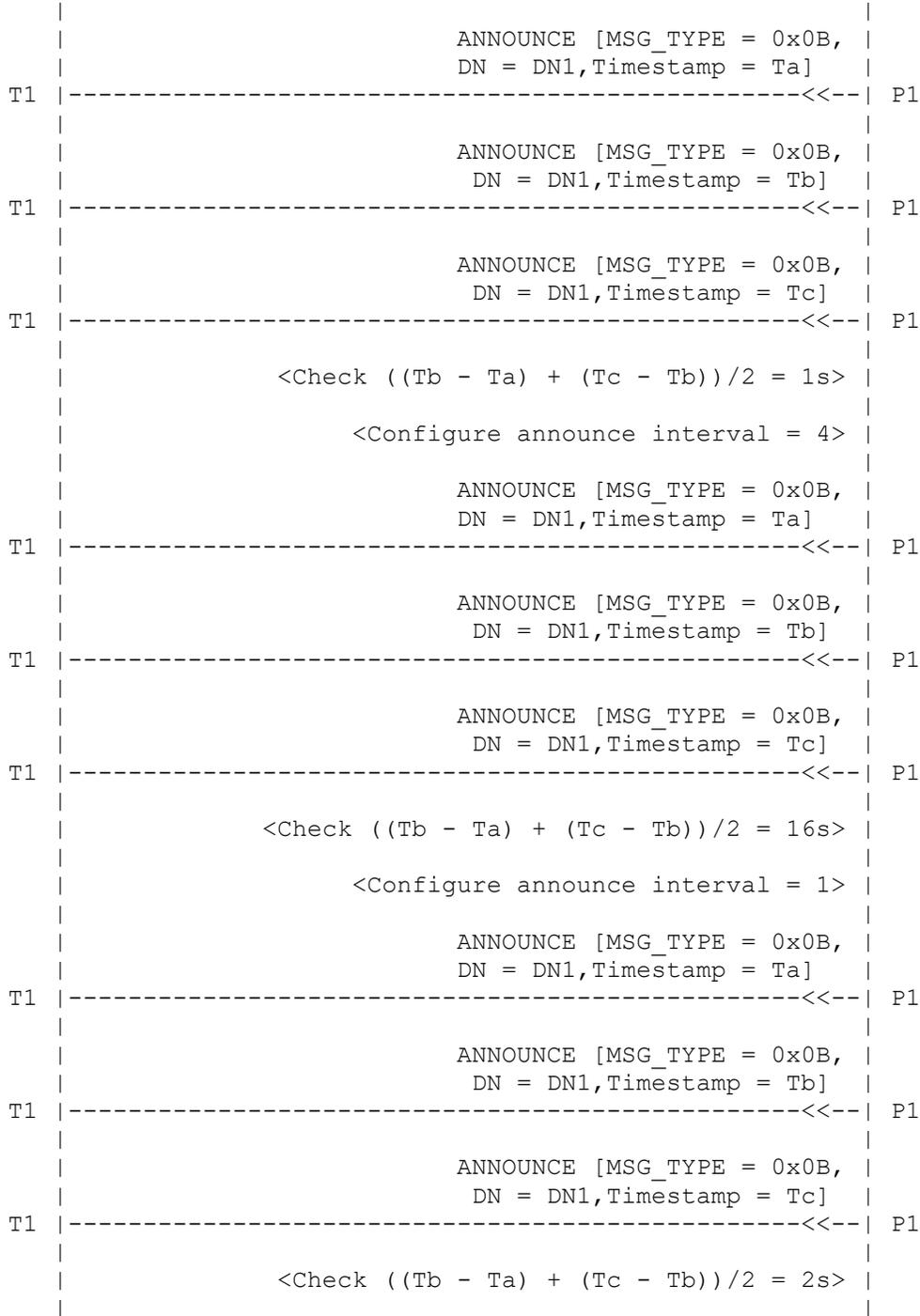


Legends:

- 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 :





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 $((T_b - T_a) + (T_c - T_b))/2 = 16s$

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 T_a , T_b and T_c for messages respectively.

```

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

Step 13: Verify whether $((T_b - T_a) + (T_c - T_b))/2 = 2s$

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)

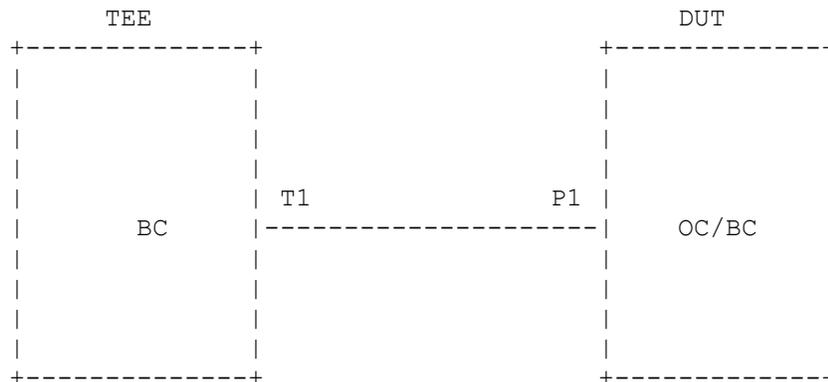
Title          : logSyncInterval

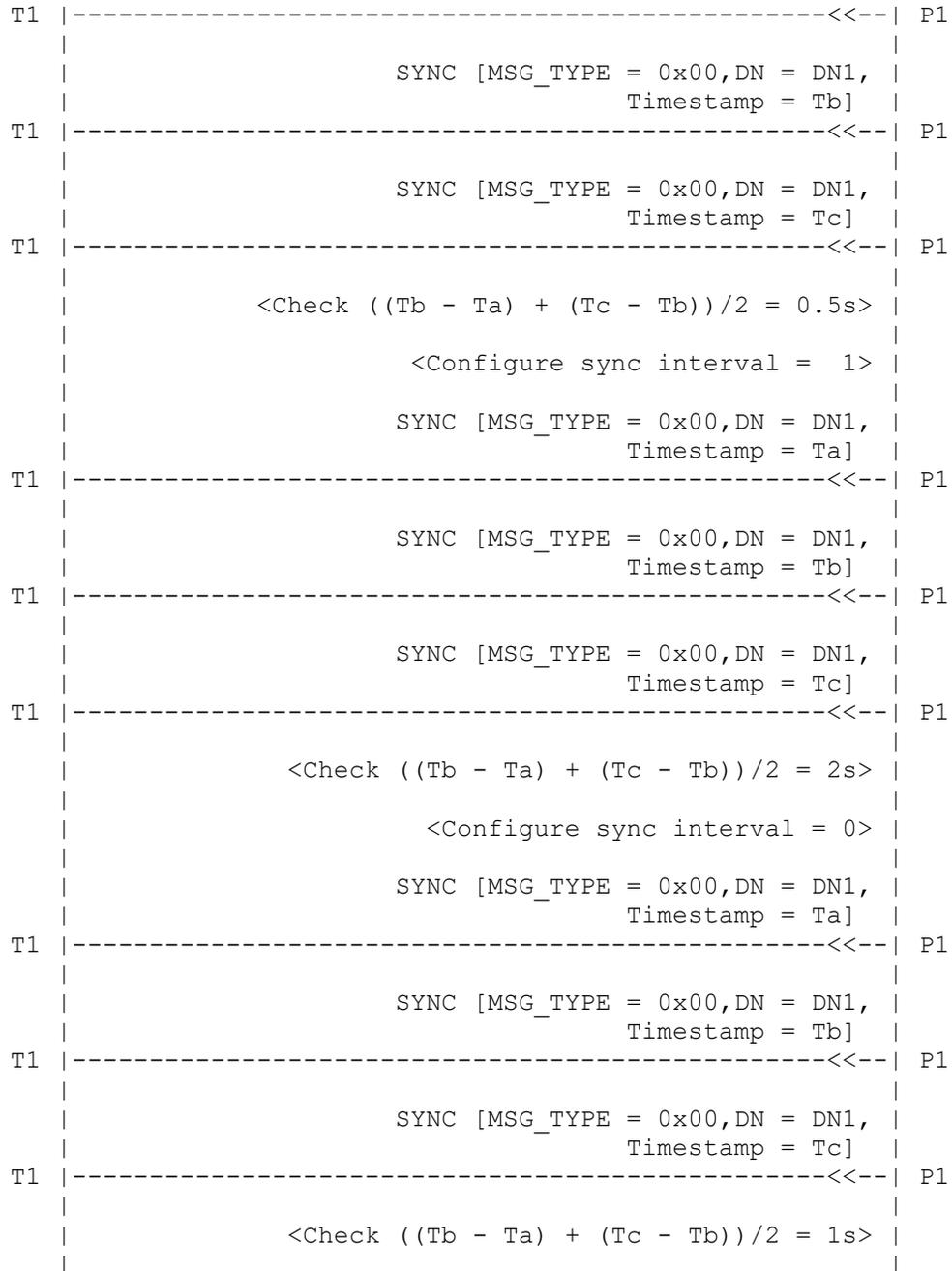
Purpose        : To verify that a PTP enabled device transmits Sync
                messages at configured logSyncInterval (allowable
                range: -1 to +1).

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





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 $((T_b - T_a) + (T_c - T_b))/2 = 1s$

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 $((T_b - T_a) + (T_c - T_b))/2 = 0.5s$

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 $((T_b - T_a) + (T_c - T_b))/2 = 2s$

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 $((T_b - T_a) + (T_c - T_b))/2 = 1s$

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
	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

$$\langle \text{Check } ((T_b - T_a) + (T_c - T_b)) / 2 \leq 2s \rangle$$

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 $((T_b - T_a) + (T_c - T_b))/2 \leq 2s$

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 $((T_b - T_a) + (T_c - T_b))/2 \leq 64s$

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 $((T_b - T_a) + (T_c - T_b))/2 \leq 4s$

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 $((Tb - Ta) + (Tc - Tb))/2 \leq 4s$

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)
    
```

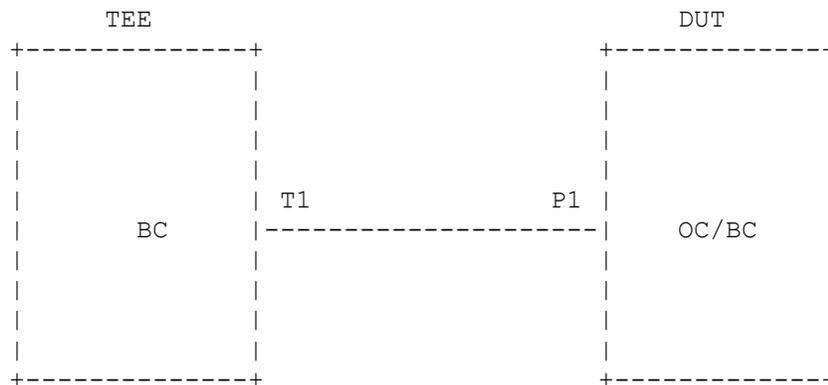
Title : announceReceiptTimeout

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



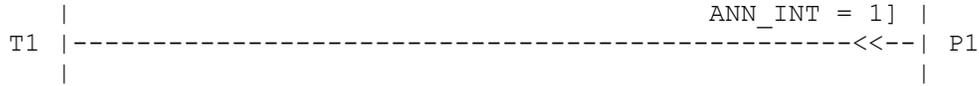
Legends:

```

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,



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)

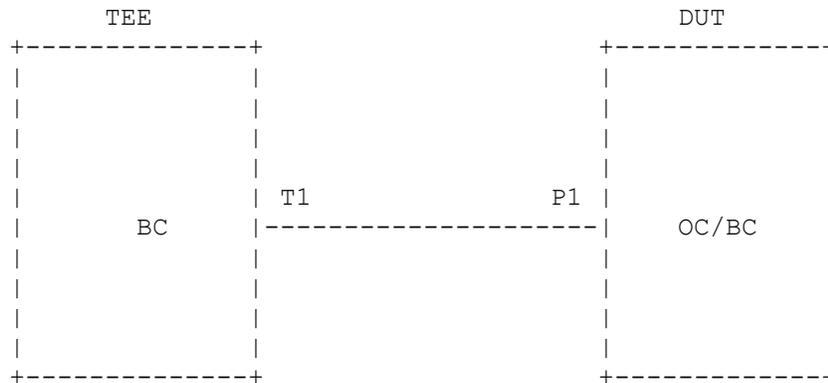
Title : logMinpdelayRequestInterval

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

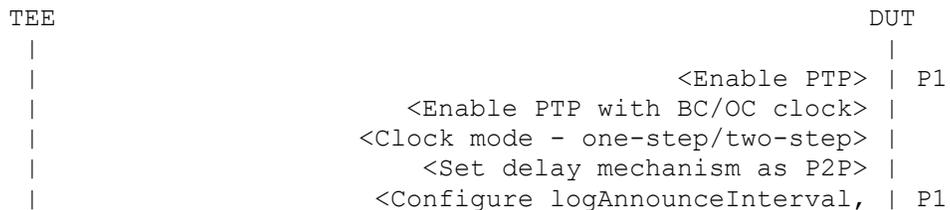
Topology



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

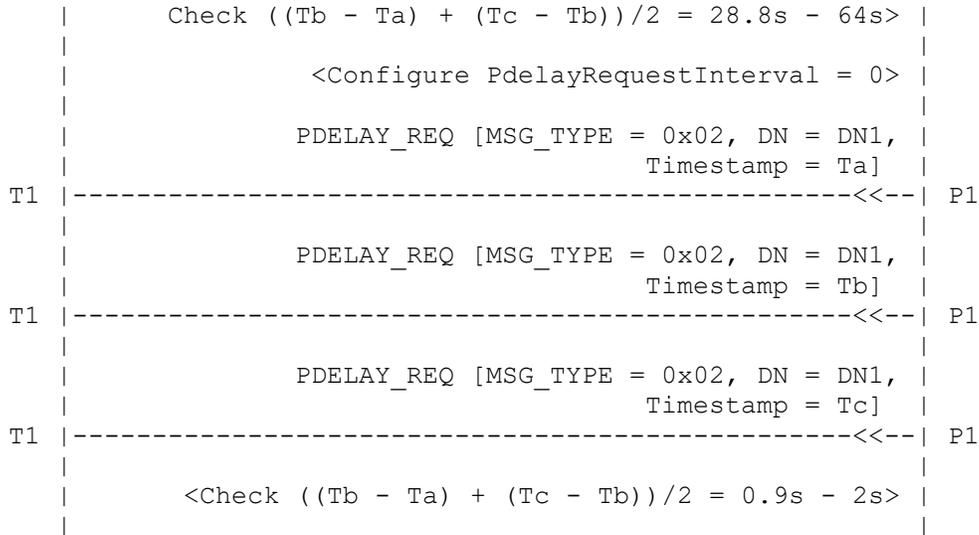
Ladder Diagram :



```

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

```



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 $((T_b - T_a) + (T_c - T_b))/2 = 0.9$ 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 $((T_b - T_a) + (T_c - T_b))/2 = 3.6s$ 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 $((T_b - T_a) + (T_c - T_b))/2 = 28.8s$ 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 $((T_b - T_a) + (T_c - T_b))/2 = 0.9s$ 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)
```

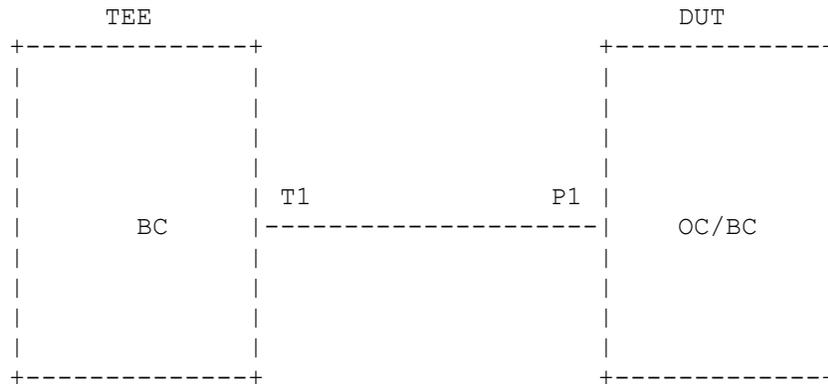
Title : logL1SyncInterval

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 0.4.6 Page 443

Conformance Type : SHALL

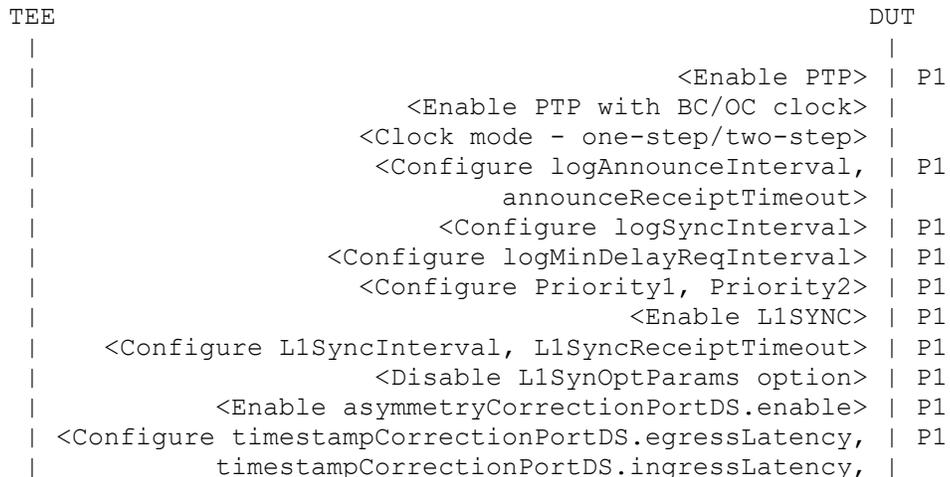
Topology

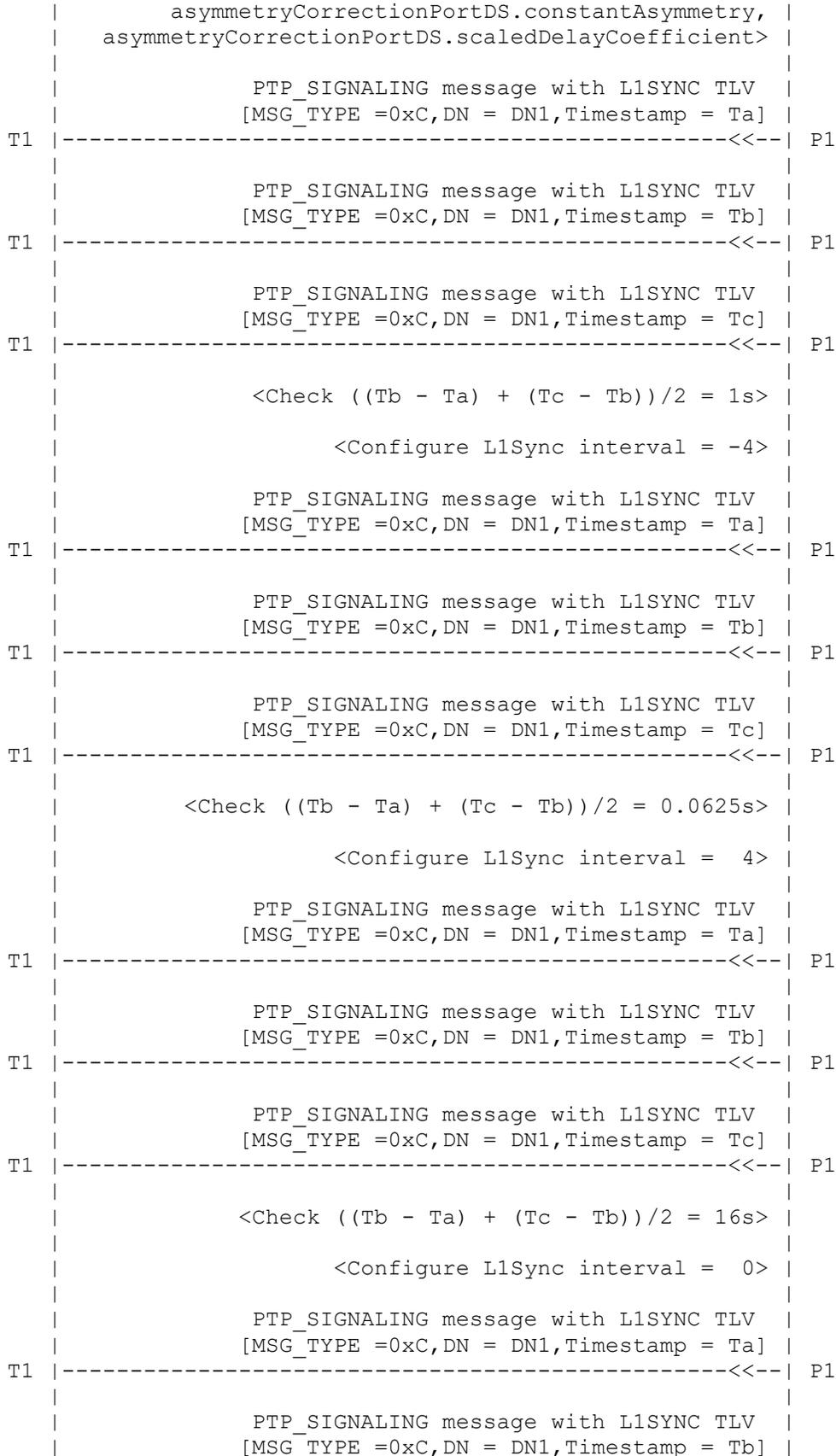


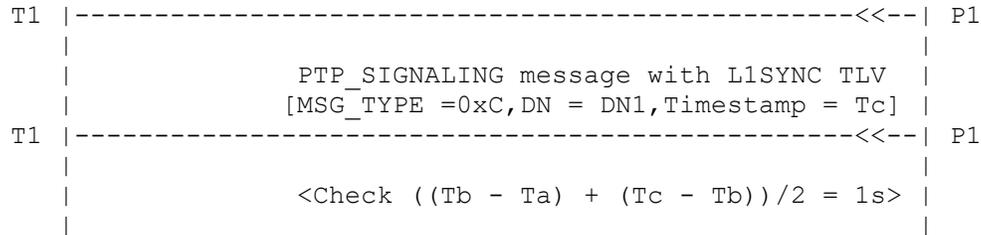
Legends:

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 :







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 $((T_b - T_a) + (T_c - T_b))/2 = 1s$

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 T_a , T_b and T_c for messages respectively.

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

Step 7 : Check whether $((T_b - T_a) + (T_c - T_b))/2 = 0.0625s$

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 T_a , T_b and T_c for messages respectively.

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

Step 10: Check whether $((T_b - T_a) + (T_c - T_b))/2 = 16s$

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 T_a , T_b and T_c for messages respectively.

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

Step 13: Check whether $((T_b - T_a) + (T_c - T_b))/2 = 1s$

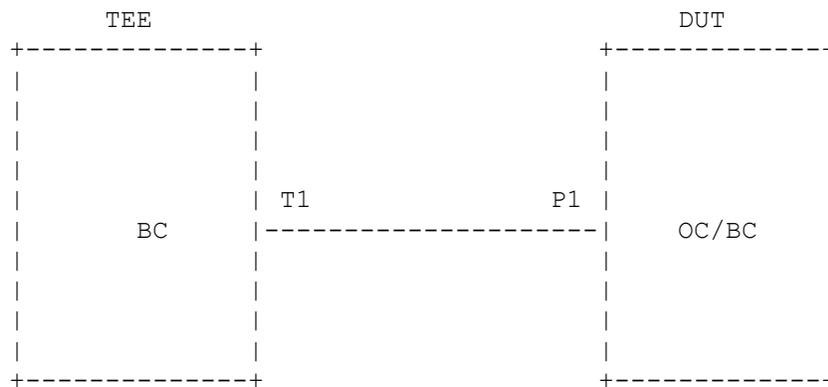
6.9. tc_conf_ptp-ha_pcg_009

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

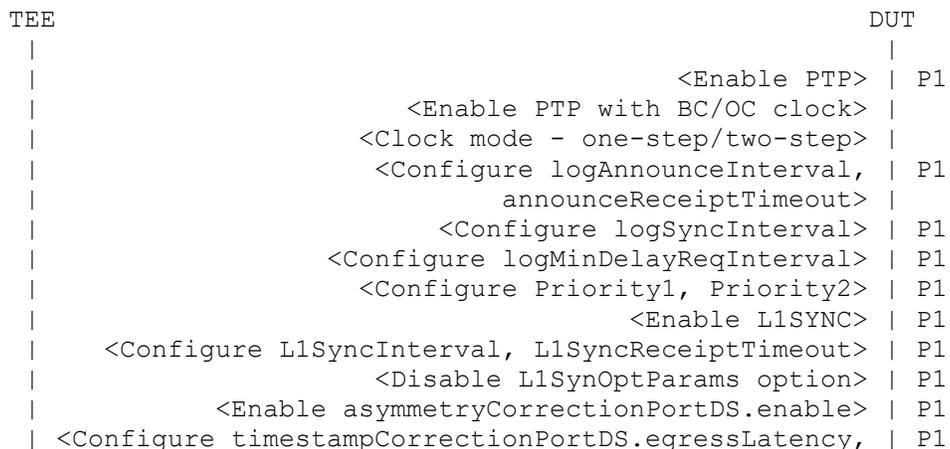
Topology



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 :

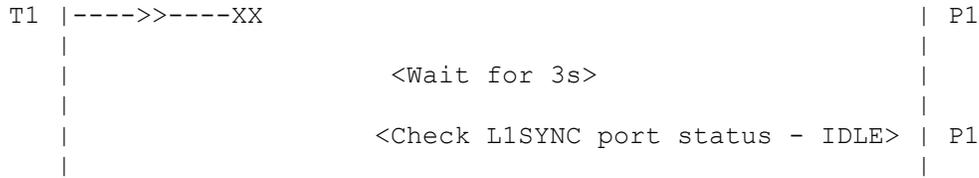


```

|         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> |
|
|         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> |
|
| 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> |
|
|         <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> |
|
| PTP SIGNALING with L1 Sync TLV |
| [MSG_TYPE = 0xC, DN = DN1, |
| TLV_TYPE=0x8001, TCR = 0, |

```

T1	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]	



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 SIGNALING 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.

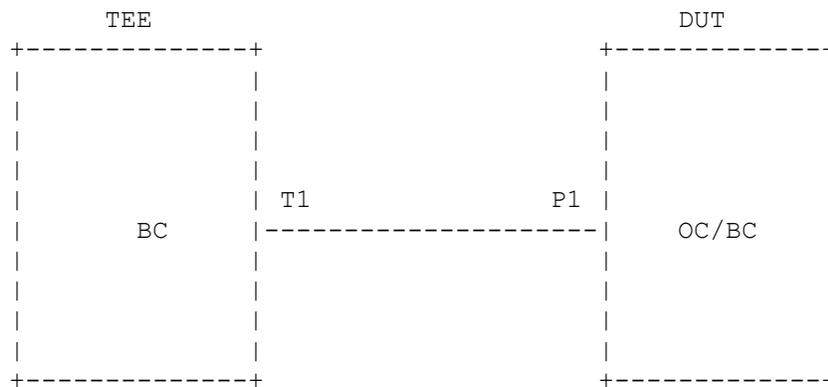
6.10. tc_conf_ptp-ha_pcg_012

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

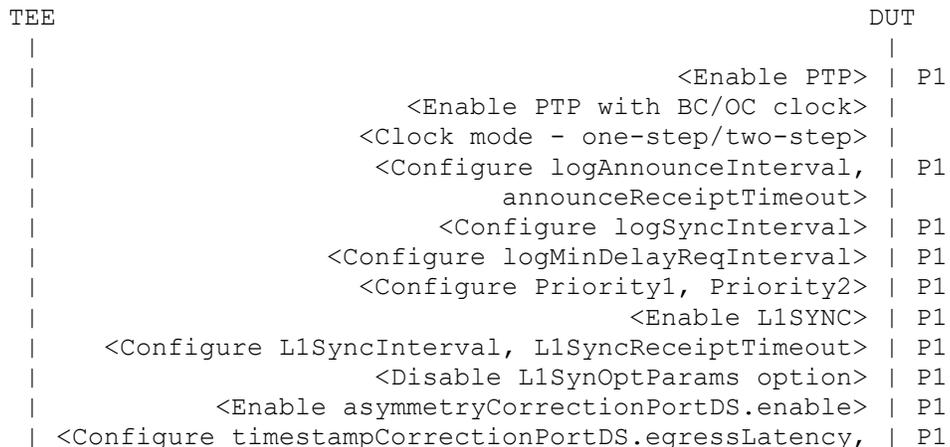
Topology



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 :



	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)

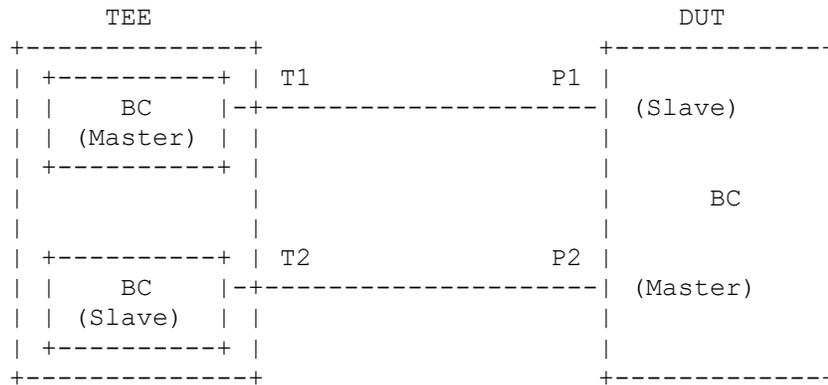
Title          : No-updation of data set based on Announce message when
                portstate is masterOnly

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



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, announceReceiptTimeout> P1
	<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, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry, asymmetryCorrectionPortDS.scaledDelayCoefficient> P1
	<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)

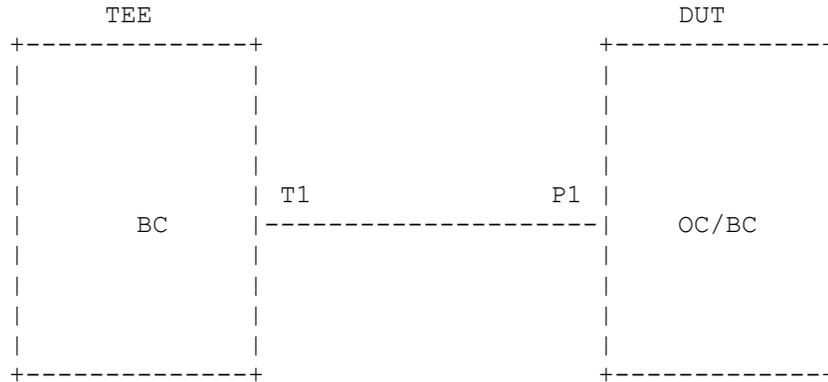
Title           : timestampCorrectionPortDS.egressLatency

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

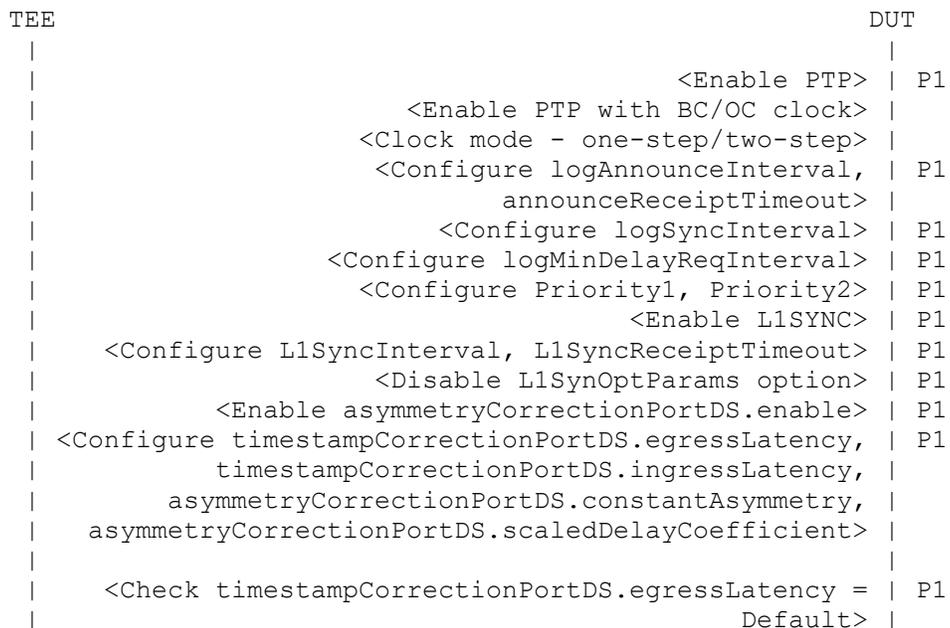
Topology



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 :



!<Configure timestampCorrectionPortDS.egressLatency value to -2^{64} >	P1
<Check timestampCorrectionPortDS.egressLatency = Default or zero>	P1
<Configure timestampCorrectionPortDS.egressLatency value to -2^{63} >	P1
<Check timestampCorrectionPortDS.egressLatency = -2^{63} >	P1
!<Configure timestampCorrectionPortDS.egressLatency value to 2^{63} >	P1
<Check timestampCorrectionPortDS.egressLatency = -2^{63} or zero>	P1
<Configure timestampCorrectionPortDS.egressLatency value to $2^{63}-1$ >	P1
<Check timestampCorrectionPortDS.egressLatency = $2^{63}-1$ >	P1
<Configure timestampCorrectionPortDS.egressLatency value to Default>	P1
<Check timestampCorrectionPortDS.egressLatency = Default>	P1

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.

<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, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry, asymmetryCorrectionPortDS.scaledDelayCoefficient>	P1
<Check timestampCorrectionPortDS.ingressLatency = Default>	P1
!<Configure timestampCorrectionPortDS.ingressLatency value to -2^64>	P1
<Check timestampCorrectionPortDS.ingressLatency = Default or zero>	P1
<Configure timestampCorrectionPortDS.ingressLatency value to -2^63>	P1
<Check timestampCorrectionPortDS.ingressLatency = -2^63>	P1
!<Configure timestampCorrectionPortDS.ingressLatency value to 2^63>	P1
<Check timestampCorrectionPortDS.ingressLatency = -2^63 or zero>	P1
<Configure timestampCorrectionPortDS.ingressLatency value to 2^63-1>	P1
<Check timestampCorrectionPortDS.ingressLatency = 2^63-1>	P1
<Configure timestampCorrectionPortDS.ingressLatency value to Default>	P1
<Check timestampCorrectionPortDS.ingressLatency = Default>	P1

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)

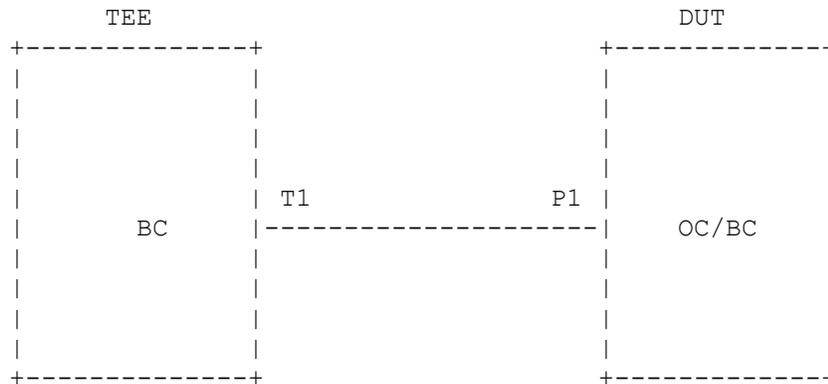
Title : asymmetryCorrectionPortDS.constantAsymmetry

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



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 :



		<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)

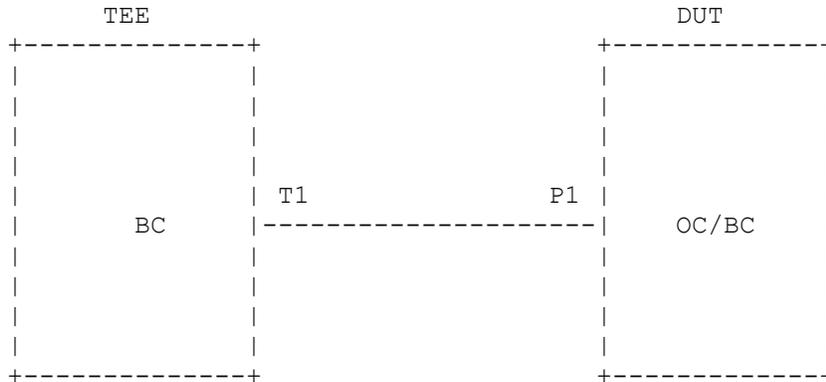
Title : asymmetryCorrectionPortDS.scaledDelayCoefficient

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

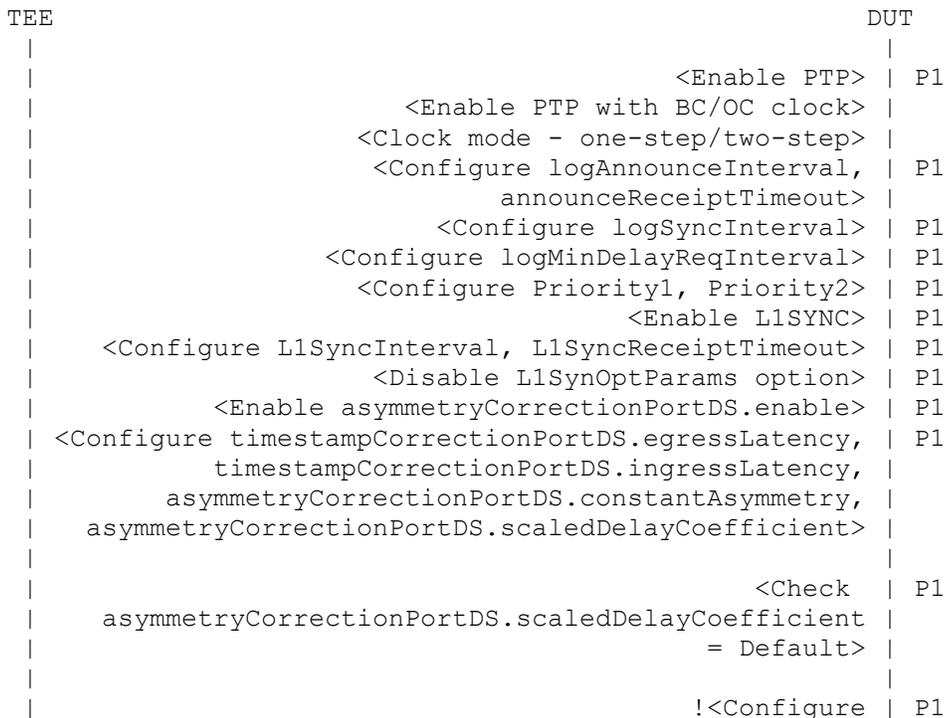
Topology



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 :



	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

- Step 11: Check whether scaledDelayCoefficient on port P1 is 1.999999999999999978315957 (i.e., asymmetryCorrectionPortDS.scaledDelayCoefficient = 2⁶³-1 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)

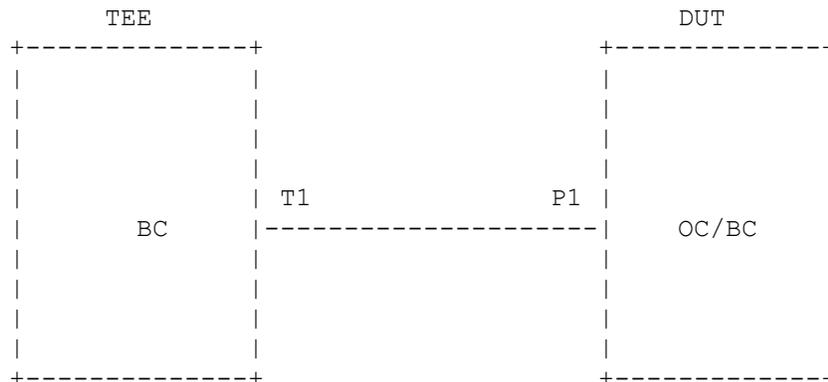
Title : externalPortConfigurationPortDS.desiredState - Port state remains in MASTER state

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

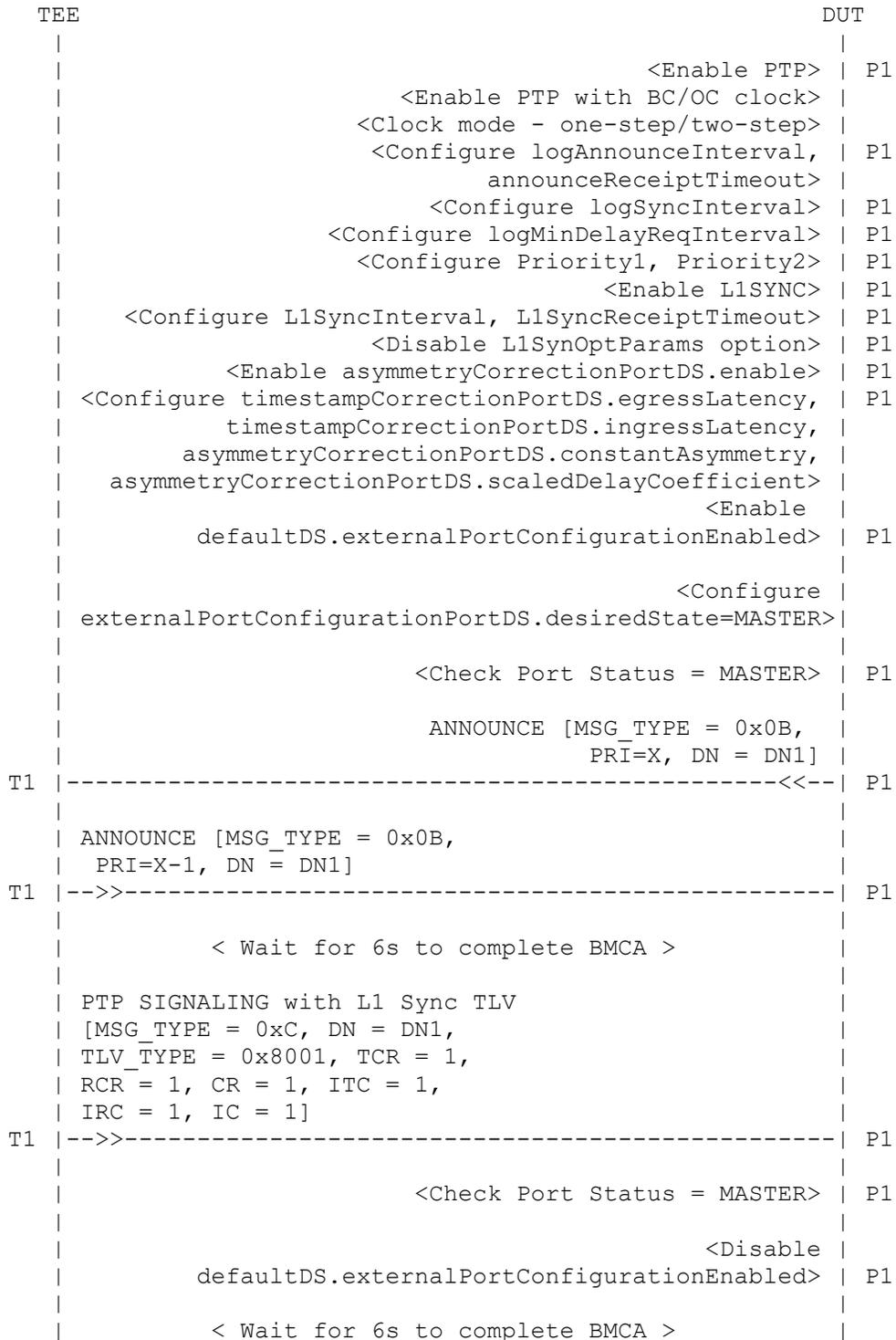


Legends:

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 :



```
|  
| <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
```

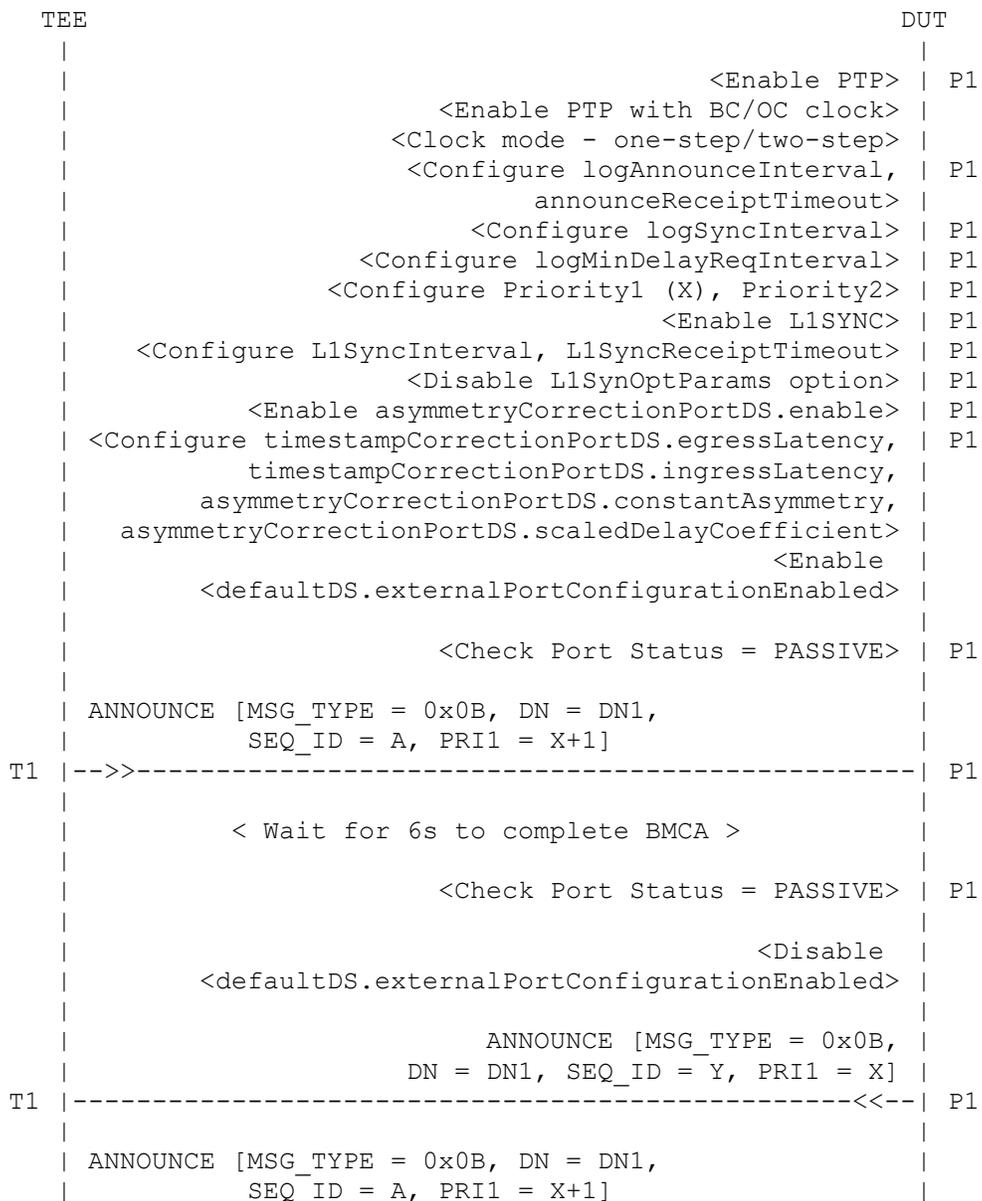
Step 6: Wait for 6s for completing BMCA.

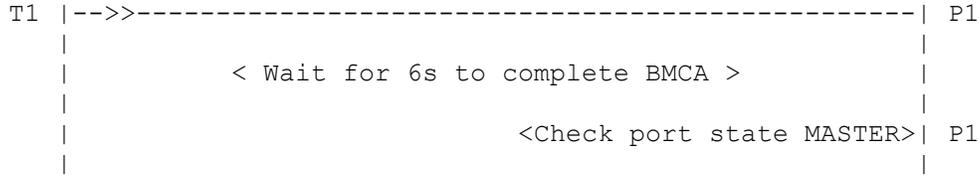


Legends:

- 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 :





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.



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 :




```
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)

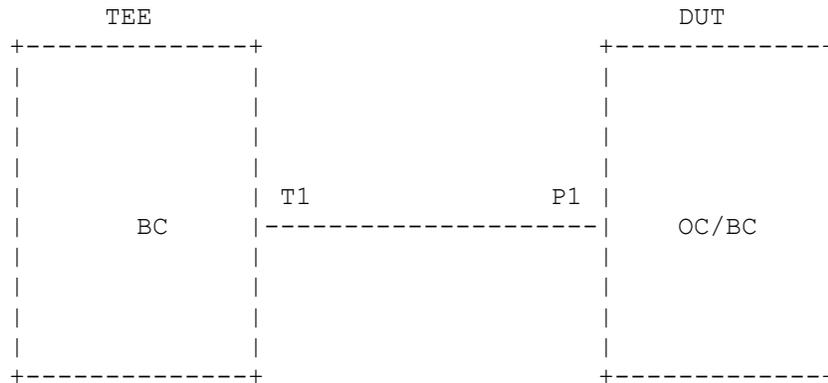
Title : External Configuration: portDS.portState is LISTENING

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

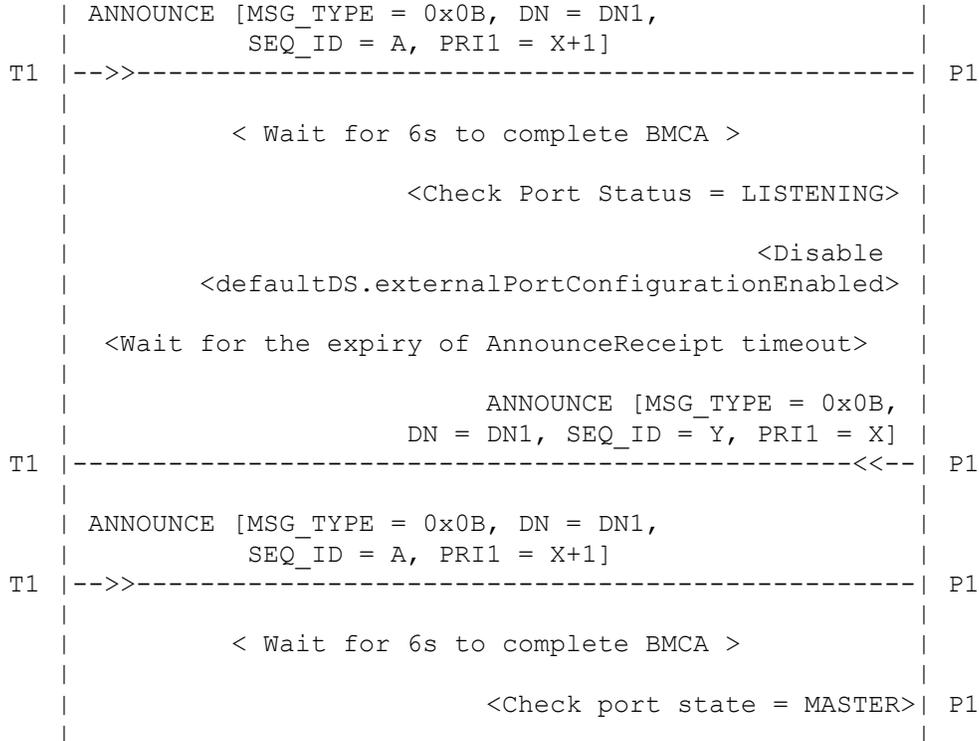


Legends:

- 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 :





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)

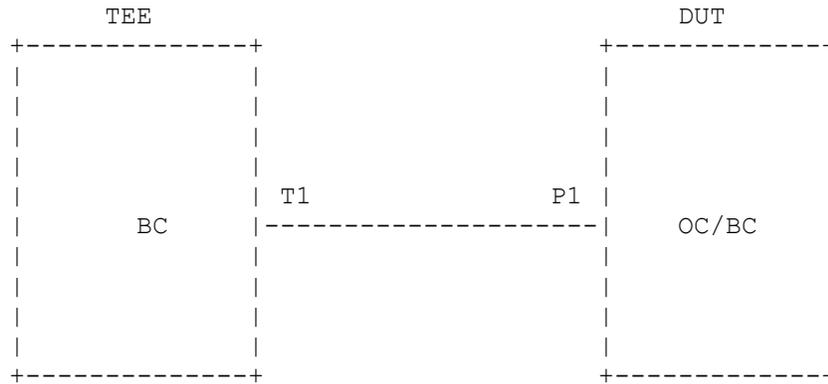
Title : External Configuration: portDS.portState is UNCALIBRATED

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

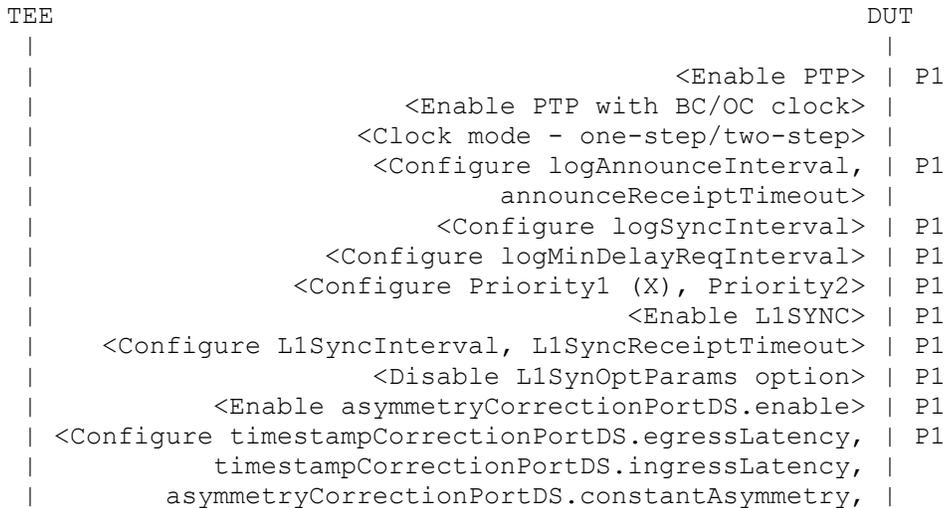
Topology



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 :



```

|   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

- viii. L1SyncReceiptTimeout. 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)

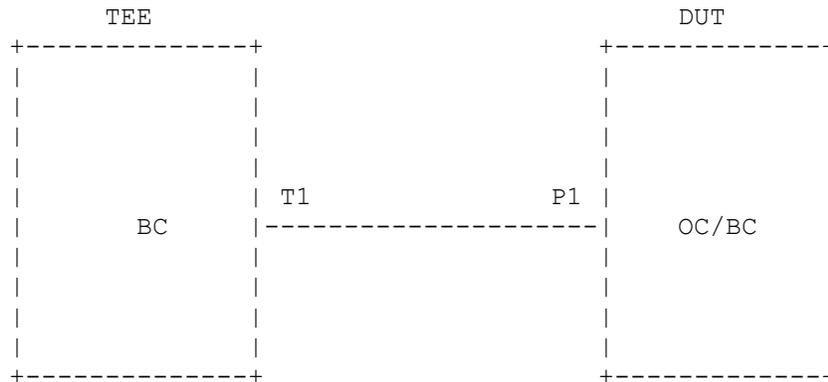
Title : External Configuration: portDS.portState is PRE-MASTER

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

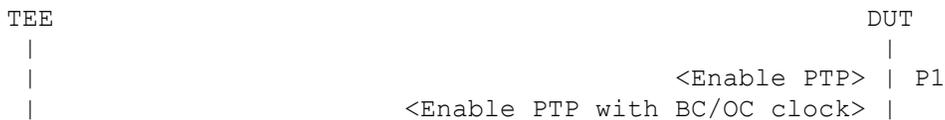
Topology



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 :



	<code><Clock mode - one-step/two-step></code>	
	<code><Configure logAnnounceInterval, announceReceiptTimeout></code>	P1
	<code><Configure logSyncInterval></code>	P1
	<code><Configure logMinDelayReqInterval></code>	P1
	<code><Configure Priority1 (X), Priority2></code>	P1
	<code><Enable L1SYNC></code>	P1
	<code><Configure L1SyncInterval, L1SyncReceiptTimeout></code>	P1
	<code><Disable L1SynOptParams option></code>	P1
	<code><Enable asymmetryCorrectionPortDS.enable></code>	P1
	<code><Configure timestampCorrectionPortDS.egressLatency, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry, asymmetryCorrectionPortDS.scaledDelayCoefficient></code>	P1
	<code><Enable
<defaultDS.externalPortConfigurationEnabled></code>	
	<code><Configure
externalPortConfigurationPortDS.desiredState=
PRE_MASTER></code>	
	<code><Check Port Status = PRE_MASTER></code>	P1
	<code>ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1, SEQ_ID = A, PRI1 = X+1]</code>	
T1	----->>>	P1
	<code>< Wait for 6s to complete BMCA ></code>	
	<code><Check Port Status = PRE_MASTER></code>	P1
	<code><Disable
<defaultDS.externalPortConfigurationEnabled></code>	
	<code><Wait for the expiry of
qualificationTimeoutInterval></code>	
	<code>ANNOUNCE [MSG_TYPE = 0x0B,
DN = DN1, SEQ_ID = Y, PRI1 = X]</code>	
T1	-----<<<	P1
	<code>ANNOUNCE [MSG_TYPE = 0x0B, DN = DN1, SEQ_ID = A, PRI1 = X+1]</code>	
T1	----->>>	P1
	<code>< Wait for 6s to complete BMCA ></code>	
	<code><Check port state = MASTER></code>	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)

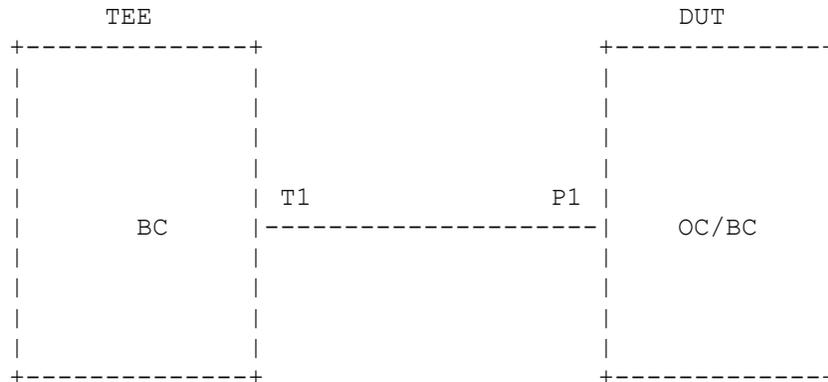
Title          : External Configuration: portDS.portState is FAULTY

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

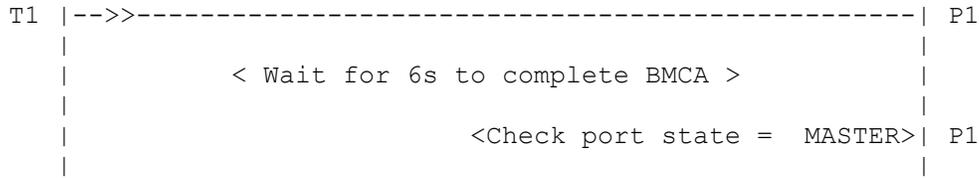


Legends:

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 :





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)

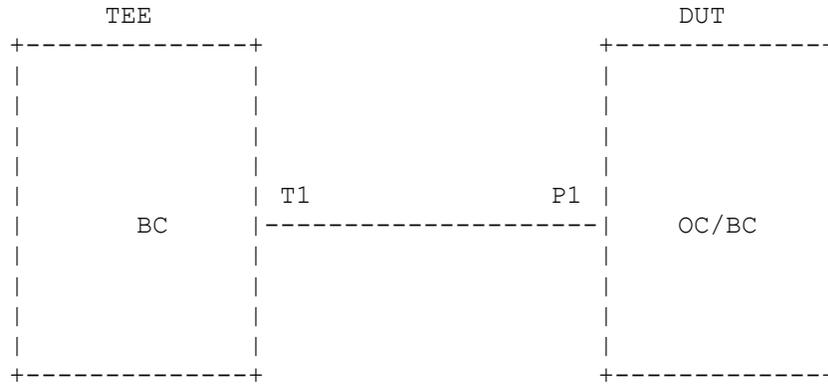
Title : portDS.portState remains in passive state - expiry of Announcereceipttimeout

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

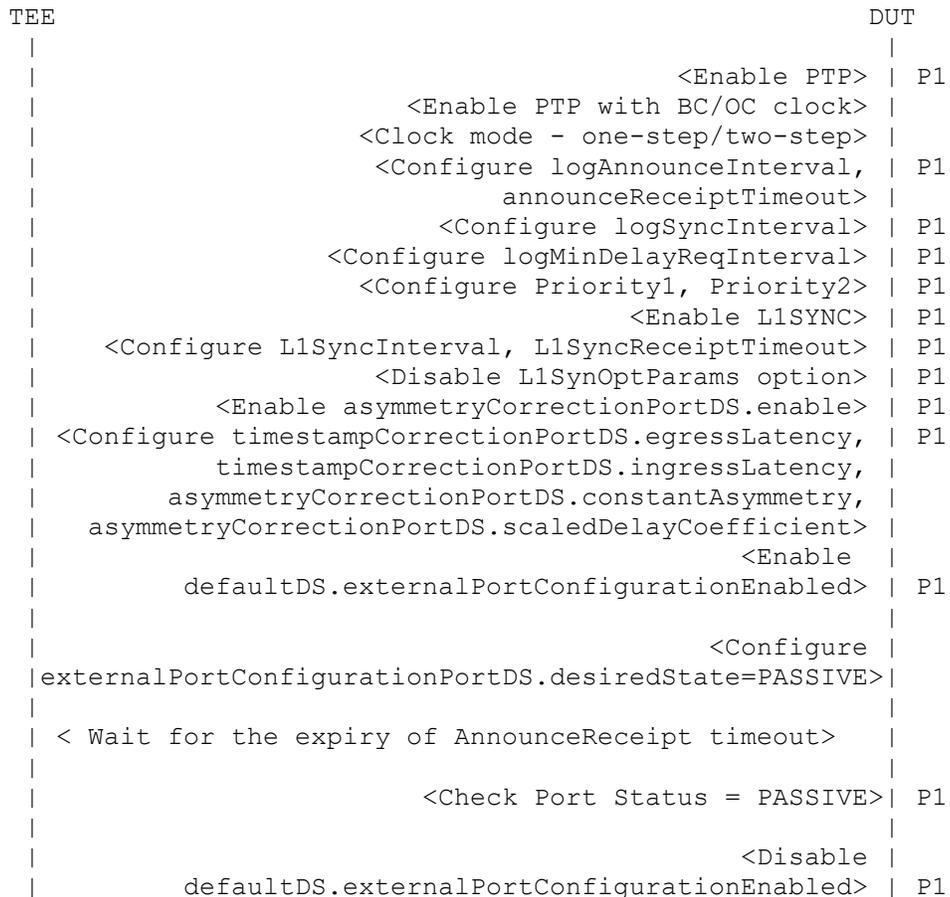
Topology



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 :



```
|  
| < 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)

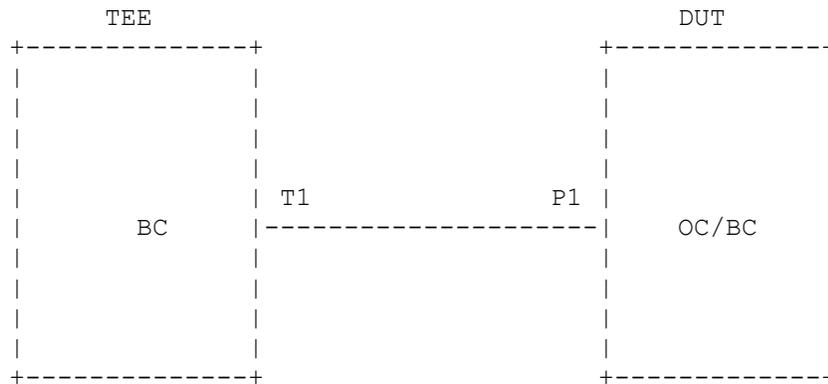
Title : portDS.portState remains in slave state - expiry of Announcereceipttimeout

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



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 :



		<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.

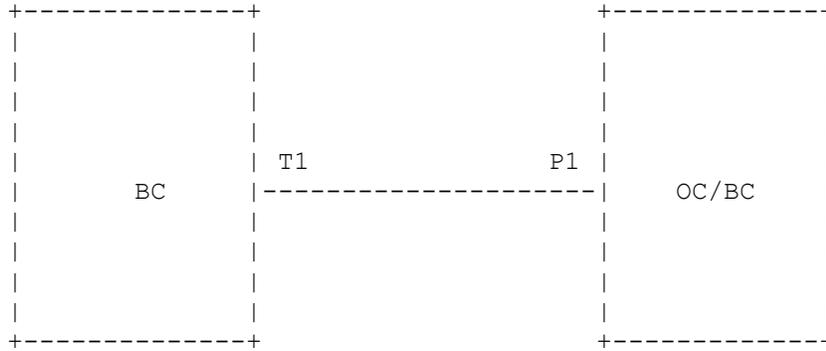
Reference : P1588/D1.3, February 2018 V3.01 Clause 17.6.5.3 Page 355

Conformance Type : SHALL

Topology

TEE

DUT



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 :



```
|  
| < 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)

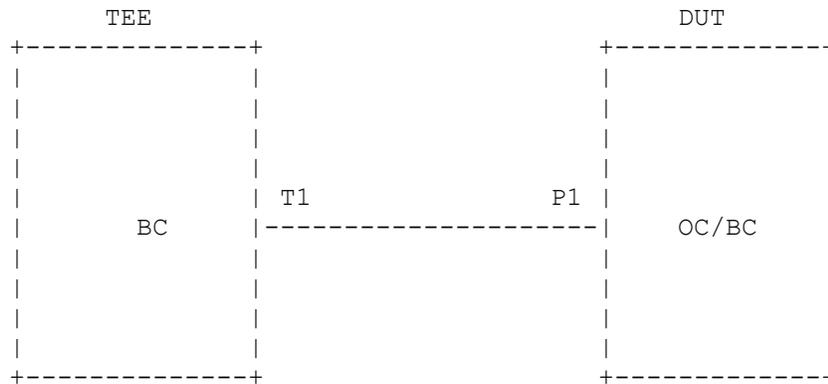
Title : portDS.portState remains in listening - expiry of Announcereceipttimeout

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



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

	P1
<Enable PTP>	
<Enable PTP with BC/OC clock>	
<Clock mode - one-step/two-step>	
<Configure logAnnounceInterval, announceReceiptTimeout>	P1
<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, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry, asymmetryCorrectionPortDS.scaledDelayCoefficient>	P1
<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)

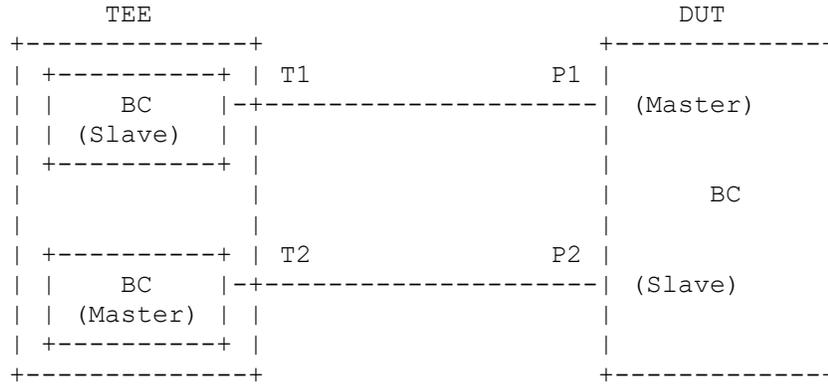
Title : Data set updation based on Announce message
portDS.portState is in UNCALIBRATED

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

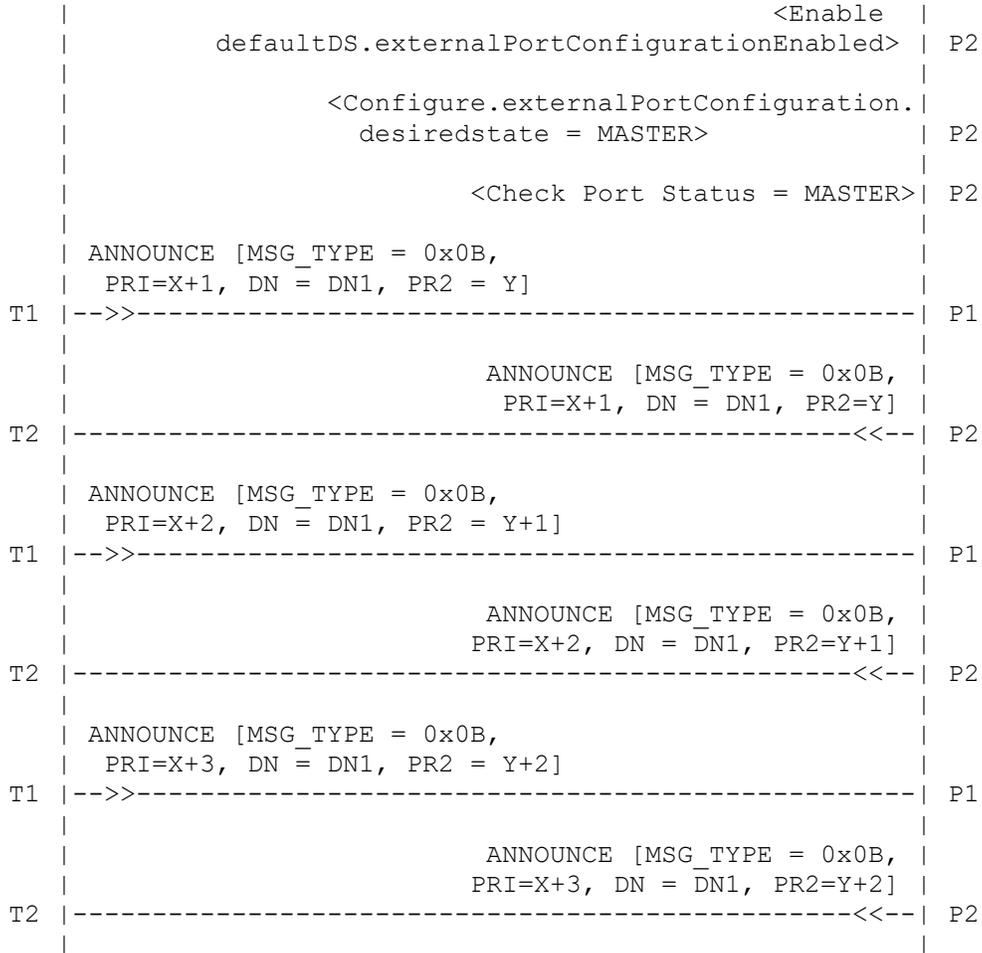


Legends:

- 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 :





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
```


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)

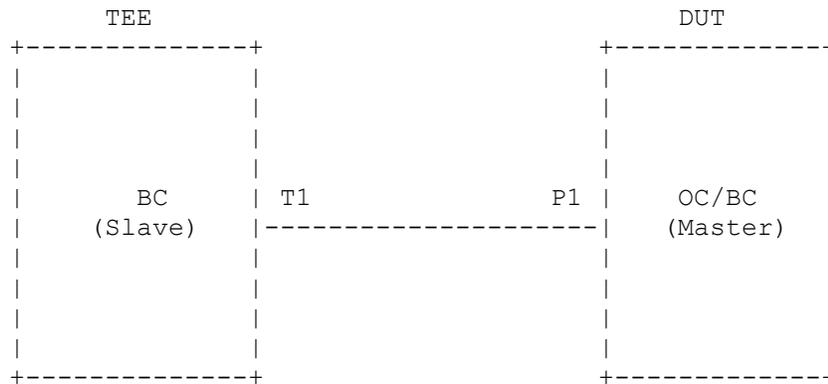
Title : slaveOnly is FALSE when defaultDS.
 externalPortConfigurationEnabled is TRUE.

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



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 :



```

|                                     <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)

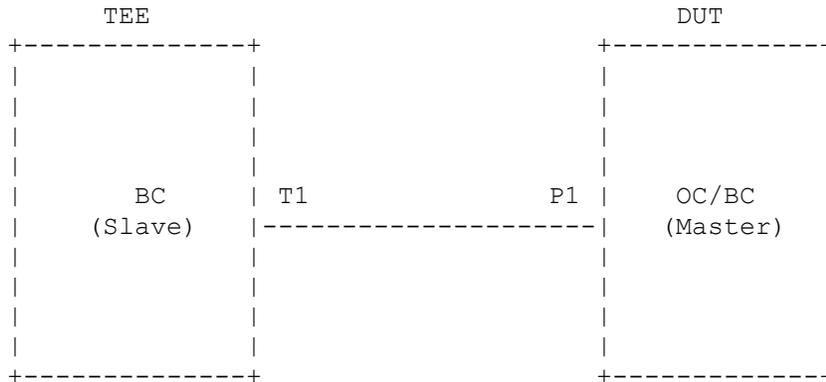
Title : masterOnly is FALSE when defaultDS.externalPortConfigurationEnabled is TRUE.

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

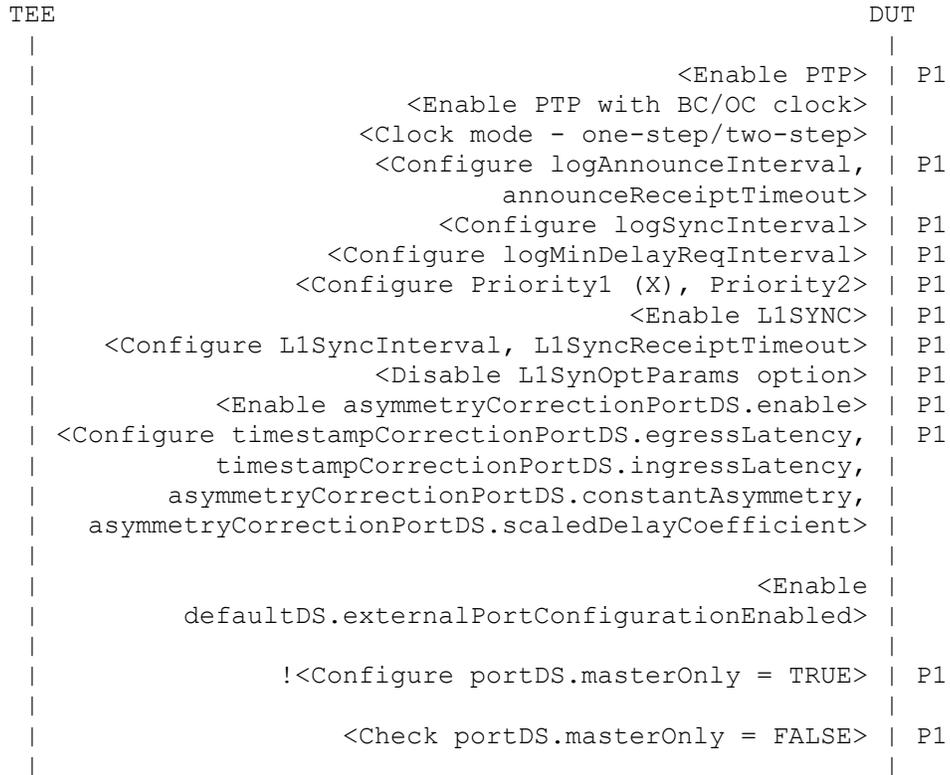


Legends:

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 :



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

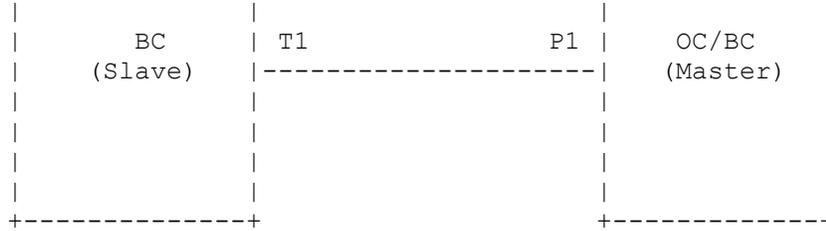
Purpose : To verify that a PTP enabled device remains in SLAVE state by setting externalPortConfigurationPortDS.desiredState to SLAVE, even if fault condition occur. (This test is applicable only if Peer to Peer Delay mechanism is supported.)

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

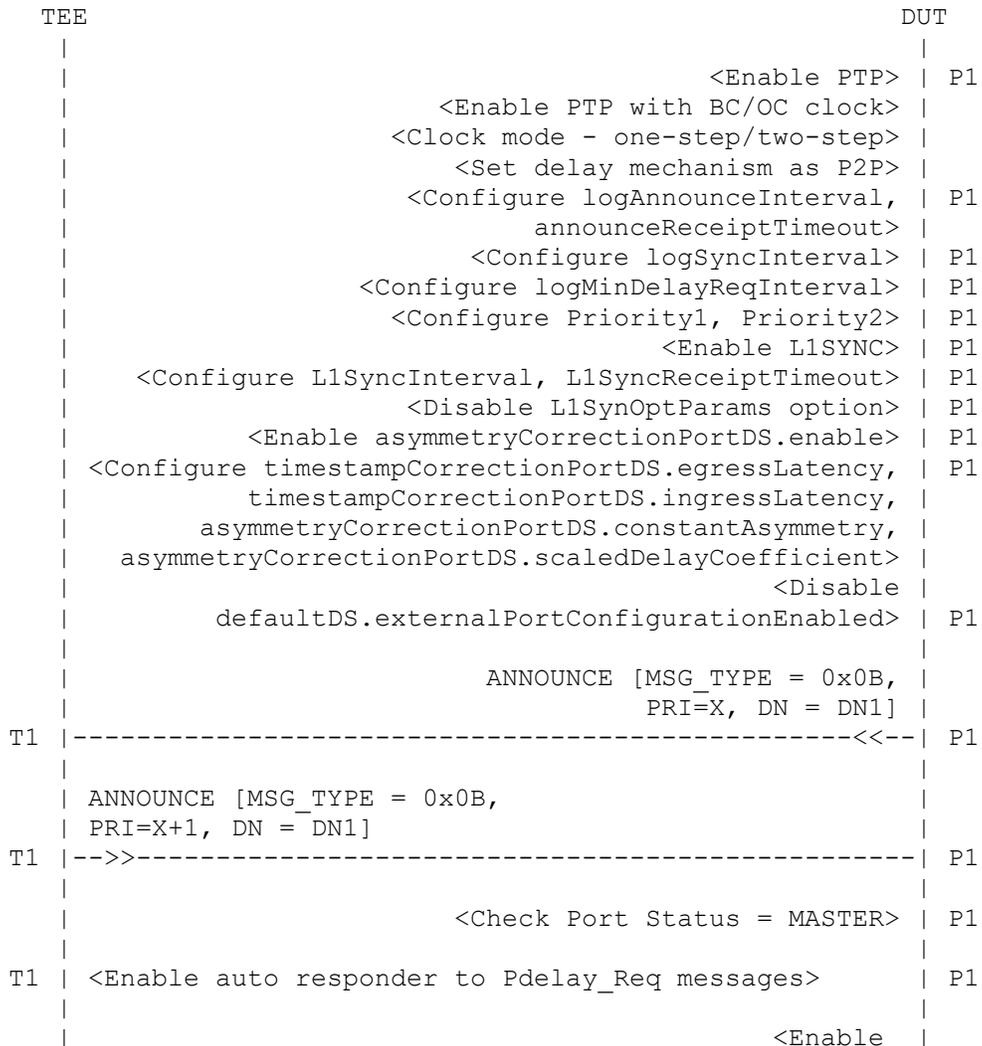




Legends:

- 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 :



```

|         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)

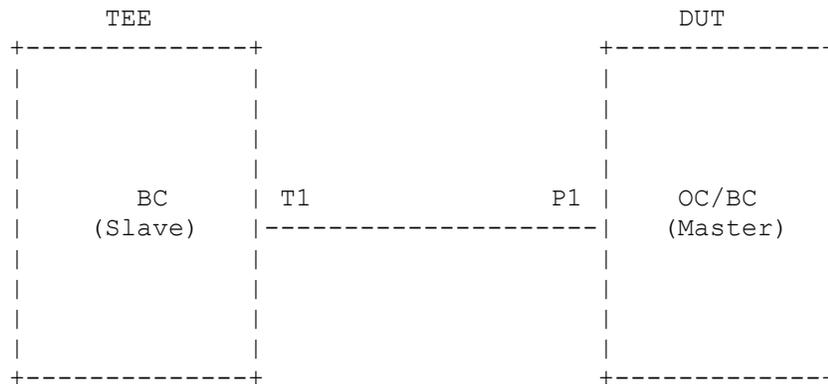
Title               : portDS.portState remains in PASSIVE state

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




```

| 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)

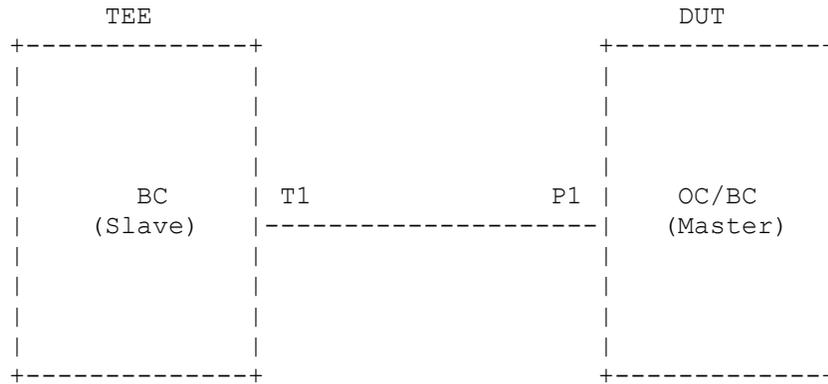
Title : portDS.portState remains in LISTENING state

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



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)

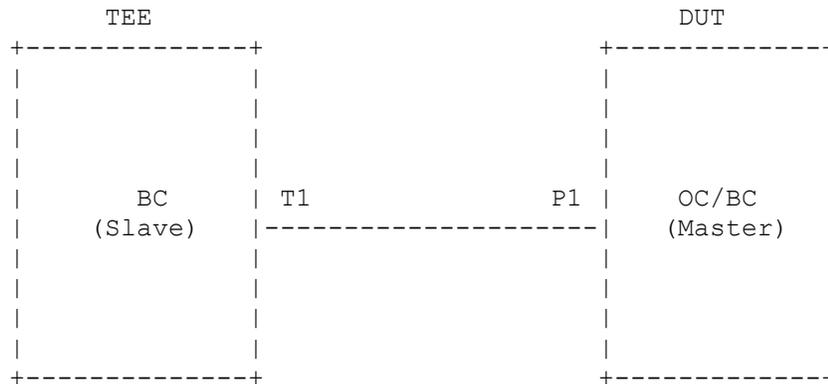
Title : portDS.portState remains in UNCALIBRATED

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

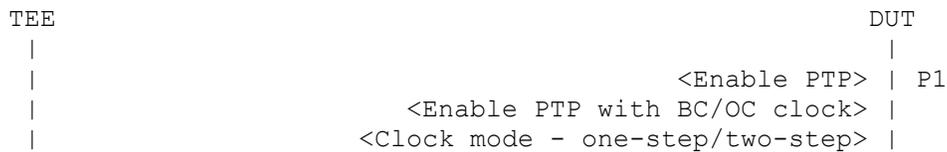
Topology



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

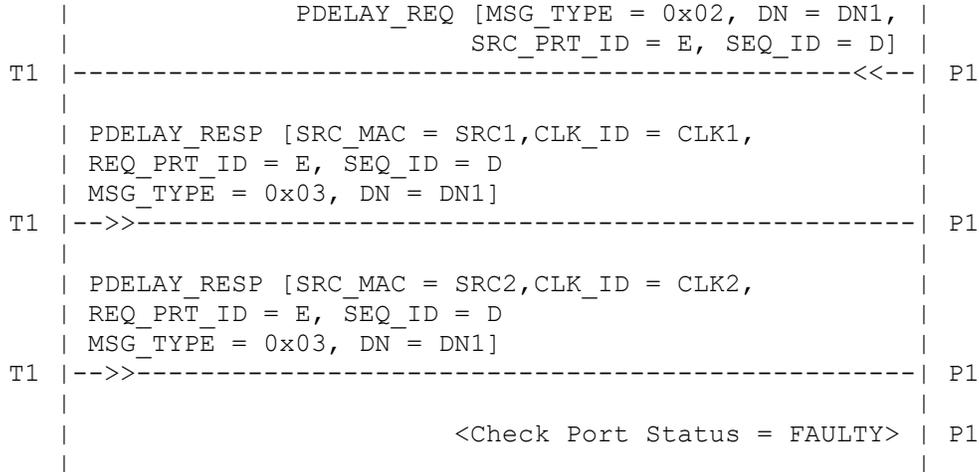
Ladder Diagram :



```

|         <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

```



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)

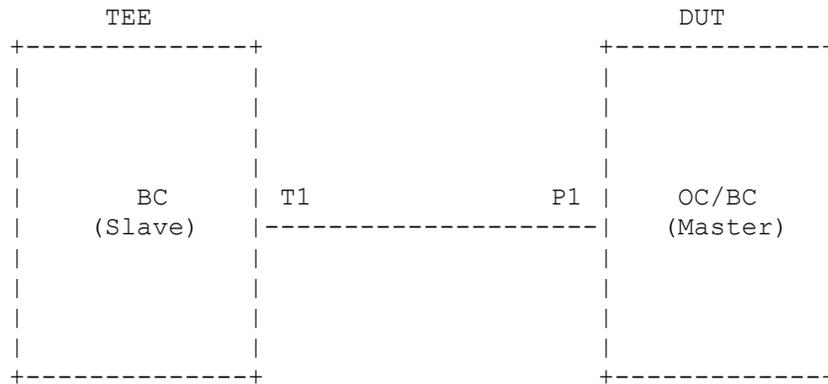
Title : portDS.portState remains in PRE-MASTER

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

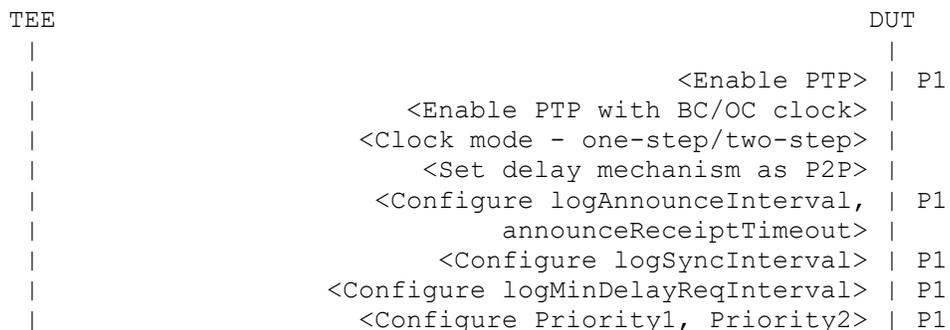
Topology



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 :



	<Enable L1SYNC>	P1
	<Configure L1SyncInterval, L1SyncReceiptTimeout>	P1
	<Disable L1SynOptParams option>	P1
	<Enable asymmetryCorrectionPortDS.enable>	P1
	<Configure timestampCorrectionPortDS.egressLatency, timestampCorrectionPortDS.ingressLatency, asymmetryCorrectionPortDS.constantAsymmetry, asymmetryCorrectionPortDS.scaledDelayCoefficient>	P1
	<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]	

(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

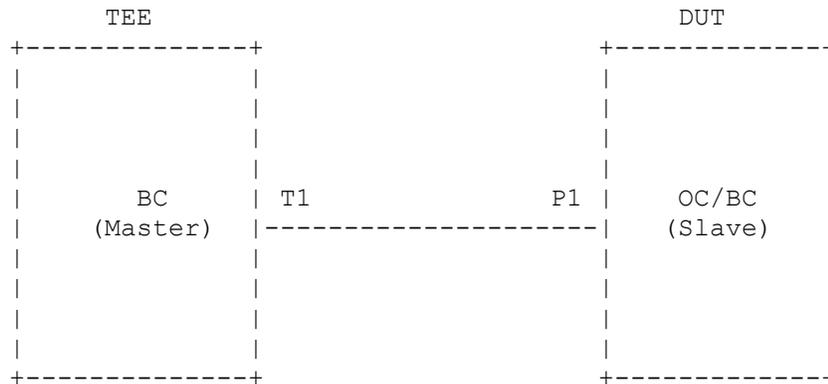
Purpose : To verify that a PTP enabled device remains in MASTER

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

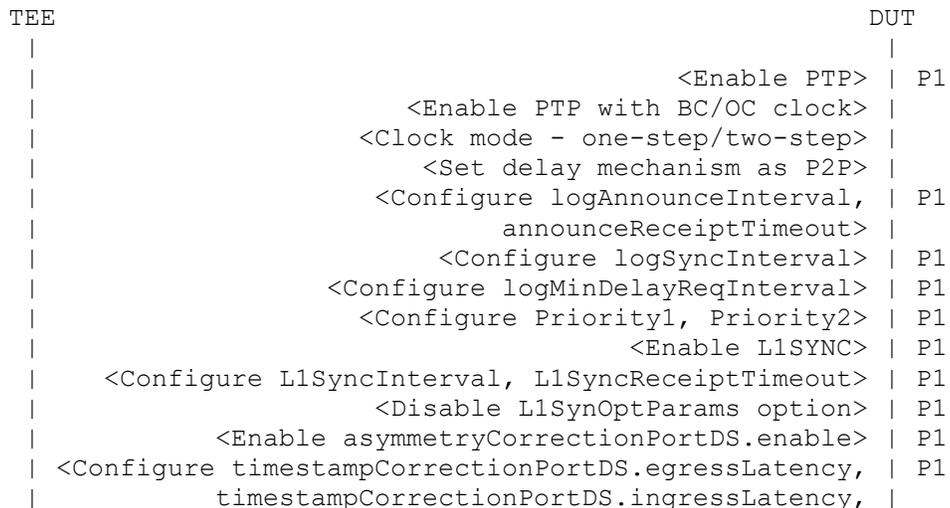
Topology



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 :



```

|         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> |
|                                     |
T1 | <Enable auto responder to Pdelay_Req messages> | P1
|
|                                     <Enable |
|         defaultDS.externalPortConfigurationEnabled> | P1
|
|                                     <Configure |
|         externalPortConfigurationPortDS.desiredState=MASTER> | P1
|
|                                     <Check Port Status = MASTER> |
|                                     |
|         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> |
|                                     |
|                                     <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
```



```

|                                     <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)

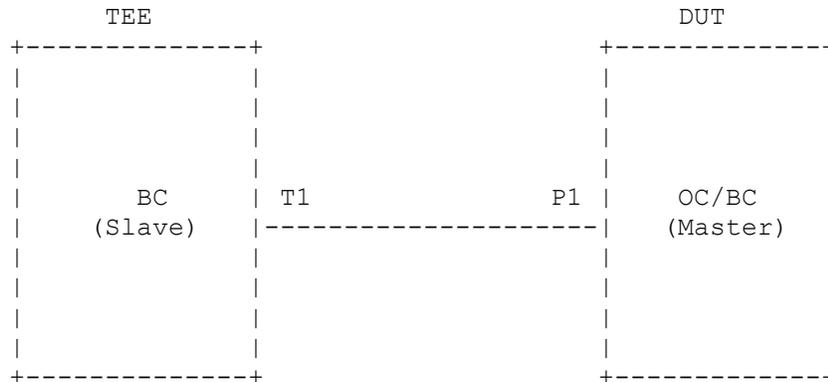
Title : Transition of masterOnly from TRUE to FALSE when
defaultDS.externalPortConfigurationEnabled is set to
TRUE

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

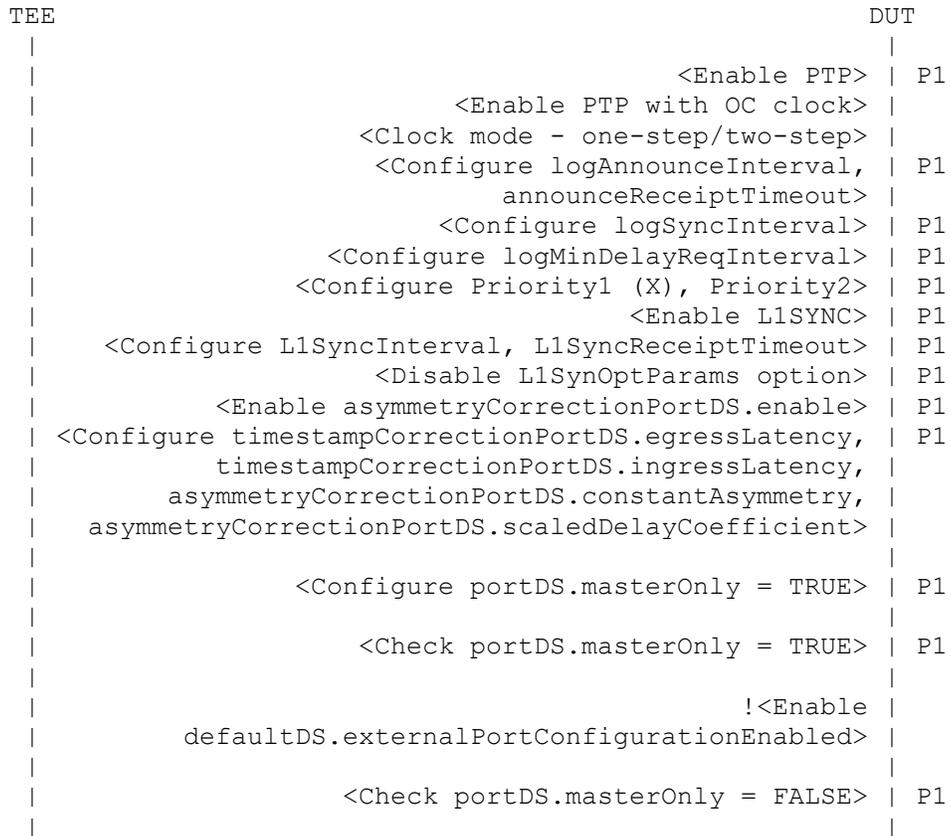
Topology



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 :



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 0.7.2 Table 157 Page 449, Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST

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

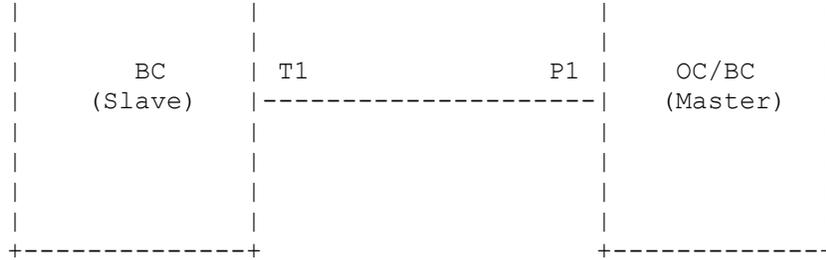
Purpose : To verify that L1 SYNC port changes its state from DISABLED to IDLE when L1_SYNC is enabled by setting dataset L1SyncBasicPortDS.L1SyncEnabled to TRUE via configuration.

Reference : IEEE 1588-2017 Clause 0.7.2 Table 157 Page 449,
Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST

Topology

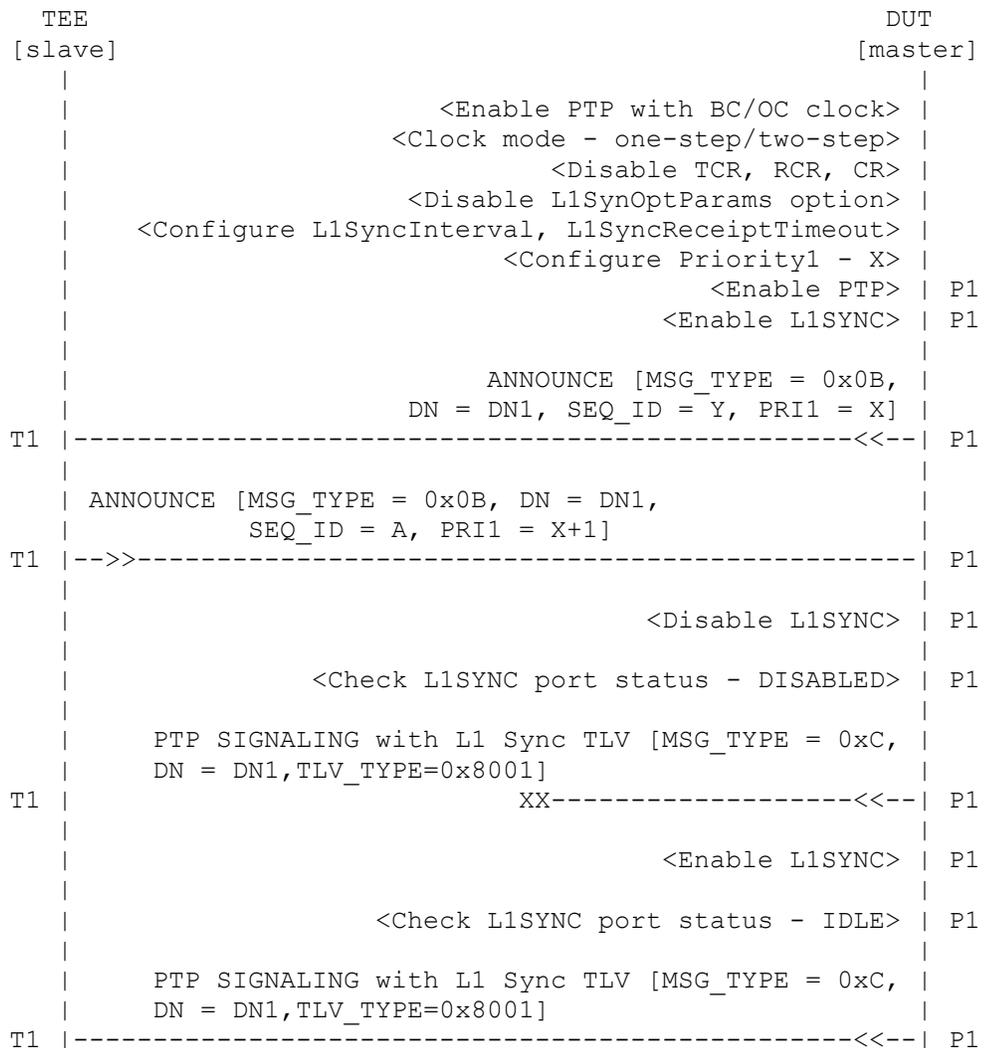




Legends:

- 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 :



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 0.7.2 Table 157 Page 449,
Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST

Topology




```

|           (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

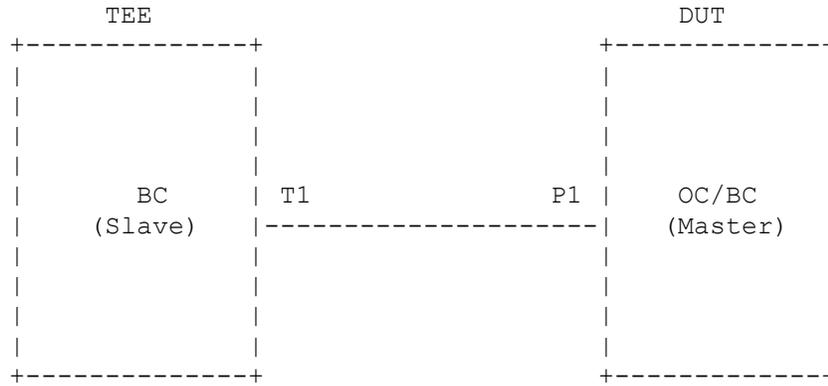
Purpose : To verify that L1 SYNC port changes its state from IDLE to LINK_ALIVE when L1 Sync TLV is received.

Reference : IEEE 1588-2017 Clause 0.7.2 Table 157 Page 449,
```

Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST

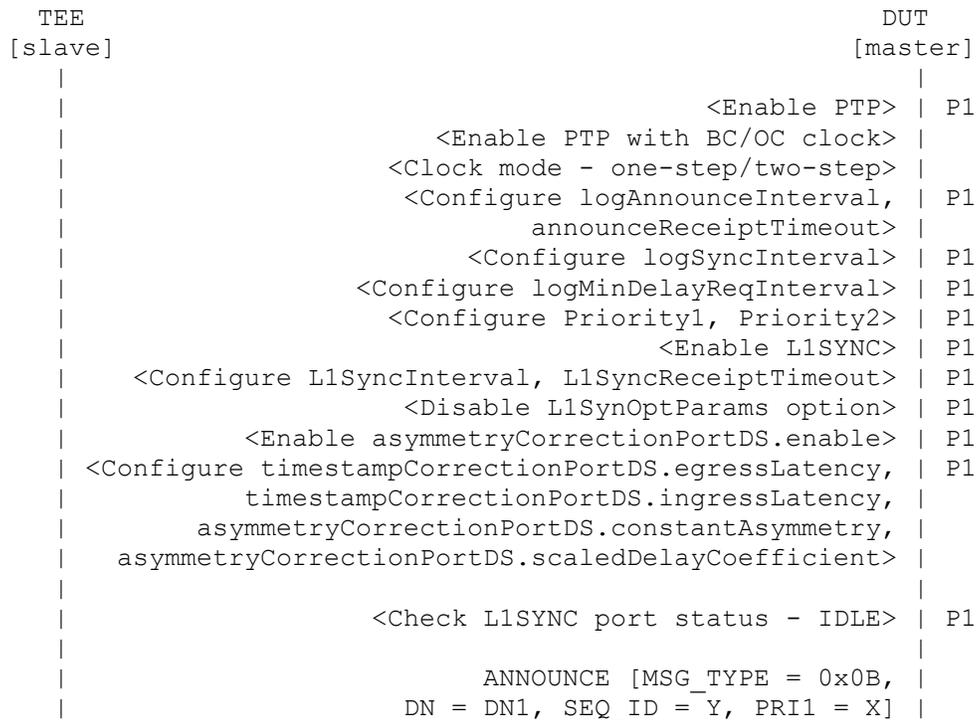
Topology



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 :



```

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>
    |
    |                               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
```

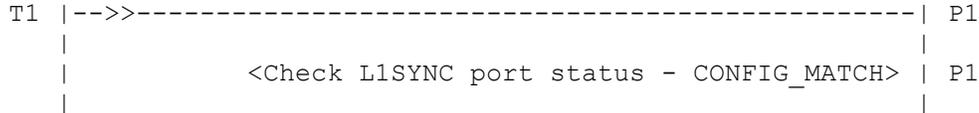
Step 6 : Observe that DUT transmits PTP SIGNALING message with L1 Sync TLV on the port P1 with following parameters:

```
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.



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)

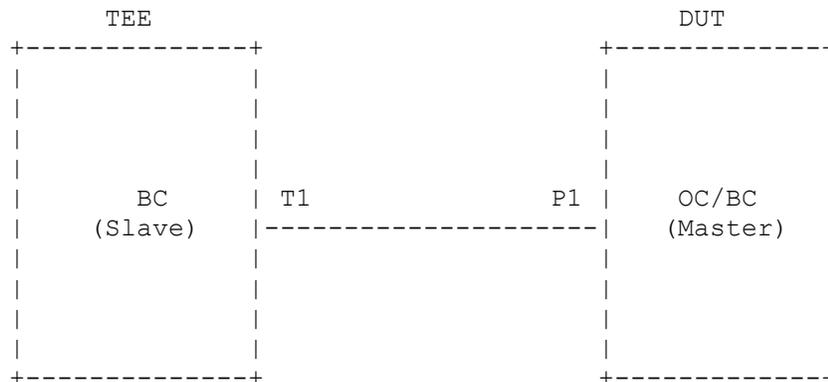
Title          : L1 SYNC port state changes from CONFIG_MATCH to
                LINK_ALIVE

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 0.7.2 Table 157 Page 449,
                Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST
  
```

Topology



Legends:


```

|                                     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:

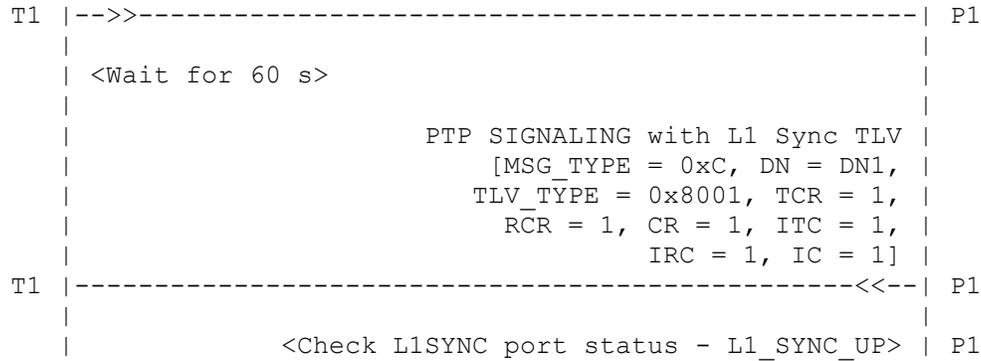
PTP Header
Message Type = 0xC
Domain Number = DN1
L1_SYNC TLV
TLV_TYPE = 0x8001
TCR = 0
RCR = 0
CR = 0
ITC = 0
IRC = 0
IC = 0

Step 13 : Verify that the DUT's L1SYNC port status P1 is in LINK_ALIVE state


```

|         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] |

```



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:

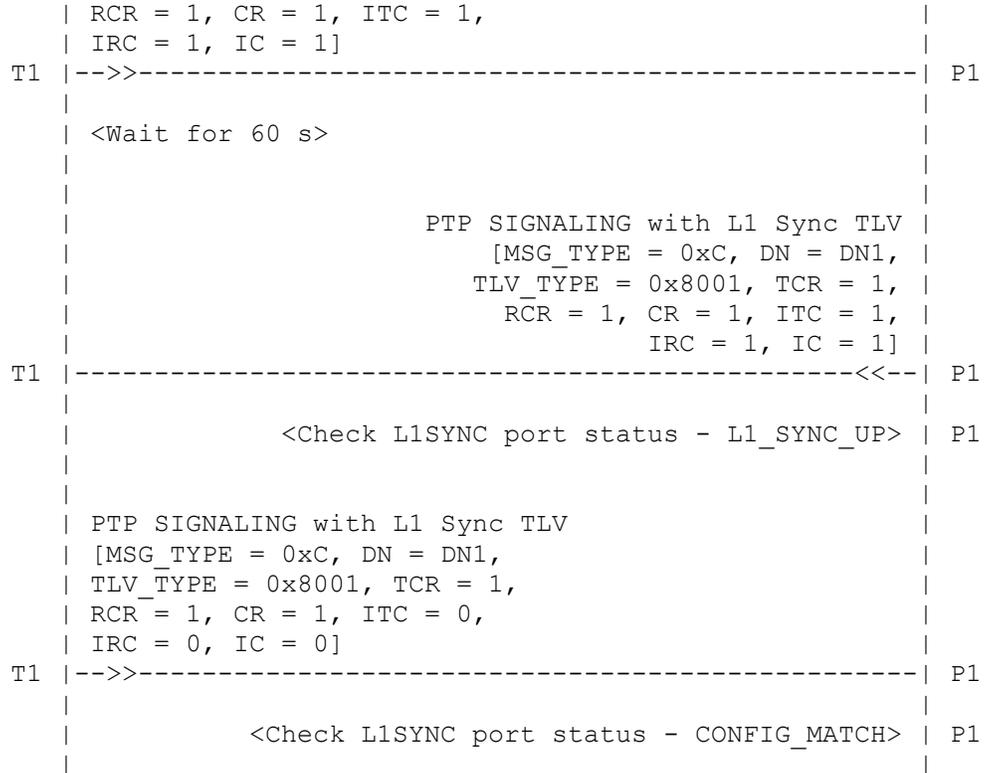
```
PTP Header
  Message Type = 0xC
  Domain Number = DN1
L1_SYNC TLV
  TLV_TYPE     = 0x8001
  TCR          = 1
  RCR          = 1
  CR           = 1
  ITC         = 1
  IRC         = 1
  IC          = 1
```

Step 14 : Verify that the DUT's L1SYNC port status P1 is in L1_SYNC_UP state


```

|         <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,

```



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 0.7.2 Table 157 Page 449,
                   Clause 0.7.3 Figure 70 Page 450

Conformance Type   : MUST
```



```

|                                     <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 0.7.2 Table 157 Page 449,
Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST

Topology


```

|                                     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)

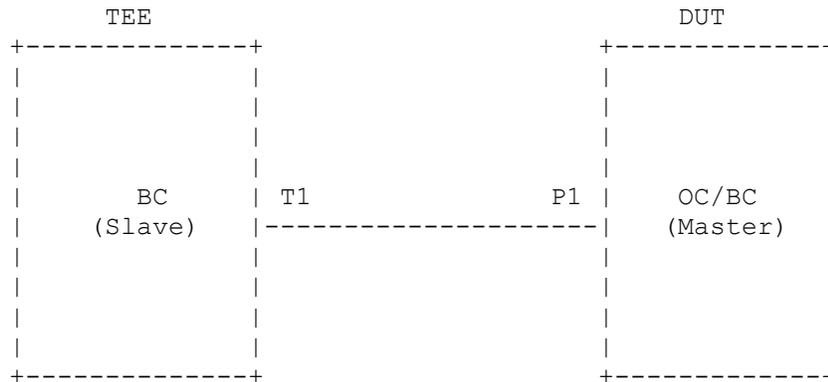
Title : L1 Sync Port state changes from L1_SYNC_UP to LINK_ALIVE when configuration of the L1Sync ports is not compatible

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 0.7.2 Table 157 Page 449, Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST

Topology



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 :



```

|         <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, |

```


- 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)

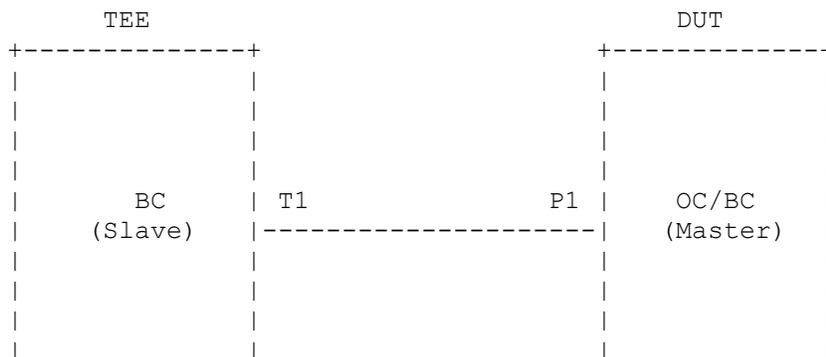
Title           : L1 Sync Port state changes from LINK_ALIVE to IDLE
                 when L1SyncLinkAlive is FALSE

Purpose        : To verify that L1 SYNC port changes its state to IDLE
                 from LINK_ALIVE when L1SyncLinkAlive is FALSE.

Reference      : IEEE 1588-2017 Clause 0.7.2 Table 157 Page 449,
                 Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST
  
```

Topology



- 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 0.7.2 Table 157 Page 449,
                 Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST
```



```

|                                     <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
```



```

| 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 P1 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.
  
```

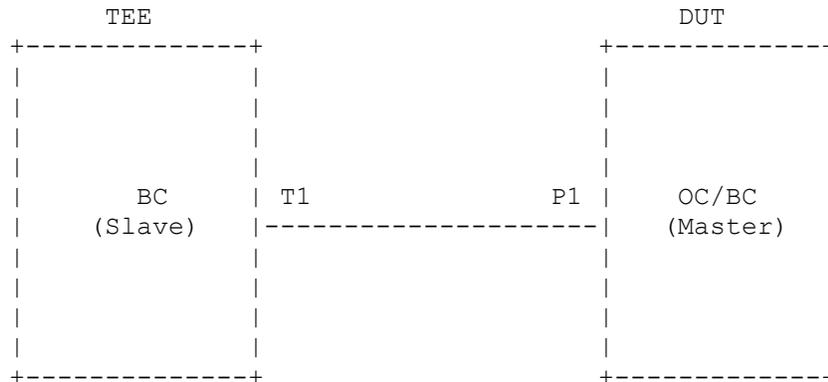
```

Reference   : IEEE 1588-2017 Clause 0.7.2 Table 157 Page 449,
            Clause 0.7.3 Figure 70 Page 450
  
```

```

Conformance Type : MUST
  
```

Topology

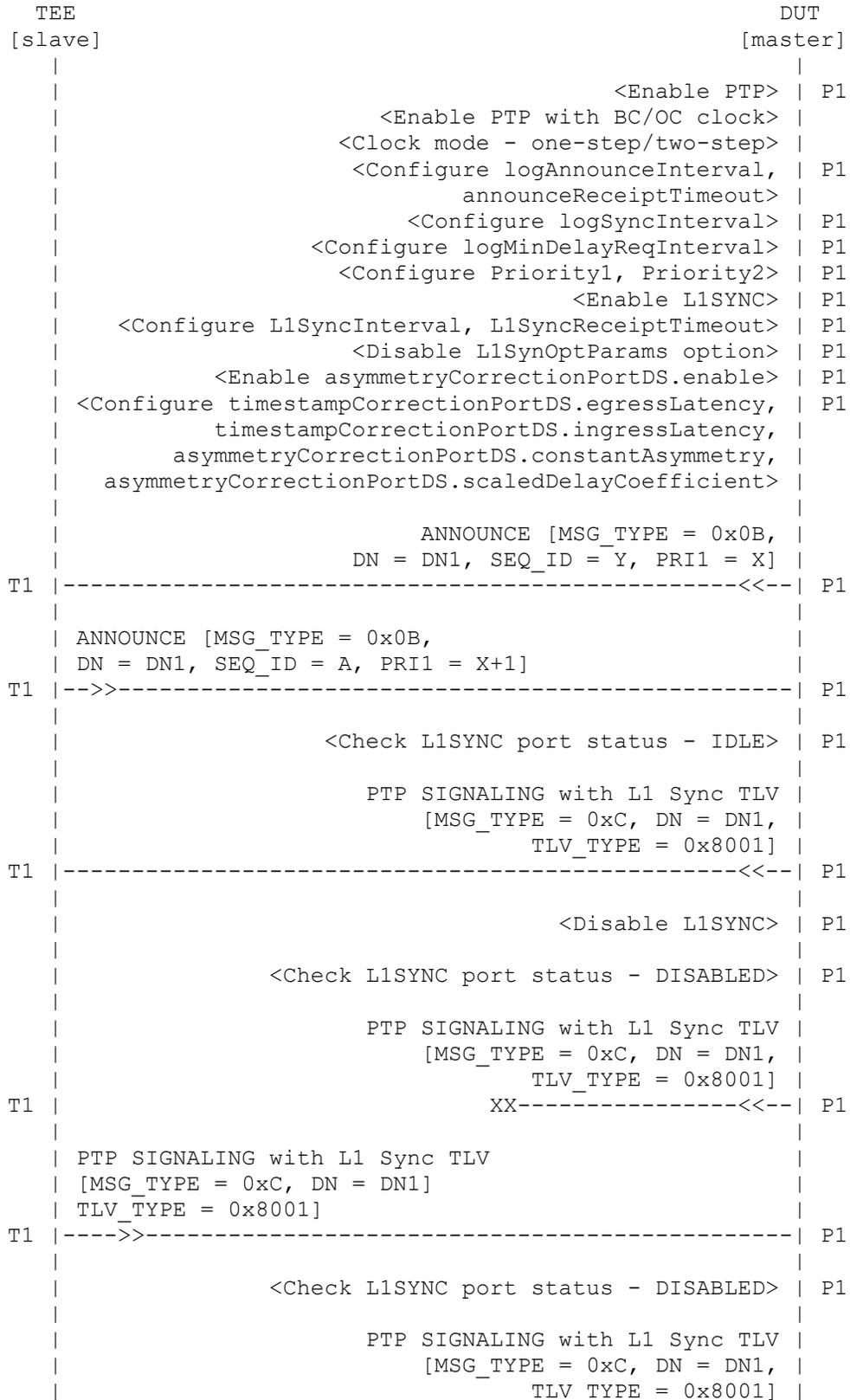


Legends:

```

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 :



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

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 0.7.2 Table 157 Page 449,
                  Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST
```

Topology

	<Enable txCoherentIsRequired,rxCoherentIsRequired congruentIsRequired>	P1 P1
T1	PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC DN=DN1,TLV_TYPE=0X8001,TCR=1,RCR=1,CR=1] -----<<--	P1
T1	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] -->>-----	P1
	<Check L1SYNC port status - CONFIG_MATCH>	P1
	<Disable L1SYNC>	P1
	<Check L1SYNC port status - DISABLED>	P1
T1	PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC, DN = DN1,TLV_TYPE=0x8001] XX-----<<--	P1
T1	PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC, DN = DN1,TLV_TYPE=0x8001] ----->>-----	P1
	<Check L1SYNC port status - DISABLED>	P1
T1	PTP SIGNALING with L1 Sync TLV [MSG_TYPE = 0xC, DN = DN1,TLV_TYPE=0x8001] 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 L1SyncOptParams 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)

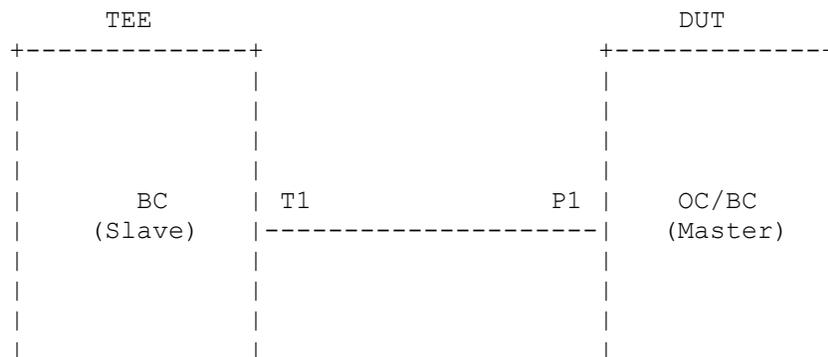
Title          : L1Sync Port state changes from L1_SYNC_UP to DISABLED
                when L1Sync is disabled

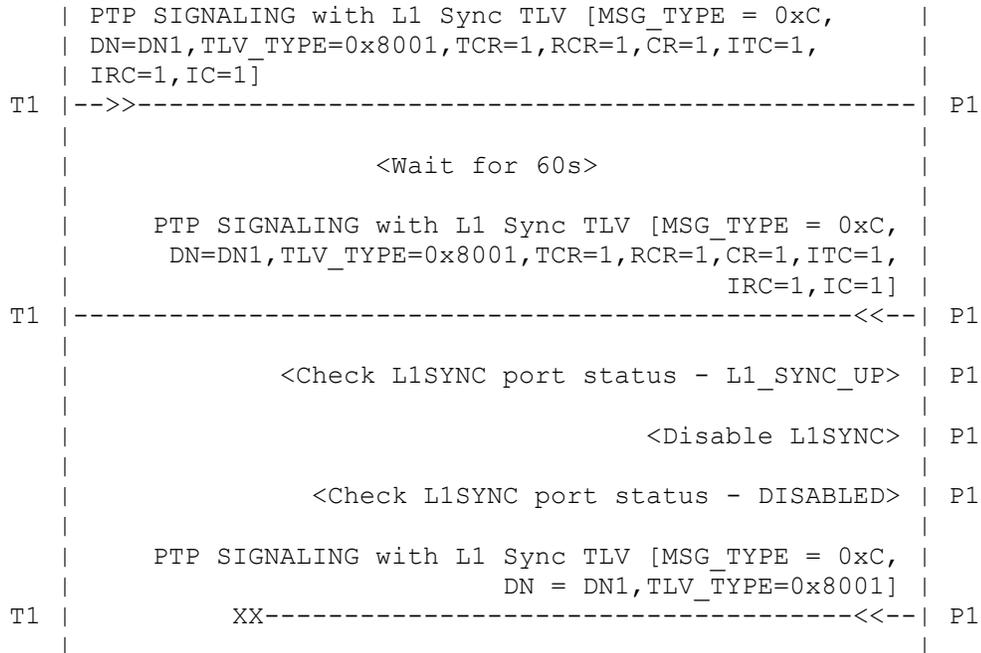
Purpose        : To verify that L1Sync port changes its state from
                L1_SYNC_UP to DISABLED when L1Sync is disabled by
                setting the data set L1SyncBasicPortDS.L1SyncEnabled
                to FALSE via configuration.

Reference      : IEEE 1588-2017 Clause 0.7.2 Table 157 Page 449,
                Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST
  
```

Topology





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 0.7.2 Table 157 Page 449,
Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST

Topology


```

|                                     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 0.7.2 Table 157 Page 449,
                   : Clause 0.7.3 Figure 70 Page 450

Conformance Type  : MUST
```


- 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 0.7.2 Table 157 Page 449,
Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST


```

|                                     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)

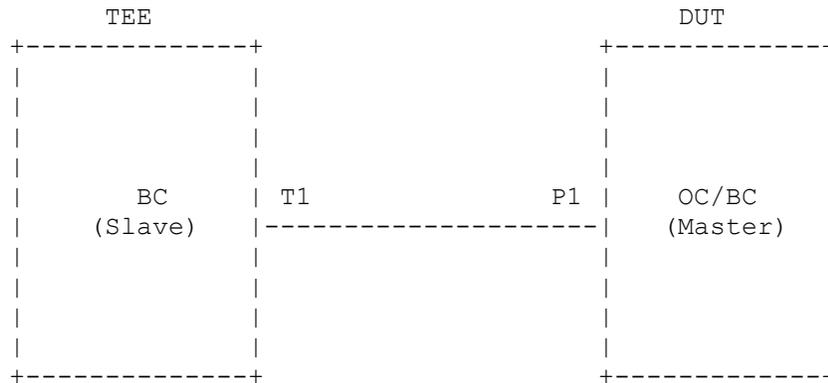
Title         : L1Sync Port state changes from L1_SYNC_UP to DISABLED
              : when L1SYNC_RESET is occurred.

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 0.7.2 Table 157 Page 449,
              : Clause 0.7.3 Figure 70 Page 450

Conformance Type : MUST
  
```

Topology

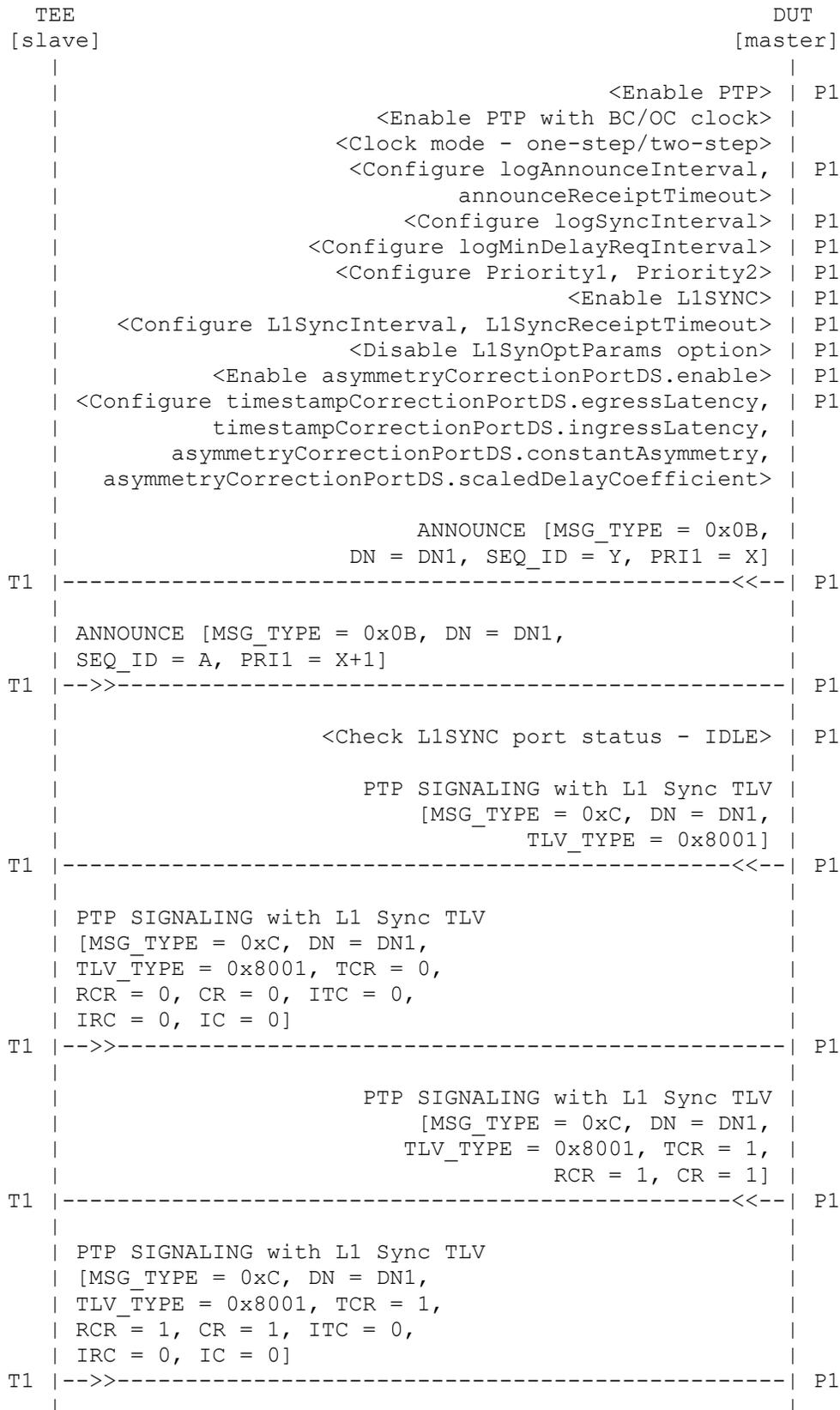


Legends:

```

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 :



```

| 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>
|
T1 | <Disable TEE's port> | P1
|
| <Check L1SYNC port status - DISABLED>
|
| 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
```