

# White Rabbit time-transfer experiment between Espoo and Kajaani in Finland

- Collaboration: MIKES/CSC/FUNET



- Aim:
  - Evaluation of PTP-WR in long-distance time-transfer using standard DWDM network (separate up- and down-links).
  - Investigation of delay variation compensation using temperature data.
  - If successful, will provide accurate representation of UTC(MIKE) to academic users at Kajaani, including MIKES laboratories and CSC data centre. Accurate time to CSC customers will be provided via standard PTP (or PTP telecom profile).
  - Investigation of possibility to geographically relocate MIKES Cs-clocks without losing their contribution to EAL.

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- Status:
  - White Rabbit link between MIKES and CSC sites in Espoo is operational and under evaluation (1PPS transfer).
  - Grandmaster clock is synchronized to UTC(MIKE) and feeds a WR-switch at the CSC Espoo site. All other links will be connected to this switch.
  - Alien wave link (all-optical underground link) has been established between MIKES sites at Espoo and Kajaani (fibre length ~900 km, with a number of unidirectional amplifiers).
  - GPS-PPP time transfer link is being set-up between MIKES sites at Espoo and Kajaani to evaluate the link performance.
  - Once proper operation of the link is verified, a 5071A Cs-clock will be transferred to Kajaani to aid in link evaluation.

