

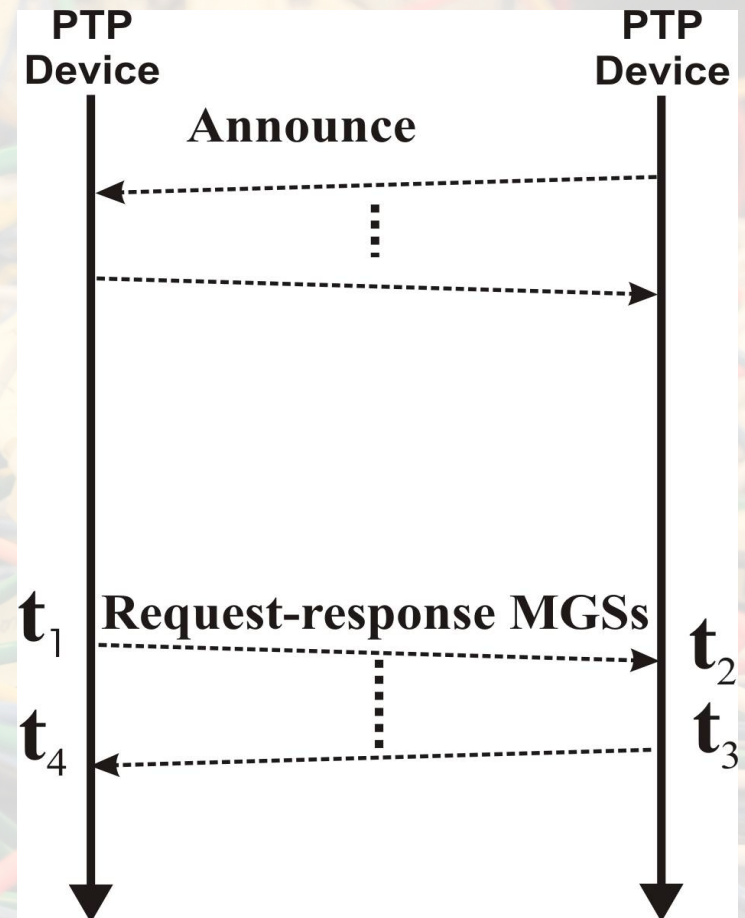


White Rabbit Standardization

Maciej Lipinski
WUT / CERN

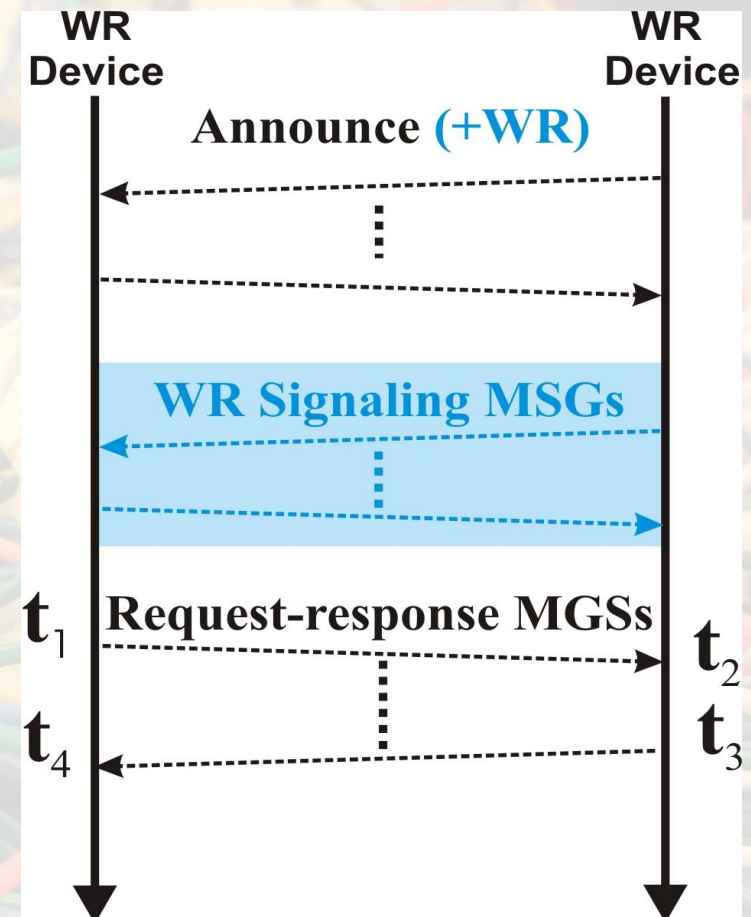
White Rabbit extension to PTP

- **White Rabbit “magic”**
 - **Exchange of additional info**
 - **Some logic**



White Rabbit extension to PTP

- White Rabbit “magic”
 - Exchange of additional info
 - Some logic
- **WR PTP**
 - **Uses PTP extension mechanisms**



White Rabbit extension to PTP

- White Rabbit “magic”
 - Exchange of additional info
 - Some logic
- WR PTP
 - Uses PTP extension mechanisms
 - **Compatible**
 - **The most accurate PTP implementation**

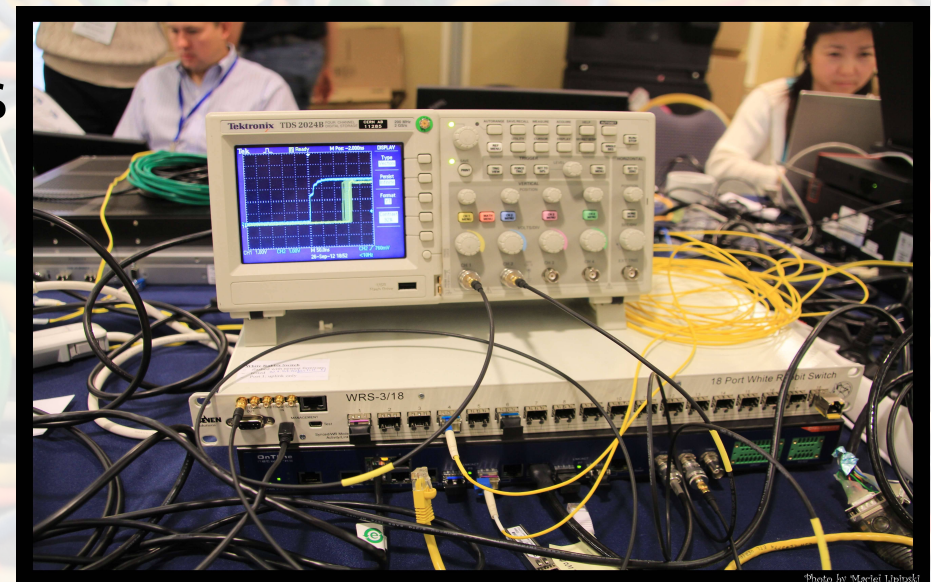


Photo by Mactej Lisowski

WR standardization

- **We want to standardize**

WR standardization

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- **Many possibilities**
 - Profile (ITU-T, IEEE, ...)
 - AVB gen 2

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- **Standardization Group**
 - **John Eidson**
 - **ITU-T people**
 - **Companies (NI, Creotech, ...)**

WR standardization

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 - John Eidson
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John Eidson:
**“Why don't you propose
to include WR into PTPv3 ?
You could do it in that way...”**

3rd revision of PTP (PTPv3)

- Standard life cycle requires revisions



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3rd revision of PTP (PTPv3)

- Standard life cycle requires revisions
- **Project Authorization Request**
- **Scope of the work**
- **First page**

IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems

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1. Overview

1.1 Scope

This standard defines a protocol enabling precise synchronization of clocks in measurement and control systems implemented with technologies such as network communication, local computing, and distributed objects. The protocol is applicable to systems communicating by local area networks supporting multicast messaging including, but not limited to, Ethernet. The protocol enables heterogeneous systems that include clocks of various inherent precision, resolution, and stability to synchronize to a grandmaster clock. The protocol supports system-wide synchronization accuracy in the sub-microsecond range with minimal network and local clock computing resources. The default behavior of the protocol allows simple systems to be installed and operated without requiring the administrative attention of users. The standard includes mappings to User Datagram Protocol (UDP)/Internet Protocol (IP), DeviceNet, and a layer-2 Ethernet implementation. It includes formal mechanisms for message extensions, higher sampling rates, correction for asymmetry, a clock type to reduce error accumulation in large topologies, and specifications on how to incorporate the resulting additional data into the synchronization protocol. The standard permits synchronization accuracies better than 1 ns. The protocol has features to address applications where redundancy and security are a requirement. The standard defines conformance and management capability. There is provision to support unicast as well as multicast messaging. The standard includes an annex on recommended practices. Annexes defining communication-medium-specific implementation details for additional network implementations are expected to be provided in future versions of this standard.

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3rd revision of PTP (PTPv3)

- Standard life cycle requires revisions
- Project Authorization Request
 - Scope of the work
 - First page
- **WR in PTPv3**
- **General agreement**

IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems

The protocol enhances support for synchronization to better than 1 nanosecond.

1. Overview

1.1 Scope

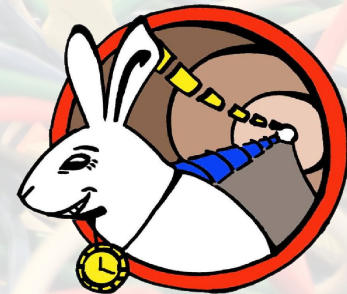
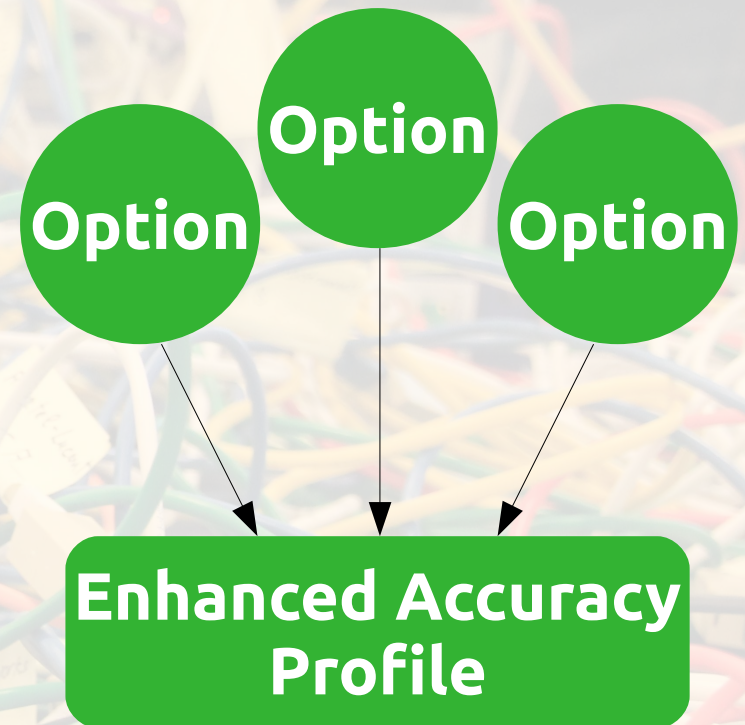
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3rd revision of PTP (PTPv3)

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- **WR in PTPv3**
 - **General agreement**
 - **Enhanced Accuracy Option/Profile**



The End

Conclusions

- **White Rabbit is widely recognized in the PTP community**
- **Including White Rabbit into PTPv3:**
 - **Widely useful**
 - **Strongly supported**
 - **Absolutely feasible**
 - **One of the most important (and cool !) additions**

The End

Thank you

