



IEEE 1588 Working Group Update

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Officers

John Eidson, UC Berkeley/Calnex/"retired", co-chair

Doug Arnold, Meinberg, co-chair

Hans Weibel, ZHAW, vice-chair

Silvana Rodrigues, IDT, secretary

John MacKay, Progeny Systems, editor

Subcommittees

Architecture

High Accuracy

Management

Security

Upkeep



Focus on currently debated proposals

- Tell a WG member what you think!

1. Dropped proposals

2. Management

3. Security

4. High Accuracy

5. Architecture

- State reduction
- Profile Isolation
- Port configuration
- New uses for domains

Don't Panic!

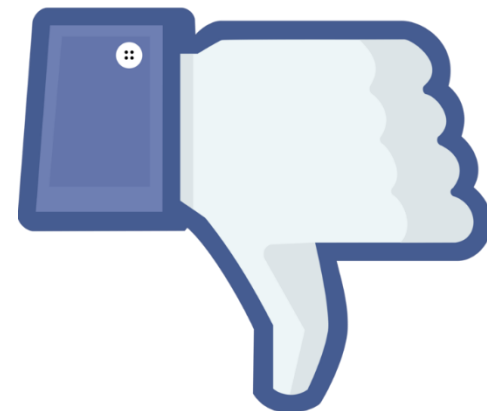
- All new features optional
- and backward compatible.

Updating protocol descriptions with IEEE 802.1AS style state machines

- Confusing for those familiar with 2008 edition
- No specific new option requires this
- State machines may be added to sections changed for other reasons

Restrictions on alternate BMCAs in profiles

- Profile defining standards bodies consistently want to retain ability to craft BMCAs



- PAR calls for “SNMP compatible MIB”
- Liaison statement sent to profile defining bodies
 - Replies from LXI, SMPTE, ITU, IEC, PI
- Native management
 - Some industries prefer this to standard management protocols
 - Objections to deprecating native management
- Some industries expect to continue to use SNMP rather than switching to NETCONF
- Unresolved: best structure for accommodating multiple profiles in the same device
 - Separate MIB for each profile
 - 1 MIB with branches for profile specific information

Performance monitoring proposal

Standard metrics

Quantities

- Offset from master
- Mean path delay
- $t_2 - t_1$
- $t_4 - t_3$

Statistics

- Mean
- Standard deviation
- Minimum
- Maximum

Others

- Locked clock counter
- Port active counter
- Dropped message fraction
- Fraction of timestamps used by servo

Four prong* approach

1. Integrated security mechanisms
 - Hash code TLV
 - Key management schemes
2. External security mechanisms
 - MACSEC
 - IPSEC
3. Architectural guidance
 - Multiple simultaneous masters
 - Multipath PTP
4. Monitoring and management



Focus next on Integrated security mechanisms

- Proposal expected for master port authentication using TESLA
- Proposal expected for hop by hop authentication using a group key

* Solution spaces or types

Sub ns PTP

Physical Layer syntonization

- L1 syntonization may or may not have same spanning tree as PTP messages
- Configuration and status variables defined for communication between L1 and higher layers of PTP

Calibration

- Includes
 - Cables
 - PHY asymmetry
 - 1 PPS to message time stamp counter offsets
- Expect to create informative annex
- “Golden Calibrator”.
 - All nodes in a system must use same calibrator
 - Avoids difficulty of building absolute calibrator
 - Limited scaling

The following port states would become optional

- Faulty
- Pre-master
- Uncalibrated

Foreign master qualification optional

Note these states are not directly observable outside of PTP node

Benefits

- IEEE 802.1AS becomes compliant profile
- Faster reconfigurations

Cost

- Rogue frames only killed by steps removed limit in certain topologies

Issue: multiple profiles on the same network

- Accidentally or on purpose
- Multicast profiles with different BMCAs may result in competing best masters

Transport specific attribute in PTP common header

0. PTP with no isolation protection (backwards compatible)
 1. 802.1AS
 - 2-13. assigned to specific profile defining standards bodies
 14. all other profiles
- 2-14 may use domains 128-239

Profile key attribute

- Currently reserved 8 bit field in common header
- Enumerate profiles from same standards body

Profile key TLV

- Needed for transport specific value 14

Manual port state configuration part of White Rabbit profile

Port Configuration options

- BMCA
- Manual configuration of all ports
- All manual or all BMCA, no mixed configuration

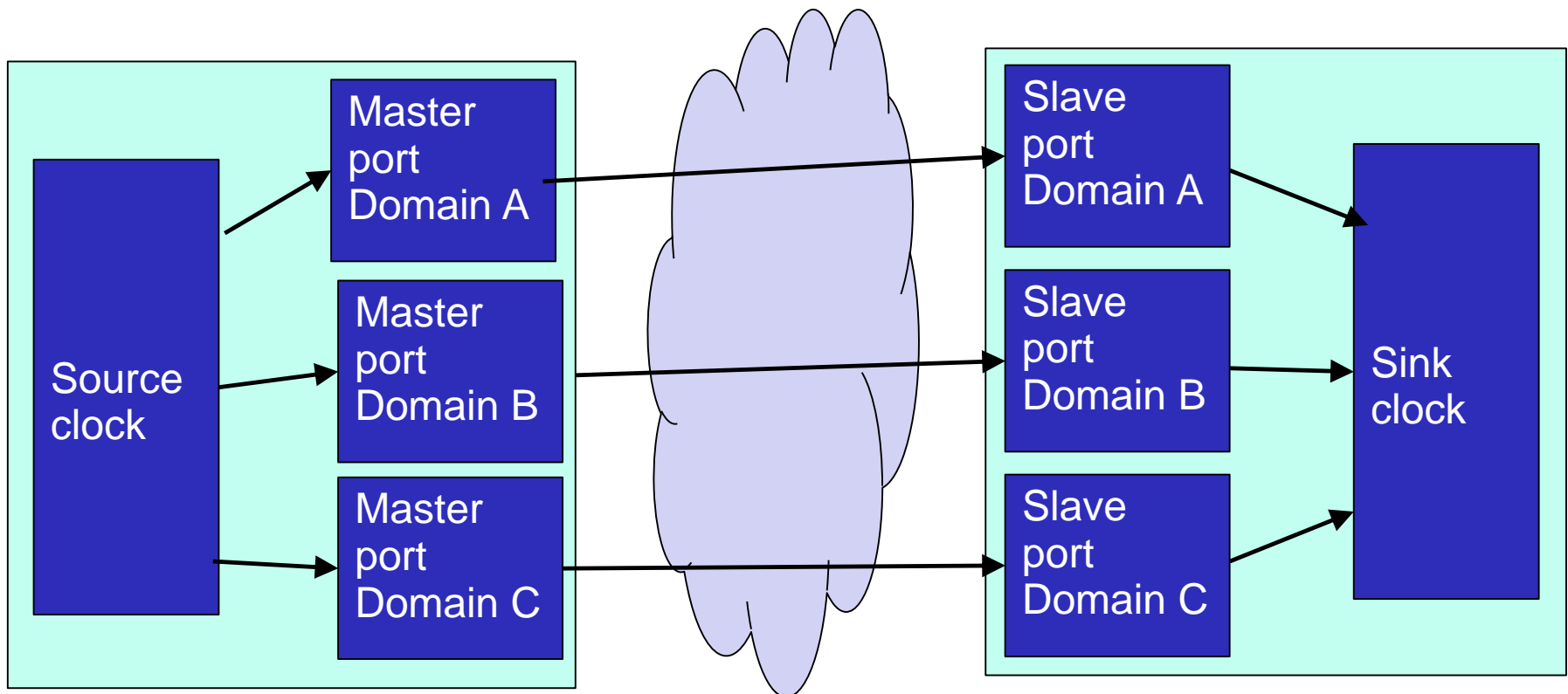
- BMCA option may include constrained ports
 - Slave only port
 - Master only port (similar to Not-slave in G.8275.1)

- Manual port configuration or constrained BMCA may result in
 - Two master ports connected together
 - Two slave ports connected together

IEEE 1588-2008: different PTP domains do not interact

Proposal: Domains can share time and timing meta data

- Support multiple simultaneous masters
- Support multipath PTP



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Public website:

<https://ieee-sa.centraldesktop.com/1588public/>

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