IEEE 1588 Working Group Update

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WSTS 2015

San Jose

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.

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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
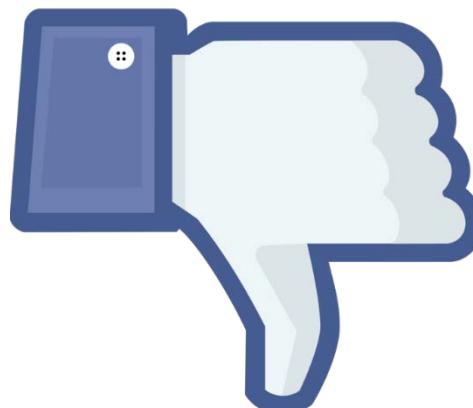
- PAR calls for "SNMP compatible MIB"

- 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
>   - t2-t1
>   - t4-t3
>   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

- Accidently 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

Domains

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
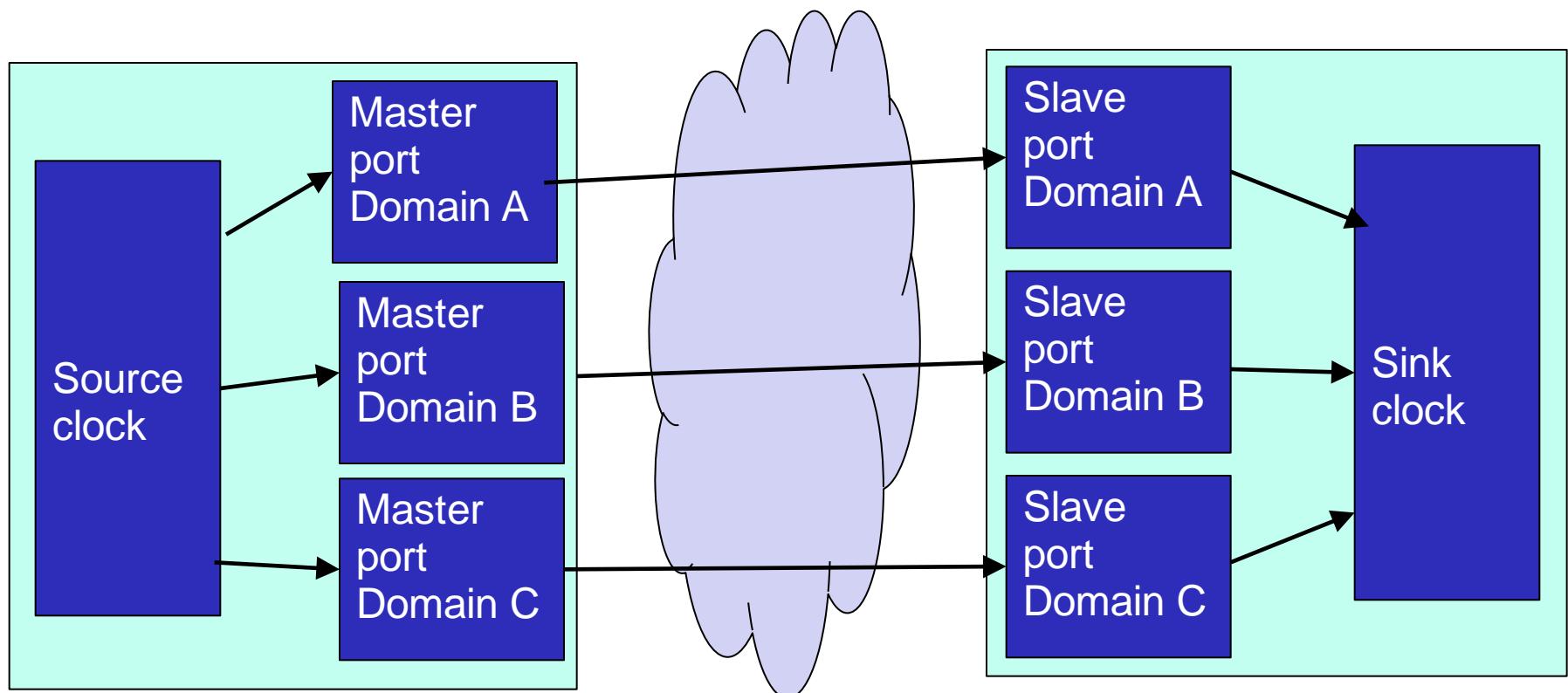
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Public website:

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

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