Enterprise Profile for Precision Time Protocol

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Agenda

Enterprise Profile
  History
  Standards initiative

PTP features
  Mixed multicast unicast
  Multidomain operation

Summary
Intended for enterprise networks, especially in financial companies

Draft RFC in IETF

Main PTP features:
- Mixed multicast/unicast operation
- Multi domain operation for grandmaster redundancy
History

Proposed by Pedro Estrella of IMC Trading

*Challenges Deploying PTPv2 in a Global Financial Company, Pedro V Estrela and Jan L Bonebakker, ISPCS San Francisco, 2012*

Draft RFC in IETF

tictoc Working Group

*Enterprise Profile for Precision Time Protocol with Mixed Multicast and Unicast*

Tested at ISPCS IEEE 1588 Plugfest

2014-2016
Profile

Layer 3
  IPv4
  IPv6

Delay Request-Response propagation delay measurement
  BCs, TCs allowed but not required

Mixed multicast and unicast operation
  Pure multicast slaves allowed
  Delay Responses sent in same communication mode as Delay Request
Profile

Message rates
- Default Sync rate (Follow Up): 1/sec
- Default Delay Request rate (Delay Response): 1/sec
- Default Announce rate: 1/sec
- Minimum message rate: 1/128 sec
- Maximum message rate: 128/sec

Multi-domain operation
- Network elements may include PTP instances in multiple domains for redundancy

No performance criteria defined
PTP messages for 1-step clocks
Multicast PTP

Grandmaster

Bridge

Slave 1

Slave 2

Slave 3
Unicast PTP

Grandmaster

Bridge

Slave 1

Slave 2

Slave 3
Multidomain operation

GM

GM

GM

Domain 0 slave

Domain 1 slave

Domain 2 slave

Multi domain clock

Robust clock
Simulation with 3 GMs, 1 with ramp error
Simulation of robust clock
Enterprise profile at the ISPCS Plugfest

Tested at the last three ISPCS Plugfest events

ISPCS 2015 Beijing
• 5 participating organizations
• HW and SW implementations tested

ISPCS 2016 Stockholm
• Nine participating organizations
• Multidomain
• IPv4 and IPv6
Enterprise Profile
   Good for networks with no on path support
   and a lot of slaves

Defined in IETF

Mixed multicast unicast operation
   Reduce unwanted messages on multicast addresses at slave ports

Multidomain PTP for robustness
   Allows slave clocks to use robust voting algorithms

Tested at ISPCS Plugfest
Thank you for your attention. Questions?

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