



Accurate time. Worldwide.

## Enterprise Profile for Precision Time Protocol

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## 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

Proposed by Pedro Estrella of IMC Trading

*Challenges Deploying PTPv2 in a Global Financial Company, Pedro V Estrella 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

## 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

## Message rates

Default Sync rate (Follow Up): 1/sec

Default Delay Request rate (Delay Response): 1/sec

Default Announce rate: 1/sec

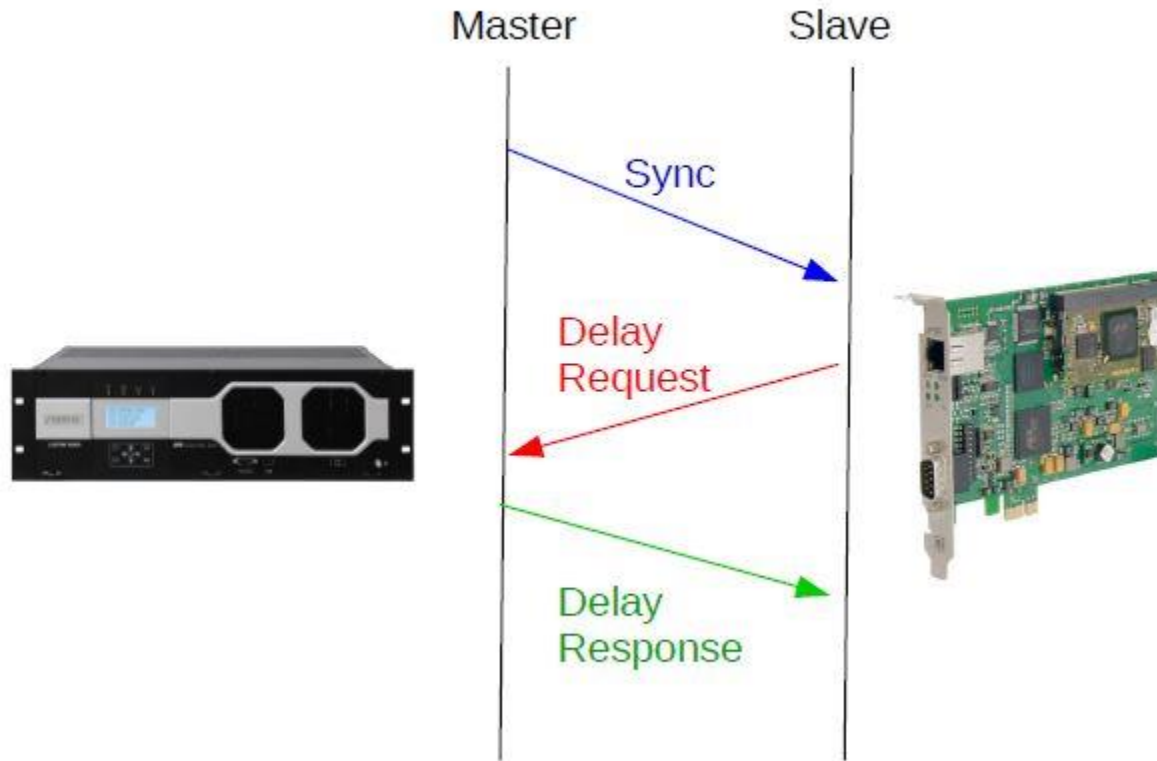
Minimum message rate: 1/128 sec

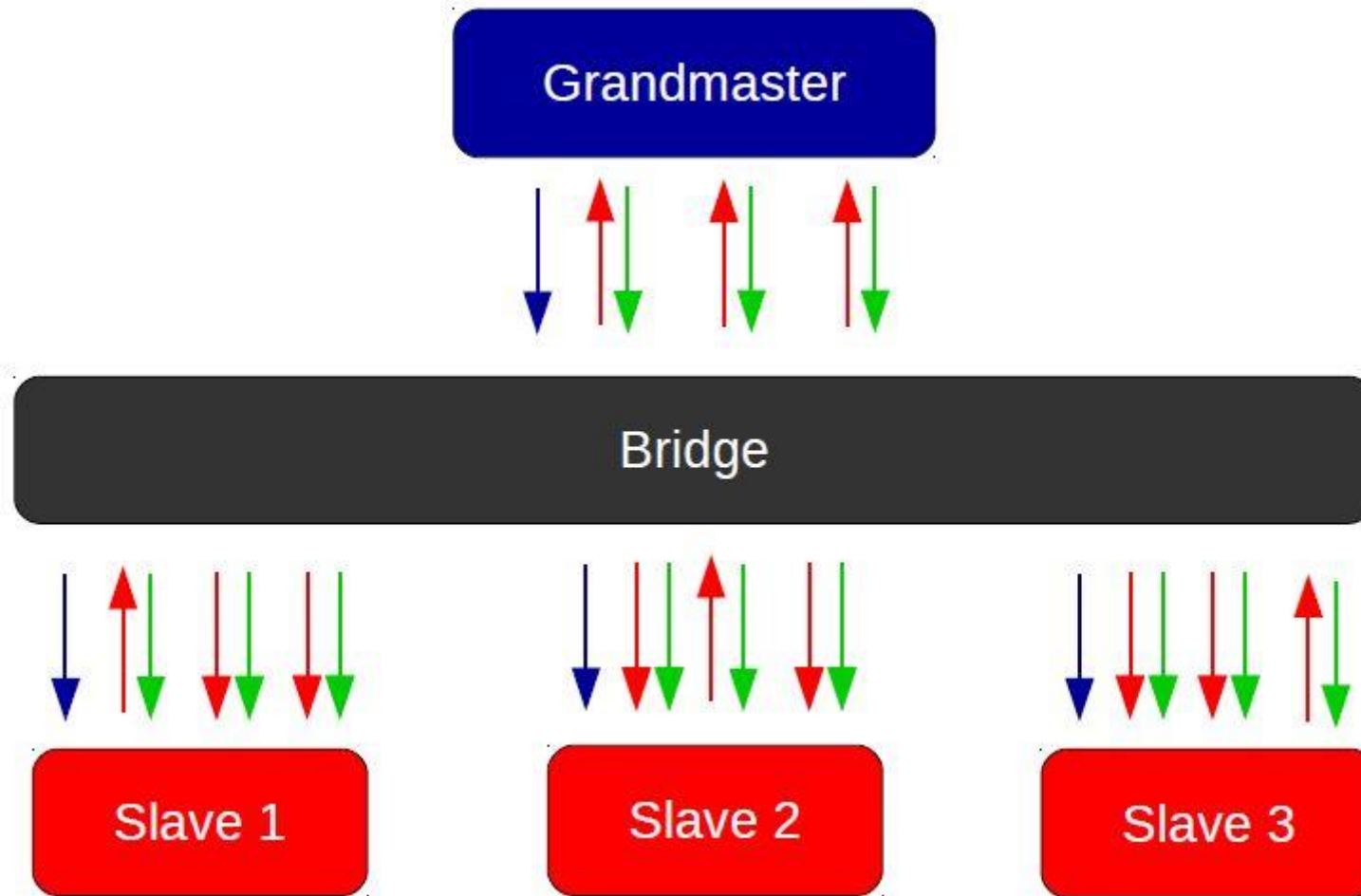
Maximum message rate: 128/sec

## Multi-domain operation

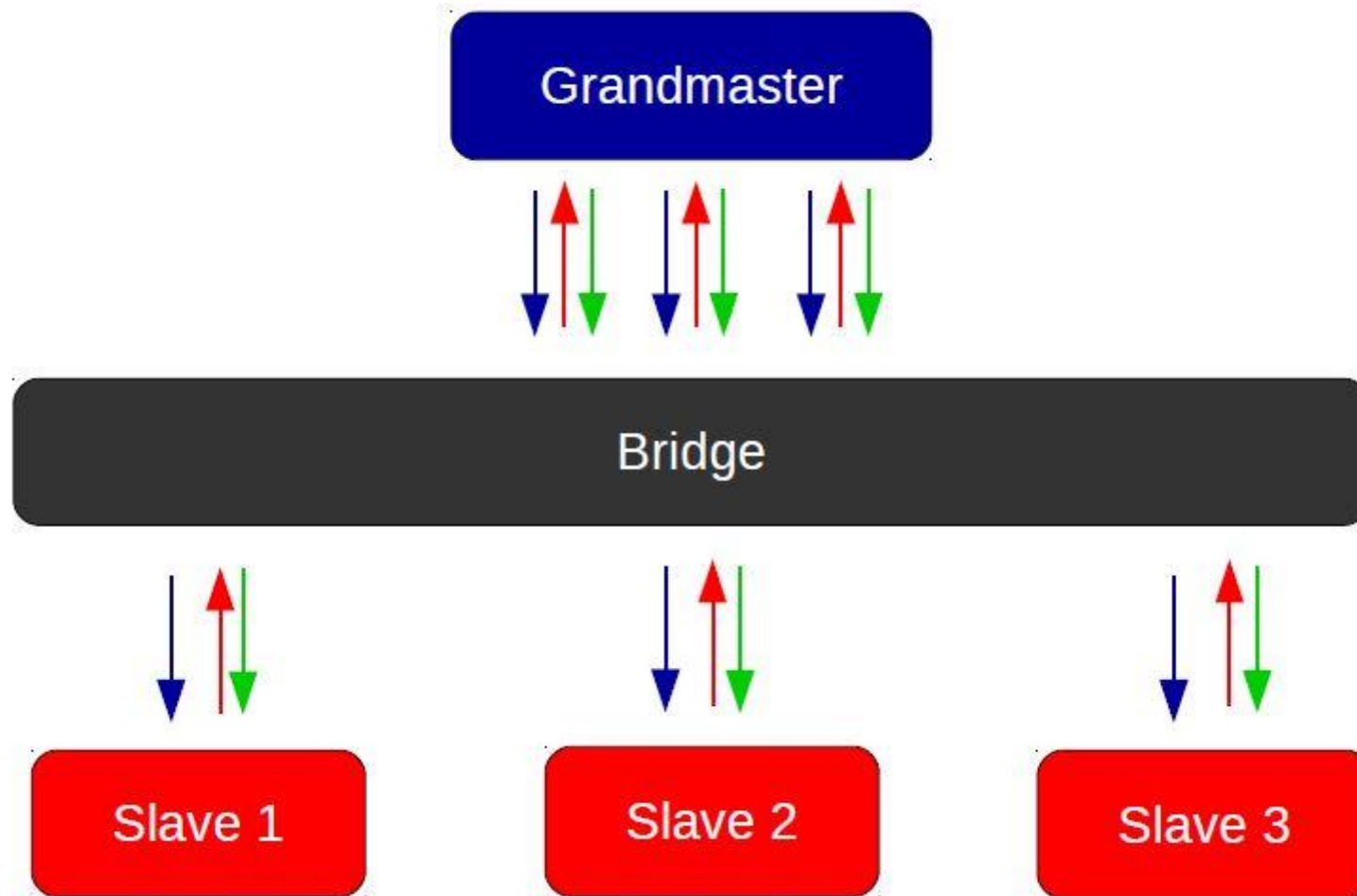
Network elements may include PTP instances in multiple domains for redundancy

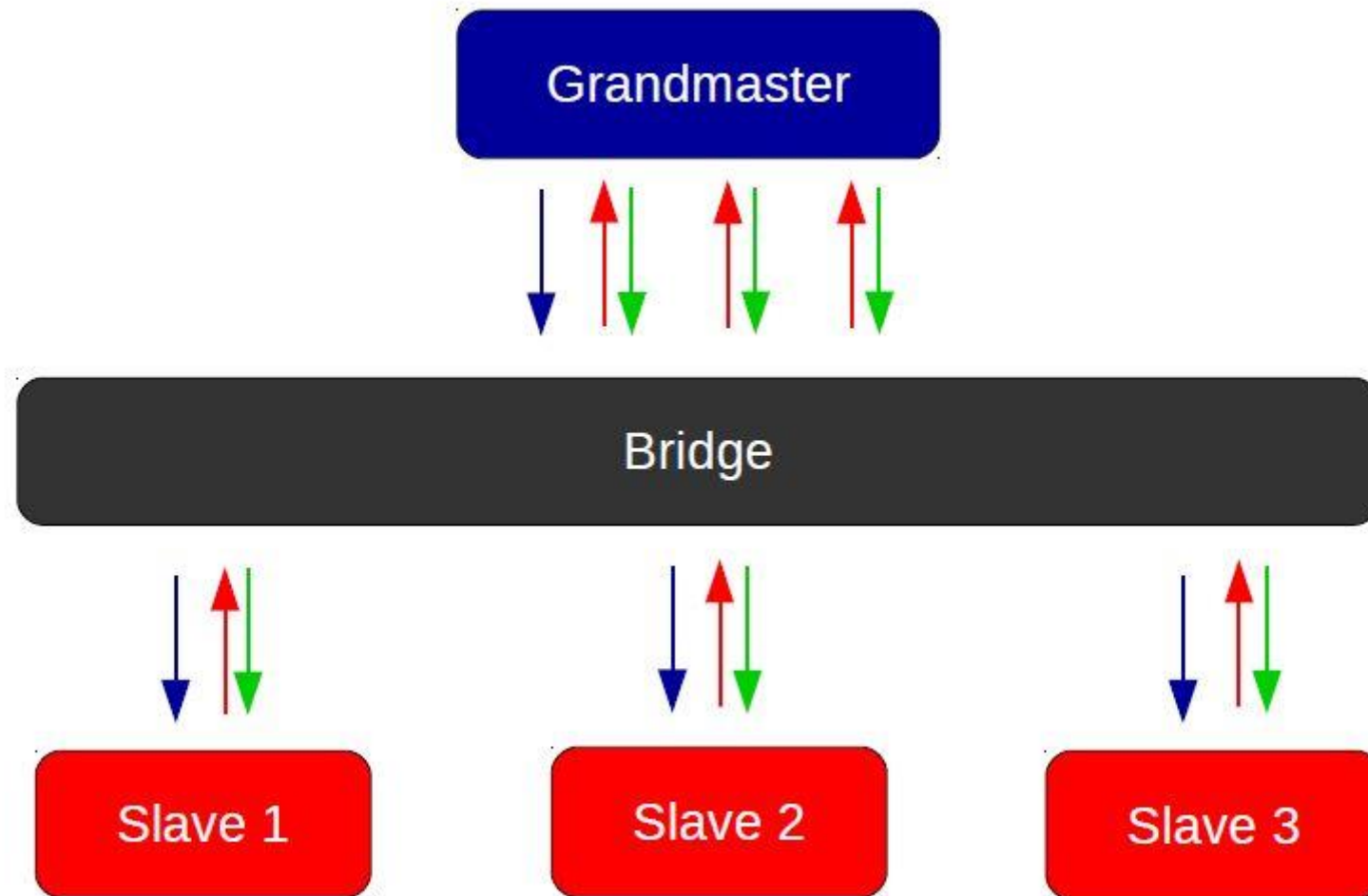
No performance criteria defined

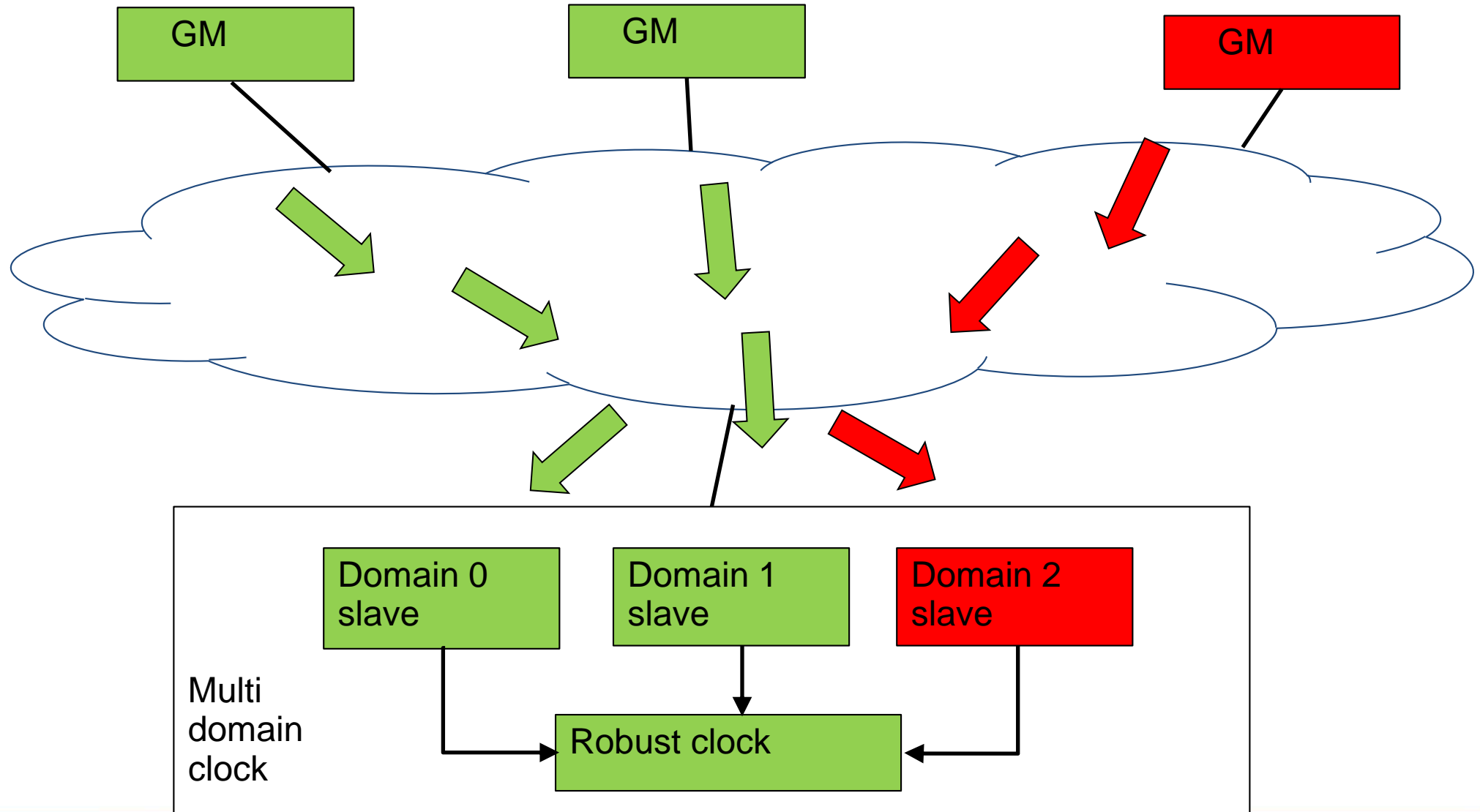




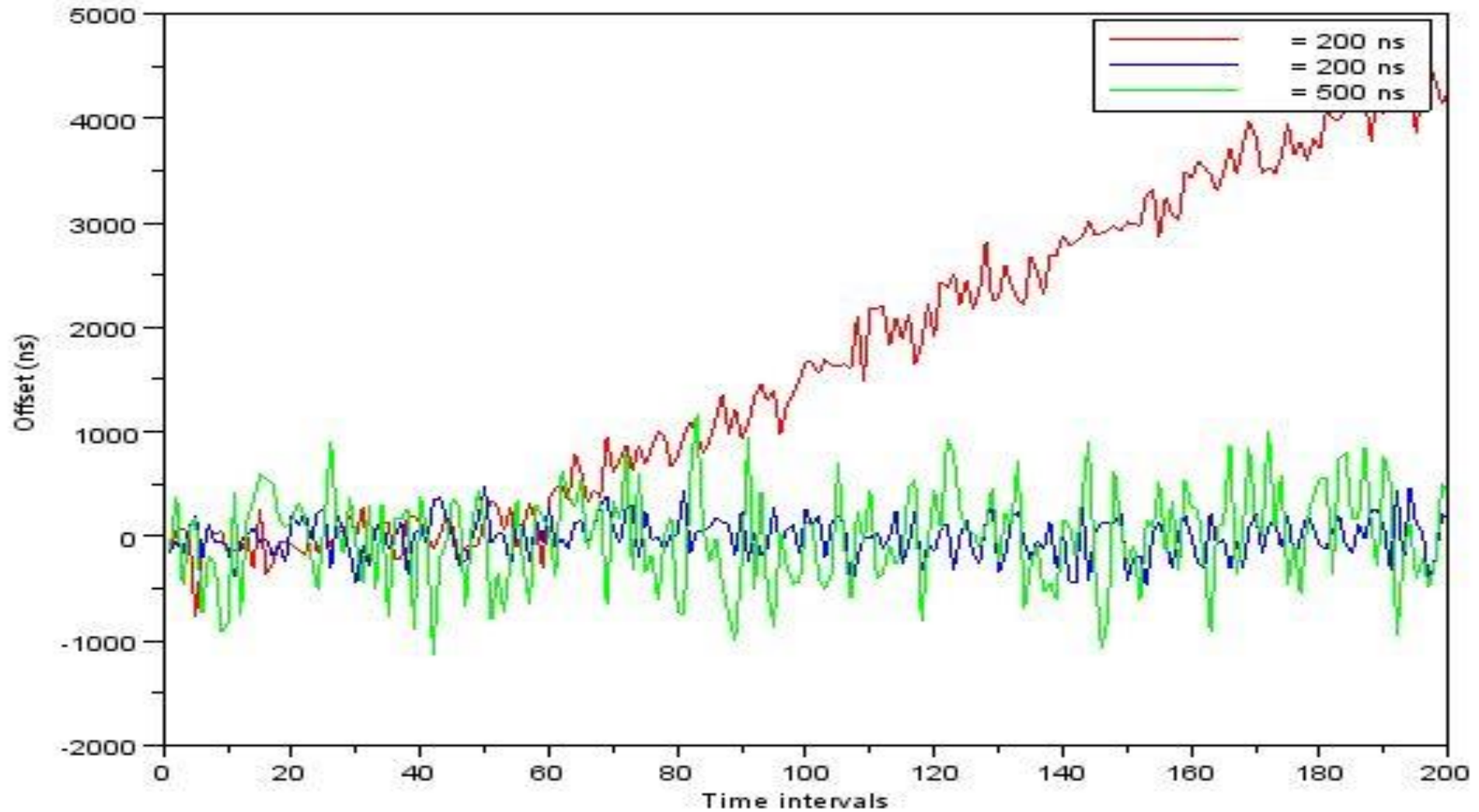


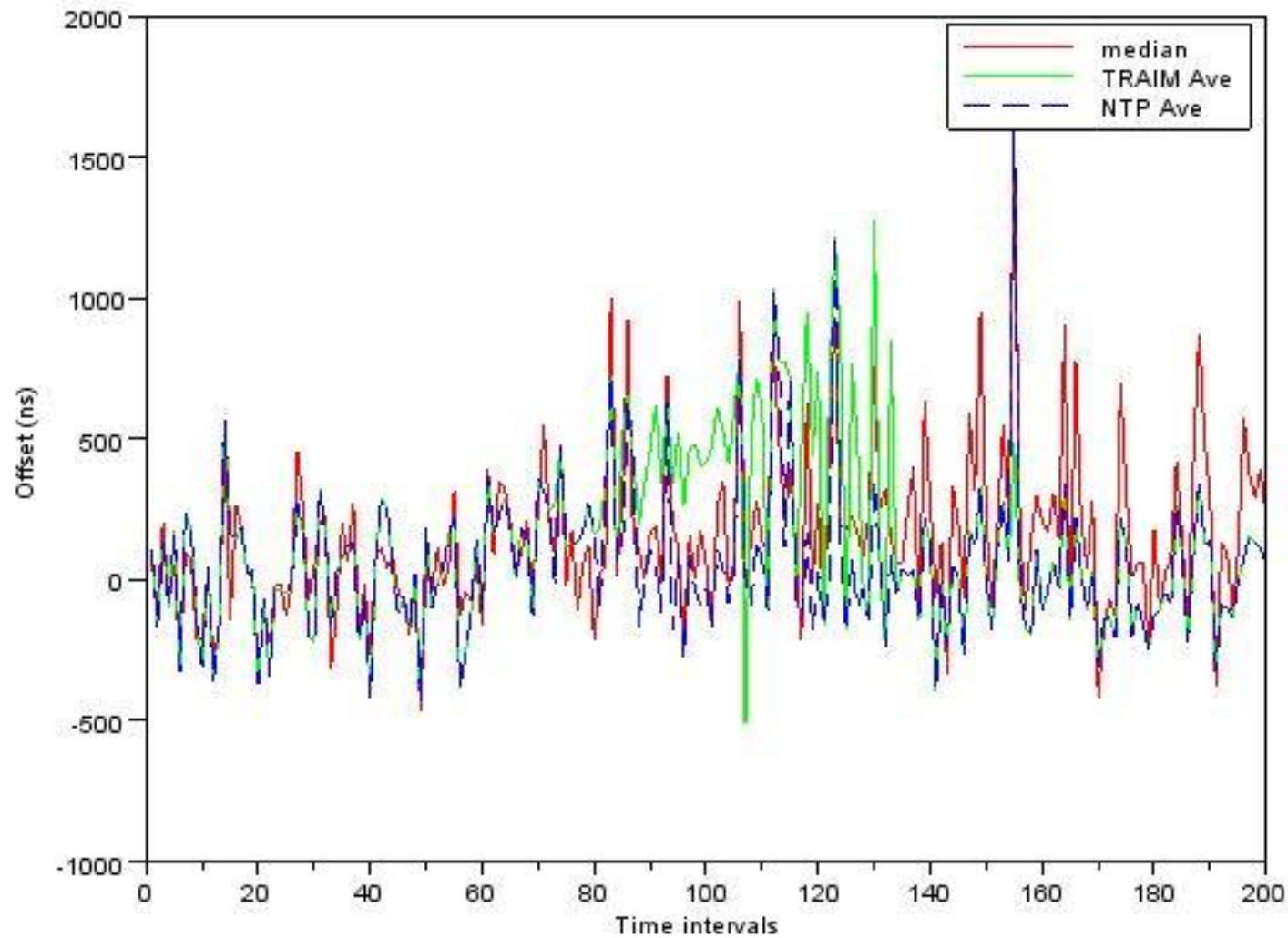






# Simulation with 3 GMs, 1 with ramp error





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



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Thank you for you attention.  
Questions?

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