



*Integrating high-accuracy synchronization into your
financial operations*



Cesar Prados @ STAC London 2018

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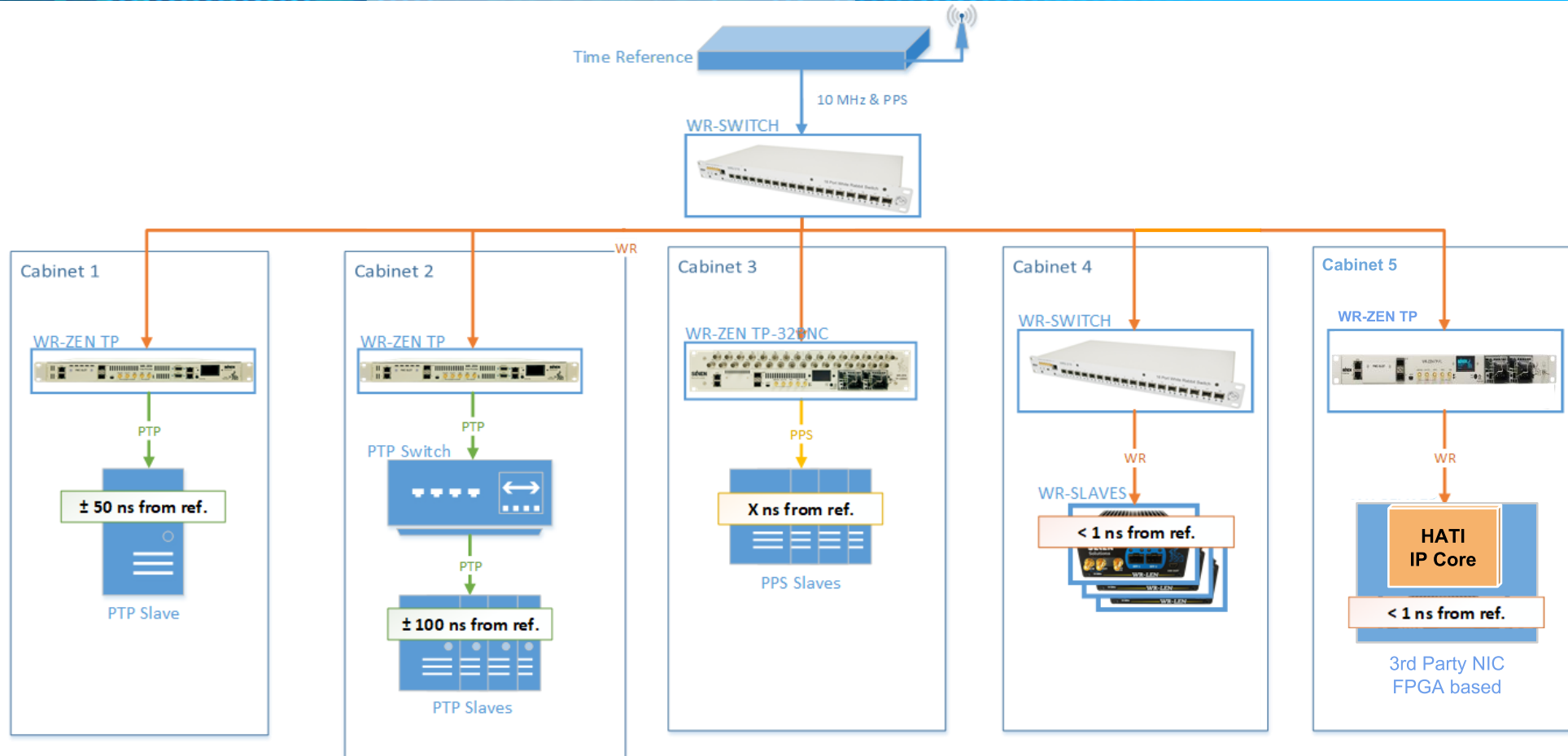
Intra-datacenter time transfer and synchronization



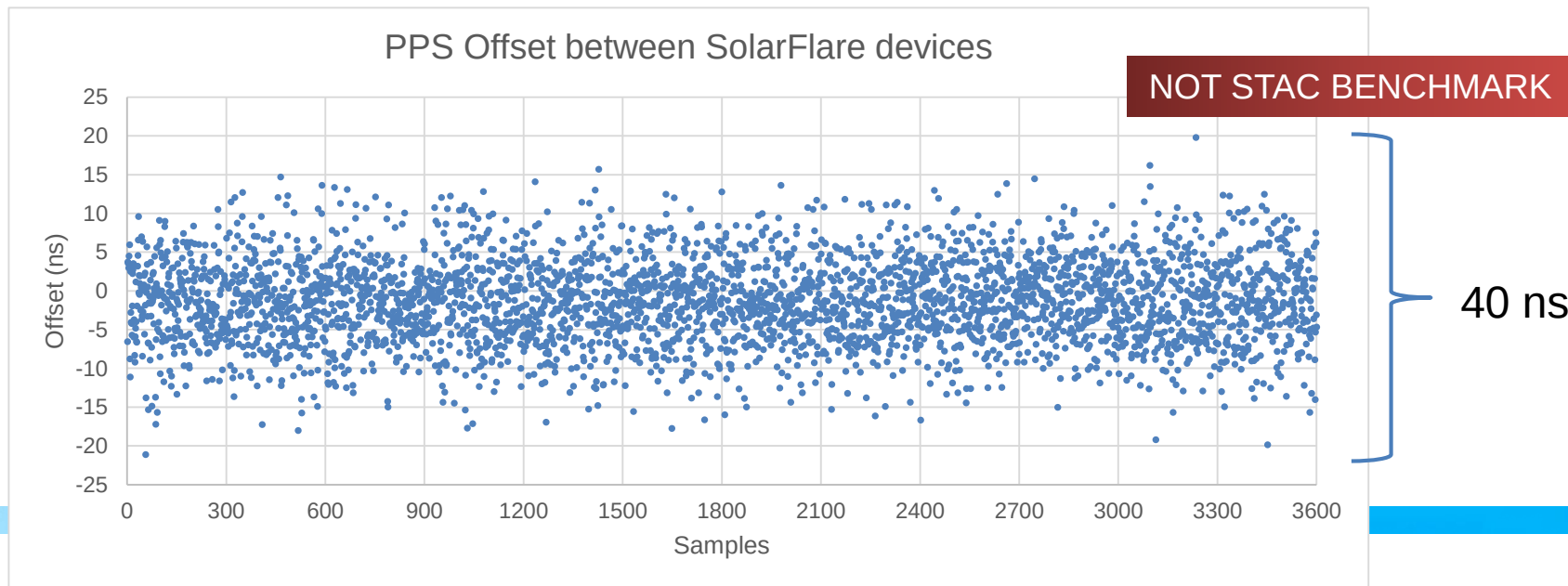
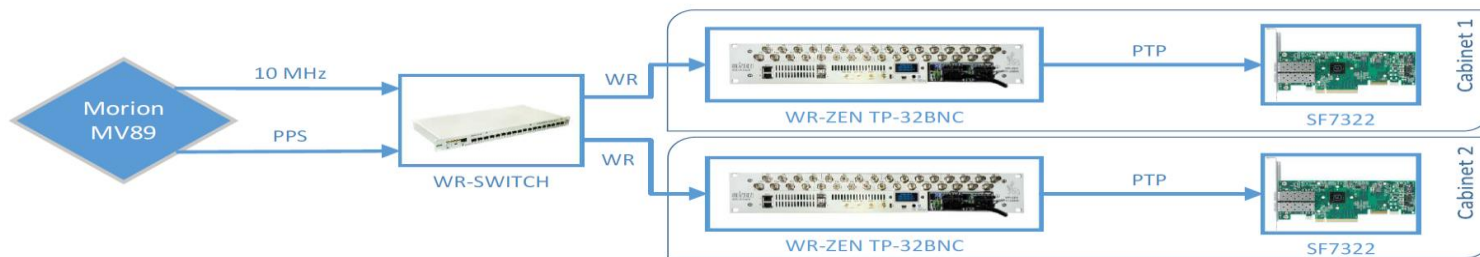
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Leaders in accurate sub-nanosecond time transfer and frequency distribution

Intra-datacenter Time Transfer and Synchronization



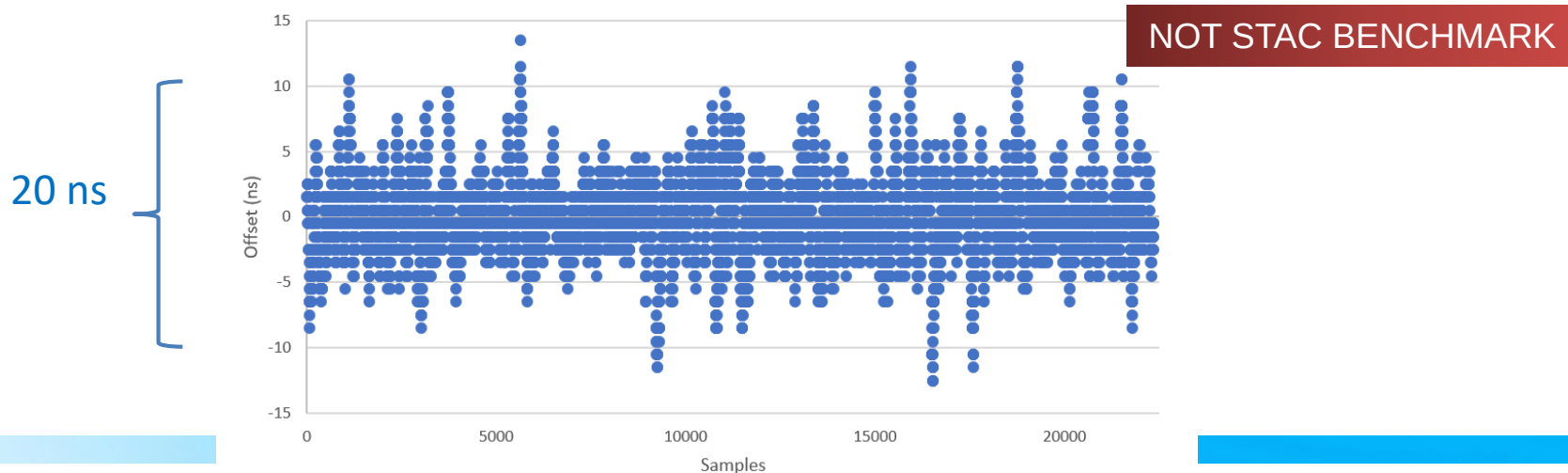
Solarflare (SF7322) Test



MetaMako tests (PPS sync)

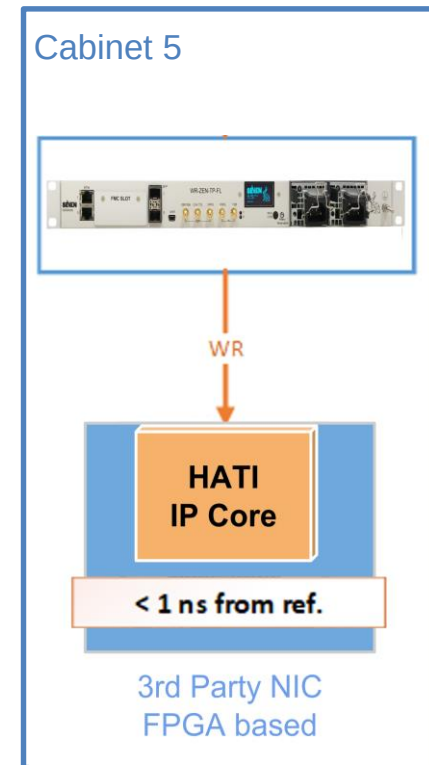


Metamako Synchronization offset using PPS



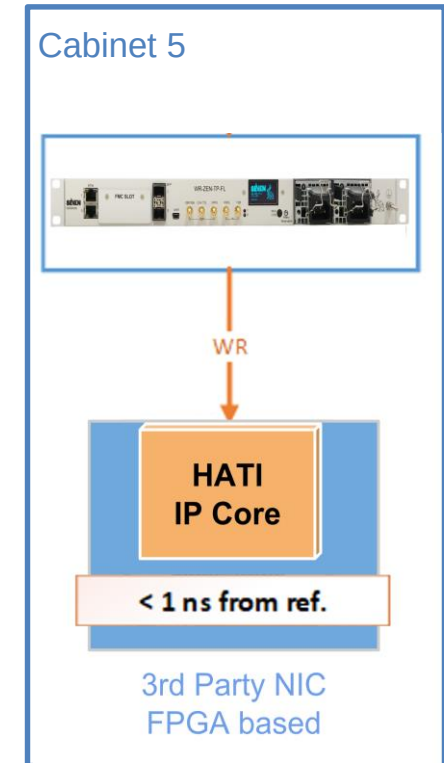
White Rabbit PTP HATI

- FPGA High Accuracy Timing IP



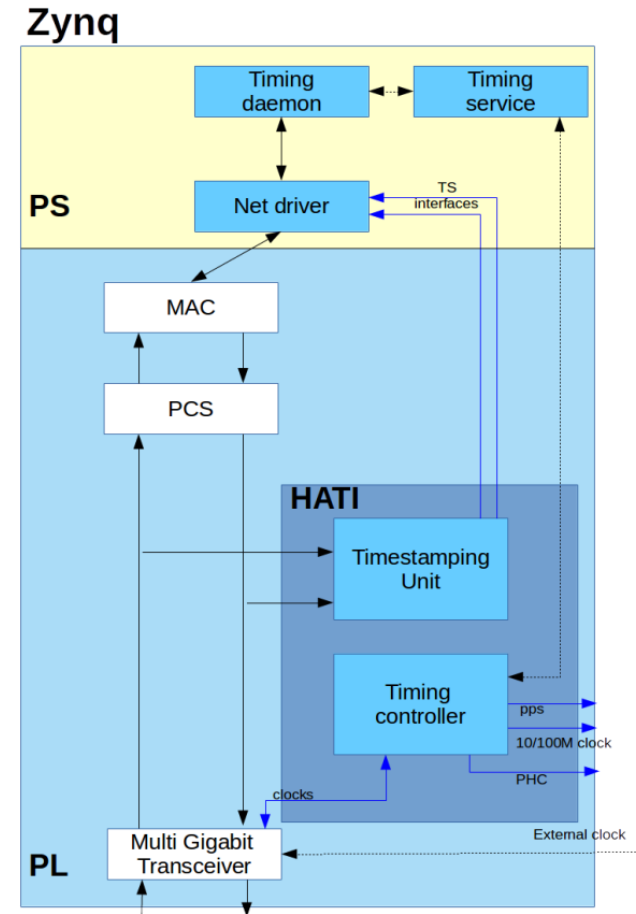
White Rabbit PTP HATI

- FPGA High Accuracy Timing IP
- Enables WR on 3rd party NICs (FPGA)
- No need of specific hardware
- Standard 1/10GbE
- Up to 120 km
- No additional latencies in the Data path



White Rabbit PTP HATI

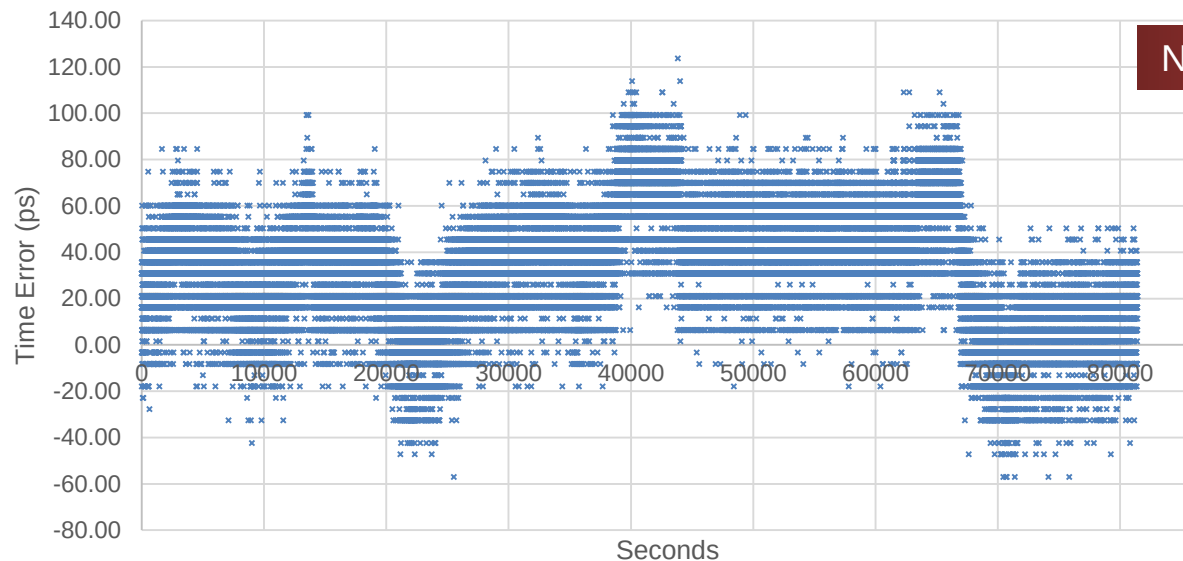
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Intra-datacenter Time Transfer and Synchronization – HATI IP Core Test

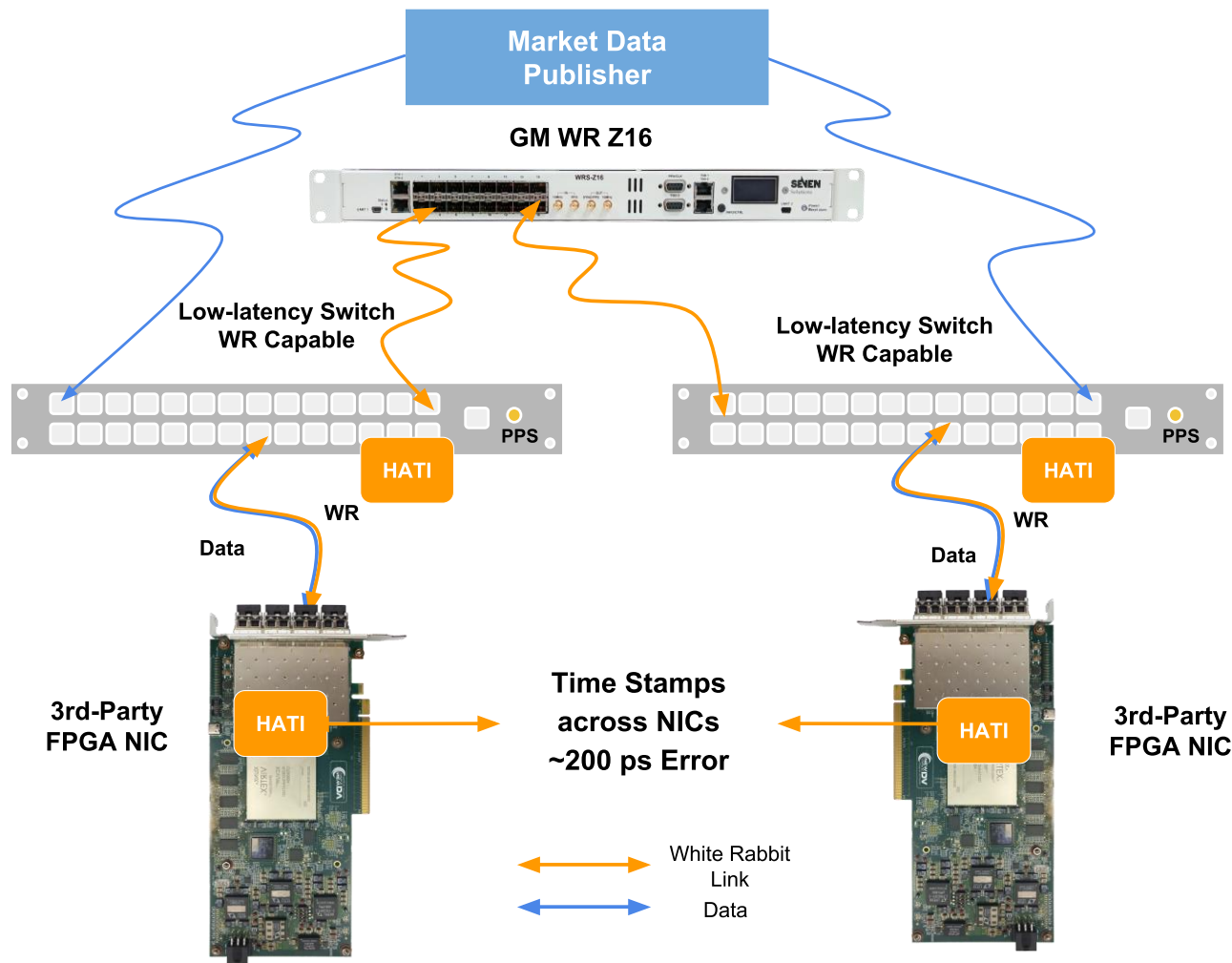
Max-Min (ps)	180,66
Mean (ps)	32,54
Dev. Std. (ps)	23,15952618

Error Between Master-Slave PPSs



Test over 80 km of fiber during 24 hours.

Intra-datacenter Time Transfer and Synchronization – HATI Integration





When every nanosecond counts

Inter-datacenter time transfer and synchronization



Inter-datacenter Time Transfer and Synchronization



Datacenter A

< 120 Km

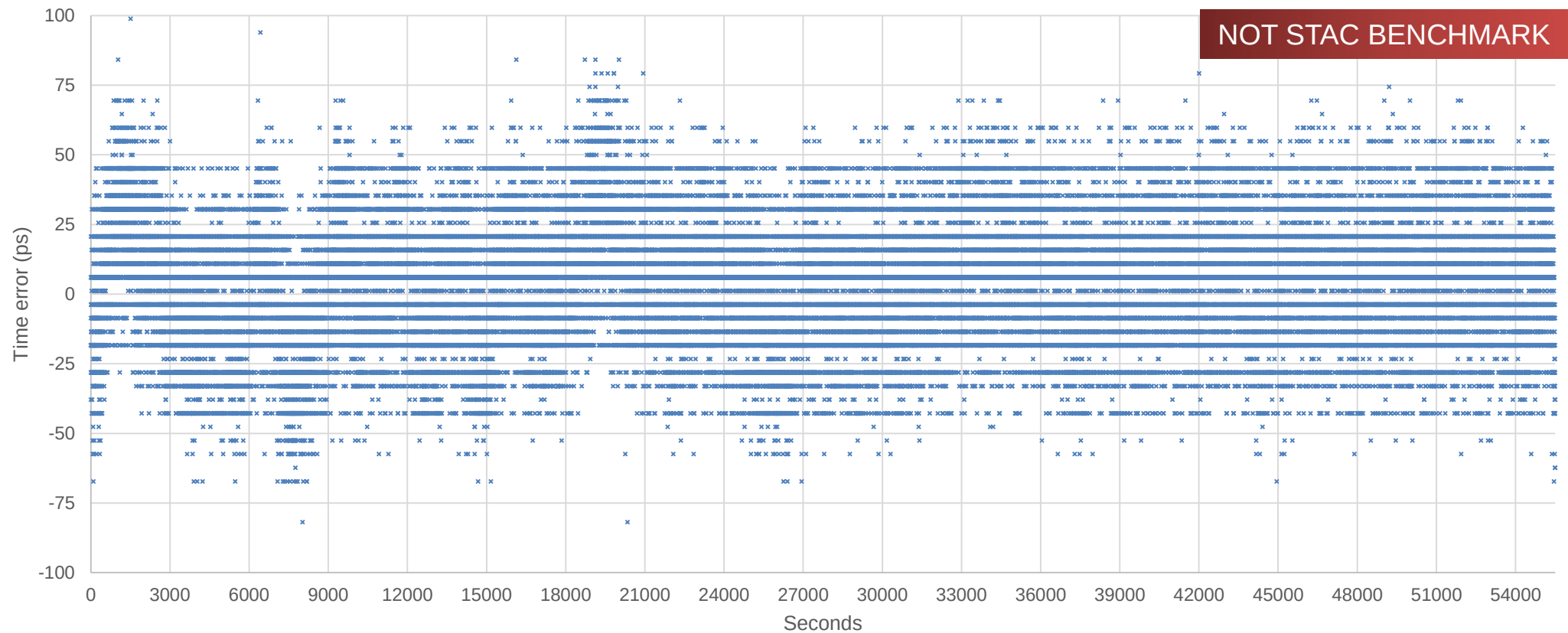


Datacenter B

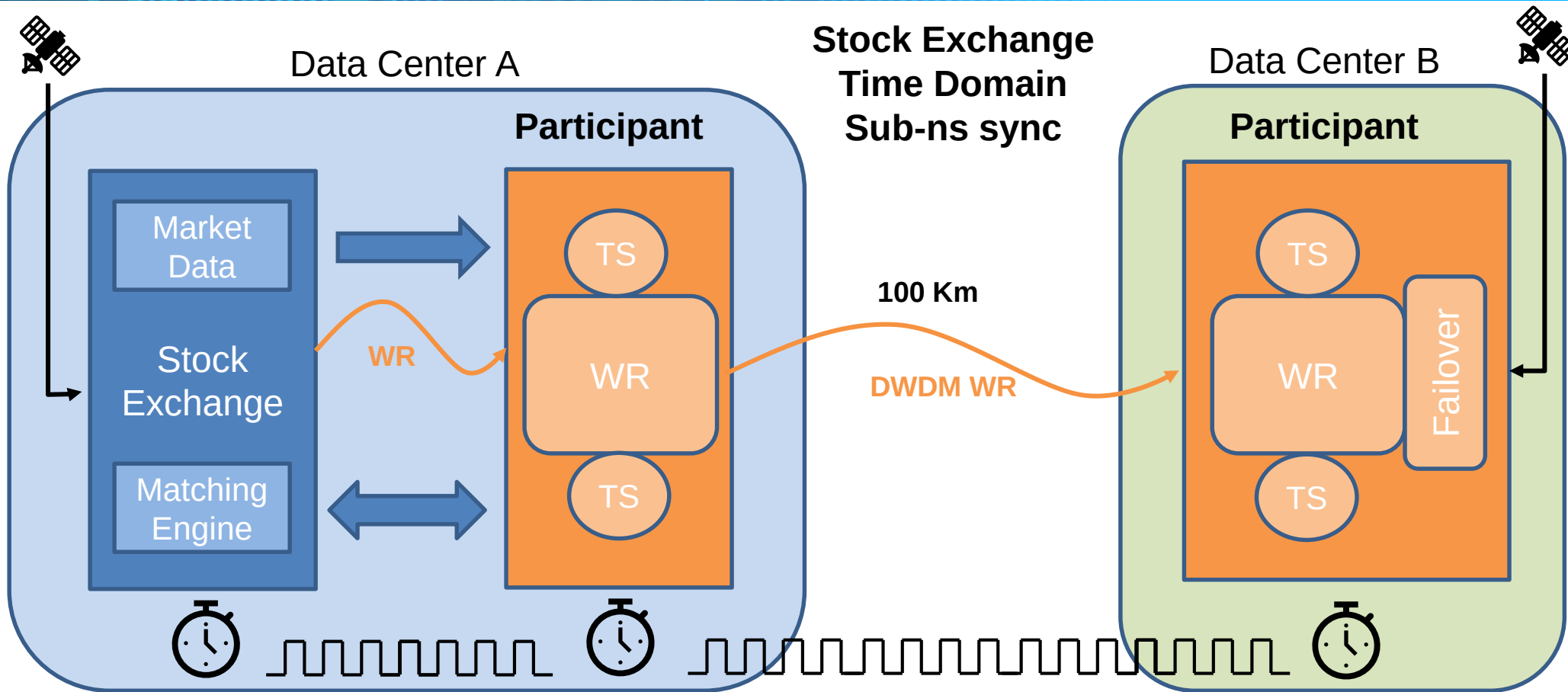


Inter-datacenter Performance

Time Error on 120 Km



Inter/Intra-datacenter Time Transfer and Synchronization





White Rabbit

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***Check out the Deutsche Boerse Talk 4:10 PM
“White Rabbit and Beyond”***

- Plain Old PTP + SyncE + HW “Tricks” = Deterministic sub-nanoseconds sync
- Full Integration of WR technology in your co-location
- It scales up to thousand of nodes
- Resilience: Holdover (Q1 2019) and Failover System (Q3 2019)
- Part of the IEEE 1588 PTP Standard (Q2 2019) → No lock-in vendor
- Thriving Community: Science & Industry

- More than 8 years leading accurate sub-nanosecond time transfer and frequency distribution for reliable industrial and scientific applications.
- We can help you:
 - Designing your nanosecond timing network
 - Providing WR equipment
 - Integrating HATI IP Core in your HDL gateware
 - Monitoring and auditing your timing networks
 - Commissioning a WR network and supporting you in production
- We're a Spanish company based in Granada, Frankfurt and Chicago

