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Accelerators for Smarter Data Delivery

TIME PRECISION PERFORMANCE

In the Napatech white paper “The time has come for greater precision,” details of several setups for time-stamping and time synchronization testing are provided. This data sheet lists the results of tests performed in Napatech test labs using some of the white paper’s setups. The tests were performed with a number of representative Napatech accelerators, with and without onboard PTP / IEEE 1588 support, and with a number of different time reference sources.

This data sheet lists standard deviation (STD) and peak results as well as results for holdover stability, that is the maximum time skew over time after loss of time references.

For background information about the test setups, and about time-stamping and time synchronization in general, please refer to the white paper.

Test Specification

- Napatech Release: Arlington
- Environment: 25°Celcius
- Test duration for time-stamping tests: 1 hour
- Test duration for time synchronization tests: 24 hours
- Test duration for holdover stability tests: 24 hours
- Unit of measurement: nanoseconds (ns), except for holdover stability results, which are measured in milliseconds (ms)

1x100 Gbps: NT100E3-1-PTP

NT100E3-1-PTP is a high-performance 1x100 Gbps intelligent PCIe Gen3 accelerator for network analysis with onboard PTP/IEEE 1588-2008 v2 support for use with applications requiring nanosecond time-stamping and time synchronization. The accelerator can be used as a master or a slave in the PTP network.



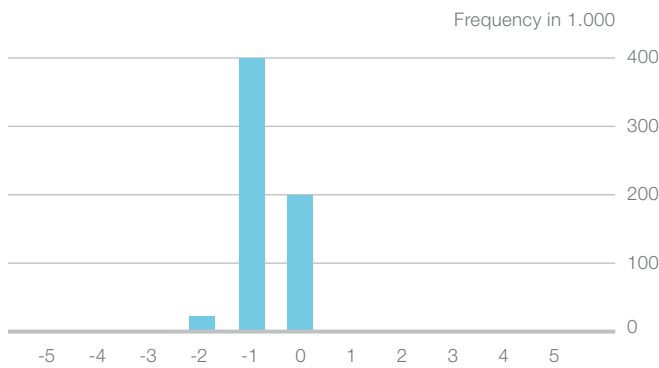
| NT100E3-1-PTP | STD | Peak |
|---|---------|--------|
| Frame time stamps on two ports on two accelerators, synchronized with shared PPS reference | 7 ns | 40 ns |
| Frame time stamps on two ports on two accelerators, synchronized with NT-TS* between accelerators | 6 ns | 40 ns |
| Frame time stamps on two ports on two accelerators, synchronized with Linux operating system time | 50 ns | 250 ns |
| Frame time stamps on two ports on two Accelerators, synchronized with PTP between accelerators | 7 ns | 60 ns |
| Time stamp clock, synchronized to PPS reference | 3 ns | 20 ns |
| Time stamp clock, synchronized to other accelerator with PTP direct cabling | 3 ns | 30 ns |
| Holdover stability, 24 hrs. run | 0.35 ms | |

4x10 Gbps: NT40E3-4-PTP

NT40E3-4-PTP is a high-performance 4x10 Gbps intelligent PCIe Gen3 accelerator for network analysis with onboard PTP/IEEE 1588-2008 v2 support for use with applications requiring nanosecond time-stamping and time synchronization. The accelerator can be used as a master or a slave in the PTP network.



Example:
NT40E3-4-PTP frame time stamps on two ports on one accelerator



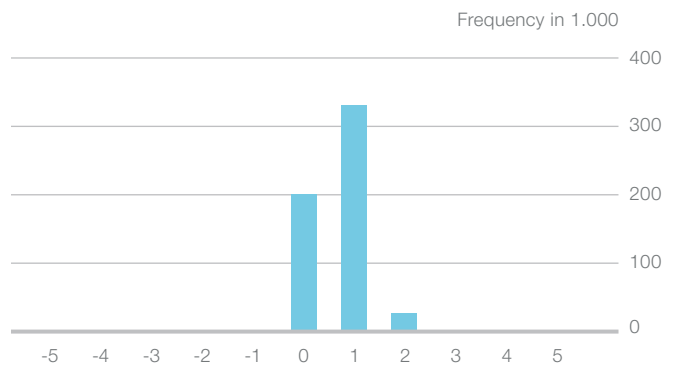
| NT40E3-4-PTP | STD | Peak |
|---|---------|--------|
| Frame time stamps on two ports on one accelerator | 5 ns | 20 ns |
| Frame time stamps on two ports on two accelerators, synchronized with shared PPS reference | 7 ns | 40 ns |
| Frame time stamps on two ports on two accelerators, synchronized with NT-TS* between accelerators | 6 ns | 40 ns |
| Frame time stamps on two ports on two accelerators, synchronized with Linux operating system time | 50 ns | 250 ns |
| Frame time stamps on two ports on two Accelerators, synchronized with PTP between accelerators | 7 ns | 60 ns |
| Time stamp clock, synchronized to PPS reference | 3 ns | 20 ns |
| Time stamp clock, synchronized to other accelerator with PTP direct cabling | 3 ns | 30 ns |
| Holdover stability, 24 hrs. run | 0.35 ms | |

2x10 Gbps: NT20E2-PTP

NT20E2-PTP Capture is a high-performance 2x10 Gbps PCIe Gen2 accelerator for network analysis with onboard PTP/IEEE 1588-2008 v2 support for use with applications requiring nanosecond time-stamping and time synchronization. The accelerator can be used as a master or a slave in the PTP network.



Example:
NT20E2-PTP frame time stamps on two ports on one accelerator



| NT20E2-PTP and NT4E2-4-PTP | STD | Peak |
|---|---------|--------|
| Frame time stamps on two ports on one accelerator | 5 ns | 20 ns |
| Frame time stamps on two ports on two accelerators, synchronized with shared PPS reference | 7 ns | 40 ns |
| Frame time stamps on two ports on two accelerators, synchronized with NT-TS* between accelerators | 6 ns | 40 ns |
| Frame time stamps on two ports on two accelerators, synchronized with Linux operating system time | 50 ns | 250 ns |
| Frame time stamps on two ports on two Accelerators, synchronized with PTP between accelerators | 7 ns | 60 ns |
| Time stamp clock, synchronized to PPS reference | 5 ns | 50 ns |
| Time stamp clock, synchronized to other accelerator with PTP direct cabling | 4 ns | 30 ns |
| Holdover stability, 24 hrs. run | 1.53 ms | |

4x1 Gbps: NT4E2-4-PTP

NT4E2-4-PTP is a high-performance 4x1 Gbps PCIe Gen2 accelerator for network analysis with onboard PTP/IEEE 1588-2008 v2 support for use with applications requiring nanosecond time-stamping and time synchronization. The accelerator can be used as a master or a slave in the PTP network.

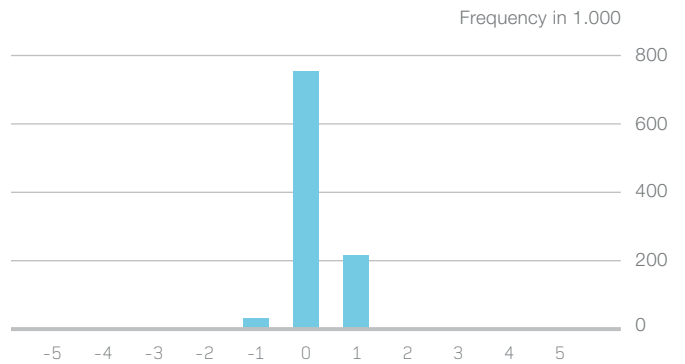


1x40 Gbps: NT40E2-1

NT40E2-1 is a high-performance 1x40 Gbps PCIe Gen2 accelerator for network analysis. The accelerator provides a single QSFP+ 40 GbE port and can be used for both packet capture and transmission.



Example:
NT40E2-1 frame time stamps on two ports on two accelerators synchronized with NT-TS between accelerators



| NT20E2-PTP and NT4E2-4-PTP | STD | Peak |
|---|---------|--------|
| Frame time stamps on two ports on one accelerator | 5 ns | 20 ns |
| Frame time stamps on two ports on two accelerators, synchronized with shared PPS reference | 7 ns | 40 ns |
| Frame time stamps on two ports on two accelerators, synchronized with NT-TS* between accelerators | 6 ns | 40 ns |
| Frame time stamps on two ports on two accelerators, synchronized with Linux operating system time | 50 ns | 250 ns |
| Frame time stamps on two ports on two Accelerators, synchronized with PTP between accelerators | 7 ns | 60 ns |
| Time stamp clock, synchronized to PPS reference | 5 ns | 50 ns |
| Time stamp clock, synchronized to other accelerator with PTP direct cabling | 4 ns | 30 ns |
| Holdover stability, 24 hrs. run | 1.53 ms | |

| NT40E2-1 | STD | Peak |
|---|---------|--------|
| Frame time stamps on two ports on two accelerators, synchronized with shared PPS reference | 9 ns | 80 ns |
| Frame time stamps on two ports on two accelerators, synchronized with NT-TS* between accelerators | 6 ns | 40 ns |
| Frame time stamps on two ports on two accelerators, synchronized with Linux operating system time | 50 ns | 250 ns |
| Time stamp clock, synchronized to PPS reference | 7 ns | 70 ns |
| Holdover stability, 24 hrs. run | 3.43 ms | |

Company Profile

Napatech is the world leader in data delivery solutions for network management and security applications. As data volume and complexity grow, organizations must monitor, compile and analyze all the information flowing through their networks. Our products use patented technology to capture and process data at high speed and high volume with guaranteed performance, enabling real-time visibility. We deliver data faster, more efficiently and on demand for the most advanced enterprise, cloud and government networks. Now and in the future, we enable our customers' applications to be smarter than the networks they need to manage and protect.

Napatech. SMARTER DATA DELIVERY

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