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Cisco Nexus 3550-F High Precision Timestamping Switch

Contents

High-precision timestamping

The Cisco Nexus® 3550-F High Precision Timestamping Switch is a network tapping, aggregation, and monitoring solution, optimized for high-performance, low-latency networks.

The device incorporates Cisco' industry-leading HPT[1] time-stamping technology, for 70-picosecond (70ps) timestamps that are embedded in every packet. This makes the Cisco Nexus 3550-F HPT the highest-precision network aggregation and monitoring solution available on the market today. The switch also offers high-quality time synchronization to pulse-per-second (PPS), GPS, and Precision Time Protocol (PTP) sources, ensuring that every packet is globally synchronized as well as precisely timestamped.

High-bandwidth ingress and egress

The system offers 400Gb/s of ingress and configurable egress options of up to 80Gb/s.

The Cisco Nexus 3550-F HPT ensures that tap aggregation performs well under adverse network conditions. The switch supports up to 40 ingress ports operating at 1Gb/s[2], 10Gb/s, or 40Gb/s[2] (400Gb/s total), with HPT timestamps at 70ps resolution. Egress is supported through between 1 and 8 ports operating at 10Gb/s each, or 1 to 2 ports operating at 40Gb/s[2] each. Egress ports also feature industry-standard Ethernet flow control, to allow lossless transmission even when capture devices are congested.

Deep packet buffer hierarchy

A deep, multilayered packet buffer architecture provides robust micro-burst protection.

Correlated micro-bursts are a fact of life, especially in high-performance networks. Yet regulatory environments require that every packet be captured. The Cisco Nexus 3550-F HPT has a deep packet buffer hierarchy to ensure that packets are captured, time stamped, and transferred to long-term storage, even under extreme correlated micro-burst scenarios. The switch provides 32kB per-port buffers, 64kB per-quad-port buffers, and 32GB of global packet buffering (see figure overleaf). This multilayer architecture makes the Cisco Nexus 3550-F HPT the most reliable tap aggregation system available today.

Transparent tapping

Replace 20 optical taps with a single 1RU device

Optical taps are difficult to deploy and manage, and consume large amounts of rack space. Every ingress port on the Cisco Nexus 3550-F HPT can be configured as a Layer 1 tap, allowing the switch to replace 20 optical taps in a single 1RU of rack space. Cisco Nexus 3550-F HPT taps are transparent to other devices. They add less than 5ns of delay to the tapped path, and nearly undetectable jitter.

Ease of use and manageability

Ease of use and enterprise manageability features are core to the Cisco Nexus 3550-F HPT.

Many users rate our CLI (Command Line Interface) as one of the best they have used. Every command available on the CLI is also available via a remote JSON RPC API. This makes the switch easy to operate and to manage at scale. All Cisco Nexus 3550-F platforms and switches include standard enterprise manageability and deployability features, including automatic configuration (via DHCP), SNMP, TACACS+ authentication, onboard Python programmability, BASH shell access, and time-series logging.

Figure 1.
Cisco Nexus 3550-F HPT
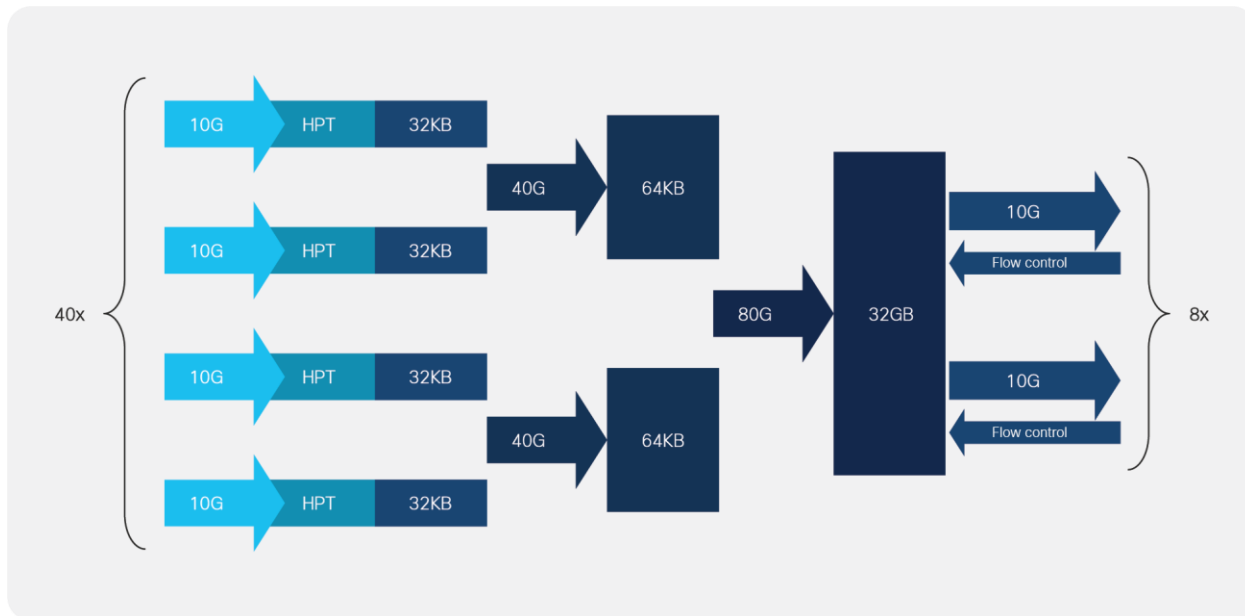
Figure 2.
Cisco Nexus 3550-F HPT multilayer, deep packet buffer hierarchy

Aggregation

- 400Gb/s ingress (1GbE[2]/ 10GbE/40GbE[2])

- 70ps high-precision timestamping (HPT[1])

- 80Gb/s egress (8x 10GE or 2x 40[2]GbE) with Ethernet flow control (IEEE 802.3x)

Packet buffering

- 32kB per port buffer (40x)

- 64kB per quad port buffer (10x)

- 32GB deep buffer (shared)

Time synchronization

- 72 channel GPS, GLONASS, QZSS, BeiDou

- Active antenna support (3.3V)

- Cold-start timesync acquisition <30s

- PPS in/out with selectable 50Ω termination

- PTP/NTP support via management port

Connectivity

- 3x 16 SFP+ line cards, up to 48 ports

- 3x 4QSFP line cards, up to 12 ports

- Any 40 ports assignable as ingress

- Any 8 ports assignable as egress

- SFP+ Fiber (10GBASE-SR, 10GBASE-LR, 10GBASE-LRM, 1000BASE-SX, 1000BASE-LX)

- SFP+ Copper Direct Attach

- SMA for PPS in/out

- SMA for GPS in

- RJ45 management port

- RJ45 industry-standard serial port

- USB (for firmware upgrades)

Footnotes

[1]Patent pending

[2]Scheduled for a future firmware release

Management

- CLI via serial, SSH, and telnet
- JSON RPC API for all CLI commands
- Automatic configuration via DHCP
- TACACS+ and multiuser support
- ACLs on management interface
- Firmware updates via SFTP, TFTP, HTTP, and USB
- Onboard BASH and Python scripts
- Onboard Cron jobs

Statistics

- Packet counters (RX, TX, dropped, etc.)
- Per port status LEDs
- Live packet dump
- SFP diagnostics (light levels, temps, etc.)
- SNMP, local, and remote syslog
- Time-series logging to InfluxDB

General

- 19" 1RU, rack mount
- Weight: 11kg (24lbs)
- Dual, hot-swappable supplies
- Standard: AC 100-240 Vac, 50-60 Hz
- Optional: DC 48-60 Vdc
- Maximum consumption: 150W
- Dual hot-swappable fan modules
- Optional airflow direction (FTB, BTF)
- Operating temperature: -5 °C to 45 °C
- Storage temperature: -40 °C to 70 °C
- Operating Relative Humidity: 5% to 90% (non-condensing)
- Storage Relative Humidity: 5% to 95% (non-condensing)
- Max Operating Altitude: 3048m (Mainland China: 2000m)
- Class I Equipment

Product Sustainability

Information about Cisco's environmental, social, and governance (ESG) initiatives and performance is provided in Cisco's CSR and sustainability [reporting](#).

Table 1.   Cisco environmental sustainability information

Sustainability topic		Reference
General	Information on product-material-content laws and regulations	[Materials](#)
	Information on electronic waste laws and regulations, including our products, batteries, and packaging	[WEEE Compliance](#)
	Information on product takeback and reuse program	[Cisco Takeback and Reuse Program](#)
	Sustainability inquiries	Contact: csr_inquiries@cisco.com
	Operating and storage conditions	[General](#)
Power	Power supply	[General](#)
Material	Maximum power consumption	[General](#)
	Product packaging weight and materials	Contact: environment@cisco.com
	Dimension and weight	[General](#)

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