Cisco Nexus 3550-F Programmable Layer 2 Application Platform

Contents

A flexible low latency networking platform

The Cisco Nexus® 3550-F Programmable Layer 2 Application Platform is a compact, yet powerful networking platform designed specifically for low-latency applications. The device features up to 48 ports of 10G Ethernet connectivity in a single rack unit form factor that can be programmed as:

- Fully managed Layer 2 MAC learning platform, with VLAN tagging/trunking and IGMP snooping. This is intended for applications where simple multiplexers are insufficient. As a Layer 2 Application Platform, the device offers latencies as low as 95ns.

Scalable modular architecture

The Cisco Nexus 3550-F Programmable Layer 2 Application Platform (N35-FS-48X) is built around a unique modular architecture that scales with your network. Three-line card bays provide the flexibility to grow and change connectivity options over time, while two internal module bays allow the device to be upgraded with expanded functionality, adding new capabilities and extending the useful life of the product. The 3550-F Programmable Layer 2 Application Platform architecture is shown in the figure below (Figure 1). At the heart of the architecture is High-Density Layer 1 connectivity that provides low-latency programmable 10GbE connectivity between all modules.

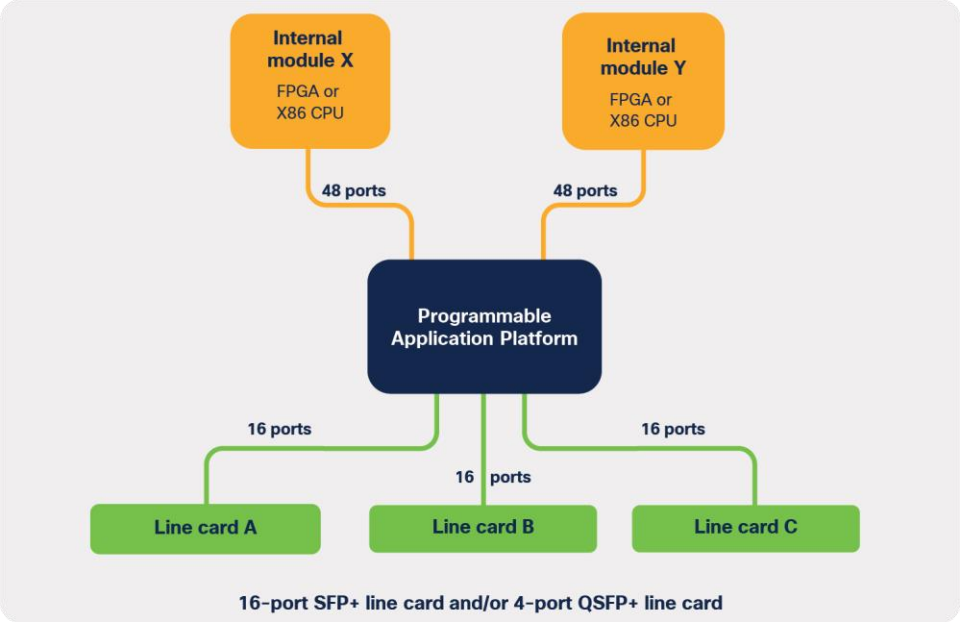

Figure 1.
Cisco Nexus 3550-F Programmable Layer 2 Application Platform architecture

The external module bays (A, B, and C) can be populated with a 16-port SFP+ line card (N35-F-16P) and/or a 4-port QSFP+ line card (N35-F-4Q). Standard SFP+ and QSFP+ optics or cable connectivity options are available.

A high-density FPGA (N35-F-KU115) module is included for Layer 2 applications. For custom applications, multiple FPGAs and/or multiple X86 CPU modules (N35-F-SKL) may be installed and programmed.

Ease of use and manageability

The Cisco Nexus 3550-F Programmable Layer 2 Application Platform runs a custom operating system and Command Line Interface (CLI), designed specifically to address the needs of Layer 2 and low-latency FPGA applications. Every command available on the CLI is also available through a remote JSON RPC API. This makes the device easy to operate and manage at scale.

The Cisco Nexus 3550-F Programmable Layer 2 Application Platform includes standard enterprise manageability and deployment features including automatic configurations (through DHCP), SNMP, TACACS+ authentication, on-board Python programmability, BASH shell access, and time-series logging.

Packet aware statistics and monitoring

The Cisco Nexus 3550-F Programmable Layer 2 Application Platform is fully packet aware. Every port on the device is monitored for vital packet statistics, including the number of packets and bytes transmitted or received and transmit and receive errors. The device also provides deep diagnostics, including light levels, operating temperatures, transceiver capabilities, and more. All these statistics are available at no latency cost on the critical path.

Layer 2 learning application capabilities

Not all use cases need Layer 1 learning or Layer 2 Multiplexing. Sometimes a Layer 2 learning platform is needed, yet low latency is still required. Along with the capability to run Layer 1 learning applications and Multiplexing applications, the 3550-F Programmable Layer 2 Application Platform provides Layer 2 learning applications with a latency as low as 95ns, which is almost half the latency of the previous generation Layer 2 devices. In addition to MAC learning, it also offers:

- VLAN tagging, trunking, stripping, and rewriting
- IGMP snooping
- TAP/agg timestamping with 2.8ns timestamp resolution
- BGP client (peering only)

Figure 2.
Cisco Nexus 3550-F Programmable Layer 2 Application Platform

Cisco Nexus 3550-F Programmable Layer 2 Application Platform features

Latency

- L1 Tap/Patch: 3ns minimum – 5ns maximum
- FastMux: 39ns minimum – 48ns maximum
- Mux: 92ns minimum – 107ns maximum
- Mux (switch): 86ns minimum – 102ns maximum
- Layer 2 Application: 95ns minimum – 126ns maximum

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

Connectivity

- 3x 16 SFP+ line cards, up to 48 ports
- 3x 4QSFP line cards, up to 12 ports (48x10G)
- 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)

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
- FW updates via SFTP, TFTP, HTTP, and USB
- Onboard BASH and Python scripts
- Onboard Cron jobs
- Time sync via PPS, GPS, PTP, and NTP

General

- 19” 1RU, rack mount
- Weight 11kg (24lbs)
- Dual, hot-swappable supplies
- Standard: AC 90-264V, 47-64 Hz, included IEC C13-C14 cables
- Optional: DC 40-72V
- Maximum consumption: 150W
- Dual hot-swappable fan modules
- Optional airflow direction
- Operating temperature: -5 °C to 45 °C
- Storage temperature: -40 °C to 70 °C
- Operating relative humidity: 5% to 90% (noncondensing)
- Storage relative humidity: 5% to 95% (noncondensing)

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
	Maximum power consumption	General
Material	Product packaging weight and materials	Contact: environment@cisco.com
	Dimension and weight	General

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