# Cisco Nexus 3550-T Programmable Network Platform

# Contents

## A flexible low-latency application platform

The Cisco Nexus® 3550-T Programmable Network Platform is a top-of-rack software application platform with a unique low-latency design. The Cisco Nexus 3550-T Platform features up to 48 ports of Ethernet connectivity in a single-rack unit form factor. The platform is built around a powerful programmable FPGA and provides a complete firmware development environment for custom application and use cases.

**Figure 1.**
Cisco Nexus 3550-T Programmable Network Platform

## Hardware architecture

The Cisco Nexus 3550-T Programmable Network Platform has a fixed form factor that is built around a dynamically reconfigurable FPGA (Field Programmable Gate Array) and provides 48 ports that are 25G capable along with an x86 (Intel® Atom® processor with 8 cores up to 1.7 GHz)–management CPU. All 48 ports are directly connected to Xilinx Virtex UltraScale Plus VU35P FPGA with a "-3" speed grade. The FPGA has 8GB of High Bandwidth Memory (HBM) on board. The Cisco Nexus 3550-T hardware architecture diagram is shown in Figure 2 below.
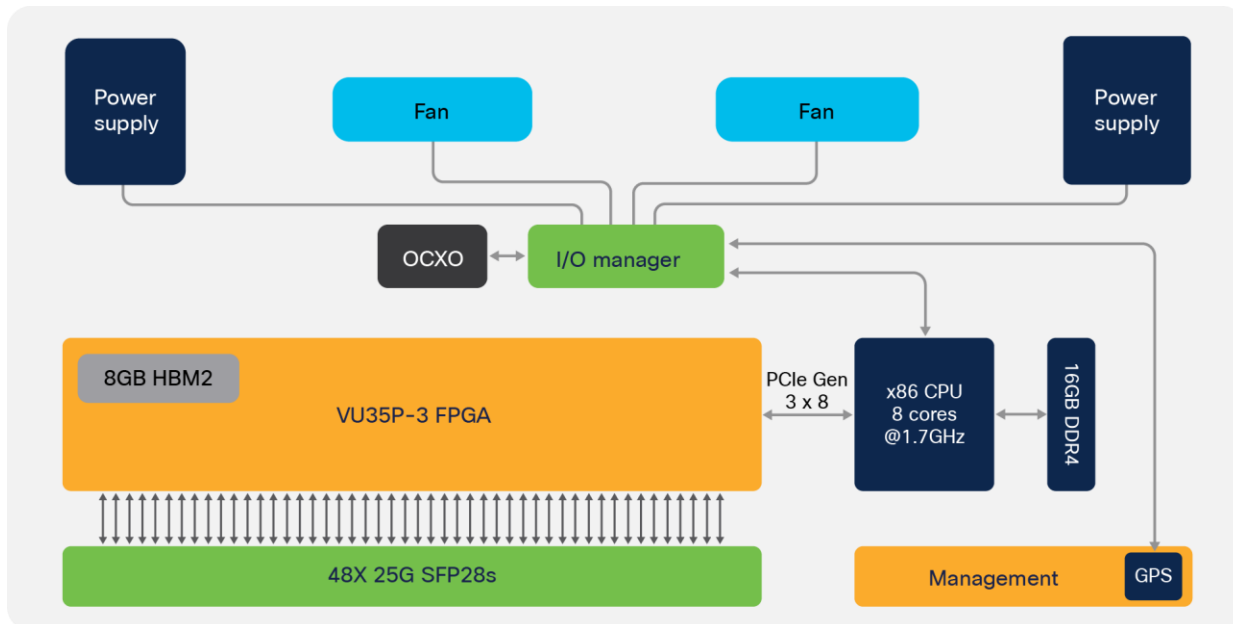
**Figure 2.**
Cisco Nexus 3550-T Programmable Network Platform hardware architecture

## Ease of management

The Cisco Nexus 3550-T Programmable Network Platform features a console port, a Micro USB port, a 1G RJ45 port, and a 10G SFP+ port, which can be used as management interfaces. The Cisco Nexus 3550-T Platform uses a Command Line Interface (CLI) designed to address the needs of low-latency FPGA configurations. Every command available on the CLI is also available via a remote JSON RPC API to make the Nexus 3550-T easy to operate and manage at scale.

The Cisco Nexus 3550-T Programmable Network Platform includes standard enterprise manageability and deployment capability features such as automatic configuration (via DHCP), SNMP, TACACS+ authentication, on-board Python programmability, BASH shell access, and time-series logging.

## Programmability

The Cisco Nexus 3550-T Programmable Network Platform provides a powerful development framework to add application-specific intelligence to the Cisco Nexus 3550 FPGA Module using Cisco's Nexus Firmware Development Kit (FDK). Our Cisco Nexus FDK provides all the required components to build, run, and maintain FPGA-based intelligent applications and accelerate network applications.

## Network platform features

### Statistics

The Cisco Nexus 3550-T Programmable Network Platform supports packet-aware statistics. The Cisco Nexus 3550-T firmware has the capability to monitor for vital packet statistics, including the number of packets/bytes transmitted/received and transmit/receive errors, and deep diagnostics, including light levels, operating temperatures, transceiver capabilities, and more. All these statistics are available at no latency cost on the critical path. The following are some of the available statistics:

- Packet counters (RX, TX)
- Current RX link state
- RX link change count
- CRC error counters for RX-temperature information
- Power-supply sensor information
- Fan speed

### Connectivity

- 48 x SFP28 (small form-factor pluggable) configuration (backward compatible with SFP+ and SFP)
- SFP+ Fiber (10GBASE-SR, 10GBASE-LR, 10GBASE-LRM, 1000BASE-SX, 1000BASE-LX)
- SFP+ Copper Direct Attach
- SMA for PPS in/out[*] (3.3V with 50 Ohm signal interface)
- SMA for GPS[*] in
- RJ45 management port
- RJ45 industry-standard serial port (default speed: 115200 N81)
- USB (for firmware upgrades)

Data rates[1]:

- 25GbE, 10GbE, 1GbE

## Management

- CLI via serial, SSH, and telnet
- JSON RPC API for all CLI commands
- Automatic configuration via DHCP
- TACACS+ and multiuser support
- ACL's on management interface
- FW updates via SFTP, TFTP, HTTP, and USB
- Onboard BASH and Python scripts
- Onboard Cron jobs
- Time synchronization via PPS, GPS, PTP, and NTP

## General

- 19" 1RU, rack mount
- Weight 10kg (22lbs)
- 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)

## Supported applications

The following table shows the list of currently supported and upcoming network applications for the Cisco Nexus 3550-T Programmable Network Platform. Some of these network applications are bundled within a single release. The details of these network applications can be found in the software release notes. Release notes are updated as new network applications are released.

**Table 1.**    Supported applications

| Application | Overview |
|---|---|
| ULL Layer 3 Routing App | Ultra-low latency Layer 3 switching capability |
| ULL Layer 2 Switching App | Ultra-low latency Layer 2 switching capability |
| Security | Enhanced packet-filtering and Network Address Translation (NAT) |
| High Availability[*] | Provides redundancy in the network |
| WAN Extension[*] | WAN link policing |
| FastMux[*] | Packet-aggregation capability |
| Exchange Gateway App[*] | Ultra-low latency exchange fairness and HPT |
| Data Broker App[*] | Packet-flow optimization |
| Grand Master App[*] | Provides Grandmaster Clock. |
| Tap Agg[*] | Provides network visibility |
| User custom applications (FDK) | Adding custom intelligence in the network. |

[*]Future release

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| Sustainability topic | Reference |
|---|---|
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| Information on electronic waste laws and regulations, including products, batteries, and packaging | WEEE compliance |

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**Footnotes:**

[1] EXOS supports 1G and 10G. NXOS supports 10G at the moment. 1G and 25G support with NXOS is on roadmap and would require a firmware update.

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