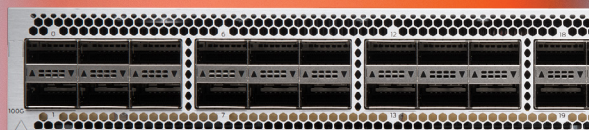
PTX1000 and PTX10002 Fixed-Configuration Packet Transport Routers



Product Overview

Increased interactions between people and machines are creating huge volumes of traffic with increasingly unpredictable patterns. These dynamics have intensified the challenge of accommodating growth with traditional network products and architectures. A new approach, based on both physical and virtual innovation, will help service providers stay ahead of growing traffic demands while remaining profitable. PTX Series Packet Transport Routers with custom ExpressPlus silicon, built from the ground up with SDN in mind, deliver an architecture that reduces TCO with highly flexible, high-performance innovations that are easy to deploy.

Product Description

Juniper Networks® PTX Series Packet Transport Routers transform the core network with physical and virtual innovations that deliver unprecedented scale at a low cost. Two fixed-configuration platforms are available: the PTX1000 Packet Transport Router, the industry's first 2 U packet transport routing device; and the PTX10002 Packet Transport Router, a second-generation device that doubles the density of the PTX1000 with Juniper Networks ExpressPlus™ silicon. These packet transport routers give cloud and communication providers the freedom to develop and deliver new virtualized services anywhere in the network. They can also create an elastic architecture with precise traffic control without compromising the service experience.

The Evolving Landscape

New traffic dynamics such as mobility, video, and cloud-based services are transforming traditional network patterns and topologies. Stratified, statically designed, and manually operated networks must evolve to support the constantly growing volumes of traffic quickly and economically. Many operators have seen their profits stagnate and TCO grow under the burden that these growing traffic volumes are imposing. Service providers need to become more agile in order to optimize their existing network resources, shorten planning cycles, and remove rigid network layers.

Operators are facing the following challenges under the current environment:

- **Static scale:** The cloud and communication providers' backbone handles the full weight of network traffic. Therefore, it is paramount that the core network be able to grow organically along with traffic to meet escalating demands. Silicon, system, and SDN innovations for the core empower service providers to scale faster than the traffic in an elegant, elastic, redundant package—without requiring forklift upgrades.
- **Static architecture:** Virtualized services and the explosion of cloud-based applications are creating increasingly unpredictable traffic patterns. To handle this unpredictability, service providers need a dynamic, scale-out architecture across all layers to create programmable, traffic-optimized networks that support any service, anywhere.
- **Power costs:** For cloud and communication providers, the operational cost of transmitting a packet through the core is less than the cost of the power required to move that packet. In fact, projections suggest that over a few short years, the total power draw will exceed the cost of deploying the entire network infrastructure. Efficient power utilization by the core router requires a holistic ground-up engineering approach.
- **Facility limitations:** Service providers cannot grow their facilities exponentially forever. They need innovations that provide a low-touch deployment model optimized around space availability, facility power requirements, and floor weight thresholds. Transport-oriented central office locations have the added burden of meeting European Telecommunications Standards Institute (ETSI) standard depth. Any transit router innovation must operate within these constraints.

In order to address these challenges, cloud and communication providers need an innovative core router that satisfies three defining principles: performance, deployability, and SDN programmability. PTX1000 and PTX10002 fixed-configuration packet transport routers provide the foundation for a scale-out core backbone architecture, ensuring a consistent user experience across geographies. Both the PTX1000 and PTX10002 meet all existing traditional core requirements, easily fitting into cloud and communication provider networks that require transit focused IP/MPLS applications such as: Internet peering, scale-out metro and backbone topologies, and label-switching router (LSR) optimized deployments.

Architecture and Key Components

The PTX1000 and PTX10002 fixed-configuration packet transport routers bring physical and virtual innovation to the service provider core network. These core routers directly address concerns about operational expenditures while scaling organically to keep pace with growing traffic demands.

Physical innovations at the core silicon level enable the PTX Series fixed-configuration routers to lower OpEx. Powered by ExpressPlus silicon, these devices build upon the Juniper Networks Junos® Express silicon concepts of low consistent latency and wire-rate packet performance for both IP traffic and MPLS transport, without sacrificing the optimized system power profile. These concepts are incorporated into the PTX Series design along with full IP functionality, preserving the spirit of the original Junos Express chipset. The ExpressPlus silicon is the first purpose-built telecommunications silicon to engineer a 3D memory architecture into the base design for more than 1.6 billion filter operations per second, dynamic table memory allocation for mammoth IP routing scale, and enormous power efficiency gains.

While the ability to meet service provider needs for performance, deployability, and SDN control begins with the silicon, the integration of optical transport with 100GbE-coherent technology further improves the economics of the core network. With PTX Series Packet Transport Routers powered by ExpressPlus silicon, service providers can now deploy an architecture with the efficiency of a lean-core network featuring Juniper Networks NorthStar Controller, a robust, full-featured Internet backbone router. The ExpressPlus silicon also allows service providers to deploy a converged regional IP/MPLS core router with integrated 100GbE coherent transport for superior performance, elegant deployment, and SDN programmability.

PTX1000 and PTX10002 Fixed-Configuration Packet Transport Routers

PTX1000

The PTX1000, with its rich IP/MPLS feature set, lets service providers organically distribute peering points throughout the network without sacrificing performance and deployability—the main contributors to eroding TCO for service providers when peering. The PTX1000 expands the applications scope that the PTX Series architecture addresses, enabling service providers to implement a distributed core architecture for interconnecting growing cloud services. Service providers can distribute peering points to match traffic demand with an optimized core router without sacrificing performance or deployability. The PTX1000 is a first-generation fixed-configuration core router in a compact, 2 U form factor, making it easily deployable in space-constrained Internet exchange locations, remote central offices, and embedded peering points anywhere in the network, including cloud-hosted services.

The PTX1000 operates at 2.88 Tbps in a fixed core router configuration and supports flexible interface configuration options, including 288 10GbE ports via a quad small form-factor pluggable plus transceiver (QSFP+) breakout, 72 40GbE ports via QSFP+, and 24 100GbE ports via QSFP28.

PTX10002

The PTX10002 is a second-generation PTX Series fixed-configuration core router, featuring a compact, 2 U form factor that is easy to deploy in space-constrained Internet exchange locations, remote central offices, and embedded peering points throughout the network, including cloud-hosted services.

The PTX10002 operates at 6 Tbps in a fixed core router configuration. It supports flexible interface configuration options, offering 60 physical quad small form-factor pluggable 28 (QSFP28) 100GbE ports, 72 QSFP+ 40GbE ports, and 192 10GbE ports via QSFP+ breakout cables.

ExpressPlus Silicon

Like the rest of the PTX Series, the PTX1000 and PTX10002 are powered by ExpressPlus silicon, delivering predictable IP/MPLS packet performance and functionality. ExpressPlus silicon also eliminates the complex sawtooth packet profile found in elaborate over-engineered network processing units (NPUs) deployed in other core routers. This delivers the distributed peering scale (more than 2 million forwarding information base [FIB] and 5 million routing information base [RIB], also known as forwarding and routing tables, respectively), required to match expanding traffic demands.

Features and Benefits

Performance is one of the guiding design principles for the PTX Series Packet Transport Routers. This focus empowers service providers with superior scale to match increased traffic levels and network engineering challenges with predictable system latency to improve the overall service experience, deliver best-in-class resiliency, and ensure that services meet strict customer service-level agreements (SLAs).

Deployability is the other guiding design principle for the PTX Series routers, focusing on power, space, and weight—fundamental concerns that impact service providers' operational budget with respect to growing traffic.

SDN programmability brings virtual innovations to the service provider core, while the NorthStar Controller is an open, standards-based solution that optimizes both the IP layer and the transport layer with precise SDN control, allowing service providers to automate and scale operations.

Table 1 summarizes the features available on the fixed-configuration PTX Series Packet Transport Routers.

Table 1: Fixed-Configuration PTX Series Features and Benefits

Feature	Feature Description	Benefit
System capacity	The PTX1000 scales to 3 Tbps in a single chassis, breaking out into 288 10GbE, 72 40GbE, and 24 100GbE interfaces. The PTX10002 scales to 6 Tbps in a single chassis, breaking out into 192 10GbE, 60 40GbE, and 60 100GbE interfaces.	Both the PTX1000 and PTX10002 give cloud and service providers the performance and scalability needed to outpace increased traffic demands.
High availability hardware	Both the PTX1000 and PTX10002 are engineered with hardware redundancy for cooling, power supplies, and forwarding.	HA is critical for service providers to maintain an always-on infrastructure base and meet stringent SLAs across the core.
Packet performance	Groundbreaking ExpressPlus silicon empowers PTX Series routers with unparalleled packet processing for both full IP functionality and MPLS transport, leveraging a revolutionary 3D memory architecture.	Exceptional packet processing capabilities help alleviate the challenge of scaling the network as traffic levels increase while optimizing IP/MPLS transit functionality around superior performance and elegant deployability.
Ultra-compact 2 U form factor	With cutting-edge innovation in power and cooling technology, the PTX10002 is the only fixed-configuration core router that provides 6 Tbps of capacity in a 2 U form factor. The PTX1000 provides 2.88 Tbps of capacity in a 2 U form factor.	Space efficiency is a critical requirement for peering Internet exchange points, peering collocations, central offices, and regional networks, especially in emerging markets.

PTX1000 Packet Transport Router

PTX10002 Packet Transport Router

PTX Series Fixed-Configuration Packet Transport Routers Specifications

Hardware	PTX1000	PTX10002
System throughput	3 Tbps	6 Tbps
Forwarding capacity	Up to 2 Bpps	Up to 4 Bpps
Max. 10GbE port density	288	192
Max. 40GbE port density	72	60
Max. 100GbE port density	24	60
Dimension (WxHxD)	17.4 x 3.46 x 31 in (44.2 x 8.8 x 78.7 cm)	17.4 x 3.46 x 31 in (44.2 x 8.8 x 78.7 cm)
Rack units	2 U	2 U
Weight	68 lb (31 kg)	68 lb (31 kg)
CPU	Intel Quad Core Ivy Bridge 2.5 GHz CPU	Intel Quad Core Ivy Bridge 2.5 GHz CPU
RAM	32 Gb SDRAM	32 Gb SDRAM
SSD	64Gx2	64Gx2
Maximum power draw	1425 W (AC, DC), 4862 BTU/hr	2425 W (AC, DC), 4862 BTU/hr
Typical power draw	1050 W (AC, DC), 3583 BTU/hr	1850 W (AC, DC), 3583 BTU/hr

Management and Precision Time Protocol (PTP) Interfaces

- 1 small form-factor pluggable transceiver (SFP/SFP+) port or PTP Grandmaster
- Fiber (SFP) or 10/100/1000BASE-T (RJ-45) Ethernet management port
- SMB in, SMB out, 10 MHz in, 10 MHz out
- One console port
- USB 2.0 storage interface

Power

- 4x 1600 W AC/DC power supply

Cooling

- Front-to-back airflow
- Three hot-swappable fan modules with redundant fans

Total Packet Buffer

- 24 GB

Latency

- As low as 2.5 microseconds within a Packet Forwarding Engine (PFE)
- As low as 5.5 microseconds across PFEs

Environmental Ranges

- Operating temperature: 32º to 115º F (0º to 46º C)
- Storage temperature: -40º to 158º F (-40º to 70º C)
- Operating altitude: Up to 10,000 ft. (3048 m)
- Relative humidity operating: 5 to 90% (noncondensing)
- Relative humidity non-operating: 5 to 95% (noncondensing)
- Seismic: Designed to meet GR-63, Zone 4 earthquake requirements

Maximum Thermal Output*

- Maximum power draw: 1,425 W (AC, DC), 4,862 BTU/hr
- Typical power draw: 1,050 W (AC, DC), 3,583 BTU/hr

*Estimated; subject to change

Safety and Compliance

Safety

- CAN/CSA-C22.2 No. 60950-1 Information Technology Equipment—Safety
- UL 60950-1 Information Technology Equipment—Safety
- EN 60950-1 Information Technology Equipment—Safety
- IEC 60950-1 Information Technology Equipment—Safety (All country deviations)
- EN 60825-1 Safety of Laser Products—Part 1: Equipment Classification

Electromagnetic Compatibility

- 47CFR Part 15, (FCC) Class A
- ICES-003 Class A
- EN 55022 Class A
- CISPR 22 Class A
- EN 55024
- CISPR 24
- EN 300 386
- VCCI Class A
- AS/NZA CISPR22 Class A
- KN22 Class A
- CNS 13438 Class A
- EN 61000-3-2
- EN 61000-3-3
- ETSI
- ETSI EN 300 019: Environmental Conditions & Environmental Tests for Telecommunications Equipment
- ETSI EN 300 019-2-1 (2000)—Storage
- ETSI EN 300 019-2-2 (1999)—Transportation
- ETSI EN 300 019-2-3 (2003)—Stationary Use at Weather-protected Locations
- ETSI EN 300 019-2-4 (2003)—Stationary Use at Non-Weather-protected Locations
- ETS 300753 (1997)—Acoustic noise emitted by telecommunications equipment

Environmental Compliance

Restriction of Hazardous Substances (ROHS) 6/6

Silver PSU Efficiency

Recycled material

Waste Electronics and Electrical Equipment (WEEE)

Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

China Restriction of Hazardous Substances (ROHS)

Telco

- Common Language Equipment Identifier (CLEI) code

Juniper Networks Services and Support

Juniper Networks is the leader in performance-enabling services that are designed to accelerate, extend, and optimize your high-performance network. Our services allow you to maximize operational efficiency while reducing costs and minimizing risk, achieving a faster time to value for your network. Juniper Networks ensures operational excellence by optimizing the network to maintain required levels of performance, reliability, and availability. For more details, please visit www.juniper.net/us/en/products-services.

Automated Support and Prevention

Juniper's Automated Support and Prevention consists of an ecosystem of tools, applications, and systems targeted towards simplifying and streamlining operations, delivering operational efficiency, reducing downtime, and increasing your network's ROI running Juniper Networks Junos operating system. Automated Support and Prevention brings operational efficiency by automating several time-consuming tasks such as incident management, inventory management, proactive bug notification, and on-demand EOL/EOS/EOE reports. The Junos Space® Service Now and Service Insight service automation tools are standard entitlements of all Juniper Care contracts.

Warranty

For warranty information, please visit www.juniper.net/support/warranty/.

Ordering Information

Product Number	Description
PTX1000	
PTX1K-72Q-AC	PTX1000 Base system with 72-port 100GbE QSFP28 / 72-port 40GbE QSFP+ / 288-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX1K-72Q-DC	PTX1000 Base system with 72-port 100GbE QSFP28 / 72-port 40GbE QSFP+ / 288-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX1K-72Q-AC-IR	PTX1000 LSR/Peering system with 72-port 100GbE QSFP28 / 72-port 40GbE QSFP+ / 288-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX1K-72Q-DC-IR	PTX1000 LSR/Peering system with 72-port 100GbE QSFP28 / 72-port 40GbE QSFP+ / 288-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX1K-72Q-AC-R	PTX1000 Full IP system with 72-port 100GbE QSFP28 / 72-port 40GbE QSFP+ / 288-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX1K-72Q-DC-R	PTX1000 Full IP system with 72-port 100GbE QSFP28 / 72-port 40GbE QSFP+ / 288-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX1K-36Q-AC	PTX1000 Base system with 72-port 100GbE QSFP28 / 72-port 40GbE QSFP+ / 288-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX1K-36Q-DC	PTX1000 Base system with 36-port 100GbE QSFP28 / 36-port 40GbE QSFP+ / 144-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX1K-36Q-AC-IR	PTX1000 LSR/Peering system with 36-port 100GbE QSFP28 / 36-port 40GbE QSFP+ / 144-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX1K-36Q-DC-IR	PTX1000 LSR/Peering system with 36-port 100GbE QSFP28 / 36-port 40GbE QSFP+ / 144-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX1K-36Q-AC-R	PTX1000 Full IP system with 36-port 100GbE QSFP28 / 36-port 40GbE QSFP+ / 144-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX1K-36Q-DC-R	PTX1000 Full IP system with 36-port 100GbE QSFP28 / 36-port 40GbE QSFP+ / 144-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX1K-18Q-AC	PTX1000 Base system with 18-port 100GbE QSFP28 / 18-port 40GbE QSFP+ / 72-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX1K-18Q-DC	PTX1000 Base system with 18-port 100GbE QSFP28 / 18-port 40GbE QSFP+ / 72-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX1K-18Q-AC-IR	PTX1000 LSR/Peering system with 18-port 100GbE QSFP28 / 18-port 40GbE QSFP+ / 72-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX1K-18Q-DC-IR	PTX1000 LSR/Peering system with 18-port 100GbE QSFP28 / 18-port 40GbE QSFP+ / 72-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays

Product Number	Description
PTX1K-18Q-AC-R	PTX1000 Full IP system with 18-port 100GbE QSFP28 / 18-port 40GbE QSFP+ / 72-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX1K-18Q-DC-R	PTX1000 Full IP system with 18-port 100GbE QSFP28 / 18-port 40GbE QSFP+ / 72-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
S-PTX1K-72Q-SCA-UP	PTX1000 Scale-up Software License to upgrade 72 port system (Base to LSR or LSR to Full IP)
S-PTX1K-36Q-SCA-UP	PTX1000 Scale-up Software License to upgrade 36 port system (Base to LSR or LSR to Full IP)
S-PTX1K-18Q-SCA-UP	PTX1000 Scale-up Software License to upgrade 18 port system (Base to LSR or LSR to Full IP)
S-PTX1K-UPG-18Q	PTX1000 Software License to add 18 more ports to Base system
S-PTX1K-UPG-18Q-IR	PTX1000 Software License to add 18 more ports to LSR/Peering system
S-PTX1K-UPG-18Q-R	PTX1000 Software License to add 18 more ports to Full IP system
JPSU-1600W-AC-AFO	PTX1000 1600 W AC power supply
JPSU-1600W-DC-AFO	PTX1000 1600 W DC power supply
PTX1000-FAN-S	PTX1000 Fan
PTX10002	
PTX10002-60C-AC	PTX10002 Base system with 60-port 100GbE QSFP28 / 60-port 40GbE QSFP+ / 192-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX10002-60C-DC	PTX10002 Base system with 60-port 100GbE QSFP28 / 60-port 40GbE QSFP+ / 192-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX10002-60C-AC-IR	PTX10002 LSR/Peering system with 60-port 100GbE QSFP28 / 60-port 40GbE QSFP+ / 192-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX10002-60C-DC-IR	PTX10002 LSR/Peering system with 60-port 100GbE QSFP28 / 60-port 40GbE QSFP+ / 192-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX10002-60C-AC-R	PTX10002 Full IP system with 60-port 100GbE QSFP28 / 60-port 40GbE QSFP+ / 192-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX10002-60C-DC-R	PTX10002 Full IP system with 60-port 100GbE QSFP28 / 60-port 40GbE QSFP+ / 192-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX10K2-60C-H-AC	PTX10002 Base system with 60-port 100GbE QSFP28 / 60-port 40GbE QSFP+ / 192-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX10K2-60C-H-DC	PTX10002 Base system with 30-port 100GbE QSFP28 / 30-port 40GbE QSFP+ / 96-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays

Product Number	Description
PTX10K2-60C-H-ACIR	PTX10002 LSR/Peering system with 30-port 100GbE QSFP28 / 30-port 40GbE QSFP+ / 96-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX10K2-60C-H-DCIR	PTX10002 LSR/Peering system with 30-port 100GbE QSFP28 / 30-port 40GbE QSFP+ / 96-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX10K2-60C-H-AC-R	PTX10002 Full IP system with 30-port 100GbE QSFP28 / 30-port 40GbE QSFP+ / 96-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX10K2-60C-H-DC-R	PTX10002 Full IP system with 30-port 100GbE QSFP28 / 30-port 40GbE QSFP+ / 96-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX10K2-60C-Q-AC	PTX10002 Base system with 15-port 100GbE QSFP28 / 15-port 40GbE QSFP+ / 48-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX10K2-60C-Q-DC	PTX10002 Base system with 15-port 100GbE QSFP28 / 15-port 40GbE QSFP+ / 48-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX10K2-60C-Q-ACIR	PTX10002 LSR/Peering system with 15-port 100GbE QSFP28 / 15-port 40GbE QSFP+ / 48-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX10K2-60C-Q-DCIR	PTX10002 LSR/Peering system with 15-port 100GbE QSFP28 / 15-port 40GbE QSFP+ / 48-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
PTX10K2-60C-Q-AC-R	PTX10002 Full IP system with 15-port 100GbE QSFP28 / 15-port 40GbE QSFP+ / 48-port 10GbE SFP+ with 4 1600 W AC power supplies, 4 power cables, and 3 fan trays
PTX10K2-60CQ-DC-R	PTX10002 Full IP system with 15-port 100GbE QSFP28 / 15-port 40GbE QSFP+ / 48-port 10GbE SFP+ with 4 1600 W DC power supplies, 4 power cables, and 3 fan trays
JPSU-1600W-AC-AFO	PTX1000 1600 W AC power supply
JPSU-1600W-DC-AFO	PTX1000 1600 W DC power supply
JNP10002-FAN1	PTX10002 Fan
S-PTX10K2-60C-S-UP	PTX10002 Scale-up Software License to upgrade 30-port system (Base to LSR or LSR to Full IP)
S-PTX10K2-30C-S-UP	PTX10002 Scale-up Software License to upgrade 15-port system (Base to LSR or LSR to Full IP)
S-PTX10K2-15C-S-UP	PTX10002 Scale-up Software License to upgrade 60-port system (Base to LSR or LSR to Full IP)
S-PTX10K2-U-15C	PTX10002 Software License to add 15 more ports to Base system
S-PTX10K2-U-15C-IR	PTX10002 Software License to add 15 more ports to LSR/Peering system
S-PTX10K2-U-15C-R	PTX10002 Software License to add 15 more ports to Full IP system

About Juniper Networks

Juniper Networks brings simplicity to networking with products, solutions and services that connect the world. Through engineering innovation, we remove the constraints and complexities of networking in the cloud era to solve the toughest challenges our customers and partners face daily. At Juniper Networks, we believe that the network is a resource for sharing knowledge and human advancement that changes the world. We are committed to imagining groundbreaking ways to deliver automated, scalable and secure networks to move at the speed of business.

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