

# PTX5000 and PTX3000 Packet Transport Routers



## Product Overview

Increased interactions between people and machines are creating a deluge of traffic, with increasingly unpredictable patterns. These dynamics have intensified the challenge to meet growth with traditional network products and architectures. A new approach, based on both physical and virtual innovations, is required to help service providers stay ahead of growing traffic demands while remaining profitable. Juniper Networks PTX Series Packet Transport Routers with custom ExpressPlus Silicon, built from the ground up with SDN in mind, provide service providers with a Converged Supercore architecture that reduces TCO with highly flexible, high-performance, and deployability innovations.

## Product Description

New traffic dynamics like mobility, video, and cloud-based services are transforming traditional network patterns and topologies. Stratified, statically designed and manually operated networks must evolve to meet demands quickly and economically. Many operators have seen profitability stagnate and total cost of ownership (TCO) grow under the burden that growing traffic demands 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.

- **Static scale:** The service provider backbone handles the entire weight of the network's traffic. Therefore, it is paramount that the core network grows organically, along with the traffic. The silicon, system, and SDN innovations for the core empower service providers to scale faster than the traffic demands themselves in an elegant, elastic, redundant package—without requiring forklift upgrades.
- **Static architecture:** Virtualized services and the explosion of cloud-based applications are creating traffic patterns that are increasingly unpredictable. To handle this unpredictability, service providers need their architectures to be flexible and dynamic across all layers. A rigid architecture hinders rather than enables programmable, predictable, and traffic-optimized networks supporting any service, anywhere.
- **Power challenges:** For service providers, the operational cost to transmit a bit through the core is far exceeded by the power requirements to move that bit. Service providers have determined that the total power draw over a few years exceeds the total cost of deploying the network infrastructure. Efficient core router power utilization requires a holistic ground-up engineering approach.
- **Facility challenges:** Service providers cannot continue growing their facilities exponentially. 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 requirement of European Telecommunications Standardization Institute (ETSI) standard depth, and any packet transport innovation must fit these constraints.

In order to address these challenges, service providers need an innovative core router that delivers three defining principles: performance, deployability, and SDN programmability. With Juniper Networks® PTX Series Packet Transport Routers, Juniper is introducing the industry's only core router that exceeds these requirements and easily fits into the service provider network, expanding the Juniper Networks Converged Supercore® architecture beyond lean LSR deployment, as shown in Figure 1.



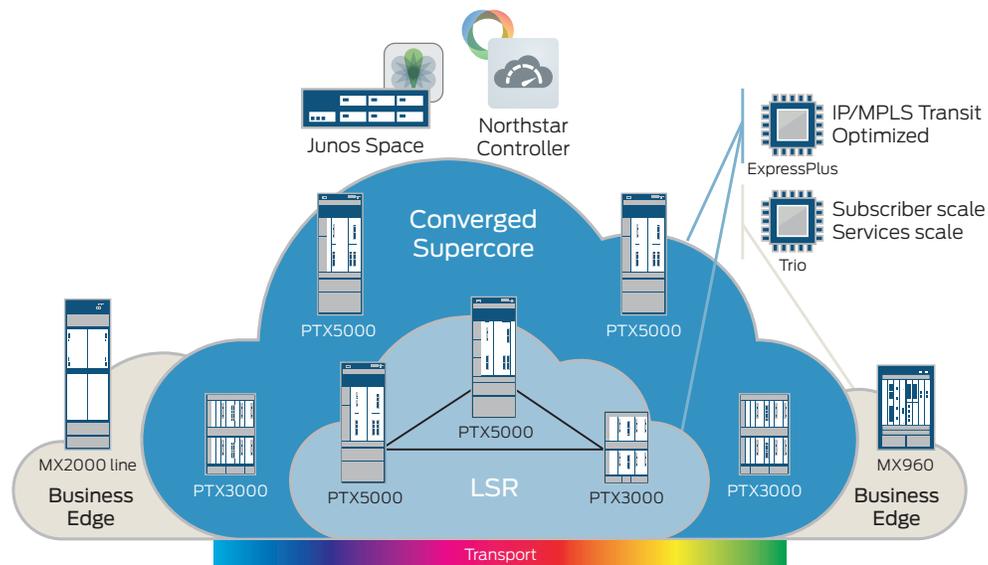


Figure 1: PTX Series Routers deliver performance, flexibility, and SDN programmability for service providers.

## PTX Series

The PTX Series Packet Transport Routers bring physical and virtual innovations to the service provider core network that directly address concerns about operational expenditures while scaling organically to keep pace with growing traffic demands. In order for PTX Series routers to lower operational expenses, physical innovations at the core silicon are needed. PTX Series routers are powered by Juniper Networks ExpressPlus™ Silicon, building 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. All of these concepts are incorporated into the design along with full IP functionality, preserving the spirit of the original Junos Express chipset. The ExpressPlus Silicon is the first purpose-built telecommunication silicon to engineer a 3D memory architecture into the base design for over 1.6 billion filter operations per second, dynamic table memory allocation for mammoth IP routing scale, and enormous power efficiency gains. The ability to address service provider core networking requirements of performance, deployability, and SDN control begins with the silicon. The integration of optical transport with 100GbE coherent technology further improves the economics of both metro and core networks. With PTX Series routers powered by the Juniper ExpressPlus Silicon, service providers can now deploy a Converged Supercore architecture with the efficiency of a lean core deployment with Juniper Networks NorthStar Controller SDN control, a robust full-featured Internet backbone router, and a converged regional IP/MPLS core router with integrated 100GbE coherent transport for superior performance, elegant deployment, and SDN programmability.

Performance is one of the guiding design principles for the PTX Series routers. This focus empowers service providers with superior scale to match increased traffic demands and simplified network engineering challenges with predictable system latency to improve

the overall service experience and best in-class resiliency to ensure that service providers meet strict customer SLAs.

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

SDN programmability brings virtual innovations to the service provider core, while the Juniper Networks 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.

## PTX5000

The Juniper Networks PTX5000 Packet Transport Router transforms the core network with physical and virtual innovations for unprecedented scale and cost. Service providers now have the freedom to create new virtualized services anywhere in the network and elastically create a Converged Supercore architecture with precise traffic control without sacrificing the service experience. The PTX5000, for the first time, lets service providers seamlessly scale IP/MPLS traffic without sacrificing performance and deployability, the contributors to eroding TCO analysis for service providers. The PTX5000 focus is on the Converged Supercore architecture for service providers, which is optimized for LSR, Internet backbone, peering, and dense 100 Gbps optical-coherent DWDM applications for large, high-speed, massive-scale networks. As such, for the first time, service providers can match traffic demand with optimized core router performance and deployability. The PTX5000, the only core router that can be deployed in a standard 19-inch telecommunications rack, stands 36U high with eight line-card slots, two redundant route engine slots, and nine switch fabric slots. At 3 Tbps per line-card slot, the PTX5000 supports 24 Tbps of total system capacity. Powered by the Juniper ExpressPlus Silicon, the PTX5000 offers

predictable IP/MPLS packet performance and functionality, eliminating the complex sawtooth packet profile found in elaborate overengineered NPUs deployed in other core routers. The PTX5000 supports 240 x 100GbE interfaces (in QSFP28 optic form factors) in a single chassis, delivering the scale required to match expanding traffic demand.

The PTX5000 also supports the industry's densest 100GbE-coherent DWDM linecard with 1 Tbps capacity, blending best-of-class IP/MPLS performance with optical transport to flatten network layers.

## PTX3000

In many countries, as well as smaller central offices and lower bandwidth applications, the Juniper Networks PTX3000 Packet Transport Router is the perfect Converged Supercore router. The PTX3000 brings unprecedented capacity in a 22U package that supports 8 Tbps per chassis or 16 Tbps per one standard 19-inch telecommunications rack, all at wire-rate performance. Powered by custom Juniper ExpressPlus Silicon, the PTX3000, like the PTX5000, delivers predictable IP/MPLS packet performance and functionality, eliminating the complex sawtooth packet profile found in elaborate over-engineered NPUs deployed in other core routers.

The PTX3000 is the only Converged Supercore platform that complies with 300 mm ETSI standards for both transport and space-constrained central office environments, making it the most globally deployable core router on the market. It supports up to 8 FPCs, each of which supports one PIC. The PTX3000 can support 80 x 100GbE interfaces in a single chassis, with support for gray and coherent optic technology. The PTX3000 enables service providers to build a Converged Supercore architecture that optimizes LSR, Internet backbone, peering, and optical convergence applications for smaller regional deployments. As such, for the first time, service providers can match traffic demand with optimized core router performance and flexible deployments. With its ultra-optimized form factor, the PTX3000 is ideally positioned for space-constrained colocation facilities such as optical transport environments, central office locations in emerging markets where space and power are at a premium, smaller service providers wanting Converged Supercore advantages, and next-generation metro regional networks.

## Architecture and Key Components

New and emerging traffic dynamics like mobility, video, and cloud-based services are transforming traditional network patterns and topologies. Networks that are stratified, statically designed and manually operated must adapt to meet demands quickly and more economically. Many operators have seen profitability stagnate and TCO grow under the weight of growing traffic demands.

In anticipation of increasingly unpredictable traffic patterns and volumes, many service providers overprovision their infrastructure months in advance. This requires considerable capital outlay for equipment that largely sits idle. This financial imbalance is

unsustainable. Instead, operators need to become more agile to optimize existing network resources, shorten planning cycles, and remove rigid network layers. Once this is done, service providers can leverage a highly intelligent Converged Supercore infrastructure to increase revenues by creating new customizable services.

Juniper Networks Converged Supercore architecture, shown in Figure 1, is composed of Converged Supercore LSR, Converged Supercore IP Backbone, Transport Integration, Juniper Networks Junos Space Network Management Platform, and NorthStar Controller for SDN Programmability.

- The Converged Supercore LSR enables service providers to leverage the heart of the core MPLS backbone with a scalable, cost-optimized network.
- The Converged Supercore IP Backbone expands the architecture to address additional applications such as Internet backbone, Internet peering, infrastructure edge, back-end data center interconnect and metro-regional cores, fully collapsing IP with optical transport. A wide breadth of applications are available to service providers with Converged Supercore architectures, helping them achieve industry-low TCO and scaling each application organically as demand dictates.
- Junos Space Network Management Platform provides comprehensive management across the Converged Supercore architecture with broad fault, configuration, accounting, performance, and security management (FCAPS) capabilities; same-day support for new Junos OS releases; a task-specific user interface; and northbound APIs for integrating with existing network management systems (NMS) or operations/business support systems (OSS/BSS).
- NorthStar Controller, the industry-first traffic optimization SDN controller which lets service providers automate and engineer traffic across their SDN, increases utilization while reducing redundancy. Combining the power of Junos OS, WANDL optimization algorithms, and transport abstraction, NorthStar Controller enables Converged Supercore design across all networking layers, runtime traffic optimization, and "what-if" analysis. The result—new levels of control and visibility that help you avoid costly overprovisioning.

## PTX Series Hardware Components

The key hardware components of PTX Series Packet Transport Routers are the FPC, PIC, Routing Engine (RE), and Switch Interface Board (SIB).

### FPC and PIC

The first-generation and second-generation FPC line cards for the PTX5000 are based on the Junos Express chipset, making the PTX5000 the industry's leading core router for LSR applications. Introducing the third-generation FPC line card for the PTX5000, based on custom Juniper ExpressPlus Silicon, expands the PTX5000's application scope, making it the leading core router for LSR, Internet backbone, peering, and transport integration. The modular FPC design for the PTX5000

provides investment protection by allowing interchangeable PICs between generations of FPCs and deploying different PIC types simultaneously in a single FPC.

The first generation small form-factor FPC line card for the PTX3000 is based upon the Junos Express chipset, making the PTX3000 the industry's leading space-constrained core router for LSR applications. Introducing the third-generation FPC line card for the PTX3000, based on custom Juniper ExpressPlus Silicon, expands the PTX3000's application scope, making it the industry's leading space-constrained core router for LSR, internet backbone, peering, and optical transport integration. The PTX3000 FPC architecture matches a single FPC slot with a single PIC slot for a 1:1 mapping schema. The PTX3000 and PTX5000 also share PIC types for interchangeable sparing.

### Routing Engine/Control Board Complex

The Control Board (CB), which runs Juniper Networks Junos operating system, works with the RE to provide control plane and chassis management functionality while maintaining RoHS compliance. Software processes running on the RE manage the routing tables, while the protocols running on the switch control all of the interfaces, manage chassis functions, and provide the interface for system management and user access. The system can house two RE/CB complexes, with one acting as the primary

and the other acting as the standby ready to take over in case of failure. The RE communicates with the CB via a pair of 10GbE links and a Peripheral Component Interconnect (PCI) bus.

### SIB

Both the PTX5000 and PTX3000 switch fabric are engineered with a 9-slot all-active SIB architecture. In the case of a SIB failure, the remaining eight active SIBs maintain enough switch fabric capacity to support full line packet performance per slot—24Tbps of total system capacity for the PTX5000 and 8Tbps of total system capacity for the PTX3000.

### Chassis Management

The PTX Series routers deliver powerful Junos OS chassis management that allows environmental monitoring and field-replaceable unit (FRU) control. Chassis management delivers a faster primary switchover, enhanced power budgeting with a modular power management, reduced power consumption for partly populated systems, granular control over FRU power-on, multi-zone cooling with better fan speed control for reduced noise, and CPU leveling during monitoring intervals.

### Simplified Management

The PTX Series simplifies the management function based on the elegance and simplicity of the Junos operating system.

## Features and Benefits

The following is a summary of the features that are available on the PTX Series products.

Table 1: PTX Series Features and Benefits

Feature	Feature Description	Benefits
System capacity	The PTX5000 scales to 24 Tbps in a single chassis, breaking out into 1536 10GbE, 384 40GbE, and 240 100GbE interfaces. The PTX3000 scales to 8 Tbps in a single chassis, breaking out into 768 10GbE, 192 40GbE, and 80 100GbE interfaces.	PTX Series routers give service providers the performance and scalability needed to outpace increased traffic demands.
High availability hardware	The PTX Series routers are engineered with full hardware redundancy for cooling, power supply, Routing Engines, control board, and SIB.	High availability (HA) is a critical requirement for service providers to maintain an <i>always-on</i> infrastructure base to meet stringent service-level agreements across the core.
High availability software	PTX Series routers feature a resilient operating system that supports HA features such as graceful Routing Engine switchover (GRES), nonstop active routing (NSR), and unified in-service software upgrade (unified ISSU) for high availability. PTX Series routers support game-changing 50 ms redundancy switchover under load.	Junos OS supports HA features that allow software upgrades and changes without disrupting network traffic.
Packet performance	The groundbreaking Juniper ExpressPlus Silicon innovation empowers the PTX Series routers with unparalleled packet processing for both full IP functionality and MPLS transport, thereby leveraging revolutionary 3D memory architecture.	Exceptional packet processing capabilities help alleviate the challenge of scaling the network as traffic continues to increase, while optimizing IP/MPLS transit functionality around superior performance and elegant deployability.
Ultra-compact form factor that meets ETSI 300 mm standards	With cutting-edge innovation in power and cooling technology, the PTX3000 is the most compact core router, providing 8 Tbps of capacity at half the size of the competition.	Space efficiency and ETSI standards are critical requirements for colocations, central offices, and regional networks, especially in emerging markets and transport-focused environments.
Optical integration	Fully collapsing the optical layer into the IP/MPLS layer gives the PTX3000 the unique ability to scale and optimize traffic with visibility across all networking layers.	Service providers no longer have to source and deploy optical equipment and IP/MPLS routers separately, reducing the number of management touch points by up to 4x and reducing operational complexities by deploying optical and IP/MPLS together.



PTX3000

PTX5000

## Specifications

Table 2: PTX Series Specifications

	PTX3000	PTX5000
Physical dimensions (W x H x D)	17.6 x 38.5 x 10.6 in (44.7 x 97.8 x 26.9 cm)	17.5 x 62.5 x 33.1 in (44.5 x 158.8 x 84.1 cm)
Maximum weight	310 lbs (140.61kg)	1,294 lbs (587.0 kg)
Mounting	Front or center Rack mount	Front or center Rack mount
Power system rating*	50 A @ -48 VDC per input	92.5A @ -48 VDC per input
Typical power consumption	6.3 kW, fully loaded	10.5 kW, fully loaded
Operating temperature	32° to 104° F (0° to 40° C)	32° to 104° F (0° to 40° C)

\*These numbers are power supply ratings. Actual power usage is much lower.

## 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](http://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.

## PTX5000 Ordering Information

For more information, please contact your Juniper Networks representative.

Model Number	Description
<b>PTX5000 Base Unit</b>	
PTX5000BASE2	Base chassis (Sheet metal, 2 x RE, 2 x CB, 2 x CCG, 2 x horizontal Fan Tray + 1 x Vertical Fan Tray, Craft panel, 2 x PDU2s, 6 x PSM2s, 9 x SIB2s)
<b>PTX5000 Software and Software License</b>	
S-FPC3-PTX-UPG-2-R	Software license for FPC3-PTX-UI-L 1 Tbps for LSR application
S-FPC3-PTX-UPG-2-L	Software license for FPC3-PTX-UI-L 1 Tbps for IP application
S-JFLOW-CH-PTX5K	Software license for inline jflow for PTX5K
<b>PTX5000 Routing Engines and Control Boards</b>	
RE-DUO-C2600-16G-R	Routing Engine – redundant
RE-DUO-C2600-16G-S	Routing Engine – spare
RE-PTX-X8-64G-R	PTX RE, 8-Core:2.3Ghz,64 – redundant
RE-PTX-X8-64G-S	PTX RE, 8-Core:2.3Ghz,64 – spare
RE-PTX-X8-64G-BB	PTX RE, 8-Core:2.3Ghz,64 - base bundle
CB2-PTX-BB	PTX, Control Board-2, - base bundle
CB2-PTX-R	PTX, Control Board-2 – redundant
CB-PTX-BB	Control Board - base bundle
CB-PTX-R	Control Board – redundant
CB-PTX-S	Control Board – spare
CCG-BLANK-PTX	CCG Blank – spare
<b>PTX5000 Switch Fabric</b>	
SIB3-PTX5K-S	PTX5000 Switch Interface Board, third generation, spare
SIB3-PTX5K-BB	PTX5000 Switch Interface Board, third generation, Base Bundle
SIB2-I-PTX5K-BB	PTX5000 Switch Interface Board, second generation, base bundle
SIB2-I-PTX5K-S	PTX5000 Switch Interface Board, second generation, spare
SIB-I-PTX5008	PTX5000 SIBs first generation
SIB-I-PTX5008-S	PTX5000 Switching Fabric first-generation spare

Model Number	Description
<b>PTX5000 FPC and PICs</b>	
FPC3-PTX-U1-L	PTX5000 3rd generation 1 Tbps FPC3 for LSR application
FPC3-PTX-U1-R	PTX5000 3rd generation 1 Tbps FPC3 for IP application
FPC3-PTX-U2-L	PTX5000 3rd generation 2 Tbps FPC3 for LSR application
FPC3-PTX-U2-R	PTX5000 3rd generation 2 Tbps FPC3 for IP application
FPC3-PTX-U3-L	PTX5000 3rd generation 3 Tbps FPC3 for LSR application
FPC3-PTX-U3-R	PTX5000 3rd generation 3 Tbps FPC3 for IP application
PTX-FPC3-U1-R-BNDL	PTX5000 3rd generation 1 Tbps Bundle with FPC and PIC for full IP application (choose either one 3rd Gen PIC or two 2nd gen PICs)
PTX-FPC3-U2-R-BNDL	PTX5000 3rd generation 2 Tbps Bundle with FPC and PIC for full IP application
PTX-FPC3-U3-R-BNDL	PTX5000 3rd generation 3 Tbps Bundle with FPC and PIC for full IP application
PTX5K-FPC3-UPG-KIT	PTX5000 3rd generation Upgrade Kit to support FPC3 line cards, include 9 SIB3 and 2 FAN-H Only
FPC2-PTX-PIA	PTX 2nd generation FPC
P2-100GE-CFP2	PTX, 4 x 100GbE PIC for second-generation FPC, CFP2 pluggable optics
P2-100GE-OTN	PTX 4 x 100GbE Ethernet/OTN PIC for second generation FPC, CFP2 pluggable optics
P2-10G-40G-QSFPP	PTX Flexible 48 x 10GbE/12 x 40GbE/OTN PIC for second generation FPC, QSFP+ pluggable optics
FPC-PTX-PI-A	First-generation FPC
P1-PTX-2-100GE-CFP	2 x 100GbE PIC, first generation
P1-PTX-2-40GE-CFP	2 x 40GbE PIC, first generation
P1-PTX-24-10GE-SFPP	24 x 10GbE (LAN) PIC, first generation
P1-PTX-2-100G-C-WDM-C	2-port 100G DWDM PIC, first generation
P1-PTX-24-10G-W-SFPP	24 x 10GbE (LAN/WAN) PHY PIC, first generation
P3-24-U-QSFP28	PTX 24x40GbE, 96x10GbE QSFP, universal PIC for 3rd Generation FPC
P3-10-U-QSFP28	PTX 10x100GbE QSFP28 or 10x40GbE, 40x10GbE QSFP, universal PIC for 3rd Generation FPC
P3-15-U-QSFP28	PTX 15x100GbE QSFP28 or 15x40GbE, 50x10GbE QSFP, universal PIC for 3rd Generation FPC
PIC-BLANK-PTX	PIC Blank, Spare
FPC-BLANK-PTX	FPC Blank, Spare

Model Number	Description
<b>PTX5000 Fan Trays and Spares</b>	
CRAFT-PTX5000-S	PTX5000 Craft Interface, spare
FAN3-PTX-H-S	PTX Base Bundle Horizontal Fan Tray, for 3rd gen FPC and SIB, Spare
FAN3-PTX-H-BB	PTX Base Bundle Horizontal Fan Tray, for 3rd gen FPC and SIB, Base Bundle
FAN-PTX-H-BB	Base bundle horizontal fan tray
FAN-PTX-H-S	Horizontal fan, spare
FAN-PTX-V-BB	Base bundle vertical fan tray
FAN-PTX-V-S	Vertical fan, spare
CCG-PTX-BB	Centralized clock generator, base bundle
CCG-PTX-R	Centralized clock generator, redundant
CCG-PTX-S	Centralized clock generator, spare
<b>PTX5000 Air Filter</b>	
FLTR-PTX-KIT-S	PTX5000 replacement air filter kit includes all filters (Horizontal, Vertical, and PSMs)
<b>PTX5000 Power Modules</b>	
PDU2-PTX-AC-D-BB	PTX High Capacity AC Delta PDU, base bundle
PDU2-PTX-AC-D-R	PTX High Capacity AC Delta PDU, redundant
PDU2-PTX-AC-D-S	PTX High Capacity AC Delta PDU, spare
PDU2-PTX-AC-W-BB	PTX High Capacity AC Wye PDU, base bundle
PDU2-PTX-AC-W-R	PTX high-capacity AC Wye PDU, redundant
PDU2-PTX-AC-W-S	PTX high-capacity AC Wye PDU, spare
PSM2-PTX-AC-BB	PTX high-capacity AC PSM, base bundle
PSM2-PTX-AC-R	PTX high-capacity AC PSM, redundant
PSM2-PTX-AC-S	PTX high-capacity AC PSM, spare
PDU2-PTX-DC-BB	PTX high-capacity 60A DC PDU, base bundle
PDU2-PTX-DC-R	PTX high-capacity 60A DC PDU, redundant
PDU2-PTX-DC-S	PTX high-capacity 60A DC PDU, spare
PSM2-PTX-DC-BB	PTX high-capacity 60A DC PSM, base bundle
PSM2-PTX-DC-R	PTX high-capacity 60A DC PSM, redundant
PSM2-PTX-DC-S	PTX high-capacity 60A DC PSM, spare
PSM2-BLANK-PTX	PTX PSM blank for high-capacity PSM slot
CBL2-PTX-AC-D-S	PTX power cord for high-capacity AC Delta PDU, spare
CBL2-PTX-AC-W-S	PTX power cord for high-capacity AC Wye PDU, spare
PTX5K-PSM2TRAY-BB	Metal sleeves and overlay kit for chassis for PSM upgrade to PSM2s, base bundle
PTX5K-PSM2TRAY-S	Metal sleeves and overlay kit for chassis for PSM upgrade to PSM2s, spare

Model Number	Description	Model Number	Description
PTX5K-PS-UPG-KIT	Product bundle: Contains (2) DC or AC PDU2s, (8) DC or AC PSM2s, (1) PTX5K-PSM2TRAY	PDU-PTX-DC-60-R	PTX 60A DC power distribution unit, redundant Option
PDU-PTX-AC-D-BB	PTX AC Delta PDU, base bundle	PDU-PTX-DC-60-S	PTX DC PDU, spare
PDU-PTX-AC-D-R	PTX AC Delta PDU, redundant option	PSM-BLANK-PTX	PTX PSM blank, spare
PDU-PTX-AC-D-S	PTX AC Delta PDU, spare	PSM-PTX-AC-BB	PTX AC PSM, base bundle
PDU-PTX-AC-W-BB	PTX AC Wye PDU, base bundle	PSM-PTX-AC-R	PTX AC PSM, redundant option
PDU-PTX-AC-W-R	PTX AC Wye PDU, redundant option	PSM-PTX-AC-S	PTX AC PSM, spare
PDU-PTX-AC-W-S	PTX AC Wye PDU, spare	PSM-PTX-DC-120-BB	PTX 120A DC power supply module, base bundle
PDU-PTX-DC-120-BB	PTX 120A DC power distribution unit, base bundle	PSM-PTX-DC-120-R	PTX 120A DC power supply module, redundant option
PDU-PTX-DC-120-R	PTX 120A DC power distribution unit, redundant option	PSM-PTX-DC-120-S	PTX DC PSM, spare
PDU-PTX-DC-120-S	PTX DC PDU, spare	PSM-PTX-DC-60-BB	PTX 60A DC power supply module, base bundle
PDU-PTX-DC-60-BB	PTX 60A DC power distribution unit, base bundle	PSM-PTX-DC-60-R	PTX 60A DC power supply module, redundant option
		PSM-PTX-DC-60-S	PTX DC PSM, spare

### PTX5000 Supported FPC and PIC Compatibility

PICs	FPC1	FPC2	FPC3-2T	FPC3-3T
First-Generation PIC 24 x 10GbE LAN-PHY	Yes	Yes	No	No
First-Generation PIC 24 x 10GbE Ethernet/OTN	Yes	Yes	Yes	Yes
First-Generation PIC 2 x 100GbE	Yes	No	No	No
First-Generation PIC 2 x 40GbE	Yes	Yes	No	No
First-Generation PIC 2 x 100GbE OTN DWDM	Yes	Yes	Yes	Yes
Second-Generation PIC 4 x 100GbE CFP2	No	Yes	No	No
Second-Generation PIC 48 x 10GbE / 12 x 40GbE Ethernet/OTN QSFP	No	Yes	Yes	Yes
Second-Generation PIC 4 x 100GbE Ethernet/OTN CFP2	No	Yes	Yes	Yes
Second-Generation PIC 4 x 100GbE CXP (SR10)	No	Yes	Yes	Yes
Third-Generation PIC 96 x 10GbE/24 x 40GbE QSFP28 Universal	No	No	Yes	Yes
Third-Generation PIC 60 x 10GbE/15 x 40GbE/15 x 100GbE QSFP28 Universal	No	No	Yes	Yes
Third-Generation PIC 5x100GbE OTN DWDM CFP2-ACO	No	No	Yes	Yes

### PTX3000 Ordering Information

Model Number	Description	Model Number	Description
<b>PTX3000 Base Unit</b>		<b>PTX3000 Switch Fabric</b>	
PTX3000BASE	Base chassis (sheet metal, 1 x RE, 1 x CB, 2 x horizontal fan tray, craft panel, 3 x PSMs, 9 x SIBs)	SIB3-SFF-PTX	PTX second generation Small Form Factor Fabric Module
<b>PTX3000 Routing Engines and Craft Interface</b>		SIB-SFF-PTX-240-R	Switching Board – redundant
RE-DUO-C2600-16G-R	Routing Engine – redundant	SIB-SFF-PTX-240-S	Switching Board – spare
RE-DUO-C2600-16G-S	Routing Engine – spare	<b>PTX3000 Supported FPCs</b>	
FPD-SFF-PTX-S	Craft Panel – spare	FPC-SFF-PTX-PI-A	Flexible PIC Concentrator (FPC)

Model Number	Description
<b>PTX3000 Supported PICs</b>	
P1-PTX-2-100G-C-WDM-C	2-port 100G DWDM PIC
P1-PTX-2-100GE-CFP	2 x 100GbE PIC
P1-PTX-2-40GE-CFP	2 x 40GbE PIC
P1-PTX-24-10GE-SFPP	24 x 10GbE (LAN) PIC
P1-PTX-24-10G-W-SFPP	24 x 10GbE (LAN/WAN) PHY PIC
SFF-SLOT-BLNK FPC	Slot filler/blank
SFF-PSM-BLNK PSM	Slot filler/blank
PIC-BLANK-PTX PIC	Slot filler/blank

<b>PTX3000 Fan Trays and Spares</b>	
FAN-SFF-PTX-S	Fan tray – spare
CB-SFF-PTX-R	Control Board – for redundancy
CB-SFF-PTX-S	Control Board – for sparing

<b>PTX3000 Air Filter</b>	
FLTR-SFF-PTX-S	Air filter – spare

<b>PTX3000 Power Modules</b>	
PSM-SFF-PTX-AC-R	AC Power Supply (single phase) – redundant
PSM-SFF-PTX-AC-S	AC Power Supply (single phase) – spare
PSM-SFF-PTX-DC-R	DC Power Supply – redundant
PSM-SFF-PTX-DC-S	DC Power Supply – spare

Model Number	Description	FPC1	FPC3
<b>PTX3000 Supported FPC and PIC Compatibility</b>			
<b>PICs</b>			
First Generation PIC 24x10GbE LAN-PHY		Yes	No
First Generation PIC 24x10GbE Ethernet/OTN		Yes	Yes
First Generation PIC 2x100GbE		Yes	No
First Generation PIC 2x40GbE		Yes	No
First Generation PIC 2x100GbE OTN DWDM		Yes	Yes
Second Generation PIC 4x100GbE CFP2		No	No
Second Generation PIC 48x10GbE / 12x40GbE Ethernet/OTN QSFP		No	Yes
Second Generation PIC 4x100GbE Ethernet/OTN CFP2		No	Yes
Second Generation PIC 4x100GbE CXP (SR10)		No	Yes
Third Generation PIC 96x10GbE/24x40GbE Universal		No	Yes
Third Generation PIC 40x10GbE/10x40GbE/10x100GbE QSFP28 Universal		No	Yes

## About Juniper Networks

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at [www.juniper.net](http://www.juniper.net).

Corporate and Sales Headquarters  
 Juniper Networks, Inc.  
 1133 Innovation Way  
 Sunnyvale, CA 94089 USA  
 Phone: 888.JUNIPER (888.586.4737)  
 or +1.408.745.2000  
 Fax: +1.408.745.2100  
[www.juniper.net](http://www.juniper.net)

APAC and EMEA Headquarters  
 Juniper Networks International B.V.  
 Boeing Avenue 240  
 1119 PZ Schiphol-Rijk  
 Amsterdam, The Netherlands  
 Phone: +31.0.207.125.700  
 Fax: +31.0.207.125.701



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