NPT 2507 Family – XDR Router Series

High-Capacity Aggregation Router

The NPT 2507 is a high-capacity, high-performance aggregationrouter, designed to provide aggregation and transport for services,applications, and architectures requiring a performance/costoptimized solution.

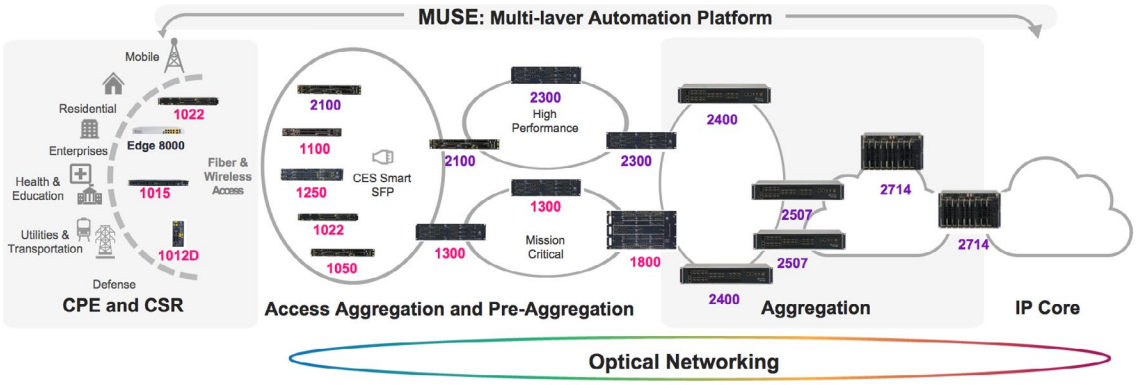
- **NPT 2507 A** –supports IP/MPLS and MPLS-TP and provides coherent routing (IPoDWDM) with a full set of optical interfaces including 400G ZR/ZR+ coherent optical pluggables
- **NPT 2507 AR** - supports IP/MPLS only and does not provide IPoDWDM

The NPT 2507 offers an impressive 7.2Tbps switching capacity and a wide range of interfaces from 10G to 400G, all within a very compact 2RU fixed form factor. The NPT 2507A variant supports coherent routing (IPoDWDM), with 8x400G ZR/ZR+ QSFP-DD coherent optical pluggables and 40x100G QSFP28 coherent pluggables, along with inline pluggable amplifiers. The hardware capabilities of the NPT 2507 are powered by Ribbon's field-hardened, industry-proven IPWave rNOS. This robust and scalable operating system provides a comprehensive suite of features and capabilities; including a full range of routing protocols, rich QoS capabilities, a network slicing toolkit, and comprehensive carrier-grade service assurance and OAM functionalities. With this rich set of capabilities IPWave rNOS is the foundation for Ribbon's entire NPT portfolio and it underpins some of the most demanding, dynamic, and reliable Ethernet and IP/MPLS networks around the world.

The NPT 2507 provides MACsec on all traffic ports and redundant, hot-swappable components, along with a high port density design to ensure high system security, reliability and Ethernet switching performance. 5G specific interfaces and Class C timing make it suitable for aggregation sites in 5GxHaul-specific networks or multiservice networks where mobile xHaul is offered as a service. Additionally, the network intelligence of the NPT 2507 helps reduce infrastructure and administrative costs.

With a full set of IP/MPLS/MPLS-TP/Segment routing transport capabilities provided by Ribbon's IPWave rNOS, the NPT 2507 can efficiently aggregate and route traffic to meet service performance requirements (SLAs) on a service-by-service basis. This makes the NPT 2507 exceptionally well-suited for a wide variety of applications and networking scenarios, including:

- **5G Aggregation** providing 5G-specific functionality, including Class C timing, Segment Routing, Flex-Algo, EVPN, and 5G interfaces
- **Broadband Backhaul**, Offering high capacity, high performance, and high scale routing, with a full set of IP/MPLS capabilities and optimized service-aware support for voice, video, and data services
- **Business Services Backhaul**, supporting a full-set of Ethernet and VPN services and ensuring this services are transported to meet SLAs on a per service basis
- **Mission and Business critical networks**, proving the rich mix of dynamic and deterministic packet transport and risk-free proven migration required for mission critical networks required
- **High-Capacity Switch for CIN networks**, providing fanout, interfaces, full set of IP protocols required by a high-capacity CIN switch in a regional hub or as a Spine in a leaf-spine architecture in a primary hub



Key Product Specifications NPT 2507 Family

Platform

Description	Specification
	NPT 2507A, NPT 2507AR
Chipset	Qumran 2C+
Performance	• 7.2Tb Packet Processing • 2700 MPPS
CPU	Intel x86 CPU Ice lake-D D-2752TER/ 12-core @ 1.8GHz
Memory	64G
Storage	256G
Traffic Interfaces	• 8 x 400G QSFP-DD ZR/ZR+ • 40x100G QSFP28 • 4x10G/25G (combo port) • Upto 80x10GE/25GE via breakout interfaces • MACsec for all traffic ports
Control and management interfaces	• 4x10GBase SFP+ Mgmt. ports • USB 3.0 Type-A • RJ45 LCT/CLI (10/100/1000Base-T) • RJ45 Console (RS232) • 1xmicro USB serial console port
Power Supplies	1+1 AC/DC input redundancy
Cooling	• 4 Fans 3+1 redundancy • Airflow – front to back
Timing	• SyncE with ESMC • 1588v2 PTP, T-GM , T-BC/OC , APTS • Built-in GNSS receiver • External timing (input/output) 10Mhz 1PPS and TOD • BITS (T3/T4) • Internal stratum 3E OCXO clock (holdover state) • Primary and secondary sources (supports SSM bits) • Supported profiles : • G.8262.1, G.8275.1, G.8275.2 • G.8273.2 - class C
Physical Specification	• H x W x D: 87.7 x 436 x 762 mm • Weight : 24.6Kg

Multi-service Capabilities NPT 2507 Family

Description	Specification	
	NPT 2507A	NPT 2507AR
L2/L3 VPN Services	L2VPN - MEF 3.0 (IP-MPLS and MPLS-TP) • E-Line • E-LAN • E-Tree • E-Access Ethernet Virtual Private Network (EVPN) • Virtual Private Wire Service (EVPN-VPWS, EVPN-ELINE) • Virtual Private LAN Services (EVPN-VPLS, EVPN-ELAN) • Anycast IRB with IPv4 and IPv6 support • Multihoming – Active-Active, Single-Flow-Active, Port-Active • PW Virtual Ethernet Segment L3VPN • IPv4 VRF • 6VPE • IRB, PHT	L2VPN - MEF 3.0 (IP-MPLS) • E-Line • E-LAN • E-Tree • E-Access Ethernet Virtual Private Network (EVPN) • Virtual Private Wire Service (EVPN-VPWS, EVPN-ELINE) • Virtual Private LAN Services (EVPN-VPLS, EVPN-ELAN) • Anycast IRB with IPv4 and IPv6 support • Multihoming – Active-Active, Single-Flow-Active, Port-Active • PW Virtual Ethernet Segment
Coherent Routing	• 400G, 200G, 100G, coherent interfaces • ZR and OPENZR+ application • QSFP-DD for 100G/200G	Not Applicable
Optical Interfaces	• CWDM, • DWDM • ZR/ZR+ • Amplifiers	Not Applicable

Software features provided by Ribbon's IP Wave rNOS

Description	Specification	
	NPT 2507A	NPT 2507AR
Layer 2	• Layer 2 forwarding and bridging • Bridge Domains (BD) • Flexible VLAN-Tagging • IEEE 802.1Q VLANs and Q-in-Q • Ethernet Link Aggregation Group (LAG) • Link Aggregation Control Protocol (LACP) 802.3ad • G.8032 • Spanning Tree Protocol • Jumbo frames on all ports	• Layer 2 forwarding and bridging • Bridge Domains (BD) • Flexible VLAN-Tagging • IEEE 802.1Q VLANs and Q-in-Q • Ethernet Link Aggregation Group (LAG) • Link Aggregation Control Protocol (LACP) 802.3ad • G.8032 • Spanning Tree Protocol • Jumbo frames on all ports
Layer 3	• IPv4 and IPv6 unicast routing • Layer 3 interfaces: physical interfaces and logical interfaces (Units). • Virtual Routing and Forwarding (VRF) • Open Shortest Path First (OSPFv2, OSPFv3) • Intermediate System to Intermediate System (ISIS) • Multiprotocol Border Gateway Protocol (MP-BGP) • Equal-Cost Multipath (ECMP) • Bidirectional Forwarding Detection (BFD), MH-BFD • Virtual Router Redundancy Protocol (VRRP) • Integrated Routing Bridging (IRB), Anycast IRB • Pseudowire Headend Termination (PHT)	• IPv4 and IPv6 unicast routing • Layer 3 interfaces: physical interfaces and logical interfaces (Units). • Virtual Routing and Forwarding (VRF) • Open Shortest Path First (OSPFv2, OSPFv3) • Intermediate System to Intermediate System (ISIS) • Multiprotocol Border Gateway Protocol (MP-BGP) • Equal-Cost Multipath (ECMP) • Bidirectional Forwarding Detection (BFD), MH-BFD • Virtual Router Redundancy Protocol (VRRP) • Integrated Routing Bridging (IRB), Anycast IRB • Pseudowire Headend Termination (PHT)
MPLS	• Label switching (LER, LSR) • Label Distribution Protocol (LDP) • BGP Labeled Unicast (BGP-LU) • MPLS-TP • MPLS Traffic Engineering with RSVP-TE, SR-TE • Point-to-point L2VPN – Static, T-LDP, EVPN-VPWS • Multipoint L2VPN – VPLS, EVPN • EVPN with Anycast IRB • 6VPE • IP Loop-Free Alternate (LFA) Fast Reroute (FRR) • RSVP-TE Fast Reroute (FRR) and Path-Protection	• Label switching (LER, LSR) • Label Distribution Protocol (LDP) • BGP Labeled Unicast (BGP-LU) • MPLS Traffic Engineering with RSVP-TE, SR-TE • Point-to-point L2VPN – Static, T-LDP, EVPN-VPWS • Multipoint L2VPN – VPLS, EVPN • EVPN with Anycast IRB • 6VPE • IP Loop-Free Alternate (LFA) Fast Reroute (FRR) • RSVP-TE Fast Reroute (FRR) and Path-Protection

Segment Routing (SR)	• SR-MPLS
	• ISIS, OSPF, BGP extensions to segment routing
	• TI-LFA
	• Segment Routing Traffic Engineering (SR-TE, SR Policies)
	  • PCE, PCC initiated SR Policies
	  • Path Protection
	  • TI-LFA Local Repair Protection
	  • Anycast SID
	  • Binding SID
	• SR, SR-TE OAM
	• Flexible Algorithm
	• BGP Color Extended Community
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		• SR, SR-TE OAM
		• Flexible Algorithm
		• BGP Color Extended Community

Software features provided by Ribbon's IP Wave rNOS

Description	Specification	
	NPT 2507A	NPT 2507AR
Multicast	• IPv4 and IPv6 Multicast Routing • PIM-SM, PIM-SSM, PIM-ASM • IGMPv3, MLDv2 • MSDP • Anycast RP • BGP IPv4 Multicast	• IPv4 and IPv6 Multicast Routing • PIM-SM, PIM-SSM, PIM-ASM • IGMPv3, MLDv2 • MSDP • Anycast RP • BGP IPv4 Multicast
Quality of Service (Qos)	• Class-based 3-level Hierarchical QoS • Virtual Output Queueing (VOQ) • Policing, Shaping • Multi-level priority queuing • Classification based on L2/L3/L4 fields • Remarking • Weighted Random Early Detection (WRED) • Deep packet buffer	• Class-based 3-level Hierarchical QoS • Virtual Output Queueing (VOQ) • Policing, Shaping • Multi-level priority queuing • Classification based on L2/L3/L4 fields • Remarking • Weighted Random Early Detection (WRED) • Deep packet buffer

OAM	• Ethernet OAM
	  • IEEE802.3ah
	  • IEEE 802.1ag
	  • ITU-T Y.1731 PM
	• IP OAM
	  • BFD
	  • Ping
	  • Trace-route
	  • TWAMP
	• MPLS-TP OAM - G8113.2, RFC5860, BFD
	• MPLS OAM – Ping/Traceroute MPLS
	• RFC 2544 Generator, Y.1564
	• LLDP
	• DHCP Relay
	• Streaming Telemetry
	• sFlow
	• Link Delay-Measurement
		• Ethernet OAM
		  • IEEE802.3ah
		  • IEEE 802.1ag
		  • ITU-T Y.1731 PM
		• IP OAM
		  • BFD
		  • Ping
		  • Trace-route
		  • TWAMP
		• MPLS OAM – Ping/Traceroute MPLS
		• LLDP
		• DHCP Relay
		• Streaming Telemetry
		• sFlow
		• Link Delay-Measurement

Software features provided by Ribbon's IP Wave rNOS

Description	Specification
Security	• Control-plane and management plane protection • Authentication, Authorization, and Accounting (AAA) • RADIUS • Terminal Access Controller Access-Control System Plus (TACACS+) • Secure Shell (SSH) • Layer 2 and Layer 3 ingress Firewall filters (ACL) • Unicast Reverse Path Forwarding (Unicast RPF) • IEEE802.1x • MACsec for all traffic ports
Manageability	• CLI • LCT • SNMP MIB • NETCONF/gRPC - XML, JSON, GPB • YANG models - OpenConfig, IETF • Muse software suite (SDN orchestration and control) • Zero-Touch Provisioning (ZTP)

Environmental

Description	Specification
Operating Environment	-5C to +50C
Operating Humidity	5% to 95%
Altitude	Up to 4000m
Acoustics	NEBS GR-63-CORE
Power input	• -48Vdc +/-15% • 100-240 VAC
Power Dissipation	Up to 2000W

Standards compliance

Description	Specification
Regulatory Compliance	• Products comply with CE markings according to directives 2014/30/EC and 2014/35/EC • VCCI-A
NEBS	Designed to be Certified (or designed to meet) with GR-63, GR-1089 and GR-3160
Safety	• IEC 62368-1 (2nd edition) • UL 62368-1 • IEC 60825-1 for lasers • IEC 60825-2 for lasers
EMS Standards	• FCC CFR 47 Part 15 Subpart B ANSI C63.4 • IEC 61850-3 • IEEE 1613 • ETSI EN 50121-4 • IEC 62236-4 • FTZ 1TR9
EMC Immunity	• ETSI EN 300 386 • IEC 61000-4 series

ETSI/Environmental	• ETSI EN 300 019
	  • Storage: Class 1.1
	  • Transportation: Class 2.3
	  • In-Use/Operational: Class 3.1
	• QM 333
	• ETSI EN 300 753

RoHS	Compliance per EU RoHS, RoHS 2 directive 2011/65/EU and amendment 2015/863/EU directives.

Specifications subject to change without notice

Contact Us Contact us to learn more about Ribbon solutions.