

NPT 2400 – XDR Router Family

High-performance metro edge aggregation router

The NPT 2400 is a high-capacity, high-performance aggregation router, designed to provide aggregation and transport for services, applications and architectures requiring a performance/cost optimized solution.



A 4.8T non-blocking switch capacity, high 100G fan-out, 6x400G client/line interfaces and 2RU form factor mean the NPT 2400 provides has the performance and interfaces required at the metro edge aggregation sites in xHaul, Broadband backhaul and CIN networks. The full set of IP/MPLS/MPLS-TP/Segment routing transport capabilities provided by Ribbon's IP Wave rNOS allow the NPT 2400 to meet the service performance needs (SLAs) at these aggregation sites, on a service-by-service basis. 5G-specific functionality such as 5G specific interfaces and Class C timing mean the NPT 2400 is ideally suited at aggregation sites in xHaul specific networks, or in multiservice networks where mobile xHaul and fixed broadband backhaul is supported. Redundant and hot-swappable components, and a high port density design allow the 2400 to deliver high system reliability.

The NPT 2400 provides an extensive number of coherent, OpenZR+ compliant, interfaces for 100G/200G and 400G providing it with the IPoDWDM and/or IPoOLS capabilities essential in today's metro aggregation network.

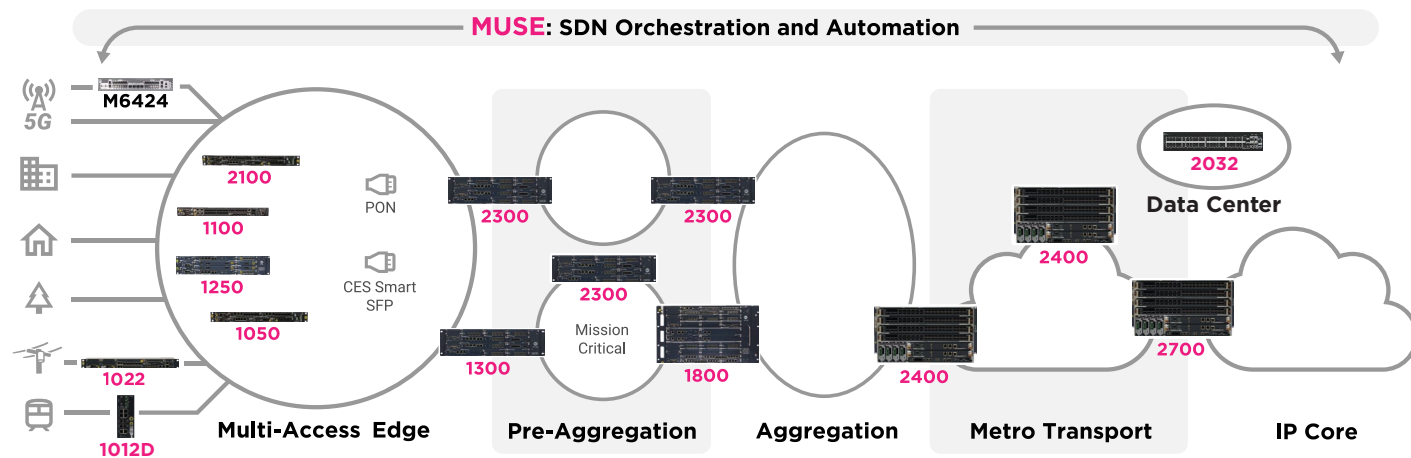
The NPT 2400 can be deployed as either a fully integrated or as a disaggregated router. This flexibility is achieved with Ribbon's IP Wave rNOS providing the network operating systems (NOS) and the NPT 2400s full compliance to the standard ONIE installation environment allowing the IP Wave rNOS to be operated on approved, certified, ODM hardware.

With its high-capacity, high-performance and rich and robust feature-set, the NPT 2400 is well suited for a wide variety of applications and networking scenarios, including:

- **5G Aggregation Router** providing 5G-specific functionality, including Class C timing, Segment Routing, Flex-Algo, EVPN, and 5G interfaces
- **Metro Edge Aggregation for Broadband Backhaul**, providing high capacity, high performance and high scale routing, a full set of IP/MPLS capabilities, and optimized service-aware support for voice, video, and data services and with high capacity,
- **Metro Edge Aggregation for Business Services**, offering a full range of Ethernet interfaces as well as a full set of IP protocols, including EVPN and segment routing, to ensure service transport meets SLAs on a per service basis
- **High-Capacity Switch for CIN networks**, providing the fanout, interface speeds and full range of Ethernet interfaces as well as the full set of IP protocols, including EVPN and segment routing, required by a high-capacity CIN switch in a regional hub or as a Spine in a leaf-spine architecture in a primary hub
- **Converged Multi-access Edge**, with support for 5G, broadband backhaul, business services, IPoDWDM, all from a single converged metro edge aggregation platform
- **TDM Migration** (future option with eEXT-2UH), supporting migration of voice trunk and legacy services with circuit emulation services (CES), mapping a full range of legacy TDM interface speeds onto the packet switched network (PSN)

NPT 2400 Key Product Highlights

- Compact 2RU form factor
- 4.8T switching capacity
- 30 traffic ports supporting 10G/25G/100G/400G
- Full IPoDWDM capabilities with coherent, OpenZR+ compliant, interfaces for 100G/200G/400G
- Ribbon's IP Wave rNOS
- Compliance to standard ONIE installation
- 1+1 redundant, hot swappable power supplies
- Front to back air flow
- Rich quality-of-service capabilities for different SLAs
- Comprehensive 5G enabled timing and synchronization G.8273.2 Class C compliant
- Open NE for 3rd Party Management
- Advanced Management Capabilities provided by Muse Software



Full NPT Portfolio

Key NPT 2400 Product Specifications

Platform

Description	Specification
CPU	<ul style="list-style-type: none"> Intel 8 cores/1.9Ghz
Memory	<ul style="list-style-type: none"> 32G DDR4
Storage	<ul style="list-style-type: none"> 128G SSD
Traffic Interfaces	<ul style="list-style-type: none"> 6 x 400G (QSFP56_DD) 24x100G (8 ports QSFP28_DD, 16 ports QSFP28) 72x10G/25G (with Break-out ports)
Control and management interfaces	<ul style="list-style-type: none"> 2x10GBase SFP+ Mgmt. ports USB 2.0 Type-A RJ45 LCT/CLI (10/100/1000Base-T) RJ45 Console (RS232) 1xmicro USB serial console port
Performance	<ul style="list-style-type: none"> 32Gbps
Power Supplies	<ul style="list-style-type: none"> 1+1 DC input redundancy
Cooling	<ul style="list-style-type: none"> 4 Fans 3+1 redundancy Airflow – front to back
Timing	<ul style="list-style-type: none"> SyncE with ESMC 1588v2 PTP, T-GM , T-BC , APTS Built-in GNSS receiver External timing (input/output) 10Mhz 1PPS and TOD BITS (T3/T4) ACR, DCR Internal stratum 3E OCXO clock (holdover state) Primary and secondary sources (supports SSM bits) Supported profiles : <ul style="list-style-type: none"> G.8262.1, G.8275.1, G.8275.2 G.8273.2 - class C
Physical Specification	<ul style="list-style-type: none"> H x W x D: 87.7 x 436 x 762 mm Weight : 29.08Kg

Multi-access Capabilities

Description	Specification
L2/L3 VPN Services	<ul style="list-style-type: none"> • L2VPN - MEF 3.0 (IP-MPLS and MPLS-TP) <ul style="list-style-type: none"> • E-Line • E-LAN • E-Tree • E-Access • E-Transit • Ethernet Virtual Private Network (EVPN) <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • IPv4 VRF • 6VPE • IRB, PHT
IP Over DWDM	<ul style="list-style-type: none"> • Colored C/DWDM • Coherent OpenZR+
TDM Services	<ul style="list-style-type: none"> • Circuit Emulation Services (CES) <ul style="list-style-type: none"> • SAToP, CESoPSN • CEP
TDM Pluggables*	<ul style="list-style-type: none"> • 30x E1/T1 (per smart SFP)

*Future with eEXT-2UH

Software features provided by the Ribbon IP Wave rNOS

Description	Specification
Layer 2	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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

Software features provided by the Ribbon IP Wave rNOS (continued)

Description	Specification
Segment Routing (SR)	<ul style="list-style-type: none"> • SR-MPLS • ISIS, OSPF, BGP extensions to segment routing • TI-LFA • Segment Routing Traffic Engineering (SR-TE, SR Policies) <ul style="list-style-type: none"> • 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
Multicast	<ul style="list-style-type: none"> • IPv4 and IPv6 Multicast Routing • PIM-SM, PIM-SSM, PIM-ASM • IGMPv3, MLDv2 • MSDP • Anycast RP • BGP IPv4 Multicast
Quality of Service (QoS)	<ul style="list-style-type: none"> • 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

Software features provided by the Ribbon IP Wave rNOS (continued)

Description	Specification
OAM	<ul style="list-style-type: none"> • Ethernet OAM - IEEE802.3ah, IEEE 802.1ag and ITU-T Y.1731 PM • IP OAM - BFD, Ping, Trace-route, TWAMP • MPLS-TP OAM - G8113.2, RFC5860, BFD • MPLS OAM – Ping/Traceroute MPLS • Y.1564 • LLDP • DHCP Relay • Streaming Telemetry • sFlow • Link Delay-Measurement
Security	<ul style="list-style-type: none"> • Control-plane and management plane protection • Authentication, Authorization, and Accounting (AAA) <ul style="list-style-type: none"> • RADIUS • Terminal Access Controller Access-Control System Plus (TACACS+) • Secure Shell (SSH), TLS, SFTP • SHA-2 SW integrity verification • Layer 2 and Layer 3 ingress Firewall filters (ACL) • Unicast Reverse Path Forwarding (Unicast RPF) • IEEE802.1x • x.509 digital certificate
Manageability	<ul style="list-style-type: none"> • CLI • LCT • SNMP MIB • NETCONF/gRPC - XML, JSON, GPB • YANG models - OpenConfig, IETF • Muse software suite (SDN orchestration and control) • LightSOFT® NMS • Zero-Touch Provisioning (ZTP)

Environmental

Description	Specification
Operating environment and altitude	<ul style="list-style-type: none">• 0°C to +45°C (-32°F to 113°F)
Operating Humidity	<ul style="list-style-type: none">• 5% to 95%
Altitude	<ul style="list-style-type: none">• Up to 4000 m
Acoustics	<ul style="list-style-type: none">• NEBS GR-63-CORE
Power input	<ul style="list-style-type: none">• -48Vdc +/-15%• 100-240 VAC
Power dissipation	<ul style="list-style-type: none">• Up to 1200W

Standards compliance

Description	Specification
Regulatory	<ul style="list-style-type: none"> • Products should comply with CE markings according to directives 2014/30/EC and 2014/35/EC • VCCI-A
NEBS	<ul style="list-style-type: none"> • Certified with GR-63, GR-1089 and GR-3160
Safety	<ul style="list-style-type: none"> • IEC 62368-1 • UL 62368-1 • IEC 60825-1 for lasers • IEC 60825-2 for lasers
EMS Standards	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • ETSI EN 300 386 • IEC 61000-4 series
ETSI	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Compliance per EU RoHS, RoHS 2 directive 2011/65/EU and amendment 2015/863/EU directives.

Contact Us

We are here to help. Contact us about our IP Wave solutions.

About Ribbon

Ribbon Communications (Nasdaq: RBBN) delivers communications software, IP and optical networking solutions to service providers, enterprises and critical infrastructure sectors globally. We engage deeply with our customers, helping them modernize their networks for improved competitive positioning and business outcomes in today's smart, always-on and data-hungry world. Our innovative, end-to-end solutions portfolio delivers unparalleled scale, performance, and agility, including core to edge software-centric solutions, cloud-native offers, leading-edge security and analytics tools, along with IP and optical networking solutions for 5G. We maintain a keen focus on our commitments to Environmental, Social and Governance (ESG) matters, offering an annual Sustainability Report to our stakeholders. To learn more about Ribbon, please visit [rbbn.com](https://www.ribbon.com).