

NPT 1800 Family – AR Router Series

Aggregation Router Optimized for High Availability

The NPT 1800 family of aggregation routers is designed for next generation services and applications. With a fully redundant, modular architecture and service-aware packet transport, the NPT 1800 router family is optimized for operators requiring a high-availability multiservice packet transport solution. There are two variants of the NPT 1800:

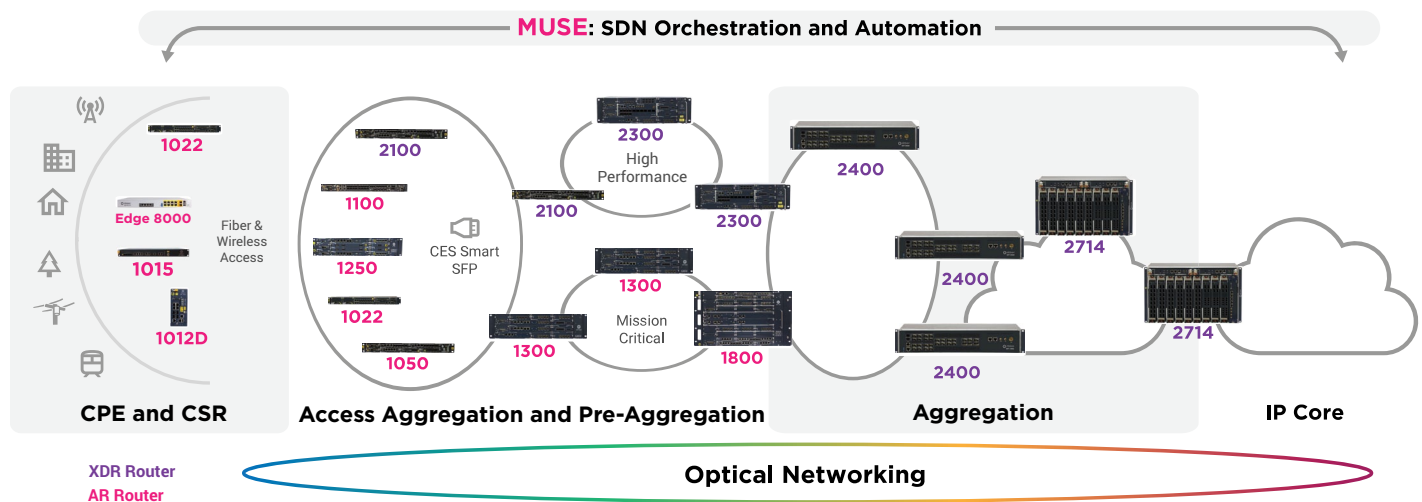
- NPT 1800 - supports IP/MPLS and MPLS-TP and provides coherent routing (IPoDWDM) with a full set of optical interfaces
- NPT 1800 R - supports IP/MPLS only and does not provide IPoDWDM



NPT 1800 provides 2 Tbps switching capacity, 100G interfaces in an 8RU form factor. NPT 1800 uses Ribbon's industry proven IP Wave rNOS network operating system to efficiently aggregate and route services over the network, meeting their service performance needs (SLAs) on a service-by-service basis.

With such a rich and robust feature-set, NPT 1800 is well suited for a wide variety of applications and networking scenarios, these include:

- Converged Aggregation for the Intelligent Middle Mile: Supporting 5G xHaul, broadband backhaul, business services, and TDM migration all from a single converged platform
- 5G backhaul: with 5G specific functionality including, Class C timing, Segment Routing, EVPN, network slicing and 5G interfaces
- Aggregation for Business services: provides packet transport to meet service SLA's on a per service basis
- TDM migration: supporting voice trunk and legacy service migration with circuit emulation services (CES) mapping a full range of legacy TDM interface speeds onto the packet switched network (PSN)



Key Product Specifications NPT 1800 Family Platform

Description	Specification	
	NPT 1800	NPT 1800 R
Chipset	Jericho+	Jericho+
Memory	16G	16G
Storage	8G	8G
Traffic Interfaces	<ul style="list-style-type: none"> • 16x100G • 64x25G • 92x10G • 300xGE ports 	<ul style="list-style-type: none"> • 16x100G • 64x25G • 92x10G • 300xGE ports
Control and Management Interfaces	<ul style="list-style-type: none"> • LCT/CLI (10/100/1000Base-T) • Console (RS232) • Alarm in/out (dry contact) 	<ul style="list-style-type: none"> • LCT/CLI (10/100/1000Base-T) • Console (RS232) • Alarm in/out (dry contact)
Performance	Switch capacity Up to 2 TBps	Switch capacity Up to 2 TBps
Power Supplies	2 hot swappable with 1+1 redundancy	2 hot swappable with 1+1 redundancy
Cooling	<ul style="list-style-type: none"> • 1 Fan • Airflow – right to left 	<ul style="list-style-type: none"> • 1 Fan • Airflow – right to left
Timing	<ul style="list-style-type: none"> • SyncE with ESMC • 1588v2 • External timing 1PPS and TOD • Internal stratum 3E clock (holdover state) • Primary and secondary sources (supports SSM bits) • ACR, DCR • Loop timing on SAToP • TDM bits (T3/ T4), and SNTP • G.8262.1, G.8275.1 • G.8273.2 – class C 	<ul style="list-style-type: none"> • SyncE with ESMC • 1588v2 • External timing 1PPS and TOD • Internal stratum 3E clock (holdover state) • Primary and secondary sources (supports SSM bits) • ACR, DCR • Loop timing on SAToP • TDM bits (T3/ T4), and SNTP • G.8262.1, G.8275.1 • G.8273.2 – class C
Physical Specification	<ul style="list-style-type: none"> • 8RU • H x W x D: 13.8" x 17.5" x 9.6" / 352mm x 445 x 243 mm • Weight: 8.9 kg 	<ul style="list-style-type: none"> • 8RU • H x W x D: 13.8" x 17.5" x 9.6" / 352mm x 445 x 243 mm • Weight: 8.9 kg

Multi-service Capabilities NPT 1800 Family

Description	Specification	
	NPT 1800	NPT 1800 R
L2/L3 VPN Services	L2VPN - MEF 3.0 (IP-MPLS and MPLS-TP) <ul style="list-style-type: none"> • E-Line • E-LAN • E-Tree • E-Access 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 	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
Coherent Routing	<ul style="list-style-type: none"> • 100G, 200G, coherent interfaces • ZR and OPENZR+ application • CFP2 DCO for 100G/200G • QSFP_DD for 100/200 	Not Applicable
Optical Interfaces	<ul style="list-style-type: none"> • CWDM, • DWDM, • Amplifiers 	Not Applicable
TDM Services	Circuit Emulation Services (CES) <ul style="list-style-type: none"> • SAToP • CESoPSN • CEP 	Circuit Emulation Services (CES) <ul style="list-style-type: none"> • SAToP • CESoPSN • CEP
TDM Pluggables	<ul style="list-style-type: none"> • E1/T1 • E3/DS3 • STM-1/OC-3 • STM-4/OC-12 • STM-16/OC-48 • 1 x STM-16/OC-48 (per smart SFP) 	<ul style="list-style-type: none"> • E1/T1 • E3/DS3 • STM-1/OC-3 • STM-4/OC-12 • STM-16/OC-48 • 1 x STM-16/OC-48 (per smart SFP)
TDM Interfaces	Max. Interfaces: <ul style="list-style-type: none"> • 32 x E1/T1 • 24 x E3/DS3 • 4 x STM-1/OC-3 • 1 x STM-4/OC-12 • 1 x STM-16/OC-48 (per smart SFP) 	Max. Interfaces: <ul style="list-style-type: none"> • 32 x E1/T1 • 24 x E3/DS3 • 4 x STM-1/OC-3 • 1 x STM-4/OC-12 • 1 x STM-16/OC-48 (per smart SFP)

Software features provided by the NPTs IP-Wave rNOS

Description	Specification	
	NPT 1800	NPT 1800 R
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 	<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) 	<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 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 	<ul style="list-style-type: none"> • 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)	<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 	<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

Software features provided by the NPTs IP-Wave rNOS (continued)

Description	Specification	
	NPT 1800	NPT 1800 R
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 	<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 	<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
Timing and Synchronization	<ul style="list-style-type: none"> • Stratum 3E OCXO • ITU-T G.8262 Sync-E • IEEE 1588v2 - T-GM, T-BC, APTS • G.8275.1, G.8275.2 • G.8273.2 Class C/D 	<ul style="list-style-type: none"> • Stratum 3E OCXO • ITU-T G.8262 Sync-E • IEEE 1588v2 - T-GM, T-BC, APTS • G.8275.1, G.8275.2 • G.8273.2 Class C/D
OAM	<ul style="list-style-type: none"> • Ethernet OAM <ul style="list-style-type: none"> • IEEE802.3ah • IEEE 802.1ag • ITU-T Y.1731 PM • IP OAM <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Ethernet OAM <ul style="list-style-type: none"> • IEEE802.3ah • IEEE 802.1ag • ITU-T Y.1731 PM • IP OAM <ul style="list-style-type: none"> • BFD • Ping • Trace-route • TWAMP • MPLS OAM – Ping/Traceroute MPLS • LLDP • DHCP Relay • Streaming Telemetry • sFlow • Link Delay-Measurement

Software features provided by the NPT's IP-Wave rNOS (continued)

Description	Specification
Security	<ul style="list-style-type: none"> • 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
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	-40°C to +65°C (10,000 ft)
Operating RH Range	5% to 93% (noncondensing)
Power Input	40 VDC to -75 VDC
Power Dissipation	1200W

Standards compliance

Description	Specification
Regulatory Compliance	Products comply with CE markings according to directives 2014/30/EC and 2014/35/EC
NEBS	Designed to meet GR-63, GR-1089 and GR-3160
Safety	<ul style="list-style-type: none"> • EN 60950/2000, according to LVD Directive 72/23/EEC • 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 300 386-2 • IEC 61000-4 series
ETSI/Environmental	<ul style="list-style-type: none"> • ETSI EN 300 019 <ul style="list-style-type: none"> • 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.

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.