NPT 1100 Family – AR Router Series

Access Aggregation Router for the Access Edge and Pre-aggregation

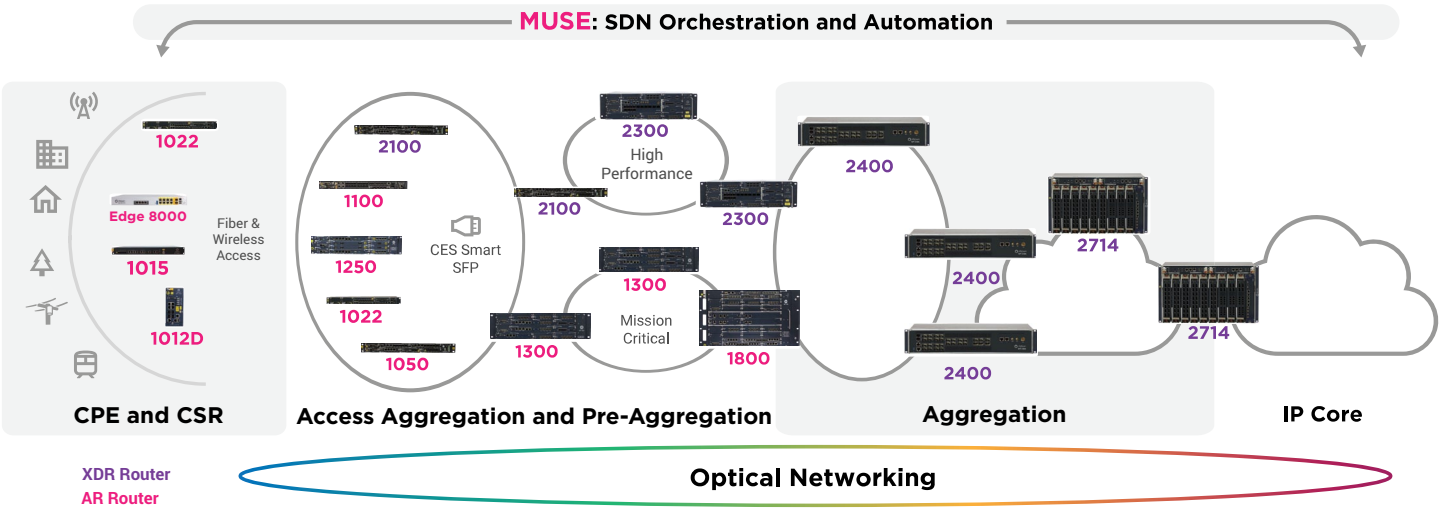
NPT 1100 is an access aggregation router designed for next generation services and applications. With support for multiple access technologies, it is optimized for access edge and pre-aggregation. It is temperature hardened, with a small form factor, and is suitable for both indoor deployment and deployment in an outdoor enclosure.

- NPT 1100 – supports IP/MPLS and MPLS-TP
- NPT 1100R – supports IP/MPLS, it does not support MPLS-TP or IPoDWDM
- NPT 1100H – supports IP/MPLS and MPLS-TP adds support for partial timing G.8275.2
- NPT 1100HR – supports IP/MPLS and adds support for partial timing G.8275.2, it does not support MPLS-TP or IPoDWDM

NPT 1100 provides 300Gbps packet switching and a port fan-out of 582G with and 100G interfaces in a 1RU form factor. It provides an extensive set of interfaces making it the ideal solution for deployment at the access edge. Using Ribbon's industry proven IP Wave rNOS operating system the NPT 1100 combines carrier-grade service assurance, visibility, and control with packet efficiency and multiservice allowing the NPT 1100 to efficiently aggregate and route the 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 1100 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 Cell site router: with 5G specific functionality including, Class C timing, Segment Routing, EVPN, and 5G interfaces
- Access 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 1100 Family

Platform

Description	Specification	
	NPT 1100, NPT 1100R	NPT 1100H, NPT1100HR
Chipset	• Qumran- AX	• Qumran- AX
Memory	• 8G DRAM	• 8G DRAM
Storage	• 16GB eMMC	• 16GB eMMC
Traffic Interfaces	• 2x100G • 8x25G • 22x10G • 30xGE ports	• 2x100G • 8x25G • 22x10G • 30xGE ports
Control and Management Interfaces	• USB (For SW installation and ZTI) • LCT/CLI (10/100/1000Base-T) • Console (RS232) • Alarm in/out (dry contact)	• USB (For SW installation and ZTI) • LCT/CLI (10/100/1000Base-T) • Console (RS232) • Alarm in/out (dry contact)
Performance	• Switch capacity Up to 300 Gbps	• Switch capacity Up to 300 Gbps
Power Supplies	• 2 hot swappable with 1+1 redundancy	• 2 hot swappable with 1+1 redundancy
Cooling	• 1 Fan • Airflow – right to left	• 1 Fan • Airflow – right to left
Timing	• SyncE with ESMC • 1588v2 • GNSS receiver • 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	• SyncE with ESMC • 1588v2 • GNSS receiver • 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, • G8275.2(partial timing) • G.8273.2 – class C
Physical Specification	• 1RU • Dimension: 465 mm (W) x 263 mm (D) x 44mm (H) • Weight: 4.2kg	• 1RU • Dimension: 465 mm (W) x 263 mm (D) x 44mm (H) • Weight: 4.2kg

Environmental

Description	Specification
Operating environment and altitude	• –40°C to +65°C (10,000 ft)
Operating humidity	• 5% to 93%
Altitude	• 0 to 4,000m
Acoustics	• NEBS GR-63-CORE
Power over Ethernet (PoE+)	• Up to 30W
Power input	• -40 VDC to -72 VDC, 110 VAC to 230 VAC
Power dissipation	• Typical : 100W

Multi-service Access Aggregation Capabilities NPT 1100 Family

Description	Specification	
	NPT 1100, NPT 1100H	NPT 1100R, NPT 1100HR

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
		• 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

Coherent Routing	• 100G, 200G, coherent interfaces • ZR and OPENZR+ application • CFP2 DCO for 100G/200G • QSFP_DD for 100/200	• Not Applicable
Optical Interfaces	• CWDM, • DWDM, • Amplifiers	• Not Applicable

TDM Services	• Circuit Emulation Services (CES)
	  • SAToP
	  • CESoPSN
	  • CEP
		• Circuit Emulation Services (CES)
		  • SAToP
		  • CESoPSN
		  • CEP

TDM Pluggables	• 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)	• 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:
	  • 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:
		  • 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 NPTs IP-Wave rNOS

Description	Specification	
	NPT 1100, NPT 1100H	NPT 1100R, NPT 1100HR
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
		• 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

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

Description	Specification	
	NPT 1100, NPT 1100H	NPT 1100R, NPT 1100HR
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
		• Y.1564
		• LLDP
		• DHCP Relay
		• Streaming Telemetry
		• sFlow
		• Link Delay-Measurement

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

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
Manageability	• 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)

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	• 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.

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.