NPT 2100 Family – XDR2000 Router Series

Compact High Performance Access Aggregation and DCSG

The NPT 2100 family of access aggregation routers is designed for next generation services and applications and has two variants:

- NPT 2100A - 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 2100AR - supports IP/MPLS only and does not provide IPoDWDM

With support for multiple access technologies, the NPT 2100 family is optimized to provide access aggregation. It is temperature hardened, with high throughput, a small form factor, and is suitable for both outdoor and indoor deployment.

The NPT 2100 family provides 800G non-blocking switching capacity in a 1RU form factor. It provides an extensive set of interfaces ranging from and 1G to 400G and supports multiple access technologies such as Ethernet, MPLS, PON and legacy TDM, making it the ideal solution for access aggregation. With a full set IP/MPLS transport capabilities, the NPT 2100 can 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, the NPT 2100 family is well suited for a wide variety of applications and networking scenarios, these include;

- 5G Cell site router: with 5G specific functionality including, Class C timing, Segment Routing, Flex-Algo, EVPN, and 5G interfaces

- Access Edge for Broadband backhaul: providing a full set of IP/MPLS capabilities providing optimized service-aware support for voice, video, and data services

- Access Edge for Business services: a full range of Ethernet interfaces and full set of IP protocols such as EVPN and segment routing ensure services are transported to meet the SLA's on a per service basis

Super Converged Multi-AccessEdge Access Router

- PON infill: with a 10GSFP+ OLT Optics pluggable module providing XGS-PON/EPON connectivity supporting up to 128 ONUs per OLT

- 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)

- Converged Multi-access Edge: Supporting 5G, broadband backhaul, business services, PON and TDM migration all from a single converged access edge platform
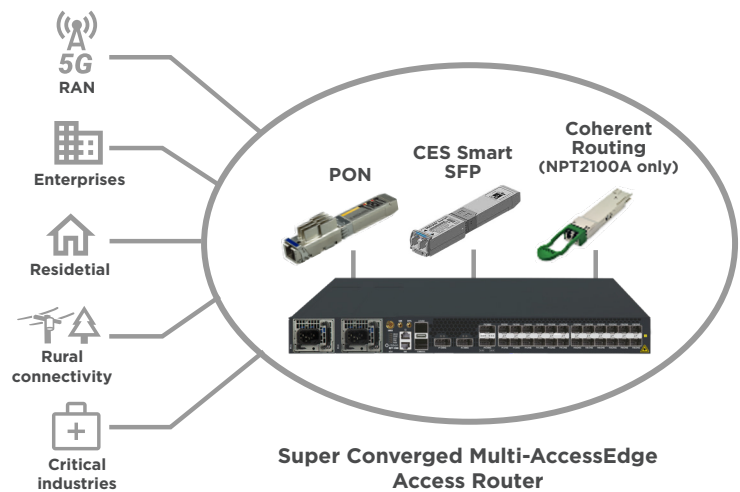
NPT 2100 Key Product Highlights

- Multi-access Edge supporting Ethernet, XGS-PON, EPON, TDM with CES

- 1RU small form factor with a 300mm depth

- Environmentally hardened, suitable for deployments in indoor or outdoor sealed cabinets

- Versatile Ethernet interface options: 1G/10G/25G/50F/100G/200G and 400G

- Low-latency forwarding, Class C compliant

- 400G/100G ZR/ZR+ optics support - NPT 2100A only

- Precise frequency and phase/time synchronization using the latest industry standards

- Rich quality-of-service capabilities for different SLAs

- Security-Trust Anchor module infrastructure, secure boot, image signing, run-time defense

- MEF 3.0 Compliant

- Open NE for 3rd Party Management

- Advanced Management Capabilities provided by Muse Software
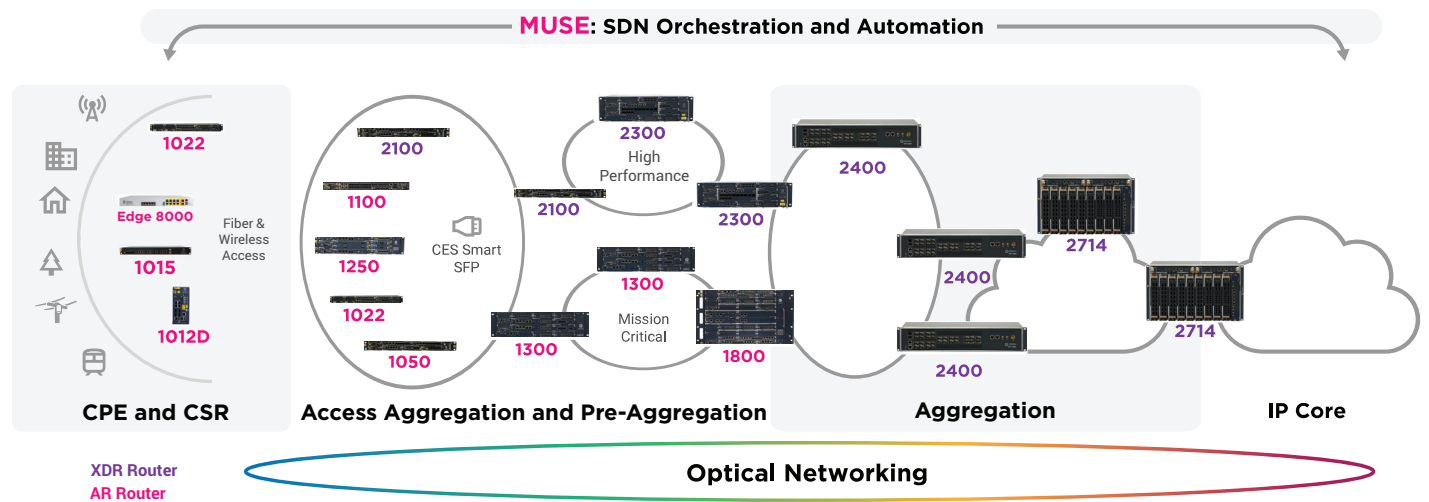
Full NPT Portfolio

Key Product Specifications NPT 2100 Family

Platform

Description	Specification
CPU	Intel x86 8-Core/1.7GHz Core
Memory	• 2 x 8GB DDR4 SO-DIMM with ECC • 2 x 16MB boot flash
Storage	1 x 128GB M.2 SSD
Traffic Ports	• 2 x QSFP-DD (400G/200G/100G) • 2 x QSFP28 (1 x 100G/50G, 4 x 25G /10G) • 24 x SFP28 (1/10/25G)
Control Interfaces	• 10/100/1000Base-T (RJ45) • RS232 console (RJ45) • USB 3.0 Type A
Timing Interfaces	• GNSS input SMA • 10MHz input/output SMB • 1PPS input/output SMB • BITS input RJ48 • ToD input RJ45
Performance	Switch capacity: 800Gb/s @600Mpps
Power Supplies	• 1 + 1 Redundant and hot-swappable • DC Power supply - 400W @ -48VDC • AC Power supply - 400W @ 100-240VAC
Cooling	• 4 + 1 reundant fan FRU • Front to back Air flow
Timing	• Stratum 3E OCXO • ITU-T G.8262 Sync-E • IEEE 1588v2 - T-GM, T-BC, APTS • G.8275.1, G.8275.2 • G.8275.2 Class C/D
Physical Specification	• 1RU • Dimension: 440 mm (W) x 302 mm (D) x 44mm (H)

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Access Aggregation Capabilities

Description	Specification	
	NPT 2100A	**NPT 2100AR**
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, 400G coherent interfaces • ZR and OPENZR+ application • CFP2 DCO for 100G/200G • QSFP_DD for 100/200/400G	• 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-4 • STM-16/OC-48	• E1/T1 • E3/DS3 • STM-1/OC-4 • STM-16/OC-48
TDM Interfaces	Max. Interfaces: • 224 x E1/T1 • 168 x DS3 • 28 x STM-1/OC-3 • 7 x STM-4/OC-12 • 64 x STM-16/OC-48	Max. Interfaces: • 224 x E1/T1 • 168 x DS3 • 28 x STM-1/OC-3 • 7 x STM-4/OC-12 • 64 x STM-16/OC-48
PON Pluggables	• Smart SFP 10G XGS-PON - 10G SFP+ OLT optics modules	• Smart SFP 10G XGS-PON - 10G SFP+ OLT optics modules

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Software features provided by the NPTs IP-Wave rNOS

Description	Specification	
	NPT 2100A	**NPT 2100AR**
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

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Software features provided by the NPT's 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

Environmental

Description	Specification
Operating Environment and Altitude	-40^{0}C to +65^{0}C (10,000 ft)
Operating Humidity	5% to 93% (noncondensing)
Altitude	0 to 10,000 ft.
Power Input	• Worldwide ranging AC (90-264V; 47-63 Hz) • Worldwide ranging DC (-37V to -75)
Power Dissipation	305W

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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   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.

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