

NPT 1022 Family - AR Router Series

High-Capacity CPE and Access Aggregation Router



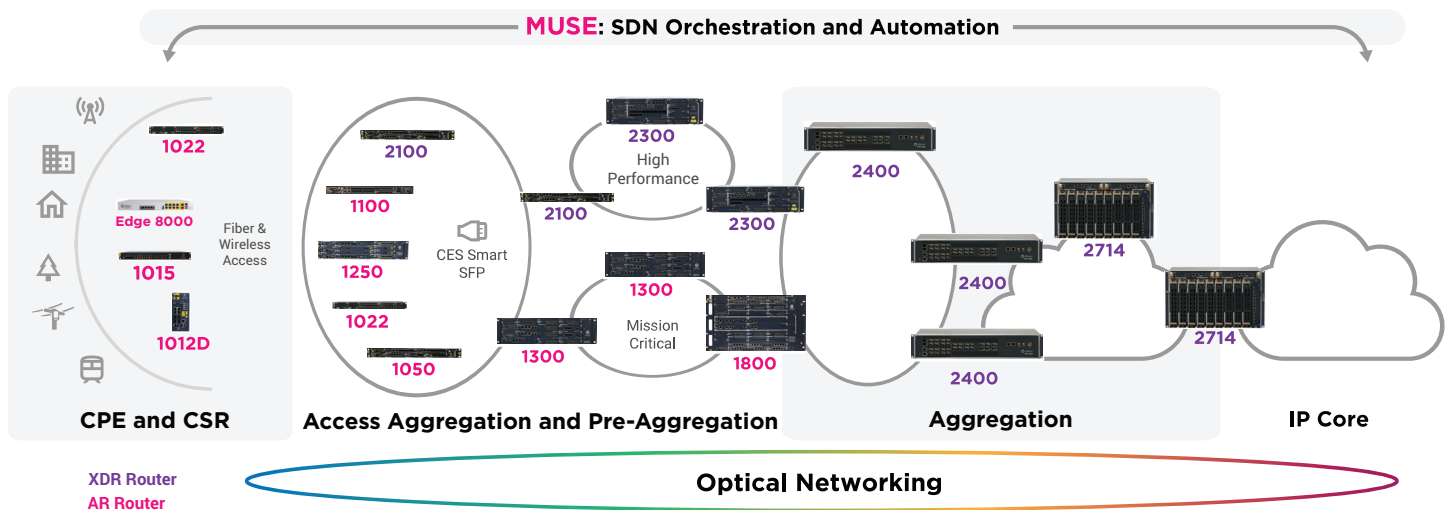
NPT 1022 provides support for multiple access technologies. With multiple variants, it is ideal for operators wanting an optimized high capacity, compact CPE device or access aggregation router able to support for both new and legacy services.



- NPT 1022 – supports IP/MPLS and MPLS-TP
- NPT 1022R – supports IP/MPLS, it does not support IPoDWDM
- NPT 1022H – supports IP/MPLS and MPLS-TP adds support for partial timing G.8275.2
- NPT 1022HR – supports IP/MPLS, it does not support IPoDWDM adds support for partial timing G.8275.2
- NPT 1022BH – supports IP/MPLS and MPLS-TP with a GNSS receiver with increased memory (8G) and storage (32GB)
- NPT 1022BHR – supports IP/MPLS with a GNSS receiver with increased memory (8G) and storage (32GB), it does not support IPoDWDM

NPT 1022 provides 64 Gbps switching capacity and a generous fan-out for 10G/GE interfaces in a 1RU form factor. It provides support for G8275.2 timing and multiple access technologies such as Ethernet, MPLS, and legacy TDM(CES), making it the ideal solution for deployment as a multi-access CPE or access aggregation router. With such a rich and robust feature-set, NPT 1022 is well suited for a wide variety of applications and networking scenarios, these include:

- 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)
- Access Aggregation and CPE for Business services: provides packet transport to meet service SLA's on a per service basis
- 5G Cell site router: with 5G specific functionality including, Class C timing, Segment Routing and EVPN
- Access Aggregation for Intelligent Middle Mile: Supporting 5G xHaul, broadband backhaul, business services, and TDM migration all from a single converged platform
- The NPT 1022BH/BHR feature a built-in GNSS receiver and double the controller memory size
- The NPT 1022 HR/BHR variants remove support for IPoDWDM and MPLS-TP



Key Product Specifications 1022 Family

Platform

Description	Specification					
	NPT 1022	NPT 1022R	NPT 1022H	NPT 1022HR	NPT 1022BH	NPT 1022BHR
Chipset	• Qumran- UX	• Qumran- UX	• Qumran- UX	• Qumran- UX	• Qumran- UX	• Qumran- UX
Memory	• 4G DDR3 DRAM	• 4G DDR3 DRAM	• 4G DDR3 DRAM	• 4G DDR3 DRAM	• 8G DDR3 DRAM	• 8G DDR3 DRAM
Storage	• 8GB eMMC	• 8GB eMMC	• 8GB eMMC	• 8GB eMMC	• 32GB eMMC	• 32GB eMMC
Traffic Interfaces	• 4 x 10/100/1000 Base-T • 12 x 100/1000 Base-X • 4 x 10/1GE	• 4 x 10/100/1000 Base-T • 12 x 100/1000 Base-X • 4 x 10/1GE	• 4 x 10/100/1000 Base-T • 12 x 100/1000 Base-X • 4 x 10/1GE	• 4 x 10/100/1000 Base-T • 12 x 100/1000 Base-X • 4 x 10/1GE	• 4 x 10/100/1000 Base-T • 12 x 100/1000 Base-X • 4 x 10/1GE	• 4 x 10/100/1000 Base-T • 12 x 100/1000 Base-X • 4 x 10/1GE
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)	• 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)	• 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	• 64Gbps	• 64Gbps	• 64Gbps	• 64Gbps	• 64Gbps	• 64Gbps
Power Supplies	• 2 hot swappable with 1+1 redundancy	• 2 hot swappable with 1+1 redundancy	• 2 hot swappable with 1+1 redundancy	• 2 hot swappable with 1+1 redundancy	• 2 hot swappable with 1+1 redundancy	• 2 hot swappable with 1+1 redundancy
Cooling	• 1 Fan • Airflow – right to left • Integrated Air Filter	• 1 Fan • Airflow – right to left • Integrated Air Filter	• 1 Fan • Airflow – right to left • Integrated Air Filter	• 1 Fan • Airflow – right to left • Integrated Air Filter	• 1 Fan • Airflow – right to left • Integrated Air Filter	• 1 Fan • Airflow – right to left • Integrated Air Filter
Timing	• Not Applicable	• Not Applicable	• SyncE with ESMC • 1588v2 • External timing 1PPS and TOD • Internal stratum 3 clock (holdover state) • Primary and secondary sources (supports SSM bits) • ACR, DCR • Loop timing on SAToP, BITS (T3/4) and SNTP • Supported profiles: • G.8262.1, G.8275.1, G.8275.2 • G.8273.2 - class C	• SyncE with ESMC • 1588v2 • External timing 1PPS and TOD • Internal stratum 3 clock (holdover state) • Primary and secondary sources (supports SSM bits) • ACR, DCR • Loop timing on SAToP, BITS (T3/4) and SNTP • Supported profiles: • G.8262.1, G.8275.1, G.8275.2 • G.8273.2 - class C	• SyncE with ESMC • 1588v2 • Built-in GNSS receiver • External timing 1PPS and TOD • Internal stratum 3 clock (holdover state) • Primary and secondary sources (supports SSM bits) • ACR, DCR • Loop timing on SAToP, and SNTP • Supported profiles: • G.8262.1, G.8275.1, G.8275.2 • G.8273.2 - class C	• SyncE with ESMC • 1588v2 • Built-in GNSS receiver • External timing 1PPS and TOD • Internal stratum 3 clock (holdover state) • Primary and secondary sources (supports SSM bits) • ACR, DCR • Loop timing on SAToP, and SNTP • Supported profiles: • G.8262.1, G.8275.1, G.8275.2 • G.8273.2 - class C
Physical Specifications	• 1RU • Dimension: 483 mm (W) x 243 mm (D) x 44 mm (H) • Weight: 3.21Kg	• 1RU • Dimension: 483 mm (W) x 243 mm (D) x 44 mm (H) • Weight: 3.21Kg	• 1RU • Dimension: 483 mm (W) x 243 mm (D) x 44 mm (H) • Weight: 3.21Kg	• 1RU • Dimension: 483 mm (W) x 243 mm (D) x 44 mm (H) • Weight: 3.21Kg	• 1RU • Dimension: 483 mm (W) x 243 mm (D) x 44 mm (H) • Weight: 3.21Kg	• 1RU • Dimension: 483 mm (W) x 243 mm (D) x 44 mm (H) • Weight: 3.21Kg

Environmental

Description	Specification
Operating environment and altitude	<ul style="list-style-type: none">-25°C to +65°C
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 over Ethernet (PoE+)	<ul style="list-style-type: none">Up to 30W
Power input	<ul style="list-style-type: none">-40 VDC to -72 VDC, 110 VAC to 230 VAC
Power dissipation	<ul style="list-style-type: none">50W

Multi-access Capabilities NPT 1022 Families

Description	Specification	
	NPT 1022, NPT 1022H, NPT 1022BH	NPT 1022R, NPT 1022HR, NPT 1022BHR
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 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Not Applicable
Optical Interfaces	<ul style="list-style-type: none"> CWDM, DWDM, Amplifiers 	<ul style="list-style-type: none"> Not Applicable
TDM Services	<ul style="list-style-type: none"> Circuit Emulation Services (CES) <ul style="list-style-type: none"> SAToP CESoPSN CEP 	<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"> 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	<ul style="list-style-type: none"> 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) 	<ul style="list-style-type: none"> 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 Ribbon's IP Wave rNOS

Description	Specification	
	NPT 1022, NPT 1022H, NPT 1022BH	NPT 1022R, NPT 1022HR, NPT 1022BHR
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 Ribbon's IP Wave rNOS (continued)

Description	Specification	
	NPT 1022, NPT 1022H, NPT 1022BH	NPT 1022R, NPT 1022HR, NPT 1022BHR
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
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 RFC 2544 Generator, Y.1564 LLDP DHCP Relay Streaming Telemetry sFlow Link Delay-Measurement

Software features provided by the NPTs 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)

Standards compliance

Description	Specification
Regulatory Compliance	<ul style="list-style-type: none"> Products comply with CE markings according to directives 2014/30/EC and 2014/35/EC
NEBS	<ul style="list-style-type: none"> Designed to meet GR-63, GR-1089 and GR-3160
Safety	<ul style="list-style-type: none"> IEC 62368-1 (2nd edition) UL 62368-1 IEC 60825-1 for lasers IEC 60825-2 for lasers
EMC 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 / 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	<ul style="list-style-type: none"> 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.