

xHaul

NPT-800FH Packet TSN Switch

Industry's First TSN, Radio over Ethernet (RoE) RAN xHaul Solution

With 4G LTE networks increasing capacity in parallel with ramping 5G and Ethernet services, operators around the world must evolve their RAN transport and access architectures. In the past, operators often relied on dedicated dark fiber which can be expensive and slow to deploy.

Fortunately, multiplexing packet technology can enhance fiber capacity using time sensitive networking (TSN), also known as Ethernet multiplexing. This allows blending time sensitive mobile services, such as 4G CPRI and 5G eCPRI using Radio over Ethernet with preemption alongside standard Ethernet services. Ribbon has a TSN based solution to address urgent xHaul requirements, including delivering higher performance and cost effective access services on a converged Ethernet access network.

Ribbon's NPT-800FH TSN Solutions: CPRI, eCPRI and Ethernet Multiplexing for xHaul

The NPT-800FH platform solution, is a cost-effective, scalable, high capacity TSN switch that delivers superior economics and enables the ability to combine RAN transport with other traffic types such as Ethernet business services on a common infrastructure. Purpose built for time sensitive networks, the NPT-800FH's state-of-the-art, high performance design enables advanced mobile networking architectures and applications with nanosecond timing requirements.

The NPT-800FH connects radios with nanosecond timing using Common Public Radio Interface (CPRI) and eCPRI to bridge traditional mobile networks and Ethernet services, supporting modern centralized or cloud-based architectures. Encapsulating CPRI traffic, the NPT-800FH utilizes IEEE 1914.3 compliant Radio over Ethernet mappers with integrated synchronization to provide higher performance, simplified operations and significant cost savings.

With flexible network deployment options, the NPT-800FH is used across both central office and remote hardened environments. This includes the ability to centralize the fronthaul aggregation of radios to baseband units (BBUs) and cloud topologies feeding a top-of-rack



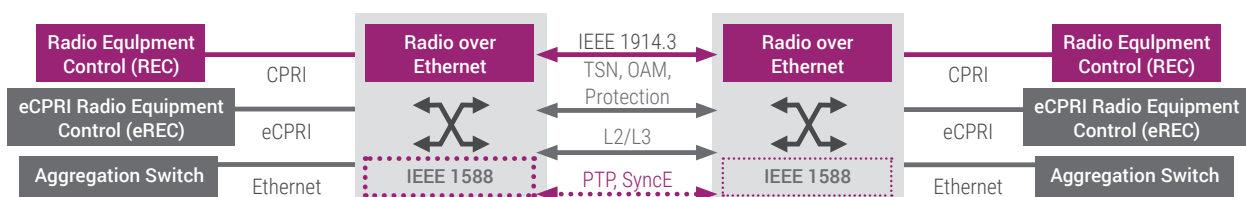
Flexible Fronthaul and Backhaul Solution for 4G and Beyond

(TOR) configuration to virtualized baseband units (vBBUs). Hardened remote deployments enable service blending, with CPRI aggregation at the remote radio head (RRH) along with adding RRH small cell eCPRI traffic and Ethernet services.

Extending fiber capacity, Ribbon's NPT-800FH speeds time to market, ensures a smooth evolution to 5G, creates additional revenue streams by enabling new services, and substantially reduces the total cost of ownership (TCO).

Key Benefits:

- Significantly lowers the total cost of ownership (TCO) for fronthaul service providers: 50% lower cost, 90% turn-up time savings, 75% footprint reduction, and simplified spares inventory management compared to transponder based offerings.
- Simplifies and converges network to reduce deployment and operational costs while simultaneously supporting multiple services: 4G LTE, 5G and Ethernet services.
- Supports 800 Gbps-scale performance by aggregating and switching radio traffic as the fronthaul links continue to scale from: 2.5G, 10G, 25G and 100G. Preemption enables the support of mixed Ethernet services along with mobile traffic.
- Enables multiple carrier isolation using a shared infrastructure with independent carrier services and structure agnostic mapping mode for encapsulation and transport of radio traffic.
- Provides an open, standards-based solution to normalize operations across leading 3rd party RAN suppliers – ending vendor lock-in and eliminating interoperability problems in mixed CPRI implementations.
- Allows better utilization of deployed fiber infrastructure for remote radio head connectivity thus reducing costs and delays associated with additional fiber investments.
- Greatly reduces footprint by blending 4G CPRI using IEEE 1914.3 RoE, 5G eCPRI, and Ethernet high speed data services over a single compact 1RU hardened TSN platform.



NPT-800FH Switch: CPRI, eCPRI, and Radio over Ethernet

System Characteristics

- Dimensions (H x W x D) 44mm x 440mm x 383mm
- Weight 4.5 kg (9.9 lbs)
- Power Consumption 240 W (Fully Loaded)
- Mounting Type 1U: 19", 21" or 23" Rack Mountable
- Port Configuration 4 Ports x 100G, 24 Ports x 25G
- Switching Capacity 800 Gbps
- Power/Fan Slots 2 Power Slots, 2 Fan Slots
- Hot Swappable FANs per Unit 4 per Module for Redundancy

Interfaces

- SFP+/SFP28 Ports 24 Ports
25Gb, 10GbE, CPRI 3/5/7/8/10
- QSFP28 Port 4 Ports
100GbE, 25GbE
- Timing I/O 1PPS In/Out
10MHz In/Out
ToD Output
- Management Port 100/1000 Mbps Ethernet RJ-45
- Console Port RS-232C RJ-45

Power/Environmental

- Hot Swappable DC Power Supply Unit
- Power Requirements -48V DC (-40 to -56V DC)
- Hot Swappable AC Power Supply Unit
- Power Requirements 110/220 AC (90 to 240V AC)
 - Environmental Operating: -40 °C to 65 °C
Storage: -40 °C to 70 °C
(GR-3108 Class 2)
Humidity: Up to 85% (Non-condensing)

Network Management

- Operating EMS (Server, Client), Local Craft Terminal
- Protocols NETCONF/YANG, SNMP Trap

L2 Features

- Double Tagging 802.1Q and QinQ VLAN Translation
- VLAN Translation VLAN Translation
- H-QoS Three-level H-QoS
- Link Aggregation LACP, Static LAG
- Jumbo Frame 9K Bytes

L3 Features

- Routing Static, BGP, ISIS, MPLS-SR
- Dual Stack IPv4 and IPv6 Routing
- LLDP 802.1AB LLDP (Link Layer Discovery Protocol)
- ACL L2 – L7

Radio over Ethernet

- Structure Agnostic IEEE 1914.3: Radio over Ethernet Encapsulations w/Structure Agnostic Mode
- Tunneling IEEE 1914.3: Radio over Ethernet Encapsulations w/Tunneling Mode
- Structure Aware IEEE 1914.3: Radio over Ethernet Encapsulations w/Structure Aware Mode

Time Sensitive Network

- IEEE 802.1CM Time-Sensitive Networking for Fronthaul
- IEEE 802.1Qbu Frame Preemption
- IEEE 802.3br Interspersing Express Traffic

Time Synchronization

- Precision Timing Protocol IEEE 1588v2 BC/OC
G.8273.2 Class C/D
- PTP Profile G.8275.1: PTP Telecom Profile for Phase/Time Synchronization with Full Timing Support from the Network
- Synchronous Ethernet G.8262: Timing Characteristics of a Synchronous Ethernet Equipment Clock
G.8263: Timing Characteristics of Packet-based Equipment Clocks
G.8264: Distribution of Timing Information Through Packet Networks

QAM

- Ethernet OAM IEEE 802.3ah, TWAMP Reflector
- Fault Control Alarm Severity: Critical, Major, Minor
- Classification Level Unit, Module, Port
- Performance Monitoring 15 MIN/24 HR
- Telemetry Telemetry Streaming gRPC
- Loopback Local / Remote
- Authentication RADIUS

Regulatory & Compliance

- FCC 47 CFR Part 15 Class A, CE Mark, UL 60950-1, IEC 60950-1
- IC (Canada EMI)
- VZ TPR 9205, Issue 7, October 2018
- EU RoHS 2: Directive 2011/65/EU, EU RoHS 3: Directive 2015/863/EU with Exemptions 6 (c), 7 (a), and 7 (c)-1
- NEBS Level 3 Certified
- GR-63, GR-1089, GR-3108 Class 2

Contact us to find out how our IP and Optical Solutions can help your business grow 

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. To learn more about Ribbon visit rbbn.com.