

OcNOS® OTN

For Packet Optical Transponders

Overview

OcNOS on modular packet transponder systems based on open specifications combines best-in-class software, open network switch and coherent modules with a data center operations model for cost-effective, web-scale Data Center Interconnect (DCI) and mobile backhaul transport applications.

Web-scale networking requires new solutions designed from the ground up to provide high-capacity metro, regional, and long-haul interconnect with a web-scale operations toolset. IP Infusion's NOS running on open networking switches combines two key principles: best-in-class coherent technology and web-scale IT. For example, OcNOS on Edgecore Cassini packet transponder addresses the massive bandwidth requirements of DCI and backhaul networks while providing power and space efficiency, and its web-scale IT operations model provides easier integration and operations through programmable, open APIs.

A key concept that will enable next generation transport networks is disaggregation, whereby networking software is separated from the switching or routing hardware and broken down into functional components that can

be more efficiently operated. One of the biggest advantages of disaggregation is CAPEX reduction, followed by OPEX savings and deployment flexibility.

Carriers need a new approach for network platform development and procurement to enable:

- Faster introduction of technologies, designs, and features by means of a collaborative ecosystem of hardware and software component vendors
- Flexibility in network design and service deployment via plug-n-play hardware and software components that can cost-effectively scale up and down
- Unit-cost reduction through use of standard hardware and software technology components with very large economies-of-scale wherever appropriate.

The OcNOS system enables community collaboration across network hardware, optical components, forwarding, and operating system layers. OcNOS provides an open NOS framework that leverages existing open source resources and complementary platforms such as switches and white box routers.

Features and Benefits:

- Enables massive capacity and density—1.6 Tb/s of line capacity plus 1.6 Tb/s of client Ethernet ports in a compact, 1.5RU form-factor—powered by standard CFP2 coherent optics from major optical vendors
- Supports flexible modulation: QPSK, 8QAM, and 16QAM for the highest capacity, from metro and regional to long-haul requirements
- Provides a new business and operational experience for deploying web-scale DCI solutions— with simplified planning, ordering, installation, operation, and maintenance
- Zero-Touch Provisioning (ZTP) simplifies onsite commissioning and service provisioning to get traffic up and running quickly
- Provides open APIs for automation, provisioning, and management programmability
- Open API to configure/manage optical modules: Transponder Abstraction Interface (TAI) significantly reduces network systems development and integration of optical subsystems and modules from months to weeks allowing faster time to market and deployment.

Packet Transponder Use Cases

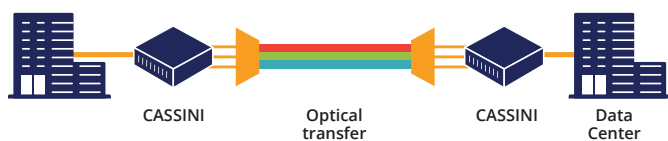
- Data Center Interconnect
- Backhaul of access edge services
- Metro Ethernet services
- Long haul using ACO with appropriate DSP

Recommended for the following applications:

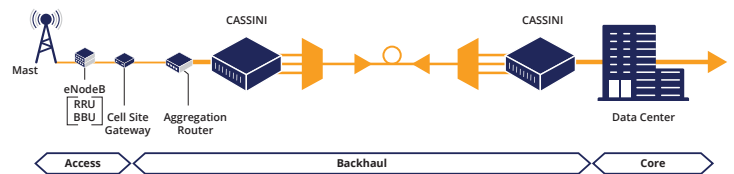
- 1.6T connectivity for DCI, cloud, internet exchange and colocation providers
- 1.6T connectivity for extending the reach in metro and mobile backhaul transport
- High capacity, 16 x 100G managed service platform
- Choice of ACO or DCO transponders for 8x200G or 8x100G links

The OcNOS-OTN on Cassini is a modular and cost-effective solution for rolling out 100G services or increasing existing network capacity. The device has eight 200G pluggable drawers and pluggable optical modules, delivering up to 1.6T in a 1.5U chassis, and enabling pay-as-you-grow architecture.

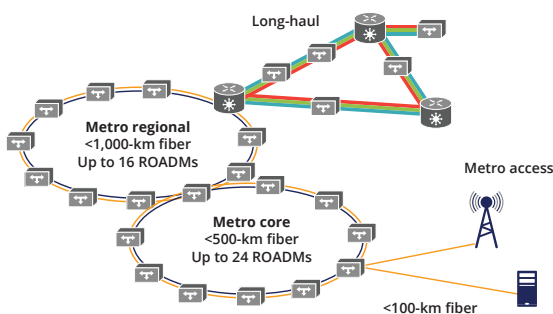
DCI:



MOBILE BACKHAUL:



METRO:



LONGHAUL/BACKBONE TRANSPORT:

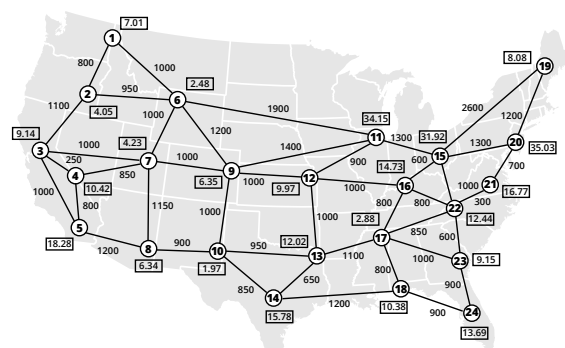


Figure 1: OcNOS packet transponder use cases

OcNOS-OTN-IPBASE: Technical Specifications – NOS Software Features, Hardware and Coherent Optics

OCNOS-OTN FEATURE	SPECIFICATION
Layer 2 Switching	Layer 2 forwarding and bridging Bridge Domains (BD) IEEE 802.1Q VLANs and Q-in-Q Ethernet Link Aggregation Group (LAG) Link Aggregation Control Protocol (LACP) 802.3ad Jumbo frames on all ports
Layer 3 Routing	IPv4 and IPv6 unicast routing Open Shortest Path First (OSPFv2, OSPFv3) Multiprotocol Border Gateway Protocol (MP-BGP) Equal-Cost Multipath (ECMP) Bidirectional Forwarding Detection (BFD)
Quality of Service (QoS)	Policing, Shaping Multi-level priority queuing Classification based on L2/L3/L4 fields Remarking Weighted Random Early Detection (WRED)
OAM	LLDP, ICMP, DHCP Relay Model/Event Driven Telemetry sflow PRBS on client and line side
Manageability	CLI SNMP MIB NETCONF/Openconfig YANG models (native, IETF) RPM-based SW infrastructure Zero-Touch Provisioning (ZTP) with ONIE boot loader
Optical Line Monitoring	Configuration Output power (dBm) Modulation format (16QAM/8QAM/QPSK) Frequency (Hz) Performance Monitoring Current pre-FEC BER (bps), current post-FEC (bps) Current input power (dBm), current output power (dBm) Current frequency (Hz) Chromatic Dispersion OSNR Alarms
Standard MSA pluggable	QSFP28 SR4/LR4/CWDM4 for 100G client interface CFP2 AC0 or DCO tunable DWDM for 100G/200G line interface
Edgecore Cassini Hardware Specification	1.5RU form factor with system throughput of 3.2Tbps based on Broadcom StrataXGS™ Tomahawk™ Plus switching silicon 16 fixed 100 Gigabit Ethernet QSFP28 ports 8 line card slots to incorporate a flexible mix of 100/200 Gbps AC0/DCO coherent DSP and optical transceivers from compatible vendors MACsec security on client-side and DCO line cards to enable secure encrypted connections Full hardware Spec: https://www.edge-core.com/products/Info.php?cls=1&cls2=345&cls3=346&id=605

OcNOS-OTN-IPBASE Solution Ordering Guide

SKU	DESCRIPTION
OCNOS-OTN-IPBASE	Open Compute Network Operating System IPBASE image for Data Center and Service Provider networks with Coherent packet optical networking using DWDM optics with Layer 2, /L3 switching and Routing Support for (OSPF, IS-IS, BGP) with perpetual use license (1 license). Applicable for Data Center and Service Provider customers with modular whitebox packet transponders with integrated 100 Gigabit Ethernet (GbE) packet switching ports and 100/200 Gbps coherent optical interfaces. Please refer Data Sheet and Hardware Compatibility Matrix for supported platforms and detailed feature set descriptions
OCNOS-OTN-CFP2-WDM	Modular slot with pluggable CFP2 ACO or DCO module. Can support 2x100G with configuration and monitoring of the optical line. Software SKU to enable each slot of 2x100G
OCNOS-MS-1Y OCNOS-MS-3Y OCNOS-MS-5Y	Software License is perpetual for the ODM device and locked to a device Maintenance and Support Options available for 1,3,5 years increments

Service and Support

IP Infusion offers a wide range of network services to help accelerate your success in deploying and optimizing the Network Operating System on open networking switches. These innovative IP Infusion Advanced Network Services offerings are delivered through a unique combination of people, processes, tools, and global system integration partners, and they are focused on helping you increase operating efficiency and improve your network operation. IPI Advanced Network Services uses an architecture-led approach to help you align your network infrastructure with your business goals and achieve long-term value.

For More Information

For more information about the OcNOS Packet Transponder solution, contact your IP Infusion sales representative.

ABOUT IP INFUSION

IP Infusion, the leader in disaggregated networking solutions, delivers enterprise and carrier-grade software solutions allowing network operators to reduce network costs, increase flexibility, and to deploy new features and services quickly. IP Infusion is headquartered in Santa Clara, Calif., and is a wholly owned and independently operated subsidiary of ACCESS CO., LTD. Additional information can be found at <http://www.ipinfusion.com>

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