

Infinera Groove (GX) Series G30 Network Disaggregation Platform

Compact Modular with 600G Generation Coherent and Flexible Metro OLS

With benefits including reduced vendor lock-in, faster innovation, and competitive pricing throughout the network lifecycle, leading to lower CapEx and OpEx, optical network disaggregation is being embraced by a wide range of network operators, decoupling transponder/muxponder and optical line system purchasing decisions. At the same time, following the Groove (GX) G30's lead, the devices used for this optical disaggregation have evolved to compact modular form factors with slot-based architectures that provide the flexibility to mix different types of sleds and evolve between technology generations with a common platform.

FLEXIBLE COMPACT MODULAR PLATFORM FOR NETWORK DISAGGREGATION

Part of the GX Series of compact modular platforms, the 1RU GX G30 can be supported in 19", 21", and 23" racks with 600 mm or greater depth. It supports redundant AC or DC power supplies, redundant fans with front-to-back airflow, and a field-replaceable controller. It has four slots and supports a wide range of single-slot and double-slot hot-swappable sleds for transponder/muxponder and metro open line system applications, as shown in Figure 1.

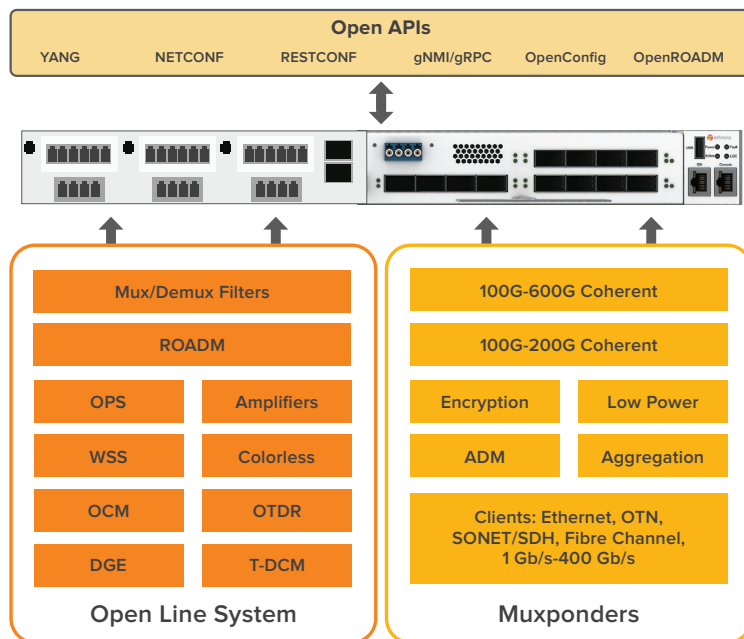


Figure 1: The GX G30: muxponder and metro OLS

Benefits of the GX G30

- Leverage** 600G generation coherent to dramatically lower cost per bit (33% savings), power consumption (~0.2 W/G), and footprint (2.4 Tb/s coherent line per RU), and boost fiber capacity (up to 38.4 Tb/s per fiber pair)
- Reduce** vendor lock-in and save on CapEx with Open ROADM compliance, open APIs, and support for third-party DWDM line systems with G30 muxponders and third-party muxponders with G30 OLS
- Address** muxponder and metro OLS applications with a common sled-based platform that features the ability to mix muxponder and OLS functions in a single shelf
- Minimize** operational costs and speed service delivery with automation enabled by RESTCONF/NETCONF open APIs and gNMI/gRPC streaming telemetry
- Transport** a wide range of Ethernet, OTN, SONET/SDH, and Fibre Channel clients from 1 Gb/s to 400 Gb/s, and secure traffic with wire-speed AES-256 encryption options



Infinera GX G30 Open Line System (OLS)



Infinera GX G30 Muxponder (MUX)

MUXPONDERS INCLUDING 600G GENERATION COHERENT AND OPEN ROADM-COMPLIANT ADM

The 600G generation CHM2T sled leverages a 16-nm DSP and high-performance indium phosphide modulators to deliver two wavelengths ranging from 100 Gb/s to 600 Gb/s in 50 Gb/s increments. It supports a tuneable baud rate from 28 to 72 Gbaud and PM-QPSK/8QAM/16QAM/32QAM/64QAM modulation. Advanced modulation features include hybrid modulation, which provides the ability to mix different QAM symbols in the time domain; geometric shaping, which optimizes the location of the QAM constellation points; and set partitioning for PM-QPSK and PM-16QAM, which provides higher-performance alternatives to PM-BPSK and PM-8QAM respectively. These features have enabled Infinera's GX G30 CHM2T sled to demonstrate 600G at 250 km. 600G distances of up to 150+ km, 400G distances of up to 2,000+ km, 300G distances of up to 4,000+ km, and 200G distances of up to 7,500+ km can also be achieved with the additional margin required for real network deployments. This increased capacity-reach can result in average cost savings of around 33% relative to 400G generation coherent. The dual-slot CHM2T provides two 100G-600G line interfaces and 12 QSFP client ports, three of which can be used for 400 GbE, or all twelve for 100 GbE/OTU4. It can provide coherent transport for over 1,000 x 100 GbE in a single rack and up to 38.4 Tb/s on a single fiber pair, with power consumption of around 0.2 W per Gb/s. The GX G25 provides the same functionality as a single CHM2T in an ETSI-compliant fixed configuration form factor with sub-300-mm depth and a height of 100 mm. Additional muxponder sleds include:

- The dual-slot UTM2 is a transponder/muxponder/ADM with 2 x 100G or 1 x 200G coherent line (CFP2-DCO), high baud rates, and Open ROADM-compliant oFEC options, plus 2 x QSFP28 (100G), 2 x QSFP+ (40G/4 x 10G) and 12 x SFP/SFP+ (1G/10G) client interfaces.
- The single-slot CHM1G leverages 16-nm DSP technology to deliver a power-efficient (<0.3 W/G) sled with two 100G/200G CFP2-ACO coherent line interfaces and four QSFP28 100G clients. It supports an Open ROADM-compliant 7% staircase FEC option for 100G and a longer-reach 200G option based on 8QAM and 42 Gbaud.
- The dual-slot CHM2 provides two 100G/150G/200G CFP2-ACO coherent line interfaces and 10 QSFP client interfaces (4 x 100G, 10 x 40G, or 40 x 10G via MPO breakout cable).
- The single-slot CHM1 provides two 100G/150G/200G CFP2-ACO coherent line interfaces and four QSFP28 100G clients.
- The dual-slot XTM2 provides a 10G aggregation option with 20 x 10G SFP+ interfaces and two 100G/OTU4 QSFP28 interfaces.

The G30 muxponder sleds support a wide range of client interfaces, including 1 GbE, 10 GbE, 40 GbE, 100 GbE, 400 GbE, OTU2/2e, OTU3, OTU4, OC-192/STM-64, and 8G/16G Fibre Channel, as well as multiple wire-speed Layer 1 AES-256 encryption options.

FLEXIBLE OLS WITH COMPACT OPTICAL LAYER PLUGGABLES AND NINE-DEGREE ROADM-ON-A-SLED

The GX G30 supports a wide range of optical layer functions in the compact OFP2 form factor of Infinera's innovative Pluggable Optical Layer. These functions include variable gain amplifiers, OTDR, optical protection switching (OPS), optical channel monitoring (OCM), optical supervisory channel (OSC), tuneable dispersion compensation, eight-channel DWDM filters, colorless add/drop, dynamic gain equalization, and a 1 x 4 WSS for four-degree ROADM applications. Up to three OFP2s can be housed in the double-slot OCC-2 sled. A nine-degree ROADM with integrated amplifiers, OCMs, and SFP-based Open ROADM-compliant OSC is available as a double-slot sled, as are 48- and 96-channel mux/demux filters. ROADM add/drop options include colored-directional, colorless-directional, and colorless-directionless. 64-channel 75 GHz and 48-channel 100 GHz mux/demux filters are also available as 2RU external units. Leveraging these functions, the GX OLS can address a wide range of metro/DCI applications, including point-to-point, ring, and chain topologies, as well as mesh ROADM.

AUTOMATION ENABLED BY OPEN APIS AND STREAMING TELEMETRY

The GX G30 supports management, automation, and streaming telemetry via open interfaces. It supports WebGUI, CLI, SNMP, TACACS+, syslog and YANG-modeled NETCONF and RESTCONF APIs, and gNMI/gRPC streaming telemetry. It is OpenConfig and Open ROADM compliant. An OSPF-based DCN is supported with in-band management via GCC and OSC and out-of-band management via RJ-45 Ethernet interfaces. Multiple GX G30 units can be managed as a single entity, while additional manageability features include zero-touch commissioning (ZTC), RMON, LLDP, and PRBS test generation and loopbacks. The GX G30 is also supported under Infinera Transcend Controller/NMS and Infinera DNA NMS.