

WaveLogic™ 6 Nano

Achieving Leading Performance at the Lowest Power Consumption with 400G–800G Pluggables

Economics, sustainability, more network applications

Smaller footprint. Reduced power consumption. More high-capacity connectivity. With WaveLogic 6 Nano (WL6n) 400G–800G coherent pluggable transceivers, network providers gain the cost, power, and space efficiencies of pluggables in 400G long-haul and 800G metro/regional deployments, as well as 800ZR DCI applications. Moreover, through Ciena’s unique engineering innovations, WL6n also offers a fit-for-purpose 800LR solution, bringing coherent technology inside the data center campus for the first time.

What is WaveLogic 6 Nano?

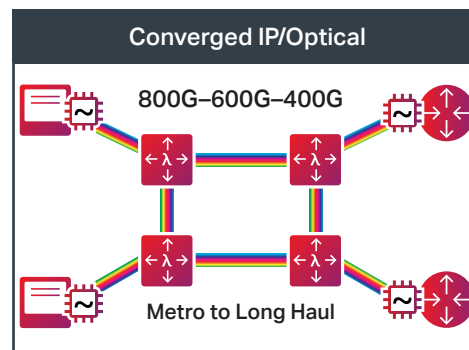
Part of Ciena’s sixth generation of coherent optical solutions, WL6n builds from Ciena’s WaveLogic 5 Nano (WL5n) which introduced the industry’s lowest power, highest performance interoperable 400ZR and now extends Ciena’s innovation in coherent Digital Signal Processing (DSP), electro-optic miniaturization, and high-speed packaging to 400G–800G coherent pluggables. WL6n 400G–800G coherent pluggables deliver double the capacity within the same space as WL5n—resulting in cost, power, and operational savings. In addition, WL6n introduces a viable alternative to Intensity Modulated Direct Detect (IMDD) 800G LR products, extending the capacity and scale benefits of coherent technology to new networking applications.

Where does WaveLogic 6 Nano fit?

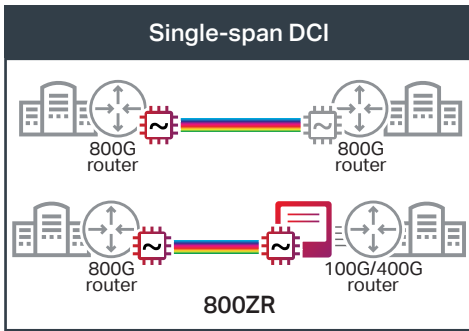
For service providers focused on power and space efficiencies looking to extend 400G pluggable reach to long-haul applications, WL6n delivers a high-performance product that enables ‘400G anywhere’ and extends 800G pluggable reach to 1000 km for the first time.

Expanding on Ciena’s WL5n 70 GBaud Universal QSFP-DD, WL6n offers high performance 400G-800G modes that implement Probabilistic Constellation Shaping (PCS) and other DSP enhancements to maximize network coverage for coherent pluggables. These include:

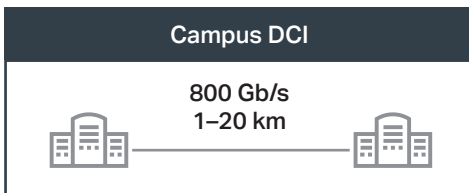
- 800 Gb/s wavelengths at 1000 km distances
- The ability to tune to 400–600 Gb/s wavelengths for long-haul applications
- Support for ITU-T/FlexO and Open ROADM–based interoperability
- Transport optimized for either Ethernet, or both Ethernet and OTN (FlexO) clients



For cloud and content providers that need to scale up to 800G client rates and upgrade to support the next generation of 800G switch/routers for metro DCI, WL6n delivers interoperable 800G Dense Wavelength Division Multiplexing (DWDM) based on the OIF 800ZR Implementation Agreement (IA). Optimized for Ethernet transport and 150 GHz fixed-grid line systems, WL6n 800ZR supports single-span reaches up to and above the 120 km distance in the OIF IA. Additional enhancements extend the WL6n 800G reach for packet transport to 500 km metro distances, compliant to ITU-T/Open ROADM MSA requirements.



Beyond the above more typical coherent networking applications, WL6n also positions coherent into the fast-growing data center campus market for the first time. Addressing the technical challenges of IMDD technology for 800G in this LR application, WL6n implements Ciena's vertically integrated DSP, electro-optics, and high-speed packaging to deliver the loss limited link budget required for new optical switched data center fabric architectures, along with the requisite cost, footprint, and power needed in a viable alternative. To address DC campus fiber exhaust scenarios, operators can also leverage a WDM-based WL6n offering for efficient capacity scaling.



The true innovation behind WL6n is the unique design implementation that allows for multiple fit-for-purpose product offerings that deliver the optimal performance and power required per application.

WL6n 400G–800G coherent pluggables will be supported across a range of Ciena's optical and routing and switching platforms and will also be made available for use with third-party products through standardized management interfaces. With WL6n in Ciena systems, service providers benefit from the power, footprint, and granular capacity benefits associated with pluggables, as well as the photonic-layer integration and link-budget guarantees needed to accelerate and optimize network deployments.

Why WaveLogic 6 Nano?

With WL6n, you can:

- Advance sustainability objectives with deployment of high-capacity coherent pluggables that deliver lowest Watts/Gigabit, leveraging lowest-power CMOS technology

- Double coherent pluggable wavelength capacity within the same footprint, resulting in operational savings related to reduced footprint and energy consumption
- Deploy in both transport and router platforms, facilitating the evolution to converged IP/Optical architecture, for network simplification and cost and power reduction
- Reduce transport costs of existing brownfield networks, with the ability to deploy 400G–800G coherent pluggables over any type of line system, including Colorless-Directionless-Contentionless (CDC), and to deploy alongside earlier generations of coherent wavelengths
- Support multi-vendor environments through support for 400G–800G interoperable standards and Multi-Source Agreements (MSAs)

How does WaveLogic 6 Nano deliver leading coherent 800G pluggable performance?

Ciena's WL6n 800G pluggable transceiver design is born through active collaboration in standards and industry forums such as IEEE, ITU-T, Open ROADM, and OIF. Combined with unmatched expertise in optical networking, coherent DSP, and high-speed mixed-signal analog design, WL6n implements specialized DSP/electro-optic designs and high-speed packaging, leveraging state-of-the-art 3 nm CMOS technology. This innovation results in the ability to deliver multiple fit-for-purpose 800G pluggable offerings that efficiently meet diverse customer and application requirements.

Summary

Optimized for 400G/800G client connectivity and substantial power and space savings, WL6n delivers:

- 800LR for coherent data center campus applications (10 km)
- 800ZR for DCI applications (120 km), with the ability to extend to 500 km
- High-performance mode for 1000 km reaches at 800 Gb/s and longer reach at 600 Gb/s
- Expanded 400G pluggable network coverage to long-haul applications, compliant to ITU-T/FlexO standards and Open ROADM MSAs

Network providers can count on Ciena to once again deliver best-in-class technology at lowest power consumption and leading performance with WL6n 400G–800G coherent pluggables.

Was this content useful?

WaveLogic 6 Nano availability is targeted for 2H 2024.