

# Enabling On-Demand Wave Services for Edge Cloud Exchange

Enterprises are shifting their IT resources to the cloud and pushing for the ability to quickly shift those resources across multiple clouds to meet the demands of the market. For Internet Content Providers (ICPs), high-speed connectivity between their clouds—and to their large enterprise customers—is more important than ever.

Moving massive amounts of data across clouds in hours versus days requires on-demand, high-capacity connectivity, especially near the metro edge where ICPs lack their own real estate and fiber assets. This presents an opportunity for Communications Service Providers (CSPs) to leverage their optical network assets at the metro edge to deliver an innovative, pay-as-you-go, high-capacity cloud exchange service that enables ICPs and enterprises to quickly, and cost-effectively, migrate large workloads to and from the cloud.

## The evolving Edge Cloud ecosystem: An opportunity for CSPs

Enterprises are accelerating their shift to cloud IT services—especially across multiple cloud providers—to become more

agile and deliver higher-quality customer experiences. In fact, that growth is projected to continue unabated. Omdia reports that IT cloud services in their entirety maintained a growth rate of about 18 percent CAGR despite the COVID-19 pandemic, and forecasts a similar growth rate for the foreseeable future\*.

A key requirement for enterprises is the ability to migrate large workloads from one cloud provider to another in hours, not days. To meet this need, ICPs are extending their networks closer to the edge—a move that requires high-capacity connectivity not only between their own data center locations but also to their large enterprise customers that are consuming the cloud services they offer.

CSPs are well positioned to play a vital role in this evolving cloud ecosystem by leveraging their metro edge real estate to deliver an on-demand, high-capacity cloud exchange that enables enterprises to migrate their IT resources across multiple cloud providers. With this new on-demand Edge Cloud exchange offering, CSPs can increase their competitive differentiation and unlock new revenue opportunities with large enterprises and ICPs seeking agile, high-bandwidth, multi-cloud connectivity.

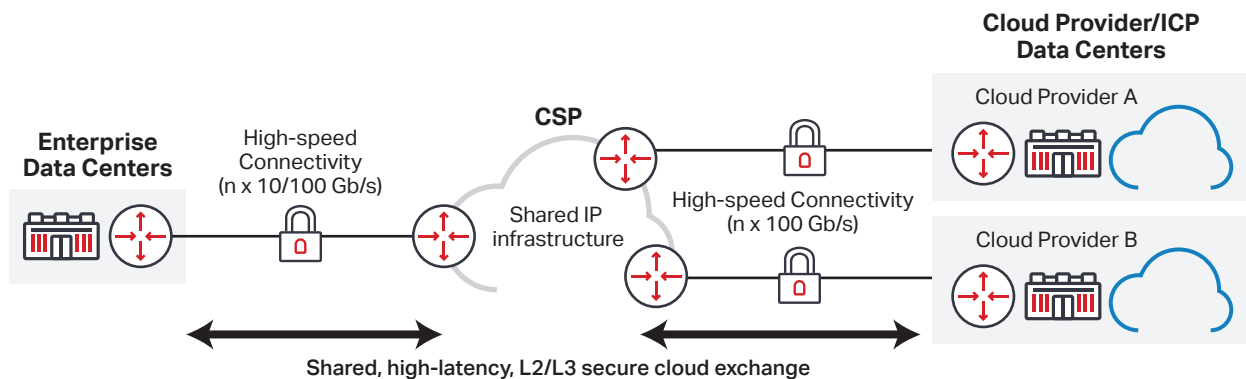


Figure 1. Today's mode of operation: shared, high-latency cloud exchange

\* Omdia, "Enterprise Services Total Addressable Market Spotlight Service", 2020

When it comes to the edge,  
will the status quo cut it?  
Find your edge



### Challenges with the present mode of operation

Today's connectivity to the cloud is typically over high-speed, non-dedicated connections over a shared IP infrastructure. The outcome is often high-latency multi-cloud access that challenges scalability, agility, and security, which results in lengthy workload migrations between cloud providers that require days to complete.

As ICPs extend their cloud resources to the edge, they must cost-effectively connect their data centers to enterprise customers within a metro area where they often lack data center real estate or fiber. Additionally, ICPs require high-capacity connectivity with direct, dedicated connections between their data centers and enterprise customers for intermittent periods of time. They also need a net-neutral party to facilitate migration of large workloads between their data centers. Without an on-demand, scalable, dedicated, and secure cloud interconnection service provided by CSPs, enterprises' ability to migrate to an increasingly dynamic multi-cloud ecosystem is hindered. If left with no other option, ICPs will find a way to build out their own Edge Cloud exchanges.

### Key advantages of Ciena's on-demand wave services for Edge Cloud exchange

Ciena's on-demand wave services offering for Edge Cloud exchange applications enables CSPs to increase their

competitive differentiation by providing a way to deliver enterprise/ICP self-service for immediate and scheduled on-demand 100GbE/400GbE services to facilitate migration of IT resources across cloud providers. Key advanced features of the solution include:

- **Pay-as-you-go consumption model:** This new, innovative service offering allows both ICPs and enterprises to control the capacity and connectivity they need to implement IT cloud migrations exactly where and when they need it at the metro edge—paying only for what they use.
- **Dedicated, high-speed, multi-cloud connectivity:** The offering makes it easy to enable a self-service portal that lets customers select their desired service endpoints and bandwidth rate, as well as choose immediate or scheduled activation and termination, with minimal CSP operational intervention. The result is a premium customer experience that accommodates large IT workload exchanges and migrations between ICPs and enterprises, with dedicated high-speed, low-latency, and highly secure multi-cloud access.
- **End-to-end automation:** With support for automated end-to-end service provisioning with Software-Defined Networking (SDN) domain control, the offering leverages open APIs to ensure standards-based integration with existing operations environments.
- **Flexible any-to-any connectivity:** Equipped with a flexible ROADM-based optically-switched infrastructure, the offering allows ICPs and enterprise customers to benefit from 100G/400G connectivity between multiple data center locations within a metro area across a CSP's metro network.

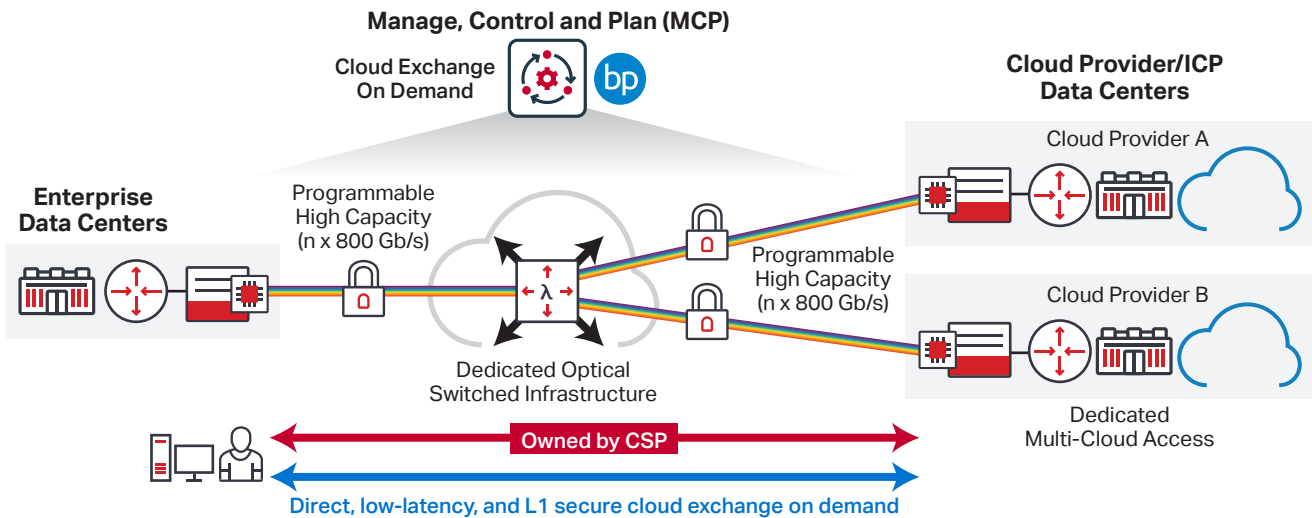


Figure 2. Ciena's on-demand wave service for Edge Cloud exchange

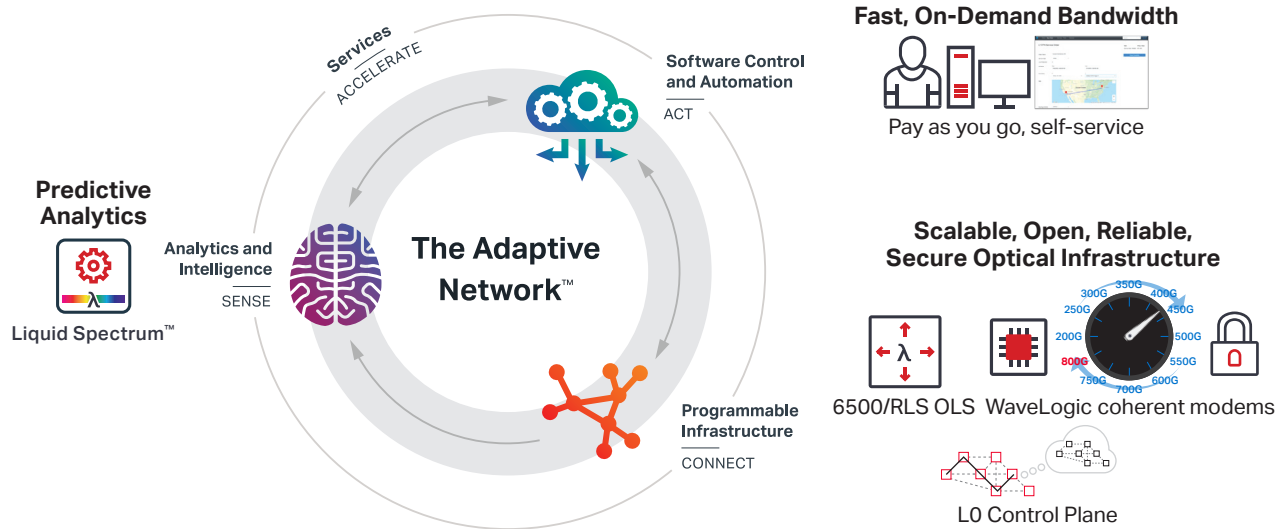


Figure 3. Ciena's Adaptive Network approach for Edge Cloud exchange

- **Programmable capacity:** The offering leverages industry-leading coherent optics that scale up to 800G, with tunability in 50G increments, to provide maximum capacity over high-capacity wavelengths.
- **Innovative dynamic service offering:** CSPs can leverage their real estate and fiber assets in the metro to deliver a differentiated cloud exchange service offering that can be further enhanced with SLA options, including a secure wave service with optical encryption, and a highly available wave service with client/line protection options and optical restoration with Layer 0 control plane.

### Ciena's Adaptive Network approach to enabling on-demand wave services for Edge Cloud exchange

The Adaptive Network™ is built on four key foundational elements—Programmable Infrastructure, Analytics and Intelligence, Software Control and Automation, and Services—that enhance network and business outcomes independently. When working together, they're a force multiplier. With Ciena's Adaptive Network approach, CSPs can leverage a flexible, scalable, and secure optical switched infrastructure using intelligent software automation to offer an innovative, on-demand, high-capacity edge cloud exchange wave service with enhanced SLA options.

**Programmable Infrastructure:** A programmable optical infrastructure comprised of a flexible 6500 or 6500 Reconfigurable Line System (RLS) ROADM-based line system equipped with WaveLogic™ coherent optics lays the foundation

for this Edge Cloud exchange service offering. This infrastructure can be accessed and configured via common open interfaces, is highly scalable and instrumented with the ability to export real-time network performance data to the application layer, and can adjust its resources as needed to meet end-user demands.

**Analytics and Intelligence:** Predictive analytics provided by Ciena's Liquid Spectrum™ advanced software apps enable new levels of visibility into the photonic layer, driving actionable insights based on the current state of the network. Leveraging these insights, CSPs can maximize the value of their network assets, such as by increasing network efficiency by maximizing optical capacity with available system margin.

**Software Control and Automation:** The offering is managed by Ciena's domain controller, Manage, Control and Plan (MCP), which provides the SDN foundation for advanced applications. It also leverages the Bandwidth on Demand solution from Blue Planet®, which uses sophisticated time-aware path computation and calendaring features to enable customer self-service on demand, scheduled service activation and termination, and innovative pay-as-you-go pricing models.

**Services:** Ciena's consulting services leverage its proven transformation methodology to help CSPs determine their best strategy and architecture to enable on-demand wave services for Edge Cloud exchange applications. Ciena's Build, Operate, and Improve lifecycle services continually improve CSP networks, ensuring they run at peak performance and accelerating their journey to the Adaptive Network.

## Summary

With this innovative on-demand Edge Cloud exchange offering, CSPs can increase their competitive differentiation and unlock new revenue opportunities by addressing their enterprise and ICP customers' need for agile, high-bandwidth, multi-cloud connectivity. This pay-as-you-go solution provides enterprises and ICPs with the power to respond quickly and efficiently to changing demands and business priorities, with minimal CSP operational intervention. This dedicated on-demand, high-speed connectivity means that large data migrations can occur in a matter of hours versus days. ICPs can cost-effectively

connect their own data center sites—and build connections to enterprise data centers across metro locations—resulting in large enterprises benefiting from secure, reliable, low-latency multi-cloud access.

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if you're ready.  
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