Cloud Aggregation for Web Providers

Create an always-up network

Today, cloud providers build resilient hyper-scale data centers by aggregating traffic into regional hubs for high-availability zones. This design creates an always-up network environment, and using automation in the network adds further resiliency because it helps improve the response time for congestion or outages. When a 10G route is down, the network probably has enough capacity on alternate routes to keep traffic flowing with minimal delays. However, when a 100G or 400G route drops, the network could be at a catastrophic standstill without the proper safeguards in place to quickly manage the capacity transition to alternate routes. The Cisco Crosswork Optimization Engine is an important tool to address this problem because it enables faster rerouting of traffic around outages. Combining Optimization Engine with the port density included in the Cisco 8000 Series Router gives cloud providers the agility to support automated failover transitions and maintain network capacity and performance levels.

Benefits

- Evolve network operations processes and policies to include automation

- Manage new bandwidth levels and service requirements more efficiently

- Increase network capacity and reduce operational complexity with a smaller footprint

- Use a single network operating system for access, edge, and data center routing environments

The need to scale up and out

Today, cloud providers aggregate traffic between their internal data centers and the caching servers or public data centers where consumers leverage public cloud services for access. Increased consumption of video, cloud applications, and the proliferation of Internet of Things (IoT) devices are causing explosive traffic growth. Web providers need to aggregate higher rates of encrypted data center traffic to connect services with consumers and peering points. To reduce the cost of aggregation and to secure ingress and egress traffic for data centers, cloud providers need to focus on building a network architecture that can scale out or up based upon requirements.

In a traditional network design, bandwidth scaling would require the web provider to increase the amount of network systems in their data centers. Adding these systems would increase costs along with rack space and power requirements. Additionally, 100 GbE links no longer offer the density or throughput required to cost-effectively meet demand. Increased bandwidth consumption creates cost challenges for operators as they work to meet customer demands with additional network capacity, router port density, and line-rate encryption.

Simplify your network architecture

The combination of a Cisco 8000 Series Router and IOS XR7 software can deliver the performance equivalent of several multi-chassis systems. Powered by a single ASIC design, the Cisco 8000 Series Router provides unified forwarding architecture and a unified programming model for simplified and scalable deployments across any network deployment topology. These innovations reduce bandwidth scarcity, so cloud providers can pursue alternatives to their current designs.

This streamlined system can simplify network architectures because one rack unit can provide the performance of two previous units. This increased performance leads to reduced operational and capital equipment expenditures. Each 8000 Series Router unit supports high-density line cards, 400 GbE links, line-rate MacSec encryption, and high-availability designs. The chassis design from Cisco will soon support 800 GbE to 1.6 TbE density links with the stringent optics qualification processes for both QSFP28 and QSFP56 compliant optics.

Learn more

As web providers continue to deploy more capacity in their networks, finding ways to simplify network architectures and improve network programmability have become critical. The Cisco 8000 Series Router is ideally suited for these critical infrastructure environments. It brings performance and cloud-enhanced automation to create a new path toward operational efficiency and profitability. To learn more:

- Cisco support for segment routing
- Cisco 8000 Series Router

Lower costs and improve experiences

Cloud services are still relatively new, but certain services are moving towards commoditization. As more provides enter the streaming video service market, price compression will occur, and cloud provider revenues will be affected. Providers need to take steps now to build a network that is based on an infrastructure that can scale to meet future bandwidth and help reduce expenses. The Cisco 8000 Series Router and IOS XR7 software combination can help meet both requirements. Incorporating the system into network designs can lead to:

- Improved client experiences with the ability to offer or meet stringent service level agreements and protect revenue streams
- Better flexibility because bandwidth can be scaled as a programming change rather than a major upgrade
- Reduced in capital equipment costs because fewer network systems need to be deployed to increase capacity
- The ability to deploy Terabits/sec of routing capacity in the same physical footprint of the current hundreds of Gigabit/sec systems
- Simplified operations and fewer network system deployments, which leads to lower operating costs
- Simplified network management with a single network operating system for all deployments from edge to core
- Reduced power and rack space, which lowers data center space and the associated costs