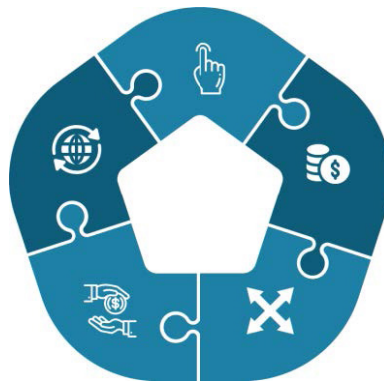


Carrier Grade Disaggregated IP/MPLS Network Peering Solutions

Disaggregated Internet Peering

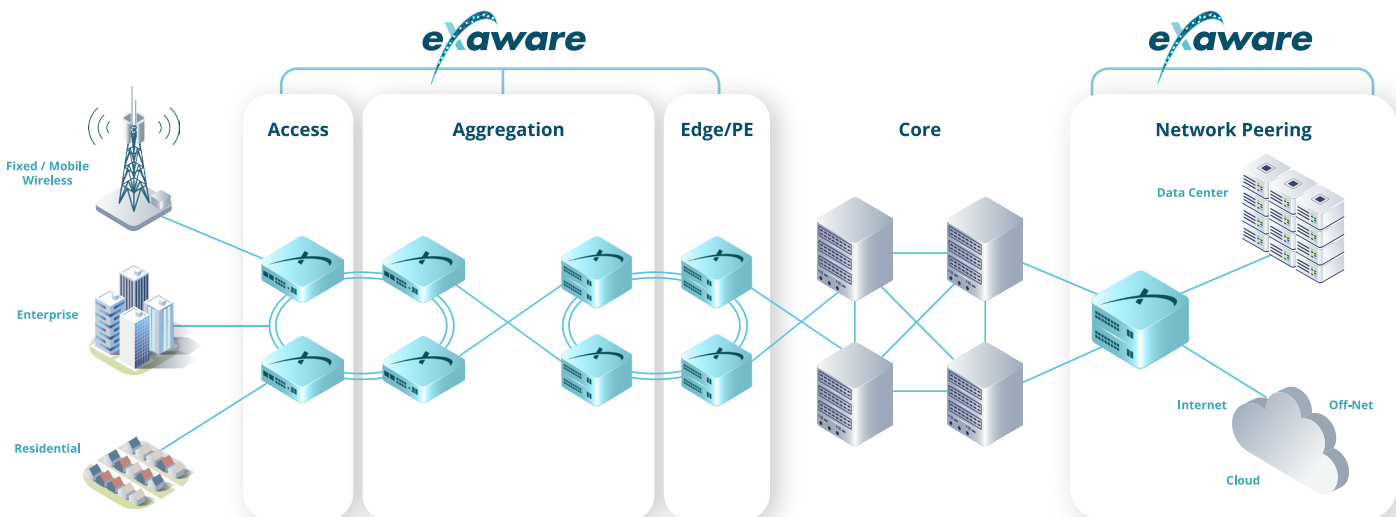
Internet peering is a critical part of every communication service provider (CSP) network. It essentially enables two (or more) networks to connect and directly exchange traffic to ensure customers' access to global internet content. In accordance with individual CSP requirements and network topology, internet peering delivers content in the most cost effective way.

Open networking solutions offer advantages over traditional monolithic systems. Exaware's network operating system (ExaDOS) boasts an agile, modern software architecture that enables you to scale with ease and onboard value added services as and when needed.



Features

- Cost effective entry-level routers
- Robust, highly scalable solution
- Modern software architecture
- Comprehensive set of peering solutions
- Reduced TCO
- Agile, flexible, and open system



Internet Peering: How It Works

To benefit end users, service providers must equip their customers with a connection to the internet. This connection, including its routing equipment, has a significant impact on overall network costs.

Peering Applications

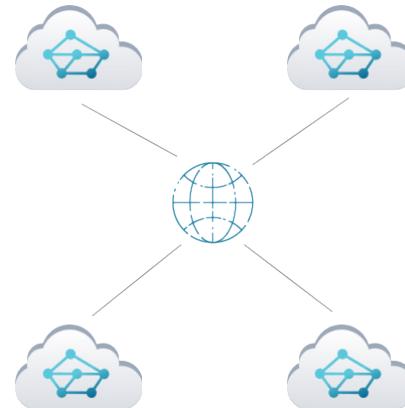
IP Transit Peering

Direct access to a large service provider (Tier 1) whose network is connected to other global networks



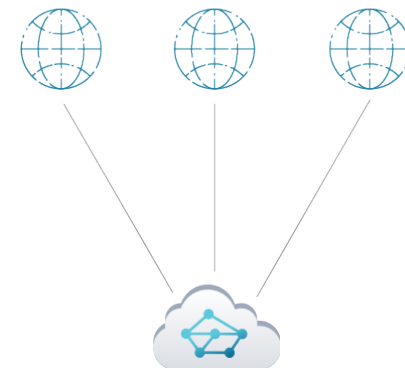
Public IXP Peering

Connections through Internet eXchange Points (IXP), organizations that provide a public connection between two or more networks, enabling the free exchange of traffic between networks



Multi-homed Peering

Connecting a host or computer network to more than one network



Private Peering

Two networks exchanging significant traffic outside an IXP



Exaware Peering Solutions

Exaware provides a comprehensive set of peering applications including IP transit peering, public IXP peering, multi-homed peering, and private peering. Our solutions are suitable for small and medium CSPs (Tier 2 and Tier 3) as well as large (Tier 1) service providers.

Exaware's network operating system (ExaDOS) provides all the functionality required to efficiently handle the complexities of BGP internet peering including 15 million paths, 3 million IP routes, BGP PIC, and RPKI.

ExaDOS offers high-end, carrier-grade features to run internet peering at scale, including:

- High-scale BGP RIB (12M prefixes)
- Flexible, easy to use, BGP policy configuration
- Fast convergence at high-scale RIB/FIB

Why use open networking solutions for internet peering?

Open networking has gained a wide adoption in data center networks, enabling more control, better management, and innovation. It also reduces significantly the network costs compared with branded routers. Deploying open networking solutions at the peering point is a natural continuation.

Cost Effective and Affordable Entry Level Routers

While traditional equipment manufacturers require you to purchase costly, high end routers to support peering traffic, disaggregation enables you to use entry level routers that support peering traffic at scale without compromising on performance or reliability.

The ExaDOS modern software architecture provides the agility required to scale seamlessly and onboard new value added services.

Robust and Scalable Solution

Having high performing, high capacity carrier class hardware, powered by a robust and scalable software operating system such as ExaDOS, is the key to ensuring flawless internet peering.

With our solutions, your network can easily scale from 800GB up to 1,300TB. Exaware's networking solutions offer

a range of features and protocols, enabling service providers to transform their network using the many benefits of a market proven disaggregated solution.

Modern Software Architecture

Routing performance is driven by two key factors – software operating system architecture and hardware performance.

ExaDOS supports advanced BGP features to ensure optimal performance, while also monitoring incoming traffic. Further, Exaware developed CUPL (Compass Unified Policy Language), an innovative policy language, that offers a common programmability for control plane and data plane policies (routing protocol, ACL, and QoS), with a powerful, yet simplified interface for advanced configurations.

As simplicity is key to service provider's operational efficiency, ExaDOS also includes an open API for third party applications that enables automation and lifecycle management solutions.

Built from the ground up, ExaDOS was developed with performance and scalability in mind. Initially designed to operate on a chassis based hardware, ExaDOS is based on a distributed architecture, enabling it to run separate processes with dedicated memory and CPU resources and to take full advantage of the underlying hardware.

ExaDOS' full feature set is included in the standard version of ExaDOS.

Hardware Built for Peering

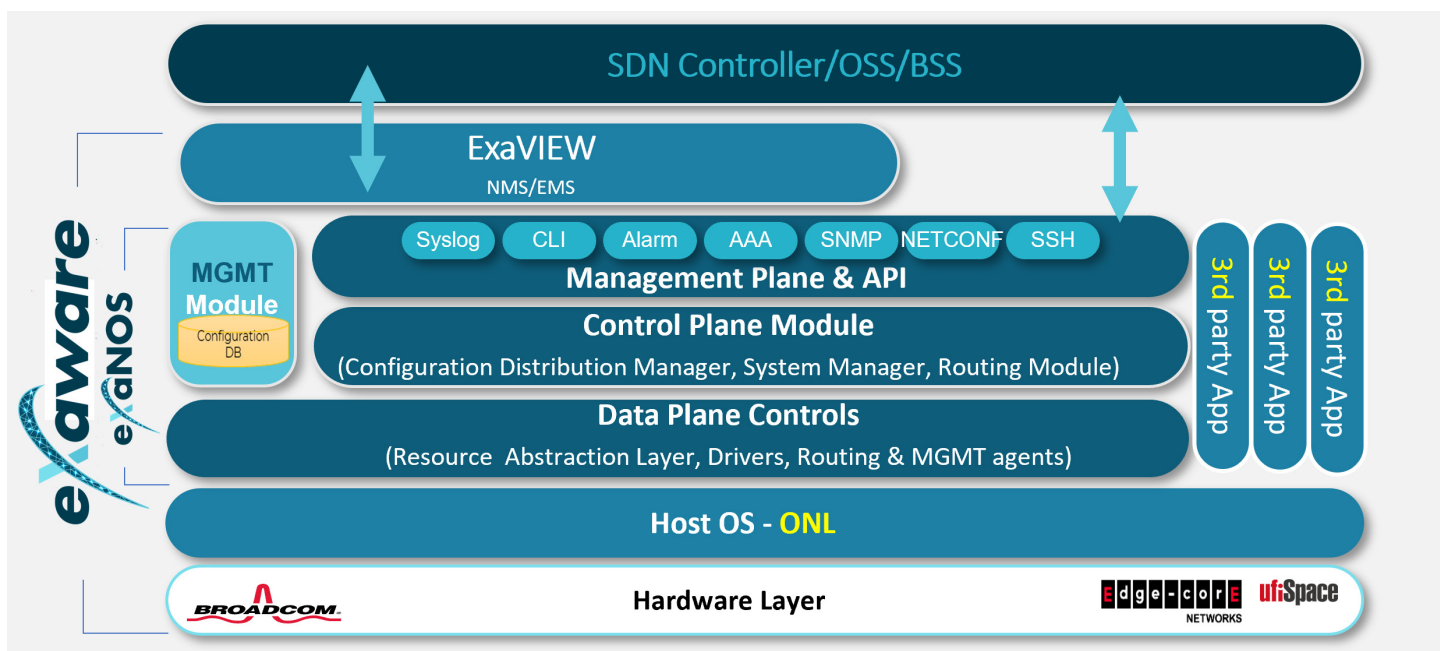
Exaware works with a variety of hardware manufacturers who use the same family set of DNX chipsets from Broadcom (Qumran MX and Jericho 2/2C).

The key performance advantage is found in the quantity and the type of memory used. Typically, peering requires external TCAM memory, to enable a fast search through millions of entries for instant routing decisions.

All of our certified white box hardware platforms support internet scaling and reliability via external TCAM, high end CPU and redundant fans and power supply.

Exaware solutions for medium size peering points are based on an 800G throughput hardware platform with redundant fans and power supply.








Key Performance Indicators

The tables below present key performance indicators of the EXA5300 model.

Feature	Value
Max number of IPv4/IPv6	3 million IPv4/IPv6
Typical insertion time	135 seconds
Insertion rate	21K prefixes/second
BGP path scale	12 million paths
BGP peers	300 iBGP, 100 eBGP

800G	2.4T
Qumran MX based platform	Qumran 2C ASIC based platform
800 Gbps throughput	2.4 Tbsp throughput
48 x 10G SFP+ ports	64 x 25G
6 x 100G QSFP28 ports	10 x 100G
External TCAM	

Exaware Platforms for Network Peering

Exaware Model	Broadcom Chip Set	System Capacity	1G/10G	10G/25G	100G	400G
EXA5300-800G 	MX	800Gbps			6	
EXA5500-2400G 	Q2C	2.4Tbps		64	8	
EXA5600-2400G 	Q2C	2.4Tbsp		64	10	
<i>*Each system includes a certified white box hardware chassis integrated with ExaNOS, Exaware's carrier grade IP routing operating system.</i>						

Roadmap Updates: Contact us for any questions on availability and suitability for your applications, as well as the latest updates to our roadmap.

Reduced TCO

Exaware's solutions help you reduce your TCO, increase network efficiency, and gain flexibility, enabling you to scale your internet connectivity services, while keeping your costs under control. More importantly, these value-added benefits will not forfeit your routing stability nor the quality of your customer support.

With Exaware's disaggregated routing solutions for network peering, you realize the following cost savings:

- Lower cost per bit
- Lower initial investment
- Lower operational costs
- No lock-in with optics
- Easy and affordable expansion
- Pay as you grow licensing model

System Openness & Agility

The innovative software architecture of ExaNOS raises the bar on system openness and agility in disaggregated networking. It allows additional applications to co-exist alongside the NOS (for example, DDoS mitigation, telemetry, and peering performance monitoring) to maximize the use of commercial white box routers.

In Summary



Cloud architecture

- Modern software environment
- Cloud-based architecture for high-performance and scalability



Comprehensive set of peering solutions

- Multiple hardware platforms to meet service providers' unique needs
- Highly flexible, customized to your network requirements



Carrier grade

- ExaDOS market-proven solution with over a decade of development
- Deployed by several leading Tier 1 service providers



Reduced TCO

- Choose from plan-ahead (chassis) to pay-as-you-grow
- Generate new revenue streams with third-party applications
- Break the chains of vendor lock-in