

Extreme Networks® Summit® X460

Extending the reach of GbE stackable switches to the core

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Industry Snapshot

Network and data center managers are challenged to deliver services to a diverse set of customers with varying application and communication needs, all at a low-cost. Server virtualization has become the hallmark for delivering cost-effective applications while improving utilization and reducing data center costs. As a result, network provisioning of servers to support virtual machine (VM) resources is tied directly to the growth of Gigabit Ethernet (GbE) ports on servers. As more and more virtualized servers are added to datacenters, the need for high-performance, high-density GbE switches increases.

Over 37% of IT professionals surveyed by IT Brand Pulse stated they are configuring 5 or more GbE ports per server. The high port counts per physical server are driven by the requirements of virtualization to access network resources, and shared iSCSI storage. Ports are being allocated for management, backup, LAN, shared storage with failover, server failover and disaster site replication, to name a few.

IT Brand Pulse believes this number will grow as more data center environments become virtualized, creating increased demand for high-density, modular, scalable, easy to manage GbE switches.

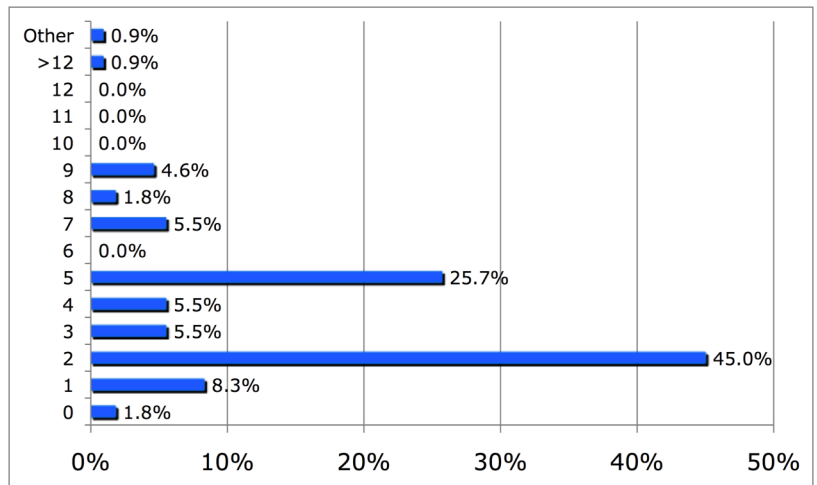


Figure 1 - IT Brand Pulse survey of IT professionals when asked, "How many 1 GbE LAN-on-Motherboard (LOM) and NIC ports do you configure per server?" This number will grow as more ports are allocated for server virtualization and shared storage.

Additionally, the Top-of-Rack (ToR) switch category is growing rapidly with revenues estimated to hit \$500M in 2010. ToR switches have become the defacto standard for racks of virtualized servers, with every GbE switch vendor delivering a product in this category. A ToR switch is characterized by large numbers of GbE ports in a small form factor, modular scalability, 10 GbE uplinks to aggregation or core switches, and ease of management.

Until now the growth of fixed, stackable switches (including ToR) has been inhibited by their ability to scale port counts, modularly through stacking. Currently, standard stacking bandwidths in GbE switches range from 10 to 40 GbE, which doesn't provide sufficient bandwidth to increase the port density in the switch without

hitting performance bottlenecks or oversubscription. If you can only stack a few switches before hitting performance limits, the switch can only support limited ToR configurations or edge applications.

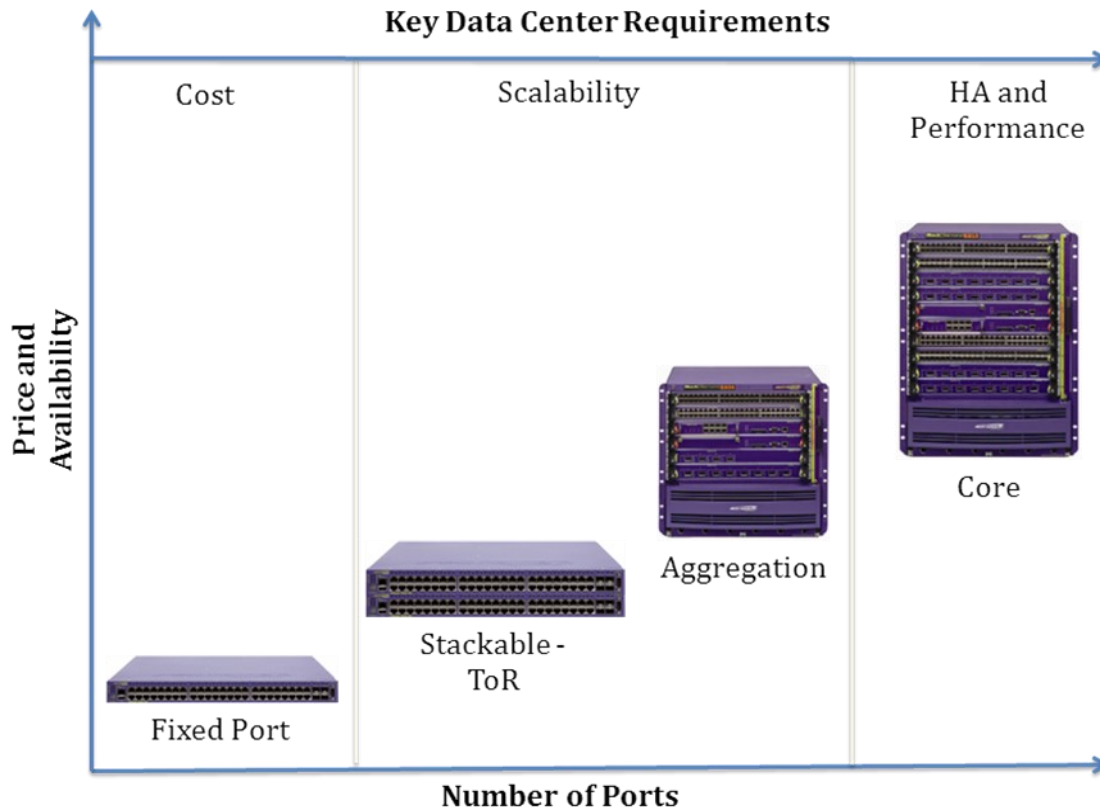


Figure 2 - Traditional data center network tiering model. When you look at the mid-tier area the stackable switches have the greatest potential to provide cost-effective scalable solutions.

What's needed is the ability to modularly scale a stackable switch without running out of bandwidth or hitting a limit that will affect performance. In this Product Spotlight, IT Brand Pulse reviews the new Extreme Networks Summit X460 Series, one of the first fixed stackable switches that uses 80 Gbps stacking technology to create large port densities in a small footprint and extend the application of fixed switches into the core.

Extreme Networks

The Summit® X460 Series is from Extreme Networks®, a company that has been delivering sophisticated, enterprise-level network connectivity and IP-based solutions for close to 15 years. They have built a reputation on delivering leading-edge technology as evidenced by the recent announcement of 40Gb Ethernet products and solutions to address IP convergence. The demands driven by virtualization and cloud environments require multi-gigabit bandwidth connectivity that Extreme delivers with their series of Ethernet switches and software solutions.

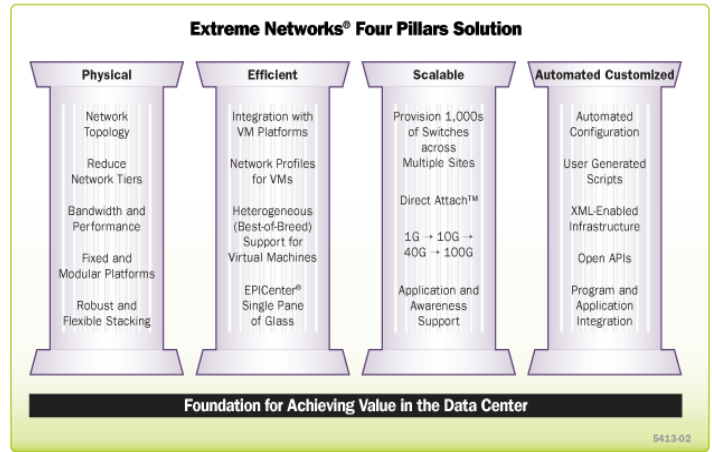


Four Pillars Architecture

Virtualization and Cloud computing have taken the network industry by storm in 2010. Extreme Networks has responded with its Four Pillar data center strategy, a unique architecture that provides customers with a smooth transition from the physical network, to a virtual network and onto the cloud.

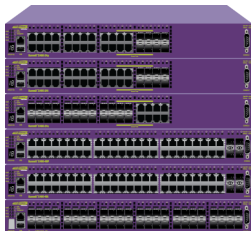
Virtualization has created significant challenges that require performance, efficiency, visibility, automation and customization of the network – critical to adapting to virtualized servers and applications running across an office, a campus or a cloud.

By reducing layers of network complexity, and increasing visibility and control of VMs throughout the data center, network administrators can efficiently manage today’s virtual infrastructure. Extreme Networks is meeting these challenges from a network perspective .



Summit X460 Series

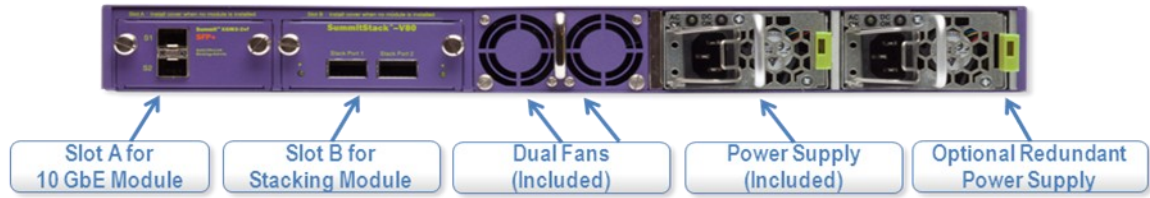
Extreme Networks continues to fulfill the promise of their The Four Pillars Architecture with the introduction of the Summit X460 Series. Aimed squarely at the key values of Pillar #1 and #3, which are to reduce network tiering, provide modular platforms and flexible stacking to meet the needs of evolving virtualized and cloud models, as well as support for scaling of switches and virtual machines.



The Summit X460 Series are highly modular, dense, versatile Gigabit Ethernet (GbE) switches that address multiple marketplaces and have some “extremely unique” stacking features. Each modular switch comes with up to 28 or 52 - 10/100/100 GbE ports of either fiber or copper and you can stack up to eight switches together to get a maximum of 416 ports in an 8U space. Stacking is provided with a SummitStack™ module (40 Gbps) that is compatible with all Summit stacking switches and two new stacking modules: SummitStack-V80 module which provides 80 Gbps and SummitStack-V module which provides stacking over 10 GbE fiber.

The modularity of the switches is carried through to the field-replaceable fans with front or side-to-back air-flow to remedy data center hot spots, and hot swappable, AC or DC, redundant power supply units. To address the emerging market for wireless access points, surveillance cameras and other standards-compliant devices, the Summit X460 Series supports Power-over-Ethernet Plus (PoE-Plus) and provides up to 30 watts per port.

Each switch also leverages dual 10 GbE uplinks, for a total of sixteen 10 GbE uplinks per stack, to reduce deployment and operational costs when attaching to a core infrastructure.



The Summit X460 Series is built-on the ExtremeXOS® modular switch operating system which includes a high availability architecture with an easy-to-use interface to access capabilities such as ACLs, QoS, counters and diagnostics. The Summit X460 is also supported by Extreme Networks EPICenter® management suite which provides fault, configuration, accounting, performance, and security functions. From a single-pane-of-glass you can configure and manage all the switches in your Summit X460 configuration, as one switch.

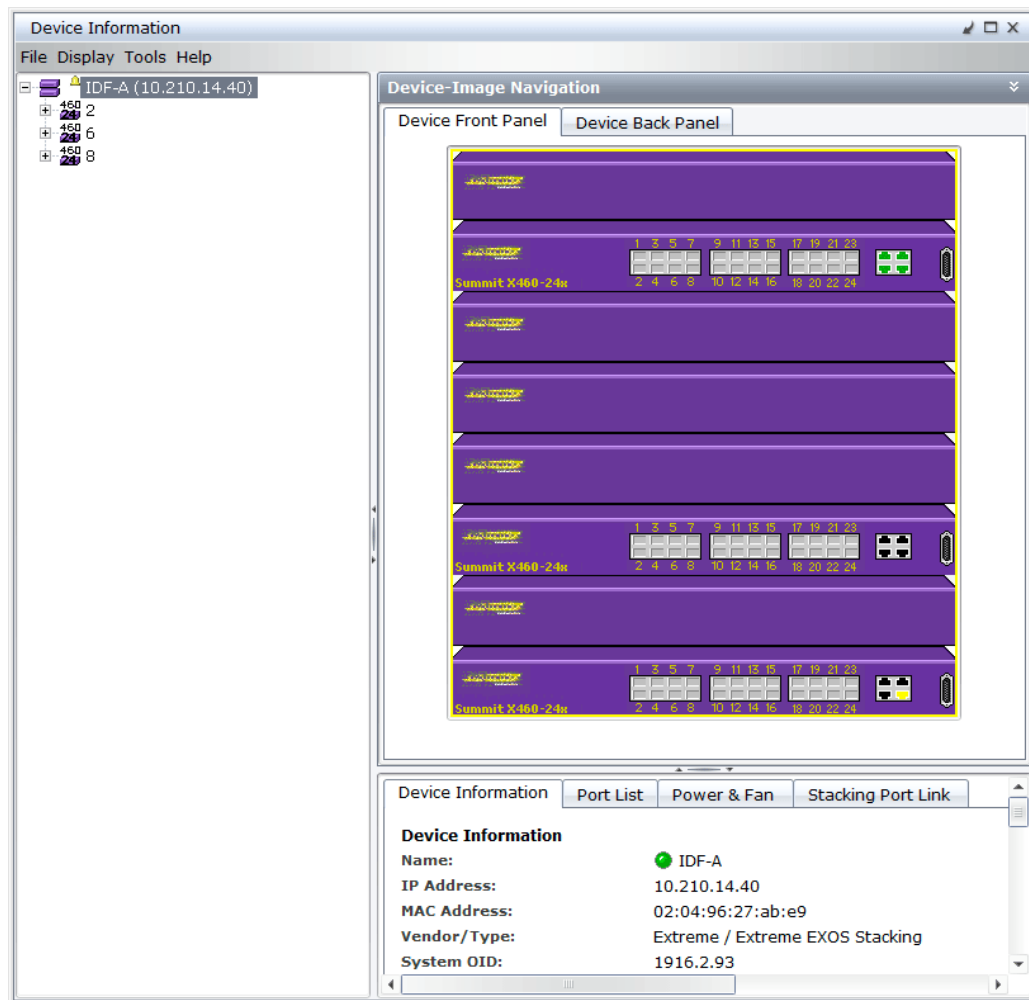


Figure 3 – EPICenter manages all switches in the stack as one switch through a single GUI.

Key Differentiators - Versatility, Stacking Technology

With the introduction of the Summit X460 Series, Extreme Networks has created a new category of GbE switch that starts to blur the lines between the traditional data center network design of Core (Tier 1), Aggregation (Tier 2) and Top-of-Rack (Tier 3). The Summit X460 can address all three areas of the network infrastructure and more. The following table outlines the various features the Summit X460 offers for the requirements of each application solution, making it a very versatile switch.

	Feature/Requirements		Feature/Requirements
Campus	Purpose-built campus network switch	Data Center	Purpose-built Top-of-Rack switch
	High port density for Edge/Aggregation		Flexible stacking options: 80 Gbps stacking, across rack and long distance
	PoE Plus for IP Telephony and remote devices		Hot swappable AC or DC PSUs and cooling fans
	Fine grained security egress ACL IPFIX hardware support		CLEARflow port level security
	CLEARflow embedded port level network security		Denial of Service (DoS) protection
	Network expansion with 10 GbE		

Stacking Technology

Out-of-the-box the Summit X460 switches support SummitStack™ 40 Gbps modules which are available for all of Extreme’s multi-platform stacks such as the Summit X250e, X450e, X450a, X480 and X650 switches. What is unique about the X460 is the introduction of two new stacking options that will soon become available for other Summit stacking switches.



SummitStack-V80 module provides one of the industry’s first 80 Gbps of stacking bandwidth plus longer distances between switches in a logical stack. Keeping with Extreme’s modular design credo, the SummitStack-V80 module uses another “first” with Quad Small Form-factor Pluggable (QSFP+) technology, four SFP+ connections in one connector plug.

Figure 4 - SummitStack-V80 module uses the latest QSFP+ connector technology to deliver 80 Gbps of stacking bandwidth.

Extreme offers the user the choice of passive copper, active copper and active optical fiber, which can be used to interconnect switches up to distances of 100 meters. Network and data center managers can now create intra-rack and cross-rack stacking configurations that reduce the number of logical units to be managed.

SummitStack-V80 is a key differentiator and technology that provides the ability to stack a large number of ports in a small footprint and is ideal for demanding applications where a high volume of traffic traverses through the stacking links. V80 enables the stacking of up to 8 fixed switches in an 8U space with a maximum configuration of 416 ports. With the ability to stack that many cost-effective GbE ports the Summit X460 can easily be configured as an aggregation or small core switch.



SummitStack-V sets the “high bar” again with the introduction of the industry’s first GbE switch with long-range, high-speed stacking over fiber. This enables the use of standard, low-cost cabling and optics technologies for 10 GbE, such as XFP, SFP+, 10GBASE-T and XENPAK.

Figure 5 - SummitStack-V module enables long distance stacking with fiber.

SummitStack-V gives data center managers the flexibility to stack switches up to 40 kilometers away while reducing cable complexity. This is a great solution for connecting remote sites, distributed campuses or disaster recovery (DR) data centers.

“Green” Power and Cooling

As switch designs evolve creating high-performance and high-density devices, the concern centers on the power draw and cooling requirements. The Summit X460 switches are powered by high-efficiency, hot-swappable AC or DC power supply units, which conserve energy. An additional power supply unit can be installed for load sharing and redundancy. Dual hot-swappable, variable speed cooling fans conserve power and support front/side-to-back cooling and hot-aisle/cold-aisle data center designs.

VM Aware

The Summit X460 Series is ideal for the deployment of virtualized infrastructures. It’s high density, modular, and stackable design can ease the configuration of your data center network to support your VM-based applications. With Extreme Networks XNV™ you can create network visibility and management of your VM’s policies. Additionally, as VMs migrate from server to server XNV automatically tracks and moves the VM’s Virtual Port Profile (VPP) to the associated Summit X460 switch and enforces the VPP-based parameters and policies in real time. The ability to automatically migrate network and security policies through VPP makes regulatory compliance much easier to enforce and manageable from a centralized network.

Market Impact

The introduction of the Summit X460 brings a number of “first” to the GbE switch marketplace and offers a high level of versatility to address the network needs of a number of diverse customers including Campus, Data Center and Carrier. With the introduction of SummitStack-V80 to provide 80 Gbps of stacking bandwidth, the fixed stacking switch can be configured in large port densities without compromising performance. Clearly, the Summit X460 can provide the scalability, in a modular, cost-effective solution that extends its application to the aggregation tier and beyond.

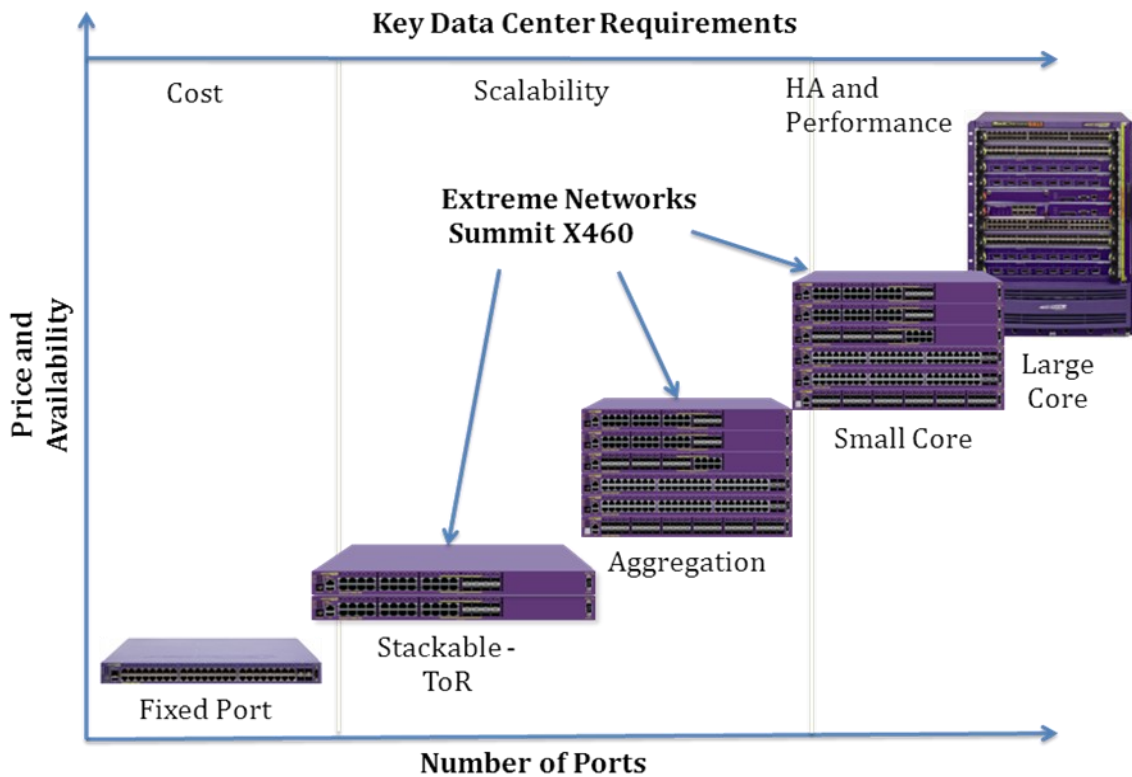


Figure 6 - Traditional data center tiering model with the introduction of the Summit X460 provides the ability to create higher port density configurations that expand its application into the aggregate and small core tiers.

Conclusions

By extending fixed stacking switches the Summit X460 switches can address ToR, aggregate, and core tiers with a single, cost-effective and scalable solution. The market demand for higher density GbE solutions will not wane as server virtualization continues to sweep the data center. With unique stacking options that support high bandwidth and long distance as well as cross-row and cross-rack configurations, network and data center managers have a very compelling solution for their network infrastructure.

Related Links:

Summit X460 datasheet

<http://extremenetworks.com/go/x460>

Pillar 1 – Physical Network Infrastructure

http://www.extremenetworks.com/solutions/datacenter_pillar_1.aspx

Pillar 3 – Scalable Virtualized Environments

http://www.extremenetworks.com/solutions/datacenter_pillar_3.aspx

XNV – ExtremeXOS® Network Virtualization

<http://www.extremenetworks.com/solutions/xnv.aspx>

EPICenter® – Network Management Software

<http://www.extremenetworks.com/products/epicenter.aspx>

About the Author

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