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Product Brochure

Extreme Networks Data Solutions

Improving communications between you and your customers...

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Extreme Networks provides enterprise solutions for IP Telephony, Security, and Wireless applications with the expert services you need to successfully implement even the most complex projects. The focus on delivering an open network gives you choice and a future-ready platform. Extreme has partnered with G3, a leading provider of advanced technology; this approach is the best alternative to proprietary solutions that force a long-term commitment to a single manufacturer.

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Since the company's start in 1996 Extreme Networks has been responsible for many cornerstone developments in the networking industry and the decision to go beyond conventional thinking was essential to these accomplishments. One measure of their success is that these innovations have been embraced by enterprise IT managers and service providers. They rely on Extreme Networks products and services to help them meet their business goals today and to be ready for tomorrow's tough challenges such as investment protection and enabling future growth and expansion.

Extreme Networks were one of the first companies to:

- Introduce Gigabit Ethernet products that were tested at full speed with zero data loss
- Offer patented Quality of Service capability on data networks to enable high quality voice and video communications
- Offer resiliency protocols and an operating system for data networks to provide 99.999% uptime
- Allow wired and wireless devices, applications and equipment to all share the same infrastructure and management tools reducing network complexity and cost
- Introduce a modular switch for the network that is ready to deliver voice and video to the desktop

What is the Extreme Networks difference?

Providing unprecedented network insight and control

As voice, video and data converge, network designers everywhere are posing the important question, what will it take to implement a converged network that improves company productivity and provides real return on investment? With meaningful insight and unprecedented control, Extreme Networks can help customers answer that question. Their data infrastructure solutions allows the merging together of diverse user groups, converged applications, multiple device types whilst providing security and the best possible user experience.

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Extreme Networks products include:

- ExtremeXOS Modular Operating System
- Modular Ethernet Switches (Core and Edge)
- Fixed Configuration & Stackable Switches
- Wireless Networking Products
- LAN Security Products
- Network Management applications

The Benefits of Extreme Networks

Leadership

- **Technology:** Superior performance for voice, video, and data
- **Partnerships:** Trusted ongoing relationships with industry leaders
- **Reach:** Presence in 50 countries with over half their sales outside North America
- **Trust:** Over 15 million network ports shipped to household names around the world

Innovation

- **Pioneering:** Created the Layer 3 switching market in 1996
- **Ongoing:** Strong R&D investment with a commitment to qualityachieved.

What an Extreme Networks infrastructure can offer you:

You will be ready for IP Telephony

- High availability with extraordinarily fast recovery times
- Excellent voice clarity for toll-quality connections
- More choice, non priortory voice

You can have a converged wireless network

- Meet tough demands for voice-quality wireless connections
- Support multiple user and device types
- Enjoy mobility without security compromises

Your network will be secure

- Exceptional reach helps reduce risk cost effectively
- Virtualized Security design diminishes risk/availability tradeoffs
- Extensive built-in security features deliver robust protection

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The Avaya / Extreme Partner Alliance

Although an Extreme Networks solution can add value to any vendor's voice solution there are added benefits for Avaya users.

The goals of the Extreme Networks & Avaya joint development project are to provide network managers simplicity for the deployment and management of a converged network by using an open, standards-based approach.

The joint development activities between Extreme Networks and Avaya are all designed to benefit the customer by reducing the cost of ownership and providing better return on investment. The focus is on the following technology areas:

- Real-time Network Monitoring and Proactive Testing Avaya's Converged Network Analyser (CNA) real-time monitoring test agents will be embedded in Extreme Networks switches and Avaya IP phones and media gateways. This will enable Avaya's CNA to perform proactive network monitoring on phone and network devices
- Integrated Network Management As a result of joint development, Extreme Networks EPICenter network management software and Avaya Integrated Management tools are both able to discover and manage products from Extreme Networks and Avaya on the network
- Discovery Services Using a standards based approach Extreme are able to provide an open, vendor independent solution that will allow discovery of network attached and network infrastructure devices, providing information to EPICenter and Avaya Integrated Management tools
- Enhanced Security Joint development efforts will result in a common authentication process across the network. By adding authentication integration into Avaya IP phones complete security is provided at the core, and the edge of the network

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As the trend to consolidate business critical application onto IP networks continues, it has been realised that the network infrastructure as a whole had to continue running even if individual connections were lost. Traditional technologies such as spanning tree protocol (SPT) were developed to establish redundant networks paths that data could be automatically redirected to. However, with delay sensitive applications such as Citrix or VoIP the time it takes for the network path to re direct using STP means that connections time out and are dropped. The impact of this is frustration for users in dropped calls or application sessions, and it increases the strain on the network as applications attempt to re start sessions.

At the Core of the Extreme solution:

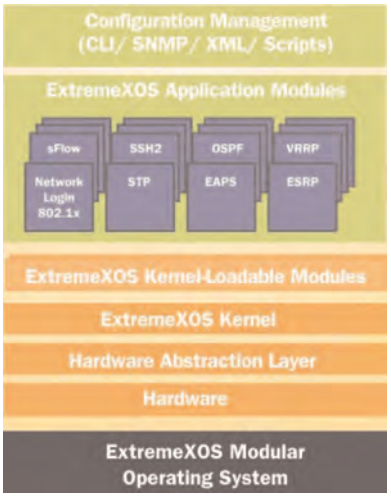
The ExtremeXOS Operating System

Whilst traditional switches incorporate processes that are tightly coupled, those switches can falter during any single process outage. Convergence requires a modular open standards based approach to the network operating system so new functionality can be added in a rapid fashion or processes restarted without impeding network operations.

What is it? ExtremeXOS is a hardened modular operating system that provides a common set of features and applications on single software release and command line interface across all Extreme Networks switches

How does this benefit the IT Manager? It greatly simplifies network complexity from a support and management perspective and enables carrier grade reliability in enterprise networks. For example new services or applications can be added or removed without taking the switch offline.

Key Benefits



It is a high availability architecture

- The high availability of ExtremeXOS creates a resilient infrastructure capable of maximum network integrity for mission-critical applications

Its an easy to manage architecture

- Universal Port dramatically simplifies rollout of VoIP via autoconfiguration of edge ports and phones

It's an open architecture

- There are endless possibilities for further expanding the networks capabilities by integrating third-party applications. An example is the VoIP application layer monitoring agent developed by Avaya to simulate and closely monitor VoIP connection behaviour in a net

It's a secure architecture

- Security of the entire network infrastructure is protected with ExtremeXOS. For example management traffic is secured through authentication and encryption. In addition access control works with or without dedicated authentication support on client devices, such as VoIP phones and printers

What is the Extreme Networks solution to high availability?

Ethernet Automatic Protection Switching (EAPS) is Extreme Networks' solution for fault-tolerant network topologies.

EAPS is a feature of ExtremeXOS and is responsible for a sub-second network recovery. This revolutionary technology provides end users with a continuous operation usually only available in voice networks and does so with radical simplicity.

Failover time comparison table

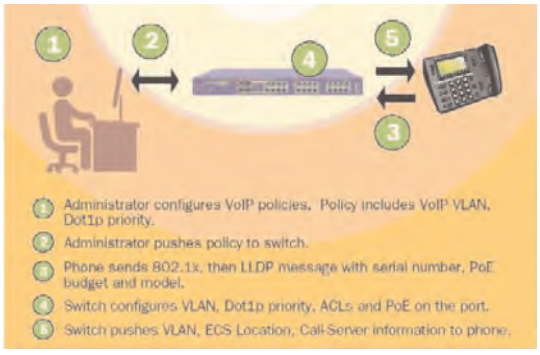
EAPS	SMLT	STP	Fast Port
Open Standard	Proprietary	Open Standard	Proprietary
<50ms	>50ms	>100ms	<100

Only EAPS is capable of truly supporting real time traffic in the event of a link failure

Why do converged networks need an easy to manage architecture?

In order to realise many of the benefits of a converged network IT managers have been looking for ways to simplify and in some cases automate the deployment of VoIP endpoints such as laptops with soft phones, WiFi base stations and IP Handsets.

What was needed was the ability for the port on a data switch to understand the nature of the device connecting to it, for example what is its power requirement and does it require connecting to specific Virtual LAN for voice?



What is Extreme Networks solution?

Universal port manager simplifies rollouts via auto-configuration of edge ports and phones. Deploying VoIP endpoints is as easy as opening the package, programming the extension and plugging into the network.

Traditional Monolithic vs Modular operating system quick comparison

Single memory address for all modules	Yes	No
Start and stop processes with switch running	No	Yes
Dynamically load and unload modules without rebooting the switch	No	Yes
Continues to run with crashed modules	No	Yes

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Ethernet switching products from Extreme Networks solve tough network connectivity challenges.

Over the past 10 years, Ethernet has become the foundation for global communications and innovative Ethernet switching products from Extreme Networks have re-defined networking.

With new expectations for rich infrastructure capabilities, high security and flawless operations are testing network professionals like never before. By delivering meaningful insight and unprecedented control, Extreme Networks are responding with solutions that help deliver secure, robust connectivity for voice, video, and data to a discerning and highly mobile user community.

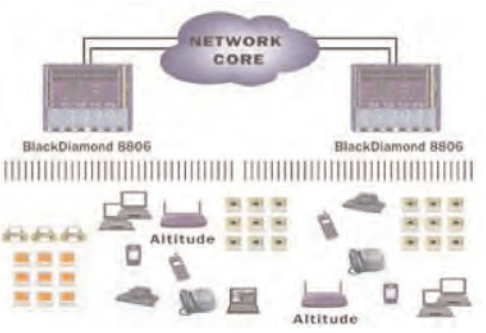
Choosing the best solution, modular chassis or stackable/fixed configuration?

Ethernet switches come in two distinct form factors. Both types of switches are sold for two main uses in business enterprises, the wiring closet and the core (or “backbone”) network. The wiring closet is the central point in a department or section of the building where the wiring from all of the client devices (mostly PCs and printers) converge. The needs in wiring closets are increasing all the time, for example more ports, better security, more quality of service features for VoIP, and Power over Ethernet for IP Telephones and WiFi access points are all considerations.

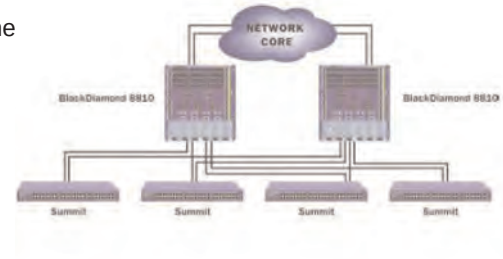
Both modular switches and fixed configuration can have their place in the wiring closet and the network core. The decision is based largely on

- Size of the installation
- Future expansion needs
- Overall budget

The wiring closet, generally, does not need to have much port media flexibility, for example UTP connected fast or gigabit Ethernet only, also cost may be a consideration so stackable switches are good option here. Some companies prefer to use Chassis based switches for wiring closet situations for a ‘pay as you grow’ philosophy despite the higher costs of modular switches. Modular switches also offer a higher level of availability than fixed configuration switches with redundant management modules, hot-swappable power supplies, hot-swappable line cards, and hot-swappable fan trays.



Black Diamond as Network Edge Switch



Black Diamond as Network Aggregation/Core Switch

Extreme Summit, fixed configuration and stackable switches

The Summit family of Extreme XOS based switches offers the benefits of highly available, scaleable and secure convergence grade data infrastructure in a cost effective compact modular form factor.

In the enterprise network architecture, the role of edge switches becomes more important to support a variety of applications as well as the proliferation of network-enabled devices. The edge switches are required to support emerging technologies and its fluctuation on day to day basis without increasing the management burden to maintain the application performance.

Key features

- High availability to meet toll grade voice quality for converged networks
- Comprehensive security to help protect company information and to help ensure availability under attack
- Universal connectivity to support variety of applications and devices
- Simplified management to reduce the total cost of ownership
- Non blocking gigabit and 10 Gigabit Ethernet switching with rich Quality of Service to help ensure the application level performance
- Carrier grade highly reliable hardware, robust modular operating system and redundant protocols to help ensure five-9s availability
- Same operating system to provide consistent manageability throughout the network

What is SummitStack?

SummitStack is a high availability stacking architecture and is designed to support converged services such as video and VoIP by its highly available and rapid failover capability. With redundancy, distributed Layer 2 and Layer 3 switching, link aggregation across the stack and distributed uplinks it provides sub seconds failover for path failure and hitless master/backup failover. SummitStack supports up to eight units in a stack, mixture of the units with Summit X250e, Summit X450e, Summit X450a.

What is Stacking?

Stacking is a technology that refers to the dedicated high speed connection of multiple individual switches to form a single ‘virtual’ device. Additionally if a loop is formed with a return cable, individual switches can be ‘hot swapped’ without losing the whole stack.

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Summit X150

Powered by ExtremeXOS, the Summit X150 switch supports process recovery and application upgrades without the need for a system reboot. Summit X150 switches provide the high network availability required for onverged applications. A Summit X150 switch provides a simple streamlined operating system across the entire enterprise network to support ease of deployment and maintenance.

- ExtremeXOS modular operating system
- Scripting capability to automate network configuration
- Quality of Service (QoS) with minimized latency
- Ethernet Automatic Protection Switching (EAPS) resiliency protocol
- Non-Blocking Forwarding
- Threat detection and response instrumentation to react to network intrusion
- Hardened network infrastructure

Summit X250

Powered by ExtremeXOS, the Summit X250e switch supports process recovery and application upgrades without the need for a system reboot. Summit X250e provides the high network availability required for converged applications. Summit X250e offers dual stacking interfaces to provide high-speed 40 Gbps stacking bandwidth. Summit X250e provides chassis-like management and availability with its SummitStack stacking technology.

- ExtremeXOS modular operating system
- Quality of Service (QoS) with minimized latency
- Ethernet Automatic Protection Switching (EAPS) resiliency protocol
- Non-Blocking Forwarding
- Threat detection and response instrument

Summit X450

Powered by ExtremeXOS, the Summit X450e switch supports process recovery and application upgrades without the need for a system reboot. It can provide the high network availability required for converged applications as either an aggregation or core network device Summit X450e provides a high bandwidth, non-blocking architecture with tri-speed copper Gigabit Ethernet ports with PoE for demanding edge applications. Combining exceptional Quality of Service (QoS) and advanced traffic management with resiliency, comprehensive security and non-blocking performance, the X450e switch is designed to be the cornerstone of a high-performance converged network.

- ExtremeXOS modular operating system
- QoS
- Ethernet Automatic Protection Switching (EAPS) resiliency protocol
- Minimized Latency
- Non-Blocking Forwarding
- Threat detection and response instrumentation to react to network intrusion
- Hardened network infrastructure

Chassis Based Solutions

The Black Diamond 8800 Series

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Black Diamond 8800 series switches deliver toll quality voice and carrier class availability to the enterprise. Network managers can deploy high-density Power over Ethernet (PoE), Gigabit Ethernet, and 10 Gigabit Ethernet wherever it's needed.

- The Black Diamond 8806 six slot chassis fits well at the edge of the most demanding enterprises, switching Voice-over-IP (VoIP), video, wireless and data traffic
- The Black Diamond 8810 switches support for a high density of non-blocking ports can interconnect thousands of servers for High Performance Cluster Computing (HPCC)

With their comprehensive security features, both Black Diamond 8800 series switches are the single switch solution for mid-sized enterprises. Black Diamond 8800 series next generation architecture eliminates bottlenecks at the edge and core.

Key features

- Single switch network solution for small to medium-sized networks
- High speed, high-density PoE edge switch for integrate wired, wireless and IP Telephony
- Interconnect switch providing lowlatency connections for HPCC
- Traditional gigabit or 10 Gigabit Ethernet aggregation switch
- High availability software and hardware features

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Wireless Solutions

One of the key characteristics of a converged network is the ability to provide business grade mobility to users. That means securely extending access to company resources such as customer information or VoIP from different locations within the company network.

Why wireless networking from Extreme?

Extreme Networks offers a complete suite of wireless LAN products providing highly scalable, secure, and robust wireless solution for the enterprise mobile workforce. Summit® WM controllers from Extreme Networks® transform wireless LAN from being a complicated technology to a high performing, secure enterprise solution that is simple to deploy and operate.

Key Benefits

- Extreme Networks wireless solution seamlessly integrates with the wired infrastructure to enable fast and easy deployment of unified voice and data services
- Common security and QoS policies can be deployed across the entire network
- Customers can manage their Extreme Networks wired and wireless networks with EPICenter, the unified management platform

Summit **WM100** and Summit WM1000 offer single-system scalability up to 200 accesspoints for coverage of large enterprise campuses down to small branch offices.

In addition, an organization can install multiple Summit WM systems to support deployments of thousands of access points.

The modular architecture of the Summit **WM200** and Summit WM2000 controllers offer the scalability and flexibility required in the fast changing wireless environment. Summit WM200 and Summit WM2000 are modular in design with field replaceable service blades. Each controller includes redundant and hot swappable power and fan modules. Summit WM200 and Summit WM2000 offer single-system scalability up to 200 access points for coverage of large enterprise campuses down to small branch offices.

Altitude **350-2** is a dual-radio access point (AP) that supports simultaneous operation of 802.11a and 802.11g/b wireless networks. Used with Summit® WM series switches for centralized management and control, Altitude 350-2 is ideal for large-scale wireless deployments where high-performance voice-grade cross-subnet roaming and availability are required.

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Network Security Solutions

Extreme Networks believe that the data infrastructure itself should play a key role in the network security architecture. As all malicious traffic must pass over the network a dedicated appliance provides the most effective threat detection and mitigation tool for interior LANs.

The Sentriant appliance uses behaviour-based threat detection method.

The use of behaviour-based technology means the product is ideally suited to identifying new threats for which signatures are unavailable.

It also includes a sophisticated early warning system to identify threats before they impact the network.

Unlike other internal LAN security systems Sentriant is not an in-line device, creates no performance impact to networks, and cannot jeopardize network availability - especially critical while under attack.

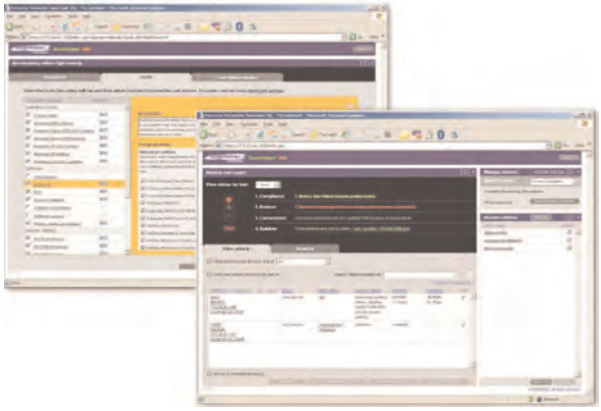
Sentriant is the best choice for converged network security because it:

- Defends against threats without interfering with network traffic
- Delivers fast detection with a network of virtual decoys creating an early warning system that fires an alert when a virtual target is contacted
- Isolates attackers and prevents them from communicating with the remainder of the network, allowing mission-critical data to continue to flow normally
- Complements existing perimeter security and host-based security solutions
- Operates effectively with all vendor switches but delivers greatest benefits when integrated with ExtremeXOS CLEAR-Flow enabled switches

Sentriant is commonly deployed on a mirror port on a switch, much like a network sniffer. However, unlike sniffers, Sentriant can actively engage, deter and terminate malicious behaviour. This deployment model gives system administrators strong security control over the internal network without the latency or single point of failure risks associated with inline devices.

Sentriant complements existing perimeter security such as firewalls and host-based security solutions. It also operates effectively with all vendor switches but delivers greatest benefits when integrated with ExtremeXOS enabled switches.

A number of different attacks can be mitigated by Sentriant. The most common is a Denial of Service (DOS) attack. These are software based programmes that create large volumes of unnecessary traffic on a data network. The effect of this can be a little as slight degradation in network performance to complete overloading of network resources. The presence of password sniffers and propagating viruses can also be detected. It can also stop an innocent network being used as the launching point for an attack against a 3rd party.



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EPICenter

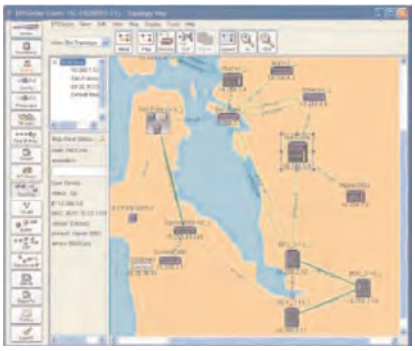
EPICenter management suite from Extreme Networks is a scalable full-featured network management platform capable of establishing and maintaining networks that are undergoing rapid change. It establishes a new benchmark for accommodating converged applications by offering intuitive user interfaces and by reducing the complexity of managing converged networking environments.

What can you determine about your network at a glance? Not just what switches and links are up and or down, but how is everything configured. From VLAN configuration to traffic trends reporting for capacity planning. The answers to these questions are essential to delivering the applications and performance that network managers demand. To compound the problem, today's networks are subject to:

- Proliferation of new converged and mission-critical applications
- Constantly changing service offerings
- Unpredictable and rapidly growing network traffic
- Pressing requirements for simplicity and expediency in network deployment
- Security issues that threaten network integrity
- Network management applications solve these problems by capturing data from the network devices and displaying it in a graphical way that can used to analyse, proactively manage and trouble shoot Ethernet networks

Key Features:

- Topology view with alarm integration, intelligent alarm systems
- Dynamic reporting and comprehensive network summary reports
- Firmware, configuration and ExtremeXOS CLI script management
- Telnet macros for easier and quicker configuration across multiple devices concurrently
- SNMPv3, SSH-2 and HTTPS and LLDP protocol support
- EAPS Monitoring and Configuration Checker Applet
- IP/MAC address finder
- Voice integration with Avaya platform and management systems, Wireless discovery and management
- Policy Manager and Quality of Service (QoS) policies
- Universal Port Manager for easy deployment of ExtremeXOS™ Universal Port profiles



EpiCenter Network Management

Avaya Integration

EPICenter integration with Avaya Integrated Management (AIM) software helps user to launch AIM console and Avaya Device Manager from within EPICenter. The EPICenter topology applet allows a user to view a network of EPICenter-managed devices and the links between devices as a set of maps.

Leveraging your success through our expertise

About G3

G3 designs, delivers and maintains converged voice and data networks. G3 uses best of breed technology solutions to develop customers' businesses. A leader in the market, G3 delivers reliable and proven IP communication solutions that will enable companies to lower risk, reduce costs and grow revenue.

Focused on both large and small enterprises, G3 really understands the business needs of the customer. As one of the only companies to fully understand and deliver truly converged solutions, G3 has reference sites with many global household names, some of which have been customers of G3 for 16 years!

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