

BlackDiamond® 8800 Series



BlackDiamond 8800 series switches redefine the architecture of the enterprise.

Voice-Class Availability

- Redundant system design
- Modular ExtremeXOS™ operating system (OS)
- Ethernet Automatic Protection Switching (EAPS) resiliency protocol

Voice-Grade Performance

- 48 Gigabits per second (Gbps) capacity per slot
- Capable of generating over 570 Mpps throughput: non-blocking on every port
- Up to 432 Gigabit Ethernet and 36 – 10 Gigabit Ethernet ports per chassis

Comprehensive Security

- User policy and host integrity enforcement
- Instrumentation to react to network intrusion
- Hardened against attacks

A modular switching family of highly available switches delivers high-density gigabit, gigabit Power over Ethernet (PoE) and 10 Gigabit Ethernet.

Enterprise IT managers don't have the time or resources to deal with overly complex, specialized network infrastructure solutions. The BlackDiamond 8800 series switches from Extreme Networks® redefine the architecture of the enterprise—replacing the traditional three-tier structure with a streamlined two-tier network that reduces management overhead, operational complexity and capital expenditures.

BlackDiamond 8800 series switches deliver voice-class availability, high-density Power over Ethernet (PoE), Gigabit Ethernet, and 10 Gigabit Ethernet wherever it's needed. It fits well at the edge of the most demanding enterprises—switching Voice-over-IP (VoIP), video, wireless and data traffic. BlackDiamond 8800 series switches' non-blocking ports interconnect thousands of servers for High Performance Cluster Computing (HPCC). With their comprehensive security features, BlackDiamond 8800 series switches are the single switch solutions for mid-sized enterprises. The BlackDiamond 8800 series switches' full range of Layers 2 – 4 features allow the aggregation of high-speed connections, eliminating bottlenecks between edge and core.

The multifaceted BlackDiamond 8800 series switches support IPv6 today and enables the enterprise to get ready to handle IPv6 traffic as this traffic may enter any network.

Target Applications

- Unified Access layer for integrated wired, wireless and IP Telephony deployments
- Interconnect switch for High Performance Cluster Computing
- Single switch network solution for medium sized networks
- Traditional gigabit or 10 Gigabit Ethernet aggregation



Voice-Class Availability

A high-performance network connection, whether used to connect PCs and IP telephones at the access layer or to interconnect servers in a cluster, is only useful if it is also highly available. BlackDiamond 8800 modular switching family incorporates extensive hardware redundancy and a modular OS—ExtremeXOS—that provides the network recovery required by converged applications.

Redundant Hardware Design

Redundant Management Modules

BlackDiamond 8800 modular switching family is configured with an automatic failover mechanism so that if one management switch module (MSM) fails, the second MSM will automatically take over management responsibility for the entire switch. This feature is critical for networks running voice and other mission-critical applications.

Advanced Chassis Design for Availability

BlackDiamond 8800 series switches include a passive backplane complemented by high availability design elements such as isolated control and data planes, redundant controller boards for power distribution, and fan control and environmental monitoring to identify anomalies before they effect network availability.

Redundant Load Sharing Power Supplies

BlackDiamond 8800 series switches support a set of redundant power configurations that can load share up to six internal power supplies simultaneously. Three power supplies in a 2 + 1 redundancy configuration can power a fully loaded chassis with gigabit or 10 Gigabit Ethernet ports. In addition, without the need of an external power tray, three power supplies are available to support large PoE implementations.

Redundant Cooling Fans in a Hot-Swappable Fan Tray

A tray of nine fans delivers redundant cooling in the BlackDiamond 8810 chassis. Up to three of the nine fans in a BlackDiamond 8810 can fail before the fan tray must be replaced. The fan tray itself is hot swappable so the BlackDiamond 8810 switch keeps operating while the fan tray is replaced.

Modular Operating System for Non-stop Operations

True Preemptive Multitasking and Protected Memory

BlackDiamond 8800 series switches allow each of the many tasks—such as Open Shortest Path First (OSPF) and Spanning Tree—to run as separate OS tasks that are protected from each other as shown in Figure 1.

Process Monitoring and Restart

ExtremeXOS dramatically increases network availability by monitoring in real time the independent OS processes. If any of them become unresponsive or stop running, they are automatically restarted.

Loadable Software Modules

The modular design of ExtremeXOS allows the extension of switch functionality without loading a new OS image and restarting the switch. New functionality can be added to the switch on the fly.

High Availability Network Protocols

Ethernet Automatic Protection Switching

EAPS allows the IP network to provide the level of resiliency and uptime that users expect from their traditional voice networks. EAPS is superior to the Spanning Tree or Rapid Spanning Tree Protocols, offering sub-second (less than 50 milliseconds) recovery and delivers consistent failover regardless of number of VLANs, number of network nodes or network topology. In most situations, VoIP calls don't drop and digital video feeds don't freeze or pixelize because EAPS enables the network to recover almost transparently from link failure.

Spanning Tree/Rapid Spanning Tree Protocols

BlackDiamond 8800 series switches support Spanning Tree (802.1D), Per

VLAN Spanning Tree (PVST+), Rapid Spanning Tree (802.1w) and Multiple Instances of Spanning Tree (802.1s) protocols for Layer 2 resiliency.

Software Enhanced Availability

Software enhanced availability allows users to remain connected to the network even if part of the network infrastructure is down. BlackDiamond 8800 series switches constantly checks for problems in the uplink connections using advanced Layer 3 protocols such as OSPF, VRRP and ESRP (ESRP supported in Layer 2 or Layer 3), and dynamically routes around the problem.

Equal Cost Multipath

Equal Cost Multipath enables uplinks to be load balanced for performance and cost savings while also supporting redundant failover. If an uplink fails, traffic is automatically routed to the remaining uplinks and connectivity is maintained.

Link Aggregation (802.3ad)

Cross module link aggregation enables trunking of up to eight links on a single logical connection, for up to 80 Gbps of redundant bandwidth per logical connection.

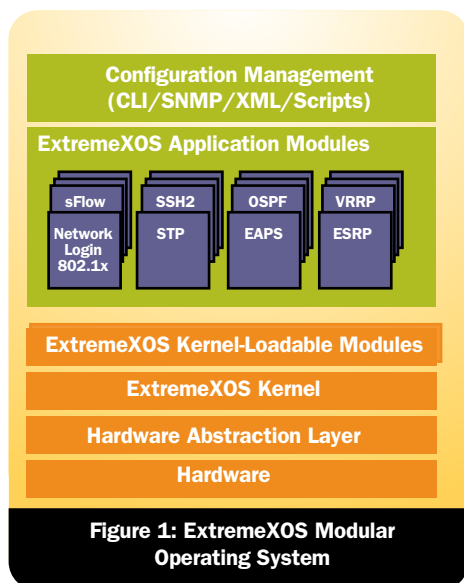


Figure 1: ExtremeXOS Modular Operating System

High-Performance Connectivity

BlackDiamond 8800 series switches deliver high-performance, cost-effective connectivity to address networking trends such as the increasing number of devices at the edge of the network: IP telephones, wireless access points, and other devices. These networking trends drive the requirement for Gigabit Ethernet to the desktop and the use of 10 Gigabit Ethernet as an interconnect technology.

Voice and Wireless Connectivity

Voice Grade Connections

Granular Quality of Service (QoS), low latency, and low jitter enable voice quality connections. BlackDiamond 8800 series switches support 8 queues per port and a range of QoS technologies that can prioritize and predictably handle high priority traffic—policing or rate limiting on ingress, 802.1q tagging and DiffServ marking, and shaping on egress. The Extreme Networks tradition of building products with low latency and jitter continues with BlackDiamond 8800 series switches—allowing network managers to build networks with low end-to-end latency and jitter.

High-Density PoE

PoE allows BlackDiamond 8800 series switches to support large IP Telephony and wireless Access Point (AP) deployments. The BlackDiamond 8810 can support up to 333 Class 3 ports in a single 14RU chassis or can power a maximum of 432 PoE ports in a single chassis with Class 1 or 2 power. No external power trays are needed in order to power up fully loaded BlackDiamond 8800 switches with Class 1, 2 or 3 devices.

Unified Access Architecture™

Unified Access Architecture (UAA) features are supported by BlackDiamond 8800 series switches so that enterprises can implement a single, secure and seamless network for wired and wireless network access, rather than having to operate two separate or parallel networks.

Link Layer Discovery Protocol Support

BlackDiamond 8800 series switches incorporate Link Layer Discovery Protocol (LLDP) to simplify troubleshooting of enterprise networks and enhance the ability of network management tools to discover and maintain accurate network topologies. It serves to reduce the complexities and expenses involved with convergence driven network changes by greatly simplifying management and connectivity issues.

sets the stage for convergence applications by allowing enterprises to add new access devices in a non-disruptive Plug and Play fashion. Voice and wireless services can be easily implemented without major network upgrades.

High-Density, Line-Rate Connectivity

BlackDiamond 8800 series switches support 1,200 non-blocking gigabit ports or almost a hundred non-blocking 10 Gigabit Ethernet ports in a single seven foot rack, allowing BlackDiamond 8800 series switches to deliver a very cost-effective connectivity option for clusters.

Local Switching

Servers connected to the same I/O module communicate with each other without having to traverse the switch backplane reducing latency in inter-server communication.

Jumbo Frame Support

Supporting jumbo frames allows cluster computing applications to optimize network performance.

IPv6 Packet Forwarding Support

IPv6 makes available trillions of new IP addresses and enables better address allocation, address aggregation, and features that provide significantly greater end-to-end connectivity and services. BlackDiamond 8800 series switches support IPv6 today, and enables the enterprises to get ready to handle IPv6 traffic as this traffic may enter any network.

Unified Access Architecture—Enabling the Universal Port

Extreme Networks' innovative edge architecture—UAA—is designed for enterprises that need a single, secure and seamless network for both wired and wireless network access, rather than having to operate two separate or parallel networks. Through this unified approach, you have the freedom to extend your network edge for wireless access, LAN telephony, PDAs and other devices without compromising security, scalability, availability, mobility or management.

UAA implements our vision of a universal port on the wall to which you can connect a traditional PC, an IP telephone or a lightweight AP. UAA centralizes the management and operation of wired closet's Layer 3 access switches, on both fixed form factor and chassis based products. The universal Ethernet port is designed to deliver consistent security, user authentication and QoS policy for a multitude of devices that access the network using wired or wireless media.

Large Switching Capacity

BlackDiamond 8800 series switches deliver industry leading 800 Gbps switch fabric bandwidth, and over 570 Mpps Layer 2-Layer 3 hardware forwarding rate.

- 800 Gbps switch fabric bandwidth
- 48 Gbps per slot capacity
- Over 570 Mpps Layer 2/Layer 3 hardware forwarding rate
- Local switching on every I/O module
- 4.016 Tbps total switching capacity*

High Gigabit and 10 Gigabit Ethernet Port Density

BlackDiamond 8800 series switches deliver voice-class availability, high density Gigabit Ethernet and 10 Gigabit Ethernet wherever it's needed.

- 10/100/1000BASE-T: 384 ports with 2 Management Switch Modules (MSMs), or 432 ports with 1 MSM on the BlackDiamond 8810
- 1000BASE-X: 208 ports with 2 MSMs or 224 ports with 1 MSM on the BlackDiamond 8810
- 10 Gigabit Ethernet: 32 ports with MSMs, or 36 ports with 1 MSM on the BlackDiamond 8810
- Capable of ports operating at line-rate when two MSMs are used

Comprehensive Security

Implementing a secure network requires the switches in the infrastructure to support a comprehensive set of security features. Security on BlackDiamond 8800 series switches encompass three main areas: user and host integrity, threat detection and response, and hardened network infrastructure.

Directory-integrated Link Security

Intelligent Network Access

Intelligent network access enforces user admission and usage policies. BlackDiamond 8800 series switches support a comprehensive range of Network Login options by providing an 802.1x agent-based approach, a web-based (agentless) login capability for guests, and a MAC-based authentication model for devices. With these modes of Network Login, only authorized users and devices can connect to the network and assigned to the appropriate VLAN.

Multiple Supplicant Support

Multiple supplicant support secures IP Telephony and wireless access. Converged network designs often involve the use of shared ports. Examples include:

- PC plugging into an IP telephone
- PoE port or multiple users connecting to a wireless AP over the air and thereby sharing the same physical PoE port.

Shared ports represent a potential vulnerability in a network. Multiple supplicant capability on a switch allows it to uniquely recognize and apply the appropriate policies for each user or device on a shared port.

Media Access Control (MAC)

MAC lockdown secures IP telephones, wireless APs and servers. The MAC address security/lockdown feature allows BlackDiamond 8800 series switches to block access to any Ethernet port when the MAC address of a station attempting to access the port is different from the configured MAC address. This feature is used to “lock down” a device like an IP telephone, an AP or a server to a specific port.

Host Integrity Checking

Host integrity checking helps keep infected or non-compliant machines off the network. BlackDiamond 8800 series switches support a host integrity or end point integrity solution that is based on the model from the Trusted Computing Group.

Threat Detection and Response

sFlow

Providing powerful network visibility, sFlow is a sampling technology that provides the ability to continuously monitor application level traffic flows on all interfaces simultaneously. The sFlow agent is a software process that runs on BlackDiamond 8800 series switches, and packages data into sFlow datagrams that are sent over the network to an sFlow Collector. The Collector has an up-to-the-minute view of traffic across the network, which can be used to troubleshoot network problems, control congestion and to detect network security threats.

Port Mirroring

Providing intrusion detection and prevention, BlackDiamond 8800 series switches support many-to-one and cross module port mirroring. This can be used to mirror traffic to an external network appliance such as an intrusion detection device for trend analysis or be utilized by a network administrator as a diagnostic tool when fending off a network attack.

Line-Rate Access Control Lists (ACLs)

ACLs are one of the most powerful tools to control network resource utilization and to secure and protect the network. BlackDiamond 8800 series switches support up to 48,000 ACLs based on Layer 2, 3 or 4-header information such as the MAC address or IP source/destination address.

Hardened Network Infrastructure

Denial of Service (DoS) Protection

BlackDiamond 8800 series switches handle DoS attacks gracefully. If the switch detects an unusually large number of packets in the CPU input queue, it will assemble ACLs that automatically stop these packets from reaching the CPU. After a period of time, the ACLs are removed. If the attack continues, they are reinstalled.

ASIC-based Longest Prefix Match (LPM)

LPM routing eliminates the need for control plane software to learn new flows

and allows the network to be resilient under a DoS attack.

Secure Management

The use of protocols like SSH2, SCP and SNMPv3 supported by a BlackDiamond 8800 series switch prevents the interception of management communications and man-in-the-middle attacks.

MD5 Authentication of Routing Protocols

MD5 authentication of routing protocols prevents attackers from tampering valid messages and attacking routing sessions.

Cost-Effective Network Design Using BlackDiamond 8800 Series Switches

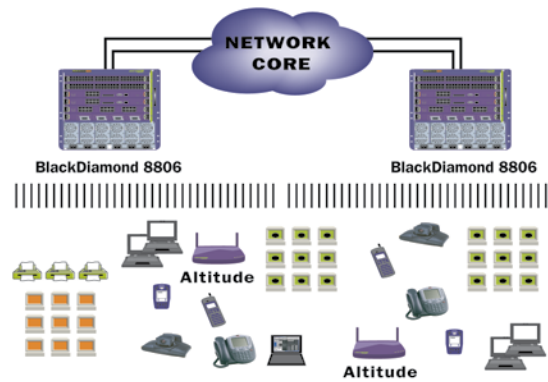
BlackDiamond 8800 series switches allow the traditional edge layer and aggregation layer of the network to be collapsed into a single access layer. A two-tier network that consists of an access layer and a core layer can reduce the number of switches required and hence reduce the network acquisition costs and network management costs. Depending on the size and geographic reach of the network, a two-tier network can be the most cost-effective design for a corporate network. BlackDiamond 8800 series switches are also designed to reduce CapEx and OpEx as demonstrated by the following features:

- Uplink ports on the MSMs lower the entry cost of the systems
- All BlackDiamond 8800 series switches share the same management and I/O blades thereby reducing sparing requirements
- All BlackDiamond 8800 series switches and the BlackDiamond 10808 core switch share the same power supplies thereby reducing sparing requirements
- All BlackDiamond 8800 series switches and the BlackDiamond 10808 core switch share the same OS and network management software thereby simplifying the management of the whole network.

Technical Applications

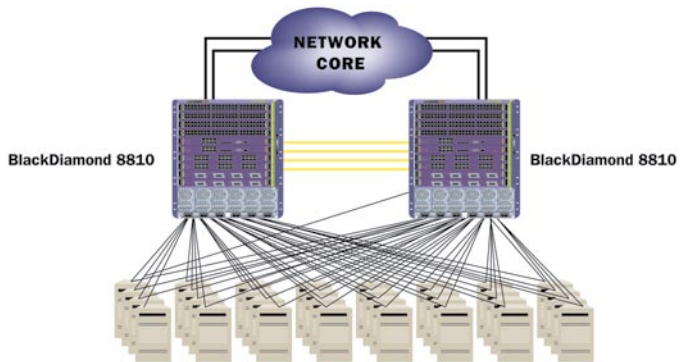
Unified Access Edge

BlackDiamond 8800 series switches deliver high-performance and cost-effective connectivity driven by networking trends such as: the increasing number of IP telephones, wireless APs and other devices at the edge of the network, Gigabit Ethernet connections to the desktop and the use of gigabit and 10 Gigabit Ethernet as an interconnect technology. BlackDiamond 8800 series switches allow the traditional edge layer and aggregation layer of the network to be collapsed into a single Unified Access layer.



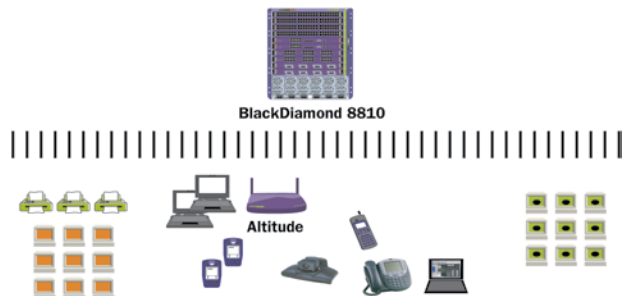
High Performance Cluster Computing

HPCC consists of hundreds or thousands of servers working co-operatively to solve large computational problems. With the use of relatively inexpensive and compact 1RU servers, a significant amount of processing power can be cost-effectively packed into a relatively small footprint. BlackDiamond 8800 series switches address the need for high-performance and cost-effective connectivity required for HPCC using gigabit and 10 Gigabit Ethernet as the interconnect technology.



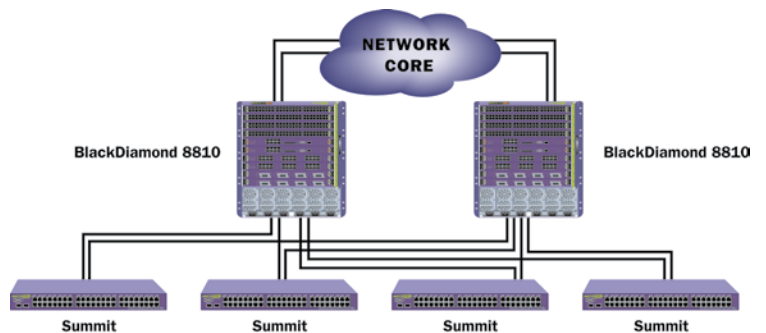
Single Switch Medium-Sized Network

BlackDiamond 8800 series switches provide the small to medium enterprise with an ideal single switch solution that satisfies their complete network needs. The typical multi-switch network can be combined to a single highly available switch that delivers high-density PoE for IP Telephony, wire-speed performance for services and comprehensive security.



Traditional Aggregation Layer

While Extreme Networks believes that a two-tier network is a simpler approach, the layout of a building or campus or the wiring plant sometimes requires an aggregation layer. This layer typically aggregates gigabit or 10 gigabit uplinks from edge switches and connects up to the core through gigabit and/or 10 Gigabit Ethernet uplinks. BlackDiamond 8800 series switches provide high-density gigabit and 10 Gigabit Ethernet that is required for the aggregation layer.



Technical Specifications

ExtremeXOS V11.4 Supported Protocols

General Routing and Switching

- RFC 1812 Requirements for IP Version 4 Routers
- RFC 1519 CIDR
- RFC 1256 IPv4 ICMP Router Discovery (IRDP)
- RFC 1122 Host Requirements
- RFC 768 UDP
- RFC 791 IP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 826 ARP
- RFC 894 IP over Ethernet
- RFC 1027 Proxy ARP
- RFC 1866 HTML – Used for web-based Network Login
- RFC 2068 HTTP server – Used for web-based Network Login
- RFC 2338 VRRP
- RFC 3619 Ethernet Automatic Protection Switching (EAPS) and EAPSV2
- IEEE 802.1D – 1998 Spanning Tree Protocol (STP)
- IEEE 802.1w – 2001 Rapid Reconfiguration for STP, RSTP
- IEEE 802.1s – 2004 Multiple Instances of STP, MSTP
- Extreme Multiple Instances of Spanning Tree Protocol (EMISTP)
- PVST+, Per VLAN STP (802.1Q interoperable)
- Extreme Standby Router Protocol (ESRP)
- IEEE 802.1Q – 1998 Virtual Bridged Local Area Networks
- IEEE 802.1AB – LLDP
- Extreme Discovery Protocol (EDP)
- Static Unicast Routes
- Extreme Loop Recovery Protocol (ELRP)
- Software Redundant Ports

VLANs, vMANs + MAC-in-MAC

- IEEE 802.1Q VLAN Tagging
- IEEE 802.3ad Static load sharing configuration and LACP based dynamic configuration
- IEEE 802.1v: VLAN classification by Protocol and Port
- Port-based VLANs
- Protocol-based VLANs
- Multiple STP domains per VLAN
- Virtual MANs (vMANs)

Quality of Service and Policies:

- IEEE 802.1D – 1998 (802.1p) Packet Priority
- RFC 2474 DiffServ Precedence, including 8 queues/port
- RFC 2598 DiffServ Expedited Forwarding (EF)
- RFC 2597 DiffServ Assured Forwarding (AF)
- RFC 2475 DiffServ Core and Edge Router Functions

RIP

- RFC 1058 RIP v1
- RFC 2453 RIP v2

OSPF

- RFC 2328 OSPF v2 (including MD5 authentication)
- RFC 1587 OSPF NSSA Option
- RFC 1765 OSPF Database Overflow
- RFC 2370 OSPF Opaque LSA Option
- RFC 3623 OSPF Graceful Restart

BGP4

- RFC 1771 Border Gateway Protocol 4
- RFC 1965 Autonomous System Confederations for BGP
- RFC 2796 BGP Route Reflection (supersedes RFC 1966)
- RFC 1997 BGP Communities Attribute
- RFC 1745 BGP4/IDRP for IP–OSPF Interaction
- RFC 2385 TCP MD5 Authentication for BGPv4
- “draft-ietf-idr-restart-10.txt (Graceful Restart Mechanism for BGP)”
- RFC 2439 BGP Route Flap Damping
- RFC 2842 Capabilities Advertisement with BGP-4
- RFC 2918 Route Refresh Capability for BGP-4

IPv4 Multicast

- RFC 1112 IGMP v1
- RFC 2236 IGMP v2
- RFC 3376 IGMP v3
- IGMP v1/v2/v3 Snooping with Configurable Router Registration Forwarding
- IGMP Filters
- Static IGMP Membership
- Multicast VLAN Registration
- RFC 2362 PIM-SM
- PIM-DM Draft IETF PIM Dense Mode draft-ietf-idmr-pim-dm-05.txt, draft-ietf-pim-dm-new-v2-04.txt
- RFC 3569, draft-ietf-ssm-arch-06.txt PIM-SSM PIM Source Specific Multicast

Management and Traffic Analysis

- RFC 2030 SNTP, Simple Network Time Protocol v4
- RFC 854 Telnet client and server
- RFC 783 TFTP Protocol (revision 2)
- RFC 951, 1542 BootP
- RFC 2131 BOOTP/DHCP relay agent and DHCP server
- RFC 1591 DNS (client operation)
- RFC 1155 Structure of Mgmt Information (SMIv1)
- RFC 1157 SNMPv1
- RFC 1212, RFC 1213, RFC 1215 MIB-II, Ethernet-Like MIB & TRAPS
- RFC 1573 Evolution of Interface
- RFC 1650 Ethernet-Like MIB (update of RFC 1213 for SNMPv2)
- RFC 1901 – 1908 SNMP v 2c, SMIv2 and Revised MIB-II
- RFC 2570 – 2575 SNMPv3, user based security, encryption and authentication
- RFC 2576 Coexistence between SNMP Version 1, Version 2 and Version 3
- RFC 1757 RMON 4 groups: Stats, History, Alarms and Events
- RFC 2021 RMON2 (probe configuration)
- RFC 2668 802.3 MAU MIB
- RFC 1643 Ethernet MIB
- RFC 1493 Bridge MIB
- RFC 1354 IPv4 Forwarding Table MIB
- RFC 2737 Entity MIB v2
- RFC 2233 Interface MIB
- RFC 3621 PoE-MIB (BlackDiamond 8800 only)
- RFC 1354 IP Forwarding Table MIB
- RFC 1724 RIPv2 MIB
- RFC 1850 OSPFv2 MIB
- RFC 1657 BGP-4 MIB
- Draft-ietf-idr-bgp4-mibv2-02.txt—Enhanced BGP-4 MIB
- draft-ietf-pim-mib-v2-01.txt
- RFC 2787 VRRP MIB
- RFC 2925 Ping/Traceroute/NSLOOKUP MIB

- Draft-ietf-bridge-rstpmb-03.txt—Definitions of Managed Objects for Bridges with Rapid Spanning Tree Protocol
- Secure Shell (SSH-2) client and server
- Secure Copy (SCP-2) client and server
- Secure FTP (SFTP) server
- sFlow version 5
- Configuration logging
- Multiple Images, Multiple Configs
- BSD System Logging Protocol (SYSLOG), with Multiple Syslog Servers
- 999 Local Messages (criticals stored across reboots)
- ExtremeWare vendor MIBs (includes FDB, PoE, CPU, Memory MIBs) <http://www.extremenetworks.com/services/documentation>

Security

- Routing protocol MD5 authentication (see above)
- Secure Shell (SSH-2), Secure Copy (SCP-2) and SFTP client/server with encryption/authentication (requires export controlled encryption module)
- SNMPv3 user based security, with encryption/authentication (see above)
- RFC 1492 TACACS+
- RFC 2138 RADIUS Authentication
- RFC 2139 RADIUS Accounting
- RADIUS Per-command Authentication
- Access Profiles on All Routing Protocols
- Access Policies for Telnet/SSH-2/SCP-2
- Network Login – 802.1x, web and MAC-based mechanisms
- IEEE 802.1x – 2001 Port-Based Network Access Control for Network Login
- Multiple supplicants for Network Login (all modes)
- Fallback to local database (MAC and Web-based methods)
- Guest VLAN for 802.1x
- SSL/TLS transport – used for web-based Network Login, (requires export controlled encryption module)
- MAC Address Security – Lockdown and Limit
- RFC 3046 IP Address Security – DHCP Option 82
- IP Address Security – Gratuitous ARP Protection
- Layer 2/3/4 ACLs

Denial of Service Protection

- RFC 2267 Network Ingress Filtering
- RPF (Unicast Reverse Path Forwarding) Control via ACLs
- Wire-speed ACLs
- Rate Limiting/Shaping by ACLs
- IP Broadcast Forwarding Control
- ICMP and IP-Option Response Control
- SYN attack protection
- CPU DoS Protection with traffic rate limiting to management CPU

Robust against common Network Attacks

- CERT (<http://www.cert.org>)
- CA-2003-04: “SQL Slammer”
- CA-2002-36: “SSHredder”
- CA-2002-03: SNMP vulnerabilities
- CA-98-13: tcp-denial-of-service
- CA-98.01: smurf
- CA-97.28: Teardrop_Land -Teardrop and “LAND” attack

Technical Specifications

- CA-96.26: ping
- CA-96.21: tcp_syn_flooding
- CA-96.01: UDP_service_denial
- CA-95.01: IP_Spoofing_Attacks_and_Hijacked_Terminal_Connections
- IP Options Attack

Host Attacks

- Teardrop, boink, opentear, jolt2, newtear, nestea, syndrop, smurf, fraggle, papasmurf, synk4, raped, winfreeze, ping -f, ping of death, peps5, Latierra, Winnuke, Sipping, Sping, Ascend, Stream, Land, Octopus

IPv6

- RFC 2460, Internet Protocol, Version 6 (IPv6) Specification
- RFC 2461, Neighbor Discovery for IP Version 6, (IPv6)
- RFC 2462, IPv6 Stateless Address Auto configuration – Router Requirements
- RFC 2463, Internet Control Message Protocol (ICMPv6) for the IPv6 Specification
- RFC 2464, Transmission of IPv6 Packets over Ethernet Networks
- RFC 2465, IPv6 MIB, General Group and Textual Conventions
- RFC 2466, MIB for ICMPv6
- RFC 1981, Path MTU Discovery for IPv6, August 1996 – Router requirements
- RFC 3513, Internet Protocol Version 6 (IPv6) Addressing Architecture
- RFC 3587, Global Unicast Address Format
- RFC 2710, IPv6 Multicast Listener Discovery v1 (MLDv1) Protocol
- RFC 3810, IPv6 Multicast Listener Discovery v2 (MLDv2) Protocol
- RFC 2740, OSPF for IPv6
- RFC 2080, RIPng
- RFC 2893, Configured Tunnels
- RFC 3056, 6to4
- Static Unicast routes for IPv6
- Telnet server over IPv6 transport
- SSH-2 server over IPv6 transport
- Ping over IPv6 transport
- Traceroute over IPv6 transport

General Specifications

Switching Capacity

- 800 Gbps total switching capacity
- 4.016 Tbps total switching capacity (Including local switching)
- 570 Mpps Layer 2 HW forwarding rate
- 570 Mpps Layer 3 HW forwarding rate

Port Capacity

BlackDiamond 8810

- 36 ports 10GBASE-X (XENPAK) (32 ports if 2 MSMs)
- 432 ports 10/100/1000BASE-T (384 ports if 2 MSMs)
- 224 ports 1000BASE-X SFP (Mini-GBIC) (208 ports if 2 MSMs)

BlackDiamond 8806

- 20 ports 10GBASE-X (XENPAK) (16 ports if 2 MSMs)
- 240 ports 10/100/1000BASE-T (192 ports if 2 MSMs)
- 128 ports 1000BASE-X SFP (Mini-GBIC) (112 ports if 2 MSMs)

Management Switch Module

- The management module contains both the control path as well as the switch fabric for the BlackDiamond 8800

MSM-G8X BlackDiamond 8800 Management Switch Module, with 8 1000BASE-X mini-GBIC ports

I/O Module Options

G48T 48-port 10/100/1000BASE-T Gigabit Ethernet module

G48P 48-port 10/100/1000BASE-T Gigabit Ethernet module with PoE

G24X 24-port 1000BASE-X Gigabit Ethernet module

- Mini-GBIC modules required. Mini-GBIC options include

- SX (up to 550m)
- LX (up to 5km as per standard; up to 10km with 2 Extreme Networks optics)
- ZX (up to 70km)

10G4X 4-port 10GBASE-X 10 Gigabit Ethernet module

- XENPAK modules required

- XENPAK options include
- SR (up to 300m)
 - LR (up to 50km)
 - ER (up to 40km)
 - ZR (up to 80km)
 - LX4 (300m MMF, 10km SMF)

Power Supply Options

Both AC and DC power supplies are available.

- AC power supplies can run from 100Volt to 240Volt, and deliver
 - 700W at 90V to 100V, or
 - 1200W at 200V to 220V
- 48V DC power supplies deliver 1200W of power

Power over Ethernet (PoE) 802.3af

333 ports with 802.3af class 0 devices

supported with 6 power supplies

432 ports with 802.3af class 1 devices

supported with 6 power supplies

432 ports with 802.3af class 2 devices

supported with 6 power supplies

333 ports with 802.3af class 3 devices

supported with 6 power supplies

Physical Specifications

Dimensions

BlackDiamond 8810 Chassis: 24.47" high x 17.51" wide x 18.23" deep (62.2 cm x 44.5 cm x 46.3 cm)

BlackDiamond 8806 Chassis: 17.5" high x 17.51" wide x 18.23" deep (44.45 cm x 44.5 cm x 46.3 cm)

Power Supply: 4.75" high x 2.75" wide x 13.75" deep (12.1 cm x 6.99 cm x 34.9 cm)

MSM Module Dimensions: 1.63" high x 15.26" wide x 15.25" deep (4.1 cm x 38.8 cm x 38.7 cm)

I/O Module Dimensions: 1.63" high x 15.26" wide x 15.25" deep (4.1 cm x 38.8 cm x 38.7 cm)

Weight

BlackDiamond 8810 Chassis: 79 lb (35.8 kg)

BlackDiamond 8810 Chassis fully loaded (max): 200.5 lb (90.9 kg)

BlackDiamond 8806 Chassis: 65 lb (29.5 kg)

BlackDiamond 8806 Chassis fully loaded (max): 151 lb (68.5 kg)

Power Supply: 7 lb (3.2 kg)

MSM-G8X Module: 7.5 lb (3.4 kg)

G48T Module: 7.75 lb (3.5 kg)

G48P Module: 8 lb (3.6 kg)

G24X Module: 7.75 lb (3.5 kg)

10G4X Module: 7.75 lb (3.5 kg)

Power

BlackDiamond 8810 Chassis with Fan Trays: 55 W, 48V, 1.1A (Heat Dissipation: 188 BTU)

BlackDiamond 8806 Chassis with Fan Trays: 45 W, 48V, 1.0 A (Heat Dissipation: 154 BTU)

MSM-G8X Module: 150 W, 48V, 3.125A (Heat Dissipation: 515 BTU)

G48T Module: 105 W, 48V, 2.2A (Heat Dissipation: 358 BTU)

G48P Module: 110 W, 48V, 2.3A (Heat Dissipation: 375 BTU)

G24X Module: 105 W, 48V, 2.2A (Heat Dissipation: 358 BTU)

10G4X Module: 115 W, 48V, 2.4A (Heat Dissipation: 392 BTU)

Operating Specifications

Operating Temperature Range: 0 to 40 °C (32 to 104 °F)

Operating Humidity Range: 10% - 90% (RH), non-condensing

Storage Temperature Range: -40 to 70 °C (-40 to 158 °F)

Storage Humidity Range: 10% - 90% (RH), non-condensing

Regulatory/Safety

- cULus Listed Device – UL 60950 3rd Edition (U.S. Safety)
- CAN/CSA-C22.2 No. 60950-00 (Canadian Safety)
- 73/23/EEC Low Voltage Directive (LVD)
- TUV-R GS Mark by German Notified Body EN60950:2000+All Available Country Deviations (European Safety)
- CB Report and Certificate - IEC60950:2000 with all country deviations (International Safety of ITE)
- NOM/NYCE (Product Safety & EMC Approval)
- AS/NZS 3260 (ACA DoC, Safety of ITE) – Australia Safety Standard
- S Mark (Argentina Safety Approval)
- GOST (Russian Federation Certificate)
- FCC 21 CFR subpart (J) (Safety of Laser Products)
- CDRH Letter of Approval (U.S. FDA Approval)
- EN60825-1:1994 +A11:1996+A2:2001 (European Safety of Lasers)
- **EMI/EMC Standards**
 - FCC 47 CFR Part 15 Class A (U.S. Emissions)
 - ICES-003 Class A (Canada Emissions)
 - 89/336/EEC EMC Directive
 - ETSI/EN 300 386:2001 (EU Telecommunication Emissions & Immunity)

Technical Specifications

- EN55022: 1998 Class A (Europe Emissions)
 - EN55024: 1998 includes IEC/EN 61000-2,3,4,5,6,11 (Europe Immunity)
 - EN 61000-3-2, -3 (Europe Harmonics and Flicker)
 - IEC/CISPR 22: 1997 Class A (International Emissions)
 - IEC/CISPR 24: 1998 (International Immunity)
 - IEC/EN 61000-4-2 Electrostatic Discharge
 - IEC/EN 61000-4-3 Radiated Immunity
 - IEC/EN 61000-4-4 Transient Bursts
 - IEC/EN 61000-4-5 Surge
 - IEC/EN 61000-4-6 Conducted Immunity
 - IEC/EN 61000-4-11 Power Dips & Interruptions
 - VCCI Class A (Japan Emissions)
 - AS/NZS 3548 (ACA DoC, Emissions)
 - Australia Emissions
 - MIC Mark (MIC Approval, Korean Emissions & Immunity Approval)
 - NOM/NYCE (Mexican Product Safety & EMC Approval)
 - GOST (Russian Federation Certificate)
 - CNS 13438:1997 Class A (BSMI DoC)
- Environmental**
- EN 300 019-2-1 (2000-09) – Storage Class 1.2 - Packaged
 - EN 300 019-2-2 (1999-09) – Transportation Class 2.3 – Packaged
 - EN 300 019-2-2 (1999-09) – Stationary Use at Weather Protected locations, Class 3.1e – Operational
 - EN 300 753 (1997-10) – Acoustic Noise - Operational
 - ASTM D5276 * – Drop – Packaged
 - ASTM D3332 * – Shock – Unpackaged
 - ASTM D3580 * – Random Vibration – Unpackaged
 - ASTM D6179 * – Tilt – Packaged
- *Additional testing requested by Extreme Networks

Warranty

- 1-year on Hardware
- 90-days on software

Ordering Information

Part Number	Name	Description
41011	BlackDiamond 8810	BlackDiamond 8810 10-Slot Chassis Including Fan Tray
41012	BlackDiamond 8806	BlackDiamond 8806 6-Slot Chassis Including Fan Tray
60020	BlackDiamond 10808/ BlackDiamond 8800 700W/1200W PSU	BlackDiamond 10808/BlackDiamond 8800 700W/1200W 100-240V PSU
60021	BlackDiamond 10808/ BlackDiamond 8800 1200W DC PSU	BlackDiamond 10808/BlackDiamond 8800 1200W -48V DC PSU
41211	BlackDiamond 8800 MSM-G8X	BlackDiamond 8800 Management Switch Module, w/8 1000BASE-X mini-GBIC I/O ports
41511	BlackDiamond 8800 G48T	BlackDiamond 8800 48-port 10/100/1000BASE-T RJ-45
41512	BlackDiamond 8800 G48P	BlackDiamond 8800 48-port 10/100/1000BASE-T PoE RJ-45
41541	BlackDiamond 8800 G24X	BlackDiamond 8800 24-port 1000BASE-X mini-GBIC
41611	BlackDiamond 8800 10G4X	BlackDiamond 8800 4-port 10GBASE-X XENPAK
41111	BlackDiamond 8810 Spare Fan Tray	BlackDiamond 8810 Spare Fan Tray
65043	BlackDiamond 8806 Spare Fan Tray	BlackDiamond 8806 Spare Fan Tray
41112	BlackDiamond 8800 Spare PSU/Fan Cntrl	BlackDiamond 8800 Spare PSU/Fan Controller board
41121	BlackDiamond 8800 Spare Blank Panel	BlackDiamond 8800 Spare Blank Panel
41141	BlackDiamond 8810 Mid Mount Kit	BlackDiamond 8810 Mid Mount Kit
41151	BlackDiamond 8800 Cable Mgmt Kit	BlackDiamond 8800 Cable Management Kit
41311	BlackDiamond 8800 Core License	BlackDiamond 8800 ExtremeXOS Core software upgrade
10110	SR XENPAK	10 Gigabit Ethernet XENPAK Transceiver, 850nm, up to 300m on multimode fiber, SC connector
10111	LR XENPAK	10 Gigabit Ethernet XENPAK Transceiver, 1310nm, up to 10km on single-mode fiber, SC connector
10112	ER XENPAK	10 Gigabit Ethernet XENPAK Transceiver, 1550nm, up to 40km on single-mode fiber, SC connector
10113	ZR XENPAK	10 Gigabit Ethernet XENPAK Transceiver, 1550nm, up to 80km on single-mode fiber, SC connector
10114	LX4 XENPAK	10 Gigabit Ethernet WWDM XENPAK Transceiver, 1310 nm, up to 300 m on multi-mode fiber and up to 10 km on a single-mode fiber, SC connector
10051	SX mini-GBIC	Mini-GBIC, SFP, 1000BASE-SX, LC Connector
10052	LX mini-GBIC	Mini-GBIC, SFP, 1000BASE-LX, LC connector
10053	ZX mini-GBIC	Mini-GBIC, SFP, Extra long distance SMF 70 Km/21 dB budget, LC connector
10060	100 FX/1000LX mini-GBIC	Mini-GBIC, SFP, dual-speed 100 FX/1000LX, LC Connector



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