BLACKDIAMOND 10808

Designed from the ground up for 10 Gigabit Ethernet, the BlackDiamond® 10808 (10K) incorporates major technological breakthroughs in the areas of scalability, resiliency, security and extensibility. Extreme Networks once again sets the standard for Intelligent Core and Data Centers against which all modular Ethernet switches will be measured.

APPLICATIONS

The BlackDiamond 10K has been designed to excel in a wide array of applications, including:

- **Enterprise Backbone**
- **Enterprise Data Centers**
- **Metro Core and Distribution**
- **Internet Exchanges**
- **High Performance Cluster Computing**

These applications require high performance, scalability and the highest level of resiliency. But even more importantly, the BlackDiamond 10K is designed to meet tomorrow's needs as well as today's. Extensibility is the key to building intelligent core networks that can adapt and respond to changing requirements over time, this is where the BlackDiamond 10K truly stands alone.

SECURITY

BlackDiamond 10K delivers a new level of security to Ethernet core networking. The BlackDiamond 10K complements the perimeter firewalls by protecting the "soft interior" of the network that currently goes unprotected.

Utilizing the industry's most advanced CLEAR-Flow Security Rules Engine – the BlackDiamond 10K can be programmed to automatically detect and mitigate security threats in seconds.

SCALABILITY

Offering industry-leading 10 gigabit + Gigabit Ethernet port density, BlackDiamond 10K scales to meet both the immediate and future requirements of even very demanding IPv4 and IPv6 environments.

RESILIENCY

The BlackDiamond 10K allows every active component (including the operating system) to be upgraded without taking the switch out of service. BlackDiamond10K also utilizes the industry-leading modular operating system ExtremeWare® XOS™ that raises the availability of the switch. Network level resiliency protocols are added to increase the availability of the network.

EXTENSIBILITY

BlackDiamond 10K hardware supports a wide array of protocols from day one. In addition BlackDiamond 10K incorporates programmable ASIC technology. This programmability ensures that the platform will support emerging protocols without costly hardware upgrades - thus offering great investment protection.

extreme networks

GENERAL SPECIFICATIONS

Switching Capacity

- 1.28 Tbps total switching capacity, with 9 microsecond latency for 64-byte packets

Port Capacity

- 48 ports of 10 Gigabit Ethernet
- 480 1000BASE-X mini-GBIC ports
- 480 10/100/1000BASE-T ports
- Future support for the emerging 40 and 100 Gigabit Ethernet standards

Management Switch Module

Management Switch Module Options

- Management modules contain both the control plane as well as the switch fabric for the BlackDiamond 10K. Both MSMs are TCAM-based, and support Longest Prefix Match (LPM) routing. Two initial versions of MSM are available:

MSM-1: The MSM-1 includes support for up to 112,000 MAC addresses, 112,000 IP routes, and 64,000 ACLs. MSM-1 is designed for most mid-sized to large enterprises. MPLS is not supported on the MSM-1.

MSM-1XL: The MSM-1XL includes support for up to 224,000 MAC addresses, 224,000 Layer 3 LPM Entries, and 128,000 ACLs. MSM-1XL is required to run MPLS.

I/O Module Options

G60T 60-port 10/100/1000BASE-T Gigabit Ethernet module (RJ-45)

G60X 60-port 1000BASE-X Gigabit Ethernet module
- Mini-GBIC modules required. Mini-GBIC options include:
  - SX (up to 550m)
  - LX (up to 5km)
  - ZX (up to 70km)

G20X 20-port 1000BASE-X Gigabit Ethernet module
- Mini-GBIC modules required. Mini-GBIC options include:
  - SX (up to 550m)
  - LX (up to 5km)
  - ZX (up to 70km)
  - 100LX (up to 100km)

10G6X 6-port 10 Gigabit Ethernet module
- XENPAK modules required. XENPAK options include:
  - SR (up to 300m)
  - LR (up to 10km)
  - ER (up to 40km)
  - ZR (up to 80km)

10G2X 2-port 10 Gigabit Ethernet module
- XENPAK modules required. XENPAK options include:
  - SR (up to 300m)
  - LR (up to 10km)
  - ER (up to 40km)
  - ZR (up to 80km)

10G2H Hybrid module with:
2-port 10 gigabit
- XENPAK modules required. XENPAK options include:
  - SR (up to 300m)
  - LR (up to 10km)
  - ER (up to 40km)
  - ZR (up to 80km)

20-port 1000BASE-X Gigabit Ethernet
- Mini-GBIC modules required. Mini-GBIC options include:
  - SX (up to 550m)
  - LX (up to 5km)
  - ZX (up to 70km)

20-port 10/100/1000BASE-T Gigabit Ethernet (RJ-45)

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 110V, or
  - 1200W at 200V to 220V
- 48V DC power supplies deliver 1200W of power.

PROTOCOLS AND STANDARDS

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 webbased Network Login
- RFC 2068 HTTP server – Used for webbased 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 802.1Q - 1998 Virtual Bridged Local Area Networks
- IEEE 802.1AB – LLDP Link Layer Discovery Protocol
- EMISTP, Extreme Multiple Instances of Spanning Tree Protocol
- PVST+, Per VLAN STP (802.1Q interoperable)
- Extreme Standby Router Protocol (ESRP)
- Extreme Discovery Protocol (EDP)
- Static Unicast Routes
- Loop detection via Layer 2 ELRP
- Software redundant port

VLANs

- IEEE 802.1Q VLAN Tagging
- IEEE 802.3ad Static 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
- Bi-directional Rate Shaping
- Policy-Based Mapping/Overwriting of DiffServ code points, .1p priority

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

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
- RFC 2439 BGP Route Flap Damping
- RFC 2842 Capabilities Advertisement with BGP-4
- RFC 2918 Route Refresh Capability for BGP-4

IP Multicast

- RFC 2362 PIM-SM
- PIM-DM Draft IETF PIM Dense Mode v2-dm-03
- 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

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 v2c, 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 2665 Ethernet-Like-MIB
- 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 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

- RFC 2787 VRRP MIB
- RFC 2925 Ping / Traceroute / NSLOOKUP MIB
- Draft-ietf-bridge-rstpmib-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, 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)
- Guest VLAN for 802.1x
- SSL/TLS transport – used for for web-based Network Login, (requires export controlled encryption module)
- MAC Address Security - Lockdown and Limit
- IP Address Security - DHCP Option 82 and Gratuitous ARP Protection
- Layer 2/3/4 Access Control Lists (ACLs)
- CLEARflow, threshold based alerts and actions
- Layer 3 Virtual Switching

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
  - 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, pepsi5, Latierra, Winnuke, Simping, Sping, Ascend, Stream, Land, Octopus

IPv6

- Hardware enabled for 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 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 2464, Transmission of IPv6 Packets over Ethernet Networks
- 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 over IPv6 transport
- SSH-2 over IPv6 transport
- Ping over IPv6 transport
- Traceroute over IPv6 transport

Safely Standards

- UL 1950 3rd Edition 2/93, (US Safety of ITE)
- cULus Listed Equivalent to CAN/CSA-22.2
- No. 950-M93 (Canadian Safety of ITE)
- Low Voltage Directive (LVD) (European Safety Directive)
- CB Report and Certificate (International Safety of ITE)
- IEC60950:1991/A1-4 2nd Edition (European Safety of ITE)
- TUV GS Mark (German Notified Body)
- EN60950:1992/A1-4,A11+ Deviations (European Safety of ITE)
- AS/NZS 3260 (Australia Safety Standard)
- S Mark (Argentina Safety Approval)
- GOST (Russian Federation Certificate) Laser Devices
- EN60825-1,2:1994, A11:1996 (European Safety of Lasers Products)
- FCC 21 CFR Subpart J (US Safety of Laser Products)
- CDRH Letter of Approval (US FDA Approval)

EMI/EMC Standards

- FCC 47 CFR Part 15 Class A (US Emissions)
- ICES-003 Class A (Canada Emissions)
- 89/336/EEC EMC Directive (European Requirements)
- CISPR22:1997 Class A (International Emissions)
- EN55022:1998 Class A (European Emissions)
- EN55024:1998 includes EN61000-4-2,3,4,5,6,8,11 (European Immunity)
- EN61000-3-2,3 (European Harmonics & Flicker)
- AS/NZS 3548 (Australia Emissions)
- VCCI Class A (Japan Emissions)
- CNS 13438:1997 Class A (Taiwan Emissions)
- MIC Mark (Korean Emissions & Immunity Approval)
- NOM/NYCE (Mexican Product Safety & EMC Authorities)
- Telcordia GR-1089 (Bellcore Emissions & Immunity Standard)

Telecom Standards

- EN 300 386-2 v1.1.3 (1997-12) (European Telecom Standard)
- NEBS Type IV, Level 3 (US Voluntary Telecom Standard) Compliant Additional Telecom Approvals held on Individual Blades

Environmental Standards

- EN60068 to Extreme IEC68 schedule
- ETS 300 019 to Extreme schedule
- Telcordia GR-63-Core (Bellcore Environmental & Safety Standard)

PHYSICAL SPECIFICATIONS

Dimensions

Chassis: 38.5" high (22 RU) x 17.3" wide x 21" deep (98.0 cm x 44.0 cm x 53.3 cm)

MSM Module Dimensions: 22.7" high x 17.9" deep x 1.7" width (57.7 cm x 45.5 cm x 4.3 cm)

I/O Module Dimensions: 22.7" high x 19.6" deep x 1.7" width (57.7 cm x 49.8 cm x 4.3 cm)

Weight

Empty Chassis: 105 lb (47.7 kg)

Power Supply: 7 lb (3.2 kg)

MSM-1 Module: 10.5 lb (4.8 kg)

MSM-1XL Module: 10.7 lb (4.9 kg)

G60T Module: 8.5 lb (3.9 kg)

G60X Module: 9.25 lb (4.2 kg)

G20X Module: 9.25 lb (4.2 kg)

10G6X Module: 7.75 lb (3.5 kg)

10G2X Module: 7.75 lb (3.5 kg)

10G2H Module: 8.5 lb (3.9 kg)

Chassis, fully loaded (max.): 242 lb (110 kg)

Power

Chassis with Fan Trays: 250W, 48V, 5.2A (Heat Dissipation: 853 BTU)

MSM-1, MSM-1XL: 335W, 48V, 7.0A (Heat Dissipation: 1144W)

G60T: 220W, 48V, 4.6A (Heat Dissipation: 751 BTU)

G60X: 223W, 48V, 4.7A (Heat Dissipation: 761 BTU)

G20X: 140W, 48V, 2.9A (Heat Dissipation: 478 BTU)

10G6X: 230W, 48V, 4.8A (Heat Dissipation: 785 BTU)

10G2X: 145W, 48V, 3.0A (Heat Dissipation: 495 BTU)

10G2H: 223W, 48V, 4.7A (Heat Dissipation: 761 BTU)

Fully Loaded System (Chassis + 2 x MSM + 8 x 10G6X): 3513W (Heat Dissipation: 11,995 BTU)

OPERATING SPECIFICATIONS

Operating Temperature: 0° to 40° C

Storage Temperature: -40° to 70° C

Operating Humidity: 10% to 95% relative humidity, non-condensing EN60068 to Extreme IEC68 schedule

ORDERING INFORMATION

Part Number	Part Name	Description
60011	BD 10808 Chassis	BlackDiamond 10808 10-slot Chassis (Includes Fan Tray)
60020	BD 10K / BlackDiamond 8800 700W/1200W PSU	BlackDiamond 10K / BlackDiamond 8800 700W/1200W 100-240V PSU
60015	BD 10K MSM-1 Mgmt Module	BlackDiamond 10K Management and Switch Fabric Module 1
60016	BD 10K MSM-1XL Mgmt Module	BlackDiamond 10K Management and Switch Fabric Module 1XL
61010	BD 10K G60X	BlackDiamond 10K 60-port 1000BASE-X SFP (mini-GBIC) Module
61011	BD 10K G20X	BlackDiamond 10K 20-port 1000BASE-X SFP (mini-GBIC) Module
61030	BD 10K G60T	BlackDiamond 10K 60-port 10/100/1000BASE-T RJ-45 Module
61050	BD 10K 10G6X	BlackDiamond 10K 6-port 10GBASE-X XENPAK Module
61051	BD 10K 10G2X	BlackDiamond 10K 2-port 10GBASE-X XENPAK Module
61071	BD 10K 10G2H	BlackDiamond 10K hybrid module with - 2-port 10GBASE-X XENPAK - 20-port 1000BASE-X SFP - 20-port 10/100/1000BASE-T RJ-45
60012	BD 10808 Spare Fan Tray	BlackDiamond 10808 Spare Fan Tray
60013	BD 10K Spare PSU Controller	BlackDiamond 10K Spare PSU Controller
62001	BD 10K Blank Front Panel	BlackDiamond 10K Blank Front Panel
62011	BD 10808 Mid Mount Kit	BlackDiamond 10808 Mid Mount Kit
62012	BD 10K Spare Filter 3-pack	BlackDiamond 10K Spare Filter 3-pack
62020	BD 6808/10808 Cable Mgmt	BlackDiamond 6808/10808 Cable Management
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
10051	SX mini-GBIC	Mini-GBIC, SFP, 1000BaseSX, LC Connector
10052	LX mini-GBIC	Mini-GBIC, SFP, 1000BaseLX, LC connector
10053	ZX mini-GBIC	Mini-GBIC, SFP, Extra long distance SMF 70 Km/21 dB budget, LC connector

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Specifications are subject to change without notice. L-DS-BD10K-506