

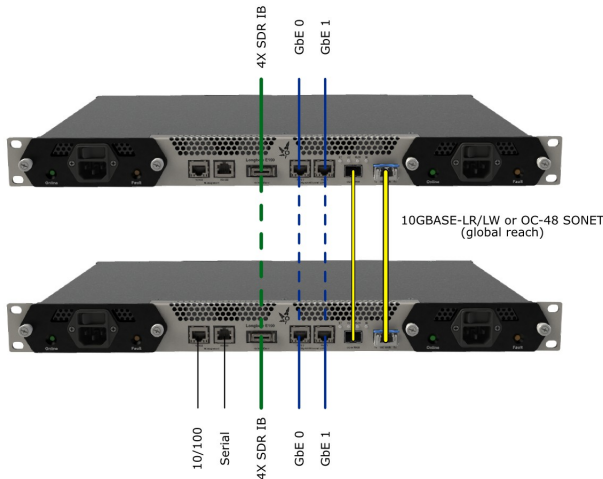
# InfiniBand Range-Extending Switch/Router/Crypto



## Longbow E100 by Obsidian

### Operation

A pair of Longbow E100 devices communicate over a 10 Gigabit Ethernet or OC-48 SONET Wide Area Network (WAN) (or a WDM light path) through their optical ports. Each device connects to local InfiniBand infrastructure through 4X SDR InfiniBand (IB) ports.



When configured in switch mode, the E series devices report as two-port IB switches to the subnet manager – the IB fabrics at the two locations merge into a single unified subnet.

When configured in router mode, the E series devices become two-port native IB routers – the two IB fabrics remain independent, yet able to exchange data through the routers.

By handling the InfiniBand buffer credit extension, InfiniBand traffic is able to traverse the WAN without application-level consideration to flow control over the link. The buffer capacity allows normally very short reach InfiniBand to span any global network and maintain very high wire-speed efficiency.

In addition to the 4X SDR IB port, two 10/100/Gigabit Ethernet channels are also encapsulated over the WAN link – the E series devices do not process the Ethernet packets, which are merely passed to the remote side as if carried on a virtual cable. The local IB and Ethernet channels are independently processed.

**Over and above range-extension and native routing, Longbow E series features integrated in-line AES-256-GCM encryption and authentication. This transparent capability provides a 10Gbits/s, highly secure InfiniBand path between locations with no latency penalty, and no bandwidth penalty.**

### Applications

Longbow E series devices are highly effective long distance bulk data transport solutions. Completely bypassing TCP/IP stack tuning and flow control problems, native IB applications can simply move data over the WAN using RDMA transfers. Sustained efficiency is very high, often above 95% of maximum over many thousands of miles.

The encryption and authentication functions are important to users with sensitive data to safeguard:

**Medical data sets** High resolution MRI scans can now exceed 1 Tbyte in size. DNA sequencers can generate many Tbytes per day. Patient confidentiality legislation such as HIPAA can prevent these large data sets from being moved without encryption.

**Financial services** High-frequency trading applications are extremely latency sensitive, and may benefit from zero-penalty strong encryption and authentication.

**Off-site replication** Avoid encrypting at rest just to support use of an untrusted high-performance replication pathway.

An equally important consideration is the control of access to the infrastructure itself. Longbow E series provides high security without performance compromise.

**Longbow Products use technology covered by U.S. Patent #7,843,962 - additionally, corresponding patents have been granted in the U.K., Australia, Mexico, Japan, China, Russia, Korea, Israel and Canada, with additional patents pending worldwide.**

### Specifications

#### Chassis

Mounting	19" rack-mount compatible, front mounting rail-less system
Physical	1U high, 12" deep, 14.5 lb
Input Power	75W Dual independent, redundant 90-264 VAC at 50-60 Hz
Environmental	10-45 degrees C (32-113 degrees F) ambient
Airflow	Pressurized system, filtered, rear-to-front
High Availability	Redundant, hot-swappable AC power and cooling modules
External Ports	2 AC input, management 10/100 Ethernet, 2 10/100/1000 Ethernet, 1 4X SDR InfiniBand, 10G / OC-48 optical WAN

#### Management

Ethernet	Full duplex 10/100 Base-T Ethernet with auto MDI-X
In-Band	WAN side management access for IPv6 capable WAN
Protocol Support	IPv4, IPv6, HTTP/HTTPS, SNMP, DNS, ZeroConf and DHCP
Serial	RS-232 w/ RJ-45 connector (CISCO style pinout)
GUI	Web-based interactive management
User Management	Single user account, SNMP v2/v3
HTTP	SSL v2/v3 and TLS with HTTP digest challenge/response password exchange
Configuration	Through Web GUI or via a text based configuration file
Firmware	Web upgradeable. Primary/Secondary high-availability

#### Standard Supplied Optics Transceivers

	10Gb Ethernet	OC-48 SONET
Type	1310nm LR XFP	1310nm IR1 SFP
Connector type	Duplex-LC SMF	Duplex-LC SMF
Raw Bit rate	10.3125 Gbits/s	2.48832 Gbits/s
Optical range	10km	20km

#### Wide Area Network Interfaces

Node Type	Host
Physical Layer	Optical 10GBASE-LW/LR or OC-48 Packet Over SONET
Ethernet Payload	IPv4 or IPv6
Buffer Capacity	1GiB for 1 data VL (up to 1 second RTT in 10G WAN mode)

#### InfiniBand Interface

Connector	IB CX4 4X Copper, SDR at 10Gbit/sec
Node Type	Two-port switch or two-port router
Physical Layer	InfiniBand Architecture v1.1, with v1.2 powered port option
Subnet Manager Agent	Integrated InfiniBand Architecture v1.2
Virtual Lanes	1 data, 1 management
GID routing entries	Up to 65536 (Unicast), Up to 32768 (Multicast)
Port-to-port latency	1.1µs (switch mode), 1.3µs (router mode) (small packet store-and-forward, encryption enabled)
Packet routing rate	Up to 20 million packets per second

#### Encryption and Authentication Algorithms

Cipher	AES-256-GCM-128, AES-192-GCM-128, AES-128-GCM-128
Integrity	HMAC-SHA2-512-256, HMAC-SHA1-160, HMAC-SHA1-96, HMAC-MD5-96
Groups	MODP-6144, MODP-8192, MODP-4096, MODP-3072
Pseudo-Random	HMAC-SHA2-512, HMAC-SHA2-384, HMAC-SHA2-256, HMAC-SHA1
Key exchange	IKEV2

#### Gigabit Ethernet Interfaces

Node Type	'virtual wire'
Ethernet	Full-Duplex 10/100/1000 Base-T RJ-45 with auto MDI-X
Max Packet Size	1536 bytes (1538 with VLAN tag)
Protocols Forwarded	All Ethernet frames including: Multicast, VLAN tagged frames, 802.3ad link aggregation and 802.3d spanning tree.
Forwarding Rate	> 1 million packets per second per interface

#### Longbow E series models

<b>E100</b>	250km reach 10GbE or OC-48, 4X SDR IB switch base model
<b>M-G/ M-R/ M-C</b>	(Available modules for global range/router/crypto options)

#### Contacts

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