

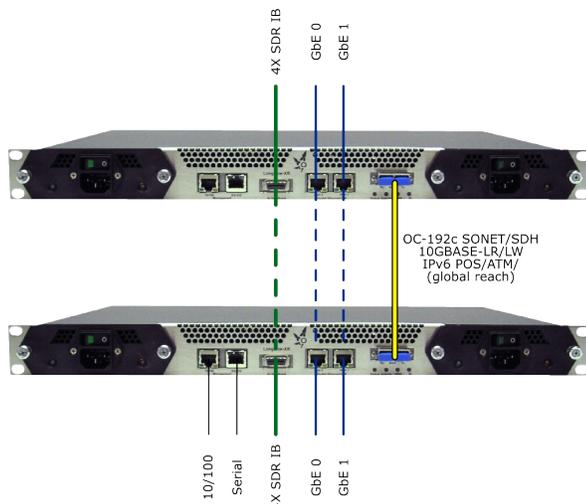
Global InfiniBand Range-Extending Switch/Router



Longbow X100 by Obsidian

Operation

A pair of Longbow X series devices communicate over an OC-192c Packet over SONET, ATM or 10 Gigabit Ethernet Wide Area Network (WAN) through their optical ports. Each device connects to local InfiniBand infrastructure through 4X SDR InfiniBand (IB) ports.



When configured in switch mode, the X 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 X 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 X 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.

Applications

Longbow X series devices are highly effective long distance bulk data transport enablers. 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.

While the 5 μ s/km (8 μ s/mile) optical flight time cannot be avoided, the devices also offer close to optimal point-to-point latencies between remote locations.

Remote IB Storage: Systems can extend the benefits of native IB storage over the WAN. Streaming at 1 Gbyte/s full duplex, 1 TByte-sized files can be exchanged in 15 minutes across the globe. Applications include compliance-or disaster-tolerance driven remote site backups, distribution of real-time streaming or at-rest science data and pure-IB Storage Area Networks (SANs) across Metro or Wide Area Networks. Military/ Intelligence communities benefit from the ability to stream large amounts of data quickly and securely across long distances.

Remote IB Visualization: High bandwidth and low latency characteristics make the devices highly suitable for long-distance real-time visualization of large and complex data sets. Extending IB performance and semantics from immobile supercomputers and clusters to cross-country or global locations allows for responsive, high-fidelity rendering and accelerated time to insight.

Grid Computing: The grid concept is underpinned by the ability to efficiently move data between data sources, computers, storage and users. Longbow X series devices can serve as excellent data pumps, moving grid traffic natively and rapidly. No TCP/IP stack tuning.

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, 14.5lb
Power	Maximum system power is 75W
Input Power	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, 10Gbits/s optical WAN
Acoustics	Intelligent fan speed control for quiet operation

Management

Ethernet	Full duplex 10/100 Base-T Ethernet with auto MDI-X
In-Band	WAN-side management access for IPv6 capable WAN protocols
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
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 FLASH storage with scrubbing.

Integrated Optics Transponder

Type	Integrated MSA-300 style factory replaceable module
Connector	Duplex-SC single mode fiber
Wavelength	1310 nm
Standards	SR-1/I-64.1, 10GBASE-LR, 10GBASE-LW
Range	GR-253-CORE: 7km, G.691: 2km, 802.3ae: 10km
Launch Power (Max.)	-1 dBm
Receiver Overload	0.5 dBm

Wide Area Network Interface

Node Type	Host
Physical Layer	Optical OC-192c SONET/SDH, 10GBASE-LW and 10GBASE-LR (user selectable)
SONET Payload	IPv6 or IPv4 over PPP (POS), AAL5 over ATM PVC, GFP-F and 10GBASE-LW
Ethernet Payload	IPv6
Buffer Capacity	1GiB for 1 data VL (up to one second round trip)
Timing	Internal stratum 3e reference, or line timing for SONET

InfiniBand Interface

Connector	IB 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	1.5 μ s (switch mode), 1.7 μ s (router mode) (small packet store-and-forward)
Packet routing rate	Up to 20 million packets per second

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 X series models

X100	Global range, 4X SDR IB switch/router
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Contacts

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