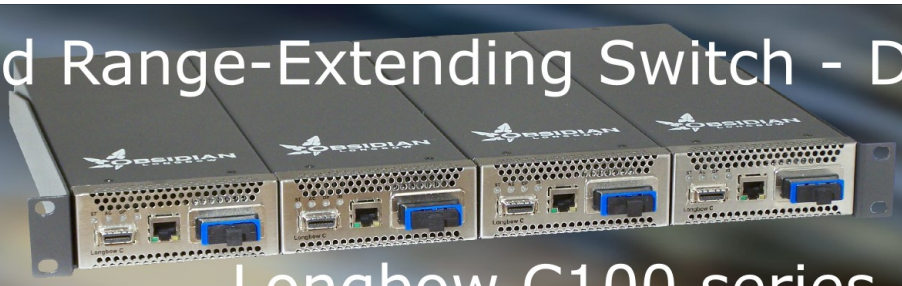
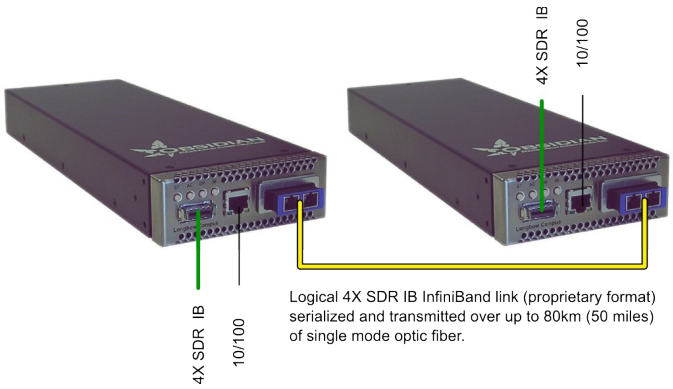
InfiniBand Range-Extending Switch - Dark Fiber



Longbow C100 series by Obsidian

Operation

A pair of Longbow C100 series devices share a point-to-point light path connection of up to 80km (50 miles) in length. Each 4X SDR InfiniBand port connects to the local InfiniBand (IB) infrastructure.



The Longbow C100 series devices report as two-port IB switches to the subnet manager – the IB fabrics at the two end-point locations unify into a single subnet.

The devices perform buffer credit extension at the link level and, when combined with the 10Gbits/sec serialized optical data stream physical layer, allow InfiniBand to reach much farther than any other technology.

Designed as a small-footprint solution, C100 series may be deployed in a desktop environment, or in a 19" rack, in which up to four units may be installed into an optional 1U shelf.

Longbow C100 series devices are managed through out-of-band 10/100 Ethernet ports. The devices use proprietary optical encoding; as such, they are deployed in pairs, connected by direct lightpaths.

Applications

Longbow C100 series devices have the effect of promoting InfiniBand from just a cluster area network to a high performance technology option for local, campus or even Metro Area Network (MAN) applications.

Storage Area Networks: With the introduction of Longbow C100 series, InfiniBand becomes a viable alternative to Fibre Channel and iSCSI over Ethernet for high performance Storage Area Networks (SANs). IB SANs offer the highest possible performance per port of any commercially available network technology. At the same time, (iSCSI with RDMA Extensions) iSER and SRP (SCSI RDMA Protocol) confer benefits by offloading the processors during data transfers. IB's intrinsic scalability and low-latency switches allow IB SANs to scale to extremely large storage capacities and throughputs, with best-in-class latency performance.

The devices enable inter-building SANs over robust, inexpensive and easy to install single mode fiber cables. Aggregating data and storage networking over a single IB fabric consolidates infrastructure and represents a significant cost savings compared to overlaying multiple fabric types.

An 80km maximum range addresses MAN applications, suitable for extremely fast file sharing between sites for routine user-level access as well as for efficient off-site backup strategies.

Cluster Aggregation: In many campus environments, numerous compute clusters are distributed over several kilometers. The C100 series' low latency enables a new class of applications; the clustering of clusters over a campus area network to assemble larger aggregate clusters. Installed at customer sites, it has been shown that such a technique is highly efficient, and goes a long way to improving the use rate of smaller clusters within a large organization or institution.

The key to the success of this approach is the network transparency of the C100 series devices (no coding changes are necessary to adapt locally connected InfiniBand applications to use the range-extended links). Coupled with the low port-to-port latency of the range extenders (840 ns), this feature makes it feasible for schedulers to dynamically provision activity across the links.

Remote Visualization: Smaller clusters are frequently used to assist in the interpretation of science data by offering responsive and high-fidelity interactive visualization experiences. Large-scale display walls are generally located in close proximity to the render cluster due to cable length restrictions of the cluster network. The devices offer campus-wide access to high-quality visualization.

This application allows more users to share a visualization resource, and encourages the consolidation of visualization clusters into a central location, from which many points on a campus can be served. This approach provides a higher performance/ cost ratio than provisioning numerous smaller clusters at each point-of-use.

Specifications

Chassis

Mounting (Desktop)	Fitted with rubber feet
Mounting (Single Unit)	19" rack-mount, front mounting no-rail system
Mounting (Quad Pack)	19" rack-mount shelf, front mounting no-rail system
Physical	1.5"x4.25"x13"
Max system power	18W
Input power	90-264 VAC at 50-60 Hz
Environmental	10-45 degrees C (32-113 degrees F) ambient
Airflow	Rear to front flow
External Ports	1 AC input, 1 management 10/100 ethernet, 4X copper IB SDR, 1 X2 module port
Acoustics	Intelligent fan speed control for quiet operation

Management

Ethernet	Full duplex 10/100 Base-T Ethernet with auto MDI-X
Protocol Support	IPv4, IPv6, HTTP/HTTPS, SNTP, DNS, ZeroConf and DHCP
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 configuration file
Firmware	Web upgradeable. Primary/Secondary high-availability FLASH storage with scrubbing.

Optics Module

Type	X2 module
Connector	Duplex-SC
Wavelength	(model dependent – see below)
Raw Bitrate	10.3125 Gbits/second

Optical Interface

Node Type	Two-port switch
Physical Layer	X2 specification
Payload	IB link - proprietary encoding
Payload Bandwidth	10.0 Gbits/second
Buffer Capacity	128KiB for 1 data VL

InfiniBand Interface

Connector	IB 4x Copper, SDR at 10 Gbits/second
Node Type	Two-port switch
Physical Layer	InfiniBand Architecture v1.1, with powered port option as per v1.2
Subnet Manager Agent	Integrated InfiniBand Architecture v1.2
VLs	1 data, 1 management
Port-to-port latency	840 ns (small packet store-and-forward)

Longbow C100 Series Models

C100-SR	300m range	(MMF – 850nm)
C100-LR	10km range	(SMF – 1310nm)
C100-ER	40km range	(SMF – 1550nm)
C100-ZR	80km range	(SMF – 1550nm)

Contacts

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OBSIDIAN STRATEGICS

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.