

XSIGO I/O DIRECTOR DATA SHEET

Xsigo I/O virtualization: dynamically connect any server to any network or storage

Transform your IT infrastructure with the Xsigo VP780 I/O Director, a hardware and software solution that streamlines server I/O management. Instead of deploying multiple I/O cards and cables to every server, Xsigo lets you connect servers with a single cable and then create virtual I/O resources instantaneously. The result is 100x faster server management, 70% fewer cables and cards, and up to 50% less capital cost.

I/O VIRTUALIZATION DELIVERS FLEXIBILITY, COST SAVINGS

The Xsigo I/O Director employs virtualization to let you flexibly connect servers to networks and storage. Xsigo eliminates the physical storage and networking cards found in every server and replaces them with virtual NICs and virtual HBAs that can be deployed on the fly. Applications and operating systems see these virtual resources exactly as they would see their physical counterparts. The result is an I/O architecture that is much easier to manage, far more cost-effective, and fully open.

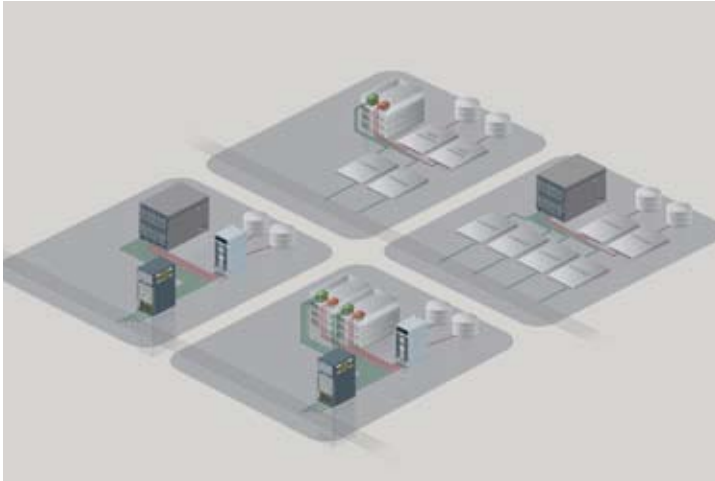
HIGH PERFORMANCE

Put an end to performance bottlenecks. With Xsigo, applications get the exact connectivity they need when they need it, with the added benefits of guaranteed I/O performance and isolation for security—even when multiple applications coexist on the same physical server. Intelligent QoS (quality of service) features guarantee specific bandwidth to critical applications or virtual machines.

HIGHLIGHTS

- Dynamically connect servers to data center resources in seconds
- Save 50% on capital cost vs traditional server I/O
- Eliminate 70% of the I/O infrastructure
- Reduce I/O-related power consumption by 30%
- Seamlessly scale I/O in blade systems and rack mount servers





Without Xsigo: Silos of server, switch and storage resources create an inflexible, complex structure



With Xsigo: Server and storage connectivity is consolidated to enable flexible allocation of resources, across the data center

“...External I/O virtualization can allow I/O resources to be pooled, expanded and assigned to individual servers or virtual instances in a more granular and dynamic fashion than traditional hardwired interfaces. ..”

- Gartner Research
May 2009

OPEN SYSTEMS FOR FLEXIBILITY

Xsigo is committed to open standards, so you can always use the servers, networking, and storage that you have today. And future purchases can be from any standards-based vendor. Most alternative solutions employ proprietary gear, which means you cannot re-use what you have. Worse, you're locked into a single vendor's gear for years to come. Xsigo keeps your options open.

RELIABLE, SIMPLE AND EASY TO INTEGRATE

With an open, standards-based architecture, the 4U-high Xsigo I/O Director is non-disruptive and simple to integrate. Transparent to applications, networking, and storage, the I/O Director's open standards support ensures interoperability across X86 servers and blade systems. The system's fully redundant, hot-swappable power and cooling, hot-swappable I/O modules, and passive mid-plane ensure superior reliability and serviceability.

PREDICTABLE USER EXPERIENCE

Get end-to-end performance control with Xsigo's integrated QoS features. Both storage and network bandwidth can be controlled via fine-grained traffic policing, helping to ensure that critical applications deliver the required performance.

INVESTMENT PROTECTION

Change is inevitable in any data center infrastructure. Whether it's a new network, a different interconnect standard, or new server connectivity, Xsigo makes it easy to adapt. The modular hardware architecture lets you quickly add new server connectivity – such as 10Gb Ethernet, FCOE, iSCSI or 8Gb Fibre Channel. Xsigo's virtual architecture lets you deploy this connectivity across hundreds of servers quickly and without disruption. What's more, Xsigo's commitment to open standards means that Xsigo solutions are widely interoperable with the servers, blade systems, switches, and storage of your choice – both now and down the road.

VIRTUALIZATION AND CLOUD COMPUTING

As managed service providers look to deliver improved service levels, Xsigo virtual I/O enables new virtual machines to be provisioned and deployed significantly faster than with traditional I/O. SaaS providers can not only move faster but have the ability to charge their customers based on smaller increments of bandwidth consumed. Better service with lower costs delivers a competitive advantage.

I/O Virtualization

THE XSIGO I/O DIRECTOR

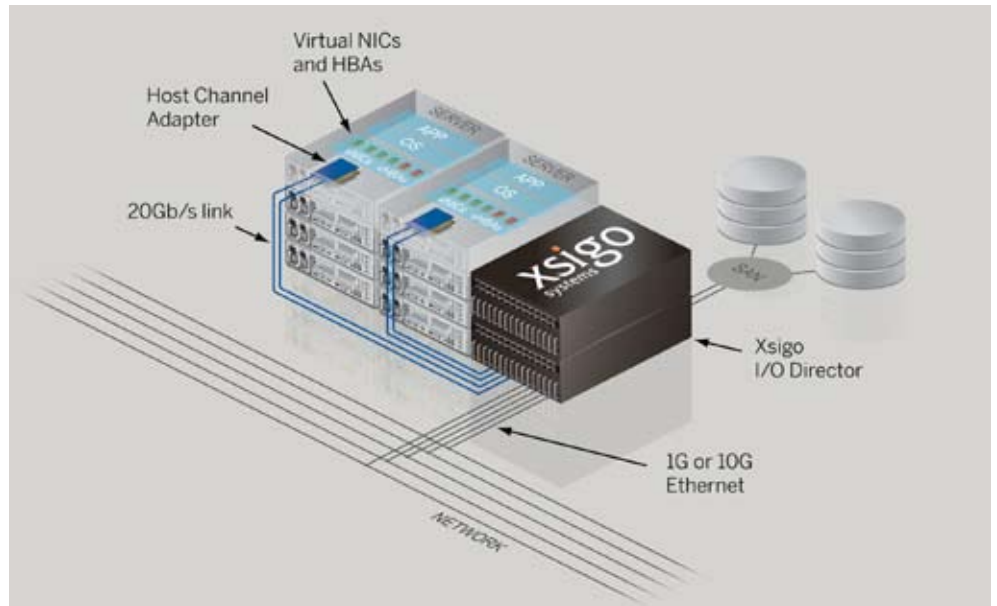
The Xsigo I/O Director consolidates server I/O by replacing a server's multiple Ethernet and Fibre Channel interfaces with a single high-speed, low-latency 20 Gb/s link. Multiple virtual Ethernet interfaces (vNICs) and virtual Fibre Channel interfaces (vHBAs) communicate over this link, and virtual interfaces are established using Xsigo's virtualization hardware and Xsigo's host drivers.

ELEMENTS OF THE XSIGO SOLUTION

- **High-Speed Fabric:** Non-blocking fabric incorporates 24 ports for direct connection to servers. Scale to hundreds of servers by integrating the Xsigo IS24 Expansion Switch.
- **System Controller:** The Xsigo system controller and Xsigo operating system control virtual resources across all attached servers. To ensure performance and reliability, the system controller lies outside the data path.
- **I/O Modules:** For connection to storage and networks, add up to 15 hot-swappable modules. Choose from Ethernet (1G or 10G), or Fibre Channel. Each module incorporates custom Xsigo silicon designed specifically to optimize server I/O.
- **Management Software:** The Xsigo I/O Director is easily managed through a CLI or its intuitive GUI. Connectivity can be deployed through a quick drag-and-drop operation. The I/O Director also integrates with existing management frameworks through an open API.

HOST CHANNEL ADAPTER

A single host channel adapter in each server consolidates storage and network connectivity. Each HCA can deploy up to



64 virtual connections within the server. Other than a standard driver, no agents or management software are installed on the server.

EXPANSION SWITCH

The Xsigo IS24 Expansion Switch provides 24 ports for additional server connectivity fan out to provide consolidated I/O for hundreds of servers.

ENABLING THE GREEN DATA CENTER

Server virtualization is a proven path to reducing energy consumption in the data center. However, server consolidation actually increases the switching infrastructure and complexity due to the increased I/O requirements.

Xsigo I/O virtualization enables more of the energy and cost saving potential to be realized by significantly reducing the switching and cabling infrastructure.



MANAGEMENT:

Management Interfaces	Java-based management GUI, command-line interface (CLI) through SSH and Advanced API for integration with third party software
Lights Out Management	Supports IPMI based LOM
Management Module I/O	Ethernet management network, RS232 console, auxiliary ports, USB

SERVER INTERCONNECTS:

Ports	24 non-blocking DDR InfiniBand server ports
Interconnect Speed	Cx4 Copper (ports powered for fibre optic interfaces) 20 Gigabits per second per port full-duplex

EXPANSION SLOTS:

Module Slots	15 slots for I/O and service modules 20 Gigabit per second full-duplex bandwidth per slot
--------------	--

10 GIGABIT ETHERNET I/O MODULE:

Physical Ports	One optical XFP or Cx4 XFP Port
Virtual Interfaces	Up to 128 virtual NICs (vNICs) per module Up to 1,920 vNICs per VP780 IO Director
Quality of Service (QoS)	User-settable QoS features per virtual NIC include: CIR – committed information rate PIR – peak information rate 802.1p Priority Queueing/Scheduling
Checksum Offload	IP header checksum offload
Jumbo Frames	Supports jumbo frames up to 9000 MTU
VLAN	Supports 802.1Q VLANs, 4096 per virtual NIC
PXE	Virtual NICs can be configured for PXE boot
MAC Addresses	Each vNIC is assigned a unique MAC address MAC addresses can dynamically migrate with specific virtual machine

4-GIGABIT FIBRE CHANNEL I/O MODULE:

Physical Ports	Two 4/2/1 Gbps auto-negotiating SFP ports
Connectors	Two SFP optical transceivers (850nm)
Virtual Interfaces	Up to 128 virtual HBAs (vHBAs) per I/O module Up to 1,920 vHBAs per VP780 I/O Director (Two vHBAs reserved for internal card management)
Protocols	FC-AL, FCP (SCSI-FCP)
LUN Masking	256 LUNs per storage target per virtual HBA
World Wide Name (WWN)	Each vHBA is assigned a unique WWN WWNs can dynamically migrate with specific virtual machine
Quality of Service	User settable QoS features per virtual HBA include: CIR – Committed information rate
SAN Boot	Virtual HBAs can be configured for SAN Boot

10-PORT GIGABIT ETHERNET I/O MODULE:

Physical Ports	Ten Gigabit Ethernet ports, RJ-45 style
Virtual Interfaces	Up to 160 Virtual NICs (vNICs) per module Up to 2,400 vNICs per VP780 I/O Director
Quality of Service (QoS)	User-settable QoS features per virtual NIC include: CIR – committed information rate PIR – peak information rate Supports 802.1p Priority Queueing/Scheduling
Port Aggregation	Supports Link Aggregation Groups (LAG), up to 10 ports
Checksum Offload	Supports IP header checksum offload
Jumbo Frames	Supports jumbo frames up to 9000 MTU
VLAN	Supports 802.1Q VLANs, 4096 per virtual NIC
PXE	Virtual NICs can be configured for PXE boot
MAC Addresses	Each vNIC is assigned a unique MAC address MAC addresses can dynamically migrate with specific virtual machine

About Xsigo Systems

Xsigo is the leader in data center I/O virtualization, a solution that dramatically reduces operational expense by changing the way that servers are connected to networks and storage.

Headquarters:
Xsigo Systems, Inc
70 West Plumeria Drive
San Jose, CA 95134
USA
Tel: 408-329-5600
www.xsigo.com

Japan:
Xsigo Systems Japan K.K.
Level 7 Wakamatsu Building
3-3-6 Hihonbashi Honcho
Chuo-ku, Tokyo 103-0023
Tel: +81-3-6202-7484
www.xsigo.co.jp

Europe:
Xsigo Systems Ltd.
No. 1 Poultry
London, EC2R 8JR
United Kingdom
Tel: +44-(0)-7917-763156