

# 10 Ways Virtual I/O Enhances Network Management

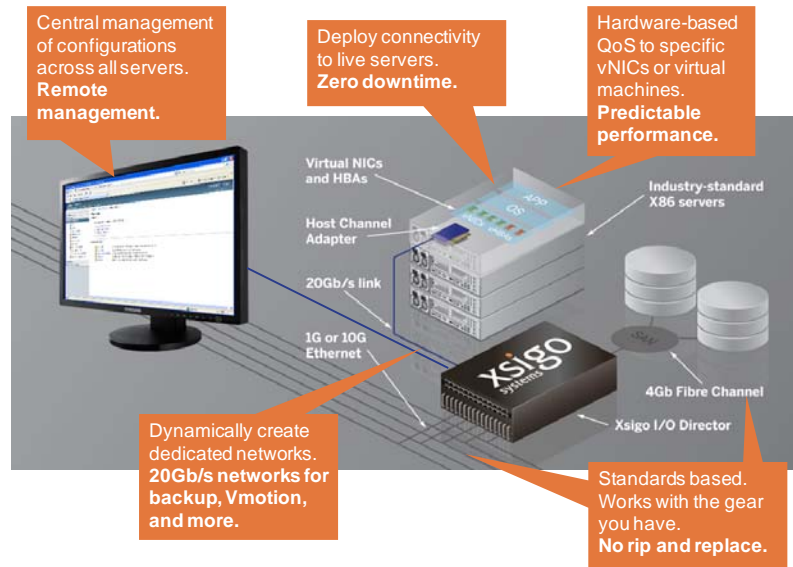
Virtual I/O delivers a new approach to network and storage connectivity. By replacing fixed resources (NICs, host bus adapter cards, and cabling) with simple-to-manage virtual resources (virtual NICs and HBAs), virtual I/O provides network management benefits such as:

- Single-pane-of-glass, remote I/O management
- Consistent user experience ensured by configurable QoS
- Resources controlled entirely in software, minimizing the disruption caused by change
- Allows I/O to adapt in real time to changing application requirements

This paper illustrates a few specific examples of how virtual I/O streamlines network management.

**1) Less downtime:** Virtual I/O lets you enhance uptime with full redundancy and accelerated re-configuration.

- Redundant network connections: With physical I/O, it may be difficult to configure redundancy on every network connection. Virtual I/O enables redundant virtual NICs that can be deployed wherever needed. Limitations of cabling, card slots, or port availability are eliminated.
- Configuration agility: When downtime strikes, virtual I/O makes it easier to respond. Meet response SLAs by re-configuring or moving I/O from one server to another in seconds. Remote management enhances your response capabilities.



**2) Reduce LAN re-mapping:** Several events can trigger the need to re-map networks, including equipment failures, upgrades, or re-distribution of applications. With virtual I/O, these tasks become far simpler. MAC and IP addresses can be moved from server to server, and remain persistent, even through equipment failures. No remapping is required.

Event	Traditional I/O	Virtual I/O	Benefit
Server failure	Install new server. If server has new NICs, remap networks	Migrate virtual NICs to new server. New server takes on the complete I/O identity of the old one.	No remapping. Fast switchover. Can migrate all I/O resources for complete server switchover in minutes.
Application Migration	Move application. Re-map networks to new NICs.	Migrate virtual NICs to new server	No network remapping. Application has immediate access to network resources.

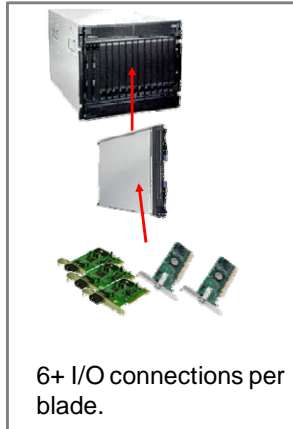
**3) Predictable user experience:** Virtual I/O lets you maintain a consistent user experience with quality of service management. Each virtual NIC can be configured with individual QoS parameters. User experience can be managed even in virtualized server environments where multiple VMs share I/O connectivity.

**4) Higher bandwidth, less latency:** Xsigo boosts bandwidth and reduces latency with fast 20Gb links to every server and vNIC-to-vNIC switching. When two vNICs are terminated to the same port -- and they share a VLAN -- traffic between them is switched in the I/O module, delivering bandwidth and latency that are superior to external Ethernet switching. Traffic isolation is ensured since vNIC-to-vNIC switching does not move data across ports or across modules.

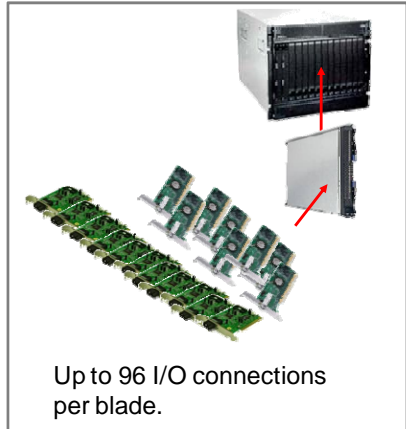
**5) Scalable I/O for blades:** Most blade systems have physical constraints that limit the number of I/O connections per blade.

With virtual I/O, storage resources can be deployed as needed, up to 64 virtual NICs and 32 virtual HBAs per blade.

Before



After



**6) Remote, single screen management:** With Xsigo, all connectivity can be managed remotely, a benefit not offered by traditional I/O. Single point control of all configuration settings simplifies management tasks. Network managers still maintain end-end management of all Ethernet connectivity, all the way to the servers.

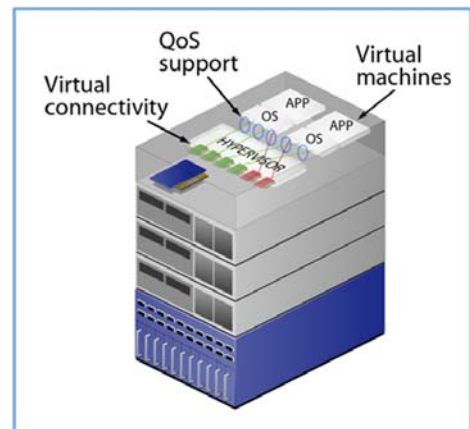
**7) Enhance iSCSI and NAS performance with dedicated networks:** Accelerate Ethernet storage by configuring dedicated networks when needed. Virtual resources can be deployed to all servers, and a new network can be created within the Xsigo infrastructure. Any Ethernet connection can access 20Gb of bandwidth when needed. iSCSI or NAS storage benefit from greater performance without the need to connect 10G networks to every server.

**8) Consistent user experience with virtual machines:** Virtual machines can create I/O bottlenecks that lead to an unpredictable user experience. With virtual I/O, network and storage QoS parameters are enforced in hardware for precise management and no server overhead.

Configure QoS in two ways:

- Per virtual NIC: Associate vNICs with specific virtual switches and virtual machines.
- Per virtual machine: Define QoS attributes per virtual machine. Controls to remain in effect through VMotion events, regardless of which physical server the VM runs on.

Dedicated virtual I/O delivers the same isolation benefits as dedicated physical connectivity, at a fraction of the cost and with far more management flexibility.



**9) Less need for open zoning:** For some users, VMotion may violate network management policies because of the requirement for "open zoning." With Xsigo, I/O can be migrated with the VM, allowing the application to move from one server to another without I/O restrictions and without the need for open zoning.

**10) Remote management:** Virtual I/O can be managed from anywhere. With the ability to remotely control all I/O settings, it becomes faster and simpler to respond when changes are needed. Server failures, DR scenarios, or performance issues are easier to manage when you are not faced with the added complexity of travelling to and gaining access at the data center.

**Fully leverages existing infrastructure and tools**

Virtual I/O is a new approach, but not a disruptive one. It ensures investment protection for existing gear, and does not change existing management protocols.

**Investment protection:** Virtual I/O does not change your network infrastructure. It extends the I/O bus from the server to the Xsigo I/O Director. From that point on, the network remains the same. Only edge switches are displaced. Xsigo does not change any of the core switch, VLAN, or firewall settings.

**Self-contained fabric:** Xsigo incorporates a self-contained fabric with integrated management tools. Xsigo sells and supports the entire solution. All devices attached to the fabric (the Xsigo I/O Director and HCA cards for the servers) are supplied by Xsigo.

**About Xsigo Systems**

Xsigo is the technology 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.



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