



Xsigo Extends Reach with VP560 I/O Director — Right Product for Managing Modern-Day Clutter

Analyst: Jim Baker

Management Summary

Every household has at least one of them: *the Clutter Drawer*. It is filled with everything that does not already have its own place, such as coupons, pencils, small tools, tape, paper clips, rubber bands, slips of paper, take out menus, and, of course, tape for wrapping packages and gifts. Even in the most organized of homes, this junk repository only makes marginal sense. However, if you do not know where something is, maybe it is in the Clutter Drawer. That situation may be good enough for most households, but such *disorganization* is not appropriate for modern IT data centers. Yet, we have all seen the clutter of wiring closets, patch panels, spaghetti cables, and dangling wires (to no one knows where) that have lost their stick-on destination labels. What a mess – and, inefficient too!

If your data center is like this, it is probably not your fault and certainly has not been intentional. You simply may not know where the last cable went or maybe you cannot trust out-of-date wiring diagrams. Perhaps that cable was installed on somebody else's shift. Yet, as the data center has evolved, there are more piece parts to need to be connected. In addition, as servers, storage, and users relocate, they necessitate adjustments to the infrastructure too. Pity the poor *Cable Guy*. He (or she) deals with this issue every day.

This situation is so prevalent that there is an urban legend involving the drop ceilings in offices all over Manhattan. The legend has it that there are copper mines right there "In the City", as New Yorkers like to describe their town. Except this time, the copper miners themselves are not wearing dungarees and helmets with lights on them. There are no conveyor belts to carry the precious metal to the surface. Rather, the new miners are using specialized equipment called "cable pullers" to yank out the many no-longer-in-use cables found in the building's cable tracks and plenums. When melted down, the copper can return good value in the reclaimed metals market. Moreover, why don't they just relocate existing cables and reuse them when a new server or network device needs to come on line? *Because it is too hard*. It is easier just to run a fresh wire of known quality that you know exactly where it is going and how it will be used. Xsigo Systems (San Jose, California) seeks to prevent this behavior. As a result, users can avoid surreptitious Manhattan mining projects and unnecessary cable pollution.

Recently, however, it has become more than just a problem for the cable installers. The advent of virtualization means that the physicality of where everything is located is now secondary to how the elements relate to each other. How are they managed if they are in constant motion? The answer lays in the management of virtual I/O from Xsigo with their *VP560 I/O Director* and its big brother the *VP780 I/O Director*. To learn why Xsigo's offerings are timely for today's evolving data centers, please read on.

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The World According to Xsigo

Xsigo Systems (pronounced, “See Go”) is an IT infrastructure company based in San Jose, California. Around since 2004, Xsigo has found their niche in the creation of non-proprietary I/O controllers that place data onto and take data off connections between IT infrastructure elements (servers, storage, networks, etc.) At first blush, it would seem that their product line simply helps organize the wiring closets of IT organizations. Yes, it does. However, it does so much more and with increasing impact. As virtualization spreads throughout the enterprise, first at the server level, then at the storage level, and ultimately at the entire business level, the beneficial results of using Xsigo take on huge proportions. That time is now, but it might have been yesterday.

Although their building block hardware elements are extremely useful, the software management of them is the real Xsigo value, since Xsigo can manage the I/O controllers in a “wire

it once” infrastructure that is built upon *I/O Directors*. There no longer is the necessity to relocate the physical building blocks as the locations change. Instead, use Xsigo software to associate them, as they are needed in the infrastructure. When the infrastructure changes, you simply re-associate the I/O Directors to the new reality. This capability has huge value to the virtualized organization. Think of it as a hardware software solution. The result of using Xsigo products in the busy data center is shown dramatically in Exhibit 1 below.

Consider the savings that can occur when your highly paid tech staff can avoid a middle of the night plane ride because he can realign your infrastructure remotely but from a local console. Fewer people on planes means savings of operational expenses. International companies can manage from anywhere on the globe because they are not physically pulling the plugs but instead are moving computer icons to achieve the same results.

Exhibit 1 — Cabling the Old Way and the Xsigo Way



The Old Way

Source: Xsigo



The Xsigo Way

Xsigo's Products

This seemingly “duh-simple” product concept is not as trivial as you might think. Today's organizations are in constant flux. Server virtualization lets servers share physical server footprints. Storage virtualization lets data float to where it is needed – with transparency. Xsigo's latest products allow all of this to occur in response to automated scripts rather than CLI commands or brute force reconfiguration procedures.

Xsigo eliminates the multiple storage and networking cards found in a server and replaces them with a single card called a *HCA (Host Channel Adapter)*. That single card (or two for redundancy) can create multiple virtual interfaces *vNICs (virtual Network Interface Cards)* and *vHBAs (virtual Host Bus Adapters)* that appear to the operating system or hypervisor exactly like their physical counterparts. These virtual NICs and HBAs can be deployed on the fly – up to 64 of them per server – using the software provided by Xsigo.

When a virtual resource is created within a server, it is mapped to a specific uplink port on the I/O Director. When you then connect that port to a LAN or SAN, it is exactly as if you had physically connected that network or storage to that server via a hardwired connection.

The difference, of course, is that with Xsigo this configuration is done entirely in software (rather than with cards and cables) and can be completed on live servers. Thus, there is no downtime, no de-racking, and no cabling.

Easier Diagnosis and Triage for Trouble Spots

Implicit in this design is on-the-fly provisioning of I/O resources without disrupting the network and storage. When trouble appears, the offending module can be taken offline without affecting other modules, other applications, or other I/O traffic.

Xsigo Represents a Repeatable Rack

Using rack-mounted Xsigo modules leads to ease and speed of deployment, both important dimensions in the virtual world. From a support point of view, this feature is good for organizational support and training. Taking the variability out of the equation means removing unnecessary opportunities for human error.

Xsigo customers report that server and storage deployments have been reduced from weeks to hours due in part to consistent usage of plug

Exhibit 2 —

Supported Environments

Xsigo supports the following server operating environments:

- *VMware ESX*
- *Microsoft Windows Server*
- *Microsoft Hyper-V*
- *Sun Solaris*
- *Oracle VM*
- *Red Hat Enterprise Linux*
- *Citrix XenServer*

Xsigo supports FC, iSCSI and NAS storage systems from these vendors:

- *Dell*
- *3PAR*
- *Compellent*
- *EMC*
- *Hitachi*
- *HP*
- *IBM, including XIV*
- *NetApp*
- *Pillar Data*

Xsigo supports networking interoperability with:

- *Cisco*
- *Brocade*
- *HP*
- *Juniper Networks*

Source: Xsigo

and play modules. They also report 70% fewer cables, cards, and switch ports in the I/O infrastructure. Besides the obvious convenience factor, the customer can reduce unnecessary acquisition and support costs. Consistent use leads to standardization. (See Exhibit 2, above, for a list of supported operating environments and tested interconnectivity with networks and storage systems.)

Quality Assurance vs. Spaghetti Wiring

Loaded question: How do you QA a length of cable? *Answer: Not easily.*

As a manufacturer, Xsigo performs rigorous quality assurance tests and processes on its products. Compare this level of assurance to what you would experience if it were even possible to “QA” spaghetti wiring.

Private Cloud Infrastructures

The phenomenon known as the *Private Cloud* uses virtual servers and virtual storage in pools interconnected by the network. Xsigo lets

each physical server use just one physical connection and then creates 100s to 1000s of I/O resources on-demand. A byproduct is that applications get the performance they need and are expecting, with the added benefit of isolated connectivity (i.e., all traffic is controlled by Xsigo). Quality-of-service profiles can be developed for each of the virtual connections (both storage and network) that make up the infrastructure. A Graphical User Interface (or GUI) manages all elements inside the cloud.

Remote Management

Imagine being able to enter the data center from a remote location. Using Xsigo's agentless software, you can reconfigure without having to go on site. This approach is perfect for lights out deployments (where systems are housed in remote locations and are running unattended).

Essentially, it is the software performing the re-cabling rather than a human being pulling, pushing, tugging, and testing. The end result is a space-efficient infrastructure that is built out just once. Servers can be "stood up" easily and the infrastructure can be extended with little effort. Maintainability is enhanced. Xsigo claims 100 times faster server management, 75% fewer cables and cards¹, and up to 50% less capital cost. Each of these claims is impressive.

The cards, cables, and switch ports that Xsigo replaces all cost money. If there are Fibre Channel or 10G connections involved, it can be a lot of money. Depending on how many are involved, the CapEx savings can range from 30% to 70%. A 50% savings is typical, according to Xsigo.

This frequently understates the true savings because it's not an apples-to-apples comparison. With Xsigo, you have multiple 20G links that can be used for anything, as opposed to having slower links that can only be used for specific tasks (and, hence, often end up being underutilized). So, with Xsigo, users often see better

¹ With traditional I/O, customers deploy from 6 to 16 I/O cables to each server. The median is around 8 per server, according to Xsigo. With Xsigo's approach, you would have two per server; hence the claim of 75% fewer cables. Today, this claim may be a little conservative. The median number of connections used with traditional I/O seems to be increasing. It is not unusual to encounter a user who has as many as 22 per server. As users virtualize more apps and run more VMs per server (on servers with more powerful processors, more cores, and more memory), they need more connectivity. For many users, Xsigo can eliminate 80%-90% of the cables.

Exhibit 3 — Comparing VP780 vs. VP560

Functionally these two models provide identical features including common software management. Each can connect to one or more Xsigo Expansion Switches and each connects HCA (host channel adapter) cards in each server.

	VP780	VP560
Height	4U	2U
# Server Ports	24	24
# I/O Module slots	15	4
Scaling	Span Racks	Single Rack

Source: Xsigo

overall performance, including faster backups, better user experience, and faster *VMotion*. If they wanted to get that better end result with traditional I/O, the cost likely would be even higher.

Xsigo's New VP560 I/O Director

Recently, Xsigo announced its latest product, the model *VP560 I/O Director*. This product joins the *VP780 I/O Director* and associated products, such as the 24-port expansion switches, various I/O modules, and server-based host adapters. The difference between the two products is uplink scalability. The VP780 accommodates up to 15 I/O modules, for up to 150 uplink ports. The VP560 accommodates up to four I/O modules, for up to 40 uplink ports. Both have 24 server ports built in, and scale to more server ports with 1U expansion switches. (See Exhibit 3, above, for a tabular comparison of the two models.)

Just 2U in size, the VP560 is perfect for single rack implementations where there are fewer required connections, say 6 to 60 servers. Being half the height of the VP780 can be an important difference in a crowded data center. Yet, it can be used in conjunction with the VP780 and/or the 24-port expansion switch, should your organization experience rapid growth. Industry-standard Fibre Channel and Ethernet (both 1G and 10G) connections make for easy integration. Xsigo supports all standard interfaces.

Both the VP560 and VP780 use industry-standard *InfiniBand* for server connectivity.

Exhibit 4 — VP560 Connectivity

24 Server Ports (20G each)



Four I/O Module Slots

Source: Xsigo

That connection is transparent to the operating system or hypervisor, and transparent to the data center LAN and SAN. Those elements are presented with conventional FC and resources. The InfiniBand link acts as a single transport for the server's multiple Ethernet and fiber Channel interfaces. This high-speed (20 or 40Gbs) link consolidates traffic from all the virtual NICs and virtual HBAs to this single transport. Virtual interfaces are established using Xsigo's virtualization hardware and Xsigo's host drivers. (See Exhibit 4, above, which depicts where devices plug into the VP560 I/O Director.)

Designed for HA

The VP560 is designed for high availability. The devices themselves are usually deployed in pairs, with each I/O Director providing an independent data path to all servers. In the event of a failure, switchover occurs exactly as it would with conventional NICs and HBAs. The I/O Directors themselves include hot swappable power and cooling modules, meaning that applications need not be taken down to effect a physical change or replacement. Likewise, I/O modules are also hot swappable.

Open Standards Based

Xsigo uses standards-based protocols that

are open and proven. The Ethernet and Fibre Channel ports are driven by industry-standard silicon to ensure broad interoperability. Xsigo intentionally avoids vendor proprietary standards because those tend to "lock in" the user to a particular vendor. This approach gives data center managers confidence in the fidelity of their networks, as well as reassurance about the future flexibility of vendor choices.

"Pods" Designed for Flexibility and Scalability

While the VP780 is sized to provide uplink capacity sufficient for hundreds of servers, (i.e., without all of the spaghetti cabling), the VP560 has been designed (sized) to service the servers in a single rack. This enables a *pod-like* reproducible scale-out rack-unit building block that allows the easy (modular) construction of the next-generation data center. Xsigo is not in the business of selling pods. However, the VP560 is (or, more likely, a pair of them are) the essential missing piece for pod-like physical building blocks. The enterprise data center, or an integrator acting for them, would specify and order "their own" Pods to be delivered to the enterprise data center (or a co-location facility) on a when-needed basis. Some might have storage and/or battery backups as part of the specified

pod components and others may rely on external devices.

For users truly to benefit from Xsigo's pod concept, they must accept the advantages of a standard datacenter building block (the "all-in-one" pod). To do this, they must buy into the pod architecture and its implicit advantages. Finally, they must be willing to make appropriate scale-out investments. If they do all three, they will save cycles and time as they deploy standard building blocks and manage them remotely, perhaps without ever touching the Pod physically more than once.

Because pods are easily duplicated and interchangeable, support personnel would know exactly what is located where, being deployed for which applications, and how the elements are interconnected. Should fault diagnosis be required, technicians will know just where to look.

Configuration – Yes; Re-Configuration – Double Yes

Xsigo's value is important when configuring systems, storage, and networks for the first time. We all want a well-organized, clean, and tidy data center. Cabling must be efficient and well-routed using minimal, but "just enough," length. The pristine data center almost always starts out this way. However, over time the initial organization starts to erode. Xsigo's value is even higher when it is time to *re-configure*. Often, especially in a heavily-virtualized data center, we are using equipment in different ways than originally planned, as our business needs evolve or as technology (such as virtualization) enables its use in a different way. This repurposing of assets is now standard operating procedure, as ordered by today's cost-conscious CIOs.

Special Use Case: Trade Shows

If your company uses trade shows and conventions to market your products, consider the mega trade shows you have attended, such as the recent EMC World in Boston, where Xsigo was demonstrating its products on the show floor. Literally, hundreds of vendors populate a trade show exposition area, most of who are showing off software, server, storage, and end point innovations. Rather than running cables that resemble a rat's nest, vendors are using Xsigo products to standardize the interconnections, the initial set ups, as well as any dynamic reconfiguration steps. VMware, as an example, used Xsigo as the infrastructure for its booth at this event. Trade show supervisors never know the precise details of their booth's layout until they

arrive on site with their gear. Any variability they can take out of the configuration is most appreciated, especially when considering the short time windows they are given to put up and tear down their exhibits. Xsigo uses standard interconnection plugs and interfaces for simple and easy configurations.

All This and Green, Too

Besides reducing cable pollution, Xsigo products reduce I/O related power consumption by as much as 30%. Cooling efficiency contributes to this reduction in carbon footprint.

Xsigo's International Presence

Xsigo has an international presence that often is required by enterprise-class suppliers. They have offices located in Japan, United Kingdom and, of course, the USA.

Conclusion

Normally, the server operations manager buys Xsigo products as part of a server procurement (either as an initial buy or as a building block in the server replacement or upgrade program). This is always a good time to consider Xsigo. However, as discussed herein, there are many reasons to apply Xsigo I/O Directors to existing infrastructure (i.e., that was procured earlier). Accordingly, it may now make sense to widen the buying team to include the architect of your virtualization strategy and also the storage and network administrators. Each practice will experience real and quantifiable benefits from Xsigo's offerings and new approaches to important challenges. Their involvement will ensure cross-organizational benefits. While Xsigo's approach may seem like a radical disruption in the status quo, the potential for improvement should not be ignored. Check it out today.



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