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# Xsigo Virtual IO Optimizes VMware View

Current trends in VMware VDI deployments and how Xsigo virtual IO enables a lower cost, more flexible, more dynamic deployment environment for VDI solutions.

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Two of the most significant trends in the data center today are Cloud Computing and VDI or Virtual Desktop Infrastructure. This paper will take a look at the current trends in VDI deployments and how Xsigo virtual IO enables a lower cost, more flexible, more dynamic deployment environment for VDI solutions. Virtual IO enables any data center to rapidly deploy compute, storage, and network resources where and when they are needed to meet the needs of dynamic environments. VDI solutions, in particular, are complex to design, build, manage, and scale efficiently and effectively. The dynamic nature of changing desktop requirements makes this environment particularly fluid requiring new levels of flexibility and performance in order to guarantee the best performance at the lowest cost.

## Xsigo Virtual IO

Xsigo's Virtual IO solution is based on the VP780 and VP560 IO Director platforms. The Xsigo I/O Director provides universal server connectivity (1GE, 10GE, Fibre Channel) to X86 servers and blades. It increases operational efficiency by dynamically connecting any server to any network and storage resource in seconds. Virtual IO enhances server virtualization by providing high-performance, scalable I/O on-demand – up to 64 connections per server – with just two cables per server. This also enables the elimination of up to 70% of the I/O infrastructure to reduce complexity and CapEx.



Xsigo eliminates 70% of the cards, cables, and switch ports, to reduce cost and simplify server management.

### Benefits:

- 50% less cost: 50% less Cap Ex than conventional FC and Ethernet I/O
- Faster performance: Up to 80Gbps bandwidth to each server
- Higher density: Just one I/O card per server (two for redundancy), enabling smaller servers and blades
- Increased server utilization: Run more virtual machines per server to save on cost, space, power, cooling
- Predictability: Quality of service controls for both network and storage traffic help deliver predictable performance from virtual machines
- Fully open: Works with all X86 servers (VMware, Windows, Linux, Hyper-V, Solaris, Xen) to ensure sourcing flexibility

Xsigo's Virtual IO solution completes the cloud infrastructure model by complimenting virtualized servers and virtualized storage with virtualized IO connectivity enabling any server to connect to any networking or storage resource where and when it is needed.

## VMware View VDI Infrastructure

The VMware View infrastructure is based off of its standard ESX server virtualization platform. ESX enables multiple Virtual Machines to run on top of a single, shared physical server. Each VM can get dedicated CPU and Memory resources for its execution space or can share CPU and Memory resources depending on configuration. In the View deployment model, each of these VMs would host a standard Windows Desktop operating system. In addition to the hosted desktops, View provides a management suite for provisioning and managing your virtual desktop infrastructure.

- **View Manager** – connection broker and web front end to connect clients to hosted desktops
- **View Publisher** – tool for creating, updating, patching, managing, and deploying desktop images
- **VMware ThinApp** – a set of tools that enable streaming of applications to clients for local execution for better performance

These management tools combined with a pool of ESX hosts complete the View architecture. Based on user requirements, there are a number of different desktop entities that the user can be connected to including:

- **Dedicated Server:** User has a dedicated server running ONLY their desktop applications and not shared with others. This provides the highest performance and is typically used as a remote workstation
- **Dedicated Desktops:** VM running a desktop that ONLY belongs to a specific user. This desktop can be customized and saved consistently
- **Pooled Desktops:** Pool of VMs running a standard desktop image. This image can be customized per the pool, but each user cannot customize their desktop to their own needs.
- **Streamed Desktops:** Terminal server hosting dedicated apps that can be accessed remotely or streamed to the remote client for local execution

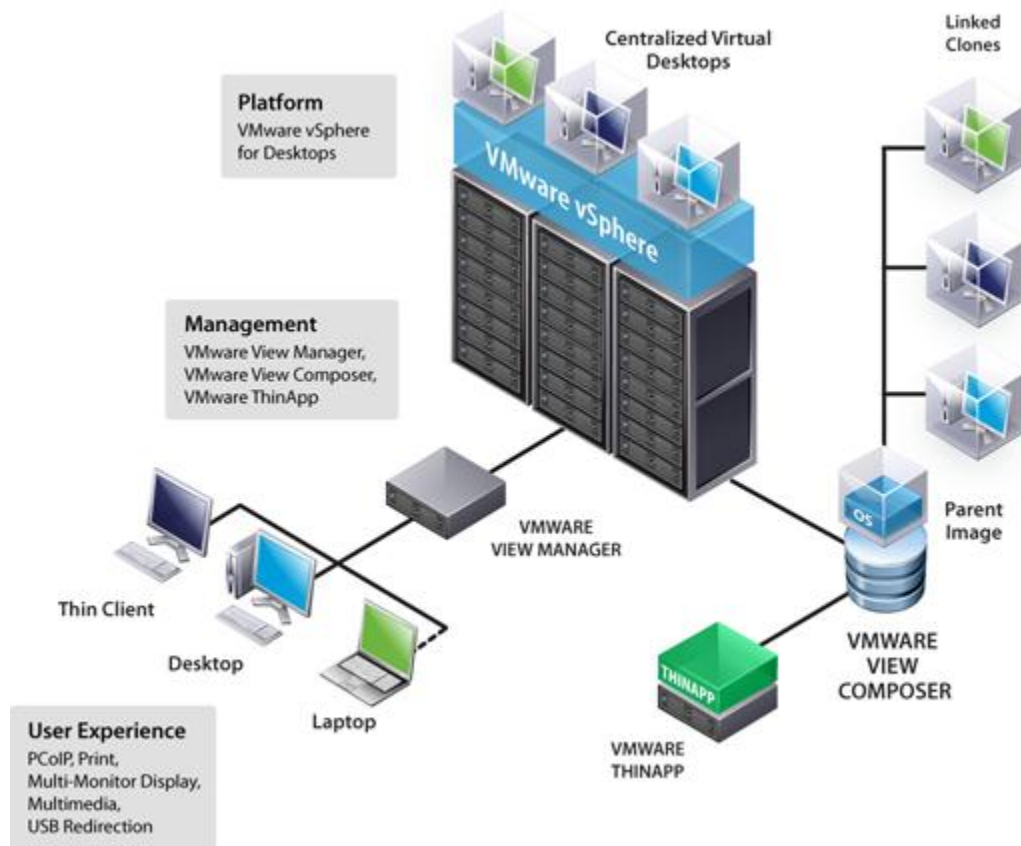
In the View architecture, all Desktop images run as a VM on top of an ESX host. In order to accomplish the above usage models, each VM will have the ability to be configured to service any user requirement above. Any VM can operate as a dedicated server, dedicated desktop, pooled desktop, or streamed desktop. For example, for a Dedicated Server, the VM would be configured to have full access to the entire server hardware resource pool and only 1 VM would run on that device.

VMware has a unique capability for servicing Pooled Desktops. Since every desktop must have its own VM, image management may become complex as each desktop image may be unique and may need to be managed individually, patched individually, and updated individually. In order to simplify this challenge, VMware has developed a technology called Linked Clones. This enables a single image to be published to a "parent VM". The parent VM can then be "cloned" to create VMs that are exact copies of the parent. In this way, a single parent VM can support many linked clone VMs all running the same image. This provides the ability to publish and manage a single image, and that single image can then be used by many different users simultaneously. Since all linked clone VMs are identical, any user can login and use any linked clone VM which provides the ability to publish a single, standardized desktop image and share it across hundreds or thousands of users.

VMware's ThinApp solution also provides the ability to share and stream specific applications to each desktop. This provides the additional benefit of centrally managing each application and who has access to the app. By centralizing the app, each app can then be centrally managed, updated, patched and upgraded and the changes will propagate across all users accessing the streamed app.

This array of virtual desktop specific management tools combined with the traditional VM management tools such as Vcenter provide a complete VDI solution that can easily scale to thousands of users.

Figure 2. VMware View Architecture



## Personalization

In addition to the core VDI infrastructure, in many cases, the VDI infrastructure is also accompanied by 3<sup>rd</sup> party solutions to provide an additional layer of personalization to each of the desktop environments. The addition of this personalization services from companies such as AppSense can add another layer of complexity to the overall VDI infrastructure. Careful network and storage subsystem design is required to in order to ensure timely access to remote desktops with the appropriate characteristic of each system.

A successful VDI deployment depends very heavily on the user experience of the remote clients. Should the users experience slow performance, long login times, slow apps, and jumpy video then the infrastructure may not meet

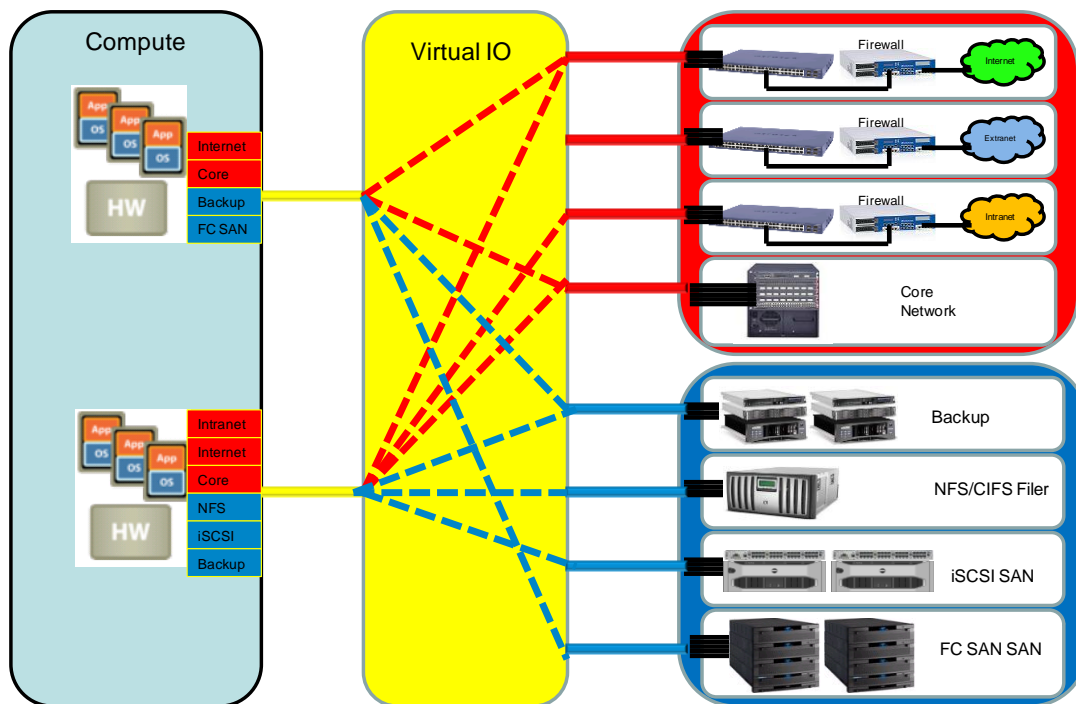
its objectives and may be scrapped. If this system is not designed and sized appropriately, then user experience can suffer significantly. In some cases, customers have experienced login times as high as 20 minutes per desktop. Clearly this is not a workable solution. So, how do you ensure sufficient user experience while optimizing the cost of the infrastructure?

In many cases, the exact user profile is not completely understood and as VDI deployments scale beyond simple call center apps there are often many different types of users with differing requirements and expectations. The VMware View architecture offers a model that enables many technologies to be brought together to offer different levels of customization and performance to meet almost any users needs, but how do you deploy this model in such a way that the different users can scale based on demand and operational characteristics can be tuned for each user? ....Deploy in a cloud

## Cloud Architectures

Cloud architectures are specifically designed for flexibility, scalability, and rapid change based on demand. Cloud infrastructure most often consists of pools of servers and VMs running on top of those servers, pools of networking resources, and pools of storage resources that can all be deployed and optimized depending on customer demand and requirements. Xsigo's Virtual IO solution is a key enabler of the flexible connectivity and optimization required to deploy cloud infrastructure. Virtual IO enables the ability to connect any compute resource to any networking and storage resource dynamically and specify the exact performance characteristics required by that connection

Figure 3. Cloud Architecture with Virtual IO



Xsigo's virtual IO solution enables IT administrators to dynamically change NICs and HBAs on the fly with no down time. Virtual IO makes it easy to add networks, add storage, change networking and storage parameters, and tune the connections for the performance requirements of a given workload. In a VDI deployment, such as VMware View architecture, the goal is to be able to meet the needs of an ever changing workforce. This means that as virtual desktop client requirements change, so must the infrastructure serving them. As an example, VMware View provides the ability to offer broadly standardized desktops down to individually customized desktops. As the mix between these different deployments changes, Xsigo can easily change the connectivity to any given server or VM to meet the needs of each client. These changes may include providing access to different network types, changing the bandwidth per VM to enable better user experience or to support higher performance applications, or simply adding more servers into the environment to scale the architecture. As a simple example, let's consider a client that uses a standardized desktop working in the Call Center of an organization. This person then gets promoted into the Marketing organization. Now they will need access to different applications and connectivity to a different network. The View infrastructure provides the ability to deliver the appropriate desktop infrastructure to the client, but if the networking and storage infrastructure is fixed....it will require significant work to delete one Desktop and recreate an entirely new configuration on a different server, connected to a different network and different storage configuration. With Virtual IO, the Network and storage connectivity can be dynamically created on the existing infrastructure to connect the existing client desktop to the appropriate network and storage infrastructure without changing a thing. With Xsigo's virtual IO infrastructure, any compute environment can become a Cloud infrastructure connecting any compute resource to any networking and storage resource dynamically with no downtime and no reconfiguration of the existing resources.

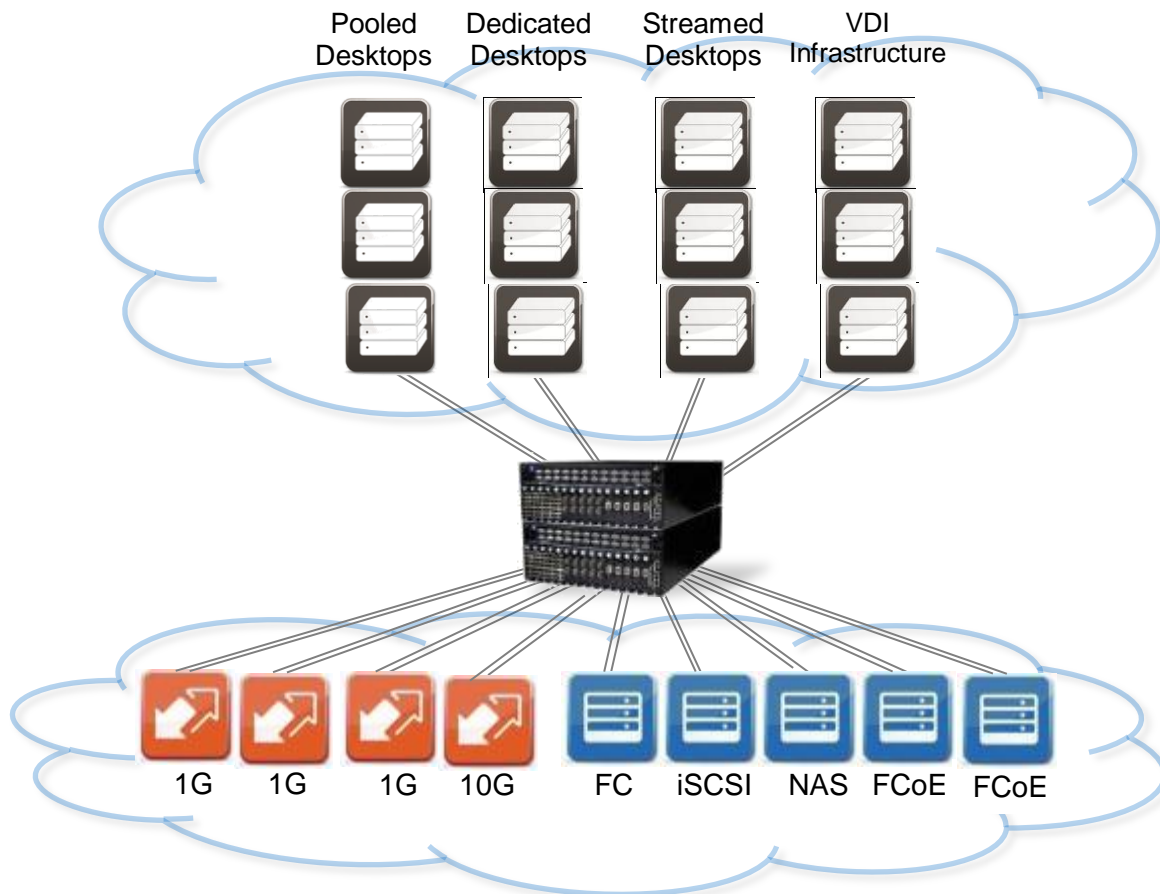
## Xsigo Virtual IO with VMware View

Xsigo virtual IO solution, when deployed with VMware View, creates a true VDI Cloud infrastructure. Any compute resource can be dynamically configured and reconfigured to connect to any networking and storage resource on the fly with zero downtime. In addition to the dynamic connectivity, Xsigo provides guaranteed bandwidth per virtual resource giving the ability of the VDI administrator to fine tune the infrastructure to guarantee the best possible user experience with the least amount of infrastructure. Xsigo's QoS parameters can be modified dynamically to help fine tune performance characteristics per VDI client with no impact to user experience. Xsigo's infrastructure also provides the ability to dynamically create private back-end networks across the Xsigo platform to enable servers to talk to each other at very high speeds further enhancing the ability to back up server configurations, migrate VMs, and dynamically change connectivity without changing any cabling. This enables higher performance infrastructure that can enable much higher VM or client density per server. Several of Xsigo's customers have been able to double the number of clients per host in their environment significantly increasing their return on investment of their View architecture.

Another critical part of planning any VDI infrastructure is the ability to plan to rapidly scale the infrastructure based on client demand and changes in the company. Most VDI deployments start out as fairly static configurations targeting simple environments such as Call Center Operations or Customer Support organizations. These organizations are fairly static in their system requirements and architectures designed to support these

specific environments rarely take into consideration the ability to scale beyond that one organization. The View architecture was specifically designed to enable the flexibility to deploy any time of VDI infrastructure to meet any client need. So, when migrating and growing beyond the initial deployment, it will be very important to consider how the architecture will scale including the additional bandwidth requirements, additional compute requirements, additional security requirements, and additional storage requirements. In many cases the secondary deployments beyond the Call Center require much different networking and storage architectures and require a re-architecting of the overall design. With Virtual IO, you can retain the “wire once” architecture and can dynamically change the connectivity, bandwidth, and additional resources without changing any of the downstream cabling and configuration. It is very easy to add additional compute nodes into the infrastructure and dynamically configure the new network and storage connectivity to any server at any time. Likewise, it is equally as simple to redeploy underutilized hosts from the primary deployment to additional users with different client requirements including additional networking and storage connectivity.

Figure 4. VDI Cloud with Virtual IO



## **Xsigo White Paper:** Xsigo Virtual IO Optimizes VMware View

The addition of Virtual IO to your VDI deployment completes the cloud in that you can now have a fully dynamic environment with the freedom to deploy any type of desktop to any network using any storage platform. In addition to the enhanced flexibility, you will also:

- Lower your IO infrastructure cost by 40-70%
- Reduce your time to provision new servers by 80-95%
- Increase your server bandwidth by as much as 4x
- Increase the number of desktops hosted per physical server
- Integrate your VDI infrastructure into your overall Cloud deployment and provisioning model.

For further information regarding Xsigo and Virtual IO, please contact us through our website at [www.xsigo.com](http://www.xsigo.com).



### **About Xsigo**

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.

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