Atlantis ILIO for VDI

Optimize Storage, Boost Desktop Performance & Make VDI Security Possible

The VDI Performance & Storage Problem

Virtual Desktop Infrastructure (VDI) revolutionizes enterprise desktop computing by lowering the total cost of desktop computing, increasing security and making desktop computing more agile. Many companies have deployed VDI only to realize that their VDI architecture could not scale without requiring additional, massive investments in storage infrastructure. The root cause of VDI storage problems is that Windows XP and Windows 7 were designed to work with a dedicated local hard drive. When the Windows operating system is deployed with VDI, thousands of virtual desktops generate tremendous IO traffic that requires significant increases in the number of storage disks and controllers. In order for VDI to achieve broad adoption, it must deliver a better user experience than a physical PC with an equivalent or lower cost per desktop. Achieving that goal simply isn’t possible without taking an intelligent approach to solving the VDI storage problem.

Atlantis ILIO™ Software Solution

Atlantis ILIO is a VDI storage and performance optimization software solution that complements Citrix XenDesktop and VMware View to optimize storage, boost desktop performance and make VDI security economically feasible. Atlantis ILIO fundamentally changes the economics and performance characteristics of VDI by intelligently optimizing how the Windows operating system interacts with storage.

Scaling and Optimizing Storage for VDI

Atlantis ILIO processes up to 90% of the virtual desktop storage traffic locally, offloading the shared storage infrastructure and therefore reducing the amount of storage needed for each desktop. This enables customers to scale their VDI deployment to 4-7 times more users with their existing storage system. In addition, Atlantis ILIO inline deduplication eliminates storage of duplicate Windows image components, which reduces the amount of storage capacity required for each additional desktop by up to 99%.

Boosting Desktop Performance

Atlantis ILIO addresses the virtual desktop performance problem without requiring additional storage infrastructure. It eliminates the storage bottleneck by effectively delivering a massive amount of IOPS to boost all aspects of virtual desktop performance including boot time, logons, profile loading, applications, productivity tasks, and applications that are virtualized using Citrix XenApp, Microsoft App-V, VMware ThinApp and Symantec SVS.

Making VDI Security Possible

Anti-virus protection and endpoint security are a requirement for enterprise VDI deployments. However, traditional Anti-virus can cut density per server up to 50%, degrade performance and ultimately increases the network, storage and server infrastructure costs of VDI. Atlantis ILIO integrates with leading Anti-virus solutions to dramatically accelerate Anti-virus scanning, and eliminate redundant Anti-virus scanning operations. With traditional Anti-virus, Atlantis ILIO can eliminate the additional storage required to service IO traffic generated by Anti-virus, which increases density and accelerates Anti-virus scanning.

“The deployment of virtual desktops is strategic to JPMorgan Chase. Virtual desktops increase user productivity, lower costs and will ultimately become a competitive advantage for us.”

—Paul McEwen
Managing Director,
JPMorgan Chase
Atlantis Computing Inducted into the JPMorgan Chase Hall of Innovation

Solution Overview

Atlantis ILIO is a VDI storage and performance optimization software solution that complements Citrix XenDesktop, VMware View and Quest to optimize storage, boost desktop performance and make VDI security economically feasible.

Atlantis ILIO Benefits

Storage Optimization

Scale Existing Storage
• 4x more users on existing storage
Use Less Storage
• Use up to 90% fewer storage disks
• Use up to 99% less storage capacity
Use Any Storage
• Use less expensive storage options including SAN/NAS/DAS

VDI Performance Acceleration

Better Performance than a PC
• Boot VMs in seconds instead of minutes
• Start and load Microsoft Office applications faster
• Boost application virtualization performance

VDI Security Boosting
• Accelerate Anti-virus scanning
• Increase server density when using Anti-virus
• Eliminate the additional storage required for Anti-virus IO traffic
Challenges of the VDI Workload

Traditional storage technologies including SAN/NAS and SSDs are not equipped to handle the unique nature of VDI workloads, which results in poor desktop performance and more storage disks required to service VDI IO traffic.

Write Heavy IO Traffic
Unlike server virtualization, VDI workloads are can be write-intensive during normal desktop operation. Traditional storage caching and SSDs are ineffective with write IO and have little impact on improving virtual desktop performance.

IO Blender Effect—From Sequential to Random Small Blocks
When the Windows operating system generates disk IO, it optimizes that IO on its local hard drive so that blocks are stored sequentially for optimal performance. With VDI, the hypervisor converts sequential IO into small blocks of random IO (the IO Blender effect), which decreases storage and desktop performance. Atlantis ILIO automatically converts the small random blocks into larger blocks of sequential IO before sending to storage, increasing storage and desktop performance.

Peak Bursts of 10x Average IO
With VDI, end user activities such as simultaneous boot, logon and application IO storms or common IT activities such as Anti-virus scanning, patching and cloning generate peak IO that can be 10 times or more the average IO traffic. As a result, storage can either be sized for peaks and be extremely expensive or sized for the average IO traffic and result in serious performance impact during periods of peak activity. Atlantis ILIO delivers local IOPS to virtual desktops to ensure consistently high performance during peak usage.

CAPEX and OPEX Cost Savings
The cost per desktop of deploying VDI can be twice as much as a physical PC with storage accounting for 40-60% of VDI budgets. In addition, industry analysts state that the ongoing operating costs of VDI storage are up to 4 times the upfront cost of the storage system. Atlantis ILIO enables customers to reduce the amount of storage required per desktop by up to 90%, lowering the CAPEX cost per desktop to be less than a physical PC and eliminating 90% of the OPEX costs for power, cooling, rack space and disk replacement.

Atlantis ILIO Technology & How We Do It
Atlantis ILIO is a software virtual machine that is installed on the same hypervisor or rack as the virtual desktops to optimize how the Microsoft Windows XP and Windows 7 operating systems interact with storage. Atlantis ILIO technology including Content-Aware IO processing and Inline Deduplication are highly efficient and designed specifically for VDI workloads:

Content-Aware IO Processing
Atlantis ILIO software processes all VDI traffic locally with Windows NTFS file content awareness—within the same server or rack—to dramatically reduce the amount of IO traffic going to storage and eliminate the huge burden normally placed on a storage array by hundreds or thousands of virtual desktops.

Inline Deduplication for VDI Workloads
Atlantis ILIO deduplicates in line all VDI images before they reach storage, effectively eliminating the need to store up to 99% of Windows image components, further reducing the amount of storage required for a successful VDI deployment.
Atlantis ILIO: 200 Virtual Desktop Example

### Storage Scalability

The number of virtual desktops that can be supported by a storage system is dependent on both the storage throughput and the storage capacity.

### Storage Throughput (IOPS)

Atlantis ILIO reduces the storage throughput up to 90% by processing I/O traffic locally before reaching storage. In the example above, Atlantis offloaded 96% of the IOPS, making it possible for the storage system to support many times more desktops with better desktop performance.

### Storage Capacity (GB)

The amount of storage capacity consumed on the disk depends on the windows image and whether the virtual desktop is persistent or non-persistent. In the example above, Atlantis ILIO inline deduplication reduced the storage capacity consumed by 90% for the non-persistent desktop (Citrix PVS, VMware Linked-Clones) and 99% for the persistent desktops.

### Boosting Desktop Performance

#### Delivering Local IOPS

The performance of a virtual desktop is a function of the availability and speed of hardware resources including CPU, Memory and Disk. When a virtual desktop has limited disk IO, desktop performance degrades significantly including long boot times, poor application performance and a generally poor user experience. Atlantis ILIO delivers very fast and almost unlimited IOPS to the virtual desktop locally within the same hypervisor or rack as the virtual desktops, boosting desktop performance up to 10 times.

#### Fault Tolerance (FT) & High Availability (HA) for VDI

When deploying VDI, organizations have the option of deploying Atlantis ILIO in a fault tolerant or high availability configuration to protect against downtime or data loss. Atlantis ILIO supports creating a synchronous FT cluster of Atlantis ILIO virtual machines on different physical servers to provide resiliency and “zero downtime” during hardware failures. In addition, Atlantis ILIO supports using HA across multiple servers or automatically restarting virtual machines on the same server.

### Accelerate the Transformation of VDI from PCs to Persistent to Stateless Desktops with Atlantis ILIO

Many organizations think that they must deploy non-persistent VDI desktops to save on storage but struggle with the complexity of implementing new management tools and virtualizing user profiles and applications. Atlantis ILIO enables IT organizations to deploy persistent VDI desktops using only 5–10% of the storage capacity, dramatically simplifying VDI deployments. Then, customers can migrate over time to non-persistent or stateless desktops with Atlantis ILIO.
Atlantis ILIO Deployment Options

Atlantis ILIO complements existing VDI, storage, desktop management, personalization and application virtualization solutions.

### Atlantis ILIO On Each Server

The Atlantis ILIO software virtual machine is deployed on each VDI server on the same hypervisor used by the virtual desktops. In this configuration, Atlantis ILIO uses either local SATA/SAS/SSD drives or a shared SAN/NAS/DAS storage system to store single instances of application and operating system files without modification to virtual desktop images. Atlantis ILIO On Each Server offers the best desktop performance and lowest possible CAPEX cost for non-persistent VDI.

### Atlantis ILIO Top-of-Rack

The Atlantis ILIO software virtual machine is deployed on a dedicated server at the top of each rack of VDI servers. In this configuration, Atlantis ILIO uses a shared SAN/NAS/DAS storage system to store user data and single instances of application and operating system files, without modification to virtual desktop images. The Atlantis ILIO virtual machine scales out easily to add more desktop capacity by adding additional VDI server racks without the need for additional storage. Atlantis ILIO Top-of-Rack is well suited for existing persistent VDI deployments with shared SAN/NAS storage.

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<thead>
<tr>
<th>Requirements</th>
<th>Top-of-Rack</th>
<th>On Each Server</th>
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<tbody>
<tr>
<td>CPU</td>
<td>1 CPU core @ 2.0GHz or faster</td>
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</tr>
<tr>
<td>RAM</td>
<td>16GB or more depending on number of desktops</td>
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</tr>
<tr>
<td>Hard Disk</td>
<td>5GB or more</td>
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<tr>
<td>Hypervisor (Atlantis ILIO)</td>
<td>VMware vSphere 4.0 or later, Citrix XenServer 5.6, Microsoft Hyper-V (Windows Server 2008 R2 SP1 or later)</td>
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<tr>
<td>Supported Storage</td>
<td>SAN, NAS, DAS</td>
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<td>Storage Protocols (Desktops to ILIO)</td>
<td>NFS, iSCSI</td>
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<tr>
<td>Storage Protocols (ILIO to Storage)</td>
<td>NFS, iSCSI, Fibre Channel</td>
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