Virtual desktop infrastructure (VDI) offers significant advantages to enterprises for certain types of users and workloads, in terms of manageability, reliability, and security. A single desktop image can be centrally maintained for various client devices, reducing support costs. In the event of an endpoint failure, users can simply use any other client device to access their desktop image and data. Also, centralized control of patching, configuration, application control, and administration of security software on a master image helps protect data.

A number of challenges can hinder VDI adoption, creating barriers or leading to delays in implementation.

• **Performance.** VDI deployments often fail to deliver responsiveness on par with conventional PC usage models, leading to user frustration, loss of productivity, and increased burden on help-desk resources.

• **Cost.** Infrastructure expense can drive up CAPEX and lead to lackluster ROI, with inefficient storage typically consuming a significant portion of VDI project budgets, often at greater cost than the dedicated PCs being replaced.

• **Complexity.** Sizing, allocating, scaling, and maintaining the large amount of storage required for a successful VDI implementation creates significant administrative overhead.

**Atlantis USX: Addressing VDI Challenges with Software-Defined Storage**

Serving as an intermediary between storage and virtual desktops, Atlantis USX pools and abstracts physical storage (for example, SAN, NAS, and local drives) to create a single, virtualized entity. Additional data services applied to those virtualized storage resources increase effective storage capacity, accelerate performance, improve cost efficiency, and simplify provisioning.
Atlantis USX increases the IOPS available from VDI by means of in-memory operation, intelligent caching, and storage acceleration. These capabilities are complemented by Intel® Xeon® processors and Intel® Solid State Drives. The total solution enhances responsiveness, user experience, and productivity.

Using Atlantis USX can dramatically improve the capacity available from existing or new storage resources through means such as advanced deduplication and compression. These factors help lower the per-desktop cost of VDI deployment.

Atlantis USX can pool resources from and increase the value of all types of storage, including SAN, NAS, Flash, RAM, local drives, hybrid arrays, and public cloud.

Virtual workloads can move smoothly between storage systems, data centers, and the cloud, to move workloads closer to users and increase utilization of all storage resources.

Atlantis USX deploys as a virtual appliance that accelerates physical storage performance while simultaneously consolidating and increasing available capacity, as illustrated in Figure 1. For enterprises deploying VDI solutions, Atlantis USX can also enable a seamless transition from expensive shared storage to lower-cost hyper-converged systems. Specific benefits available through the implementation of Atlantis USX include optimized performance, reduced cost, enhanced flexibility, and operational agility.

Figure 1. Capabilities of Atlantis USX.
High Performance at Low Cost with Atlantis USX on Intel Architecture

Citrix has validated Atlantis USX as a Citrix Ready* product, attesting to its suitability for seamless deployment of XenDesktop* into the USX storage volumes. The Citrix Ready VDI Capacity Program sets out guidelines for the required results that must be met by participating shared storage solutions. Testing to confirm and illustrate this readiness simulated a workload of 1,500 VDI desktops for knowledge workers using Citrix XenDesktop and Atlantis USX software-defined storage.

Atlantis USX and Intel® architecture simulated the VDI workload of 1,500 desktops using just three storage servers, achieving results of nearly 650 IOPS at a cost of approximately $250 per desktop (infrastructure including management, compute, and storage servers) for higher performance and lower cost than many competing VDI solutions, as illustrated in Figures 2 and 3.

Figure 2. IOPS per desktop.

Figure 3. Solution cost per desktop.

NOTE: Figure 2 shows I/O performance only, which may not represent the entire user experience.

In addition, the 1,500 user virtual machines used in this testing, which were all started simultaneously, launched in a total of 12 minutes, which corresponds to an average rate of 125 desktops per minute, or just over two per second. Citrix XenDesktop, Atlantis USX, and Intel architecture combine to deliver a robust VDI solution that provides strong performance at a low per-user cost.

Contributions from Intel Architecture Building Blocks

Intel architecture helps accelerate the VDI solution based on Citrix XenDesktop and Atlantis USX. Like other Citrix products, XenDesktop is highly optimized for Intel architecture as the result of a long-standing collaborative co-engineering relationship between the two companies. In this solution, the USX software runs on three Intel architecture-based storage nodes, and the following processor, local storage, and networking technologies make specific contributions to the performance and cost-effectiveness of the solution:

- **Intel® Xeon® processors** deliver power-efficient performance to reduce operating costs, as well as robust compute resources to accelerate Atlantis Enterprise Data Services such as inline deduplication, compression, and encryption.

- **Intel® Solid State Drives (Intel® SSDs)** provide low-latency, high-bandwidth read-write access to data, without the performance overhead associated with seek times on mechanical disks. Systems equipped with Intel SSDs also help simplify operations, with worry-free manageability and predictable performance that help reduce operational costs.

- **Intel® Ethernet Converged Network Adapters** help reduce power consumption in the data center, helping reduce OPEX, and incorporate high-throughput I/O that includes optimizations for virtualized storage traffic paths, as well as offloads that free up processor resources for other work.
Conclusion
Atlantis USX improves enterprise VDI with accelerated user logins, application launches, and task completion. The solution helps businesses simplify administration, improve storage utilization, raise productivity, and lower costs.

Intel architecture, including Intel Xeon processors, Intel SSDs, and Intel Ethernet Converged Network Adapters, complements Atlantis USX in VDI implementations to heighten the benefits to enterprises of all types with regard to increased performance, decreased cost, and a simplified environment. Together, technologies from Atlantis and Intel deliver on the promise of VDI by taking full advantage of existing storage resources to provide a better user experience and deliver maximum benefit to the business.

Learn more:
Citrix XenDesktop VDI Capacity Testing Using Atlantis USX
www.atlantis.com
www.intel.com/SSD