

# Hitachi USP VM

## *An Important Step Toward Virtualizing the Data Center*

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**Abstract:** The Hitachi USP VM is an Enterprise-class storage system that is priced closer to high-end midrange storage systems. It offers a suite of important capabilities including external storage virtualization and the ability to extend its storage services to external third-party storage systems.

I was contemplating the external storage virtualization market and realized that there really wasn't one—at least, not as a standalone category. Now that I have your attention (a lot of money is being spent on external storage virtualization) there are industry pundits that would tell you differently. But consider this: to this day, Hitachi is the only leading storage vendor to support external storage virtualization within their flagship products and generate a ton of business (claiming over 6,000 virtual controllers—USP & NSC systems). Additionally, Hitachi has spent a great deal of energy selling, supporting and educating around storage virtualization (even branching off into virtualization viral marketing with Mr. T that's resulted in hundreds of thousands of views and coverage in BusinessWeek). The other leading storage vendors have not followed suit and storage virtualization as a category has not successfully been created. However, external storage virtualization as a storage service and technology is extremely valuable.

ESG defines storage virtualization as a technology that provides logical view and control of physical storage assets for greater utilization, optimization and simplification. External storage virtualization is using a device—in Hitachi's case, its new USP V and USP VM storage systems—to provide logical view and control of other external storage systems either partially or completely.

Hitachi has been successfully leveraging its external storage virtualization capabilities within the USP—a leading Enterprise-class storage system—for over three years now, with several thousand product implementations worldwide. End-user customers really are using it to create an intelligent tiered storage environment that consists of various external storage systems, including those from competitive third party vendors.

I've said it a number of times before: external storage virtualization “networks” your storage systems. Today, storage networks are only partially networked from host to individual storage systems. But the storage systems themselves are not peers—they are not networked to one another. There is no cohesion between them; no intercommunication. Clearly, networks make our IT infrastructure greater than the sum of its parts—that's why we have networks to begin with. However, we do not network our storage systems and that is what external storage virtualization brings to the table.

We at ESG have been talking about storage virtualization since 1999. During all that time, the end-user community has told us that they want, need and love external storage virtualization. And yet, it has not become pervasive throughout the market. Why is that? First, there are only a handful of solutions that provide this functionality. In addition, there are only a few leading vendors that offer external storage virtualization products and even fewer vendors are committed to external storage virtualization as a core solution.

Hitachi has successfully made external storage virtualization part of its core storage system products. Essentially, their external storage virtualization technology is a feature, or storage service, as they refer to it—albeit an extremely important and valuable service. That is why they are doing well with it and few others are.

## The Hitachi USP VM

The USP VM has all of the intelligent software of its bigger brother, the USP V, but at a lower cost and smaller footprint. The USP VM is a rack mountable system designed to fit in any data center. It's an Enterprise-class storage system that blurs the line between high-end and midrange. It has the intelligence, performance, scalability, interoperability and resiliency of an Enterprise-class storage system, but is within the price range of a high-end midrange storage system. And the USP VM supports external storage virtualization. The biggest challenge with the USP VM is that compared to midrange storage systems, it is more sophisticated, which also makes it more complex. Its intelligence and advanced capabilities don't come without some trade offs.

Here is a quick overview of the Hitachi USP VM:

- **External Storage Virtualization:** The USP VM supports the ability to create volumes on external storage systems and perform various data management functions, including snapshots and remote mirroring.
- **Thin Provisioning - Internal (Hitachi Dynamic Provisioning):** This is the ability to provision volumes while only consuming capacity based on the amount of data you have. Thin provisioning essentially eliminates allocated, but unused, capacity and stranded storage.
- **Thin Provisioning - External:** According to Hitachi, the USP VM will also be able to create thinly provisioned volumes on external storage systems in the near future. Then you can leverage Hitachi's thin provisioning capability and use it on other storage systems as well—effectively increasing utilization rates and lowering power and cooling costs in the process. Since ESG feels that thin provisioning is one of the most useful storage technologies available, we believe that this is a great enhancement.
- **'Day 1' Support for VMware ESX Server 3.0:** This will better facilitate the integration of server and storage virtualization strategies. Additionally, it should come as no surprise that HDS is the first vendor certified for external storage virtualization by VMware for its Infrastructure 3 program.
- **Significantly Extended External Device and Capacity Support:** Up to 96 PB of External Capacity.
- **Virtual Private Storage Machines (standard):** This is the ability to carve up storage system resources including host ports, cache memory and capacity to create a "virtual" or logical storage system that is dedicated to an application, department, business unit or customer, providing the ability to chargeback business units.
- **Quality-of-Service:** When contention occurs, this is the ability to provide priority to an application or server based on performance needs.
- **Remote Mirroring:** The USP VM supports both synchronous and asynchronous remote mirroring. This is one of Hitachi's strong suits.
- **Snapshots:** You can implement full volume copies or differential snapshots using a copy-on-write technique.
- **Wide Range of O/S Support:** The USP VM supports a wide range of operating systems including Windows, Linux, a number of Unix variants and z/OS. Additionally, HDS has conducted in-depth and comprehensive interoperability testing within all of those environments.

## NAS, CAS and VTL

Hitachi supports a number of different solutions within the USP VM including NAS, CAS and VTL. They also partner with BlueArc for their high performance NAS solution. ESG believes that this NAS solution is one of the best in the market. In addition to high performance, it provides an excellent suite of features and capabilities. The USP VM also has a CAS module: the HCAP solution. Again, in our view this is one of the best CAS solutions in the market based on its ease-of-use, scalability and feature-set. To top it off, the USP VM also supports a VTL system leveraging Diligent software. This is a high-end VTL solution that supports real-time data de-duplication, allowing you to store lots of backup data without consuming a ton of capacity. ESG knows of end-users that are getting 20 to 1 data de-duplication ratios, which results in storing 20 TB of backup data on only 1 TB of actual capacity.

## ESG's View

Hitachi appears to have realized that storage virtualization as part of its storage system is the way to proliferate the technology. It is core to what they do and a valuable storage service—not a product or separate

category—but a capability that only they have within their storage controllers today and are effectively implementing throughout their customer base. The Hitachi USP VM further extends their reach to customers that couldn't cost justify the USP V. It provides high-end Enterprise capabilities for end-users with midrange storage budgets.

We are witnessing a new Hitachi that is aggressively driving its storage virtualization leadership through consistent innovation. The USP VM is the first storage system that enables IT to extend its high-end features to external heterogeneous storage systems—such as thin provisioning. This is extremely powerful and is an important step to further virtualize the data center.