Preparing for Server 2012 Hyper-V: Seven Questions to Ask Now

Greg Shields

Microsoft MVP and VMware vExpert

September, 2012 may be the release date for Windows Server 2012, but odds are good that your release date will be sometime later.

Are you prepared?

Microsoft suggests that Windows Server 2012 is their most significant release in Windows history. With it arrives hundreds of individual improvements across the gamut of services, roles, and features, a sizeable percentage of which relate to Hyper-V. Now in its third edition, Hyper-V atop Windows Server 2012 is more ready than ever to host your most-critical production workloads.

In the timespan between Microsoft's release and your implementation, you've got plenty of questions that first require answering. Indeed, you can simply start building Hyper-V servers and migrating over virtual machines, but one can't deny that this is a *major* release. Getting the most out of its new capabilities requires a wholesale review of how your datacenter delivers virtualization.

Before you begin clicking *Next, Next, Finish* inside Hyper-V v3's new interface, you might consider asking yourself these seven important questions. Their answers will better prepare you for deploying Hyper-V in Windows Server 2012.

Question #1: Must your storage strategy evolve to meet Hyper-V's new capabilities?

Hyper-V's improvements don't stand alone. Storage is another area of significant investment in Windows Server 2012. Notably, these improvements affect not only enterprise environments, but SMBs and smaller environments as well.

Microsoft has enhanced its storage position so significantly in this release that it can be challenging to find where your storage strategy fits. Ask yourself if any of these new features might drive a change in how you deliver storage.

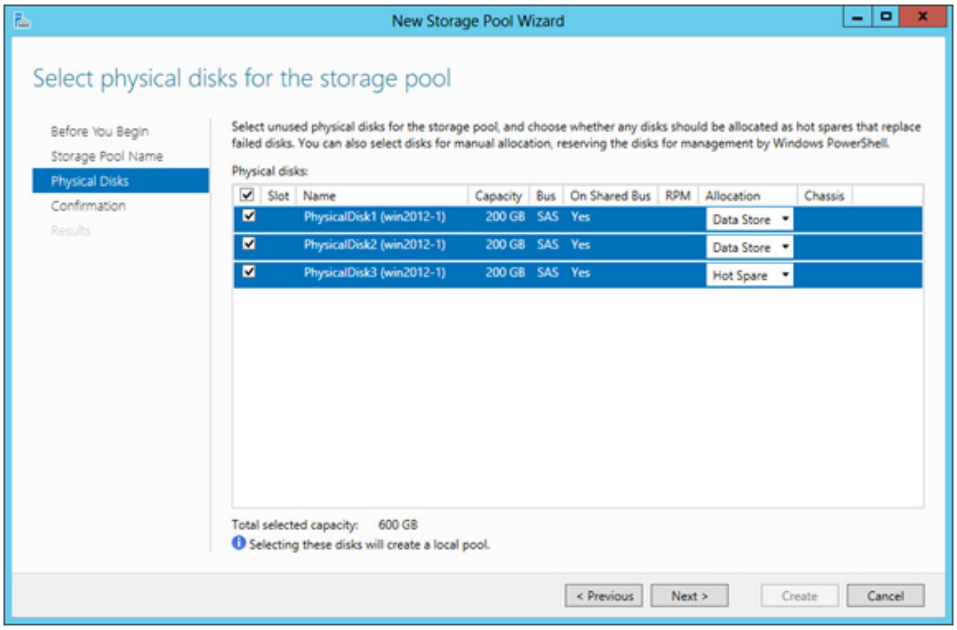

Figure 1: New Storage Pool Wizard.

Lower-complexity environments can enjoy enterprise-like storage availability with Windows Server 2012's new Storage Spaces (Figure 1). This feature adds thin provisioning, dynamic sizing, and built-in redundancy to off-the-shelf SATA and SAS disks. Protocol improvements to SMB increase its performance to near-native, offering an alternative to the prototypical SAN experience.

Larger environments can enjoy fault-tolerant VM storage with a simplified NAS-like experience by implementing a Windows Server 2012 Scale-Out File Server (SOFS). Doing so eliminates many of the complexities intrinsic to SAN storage management, while enabling Hyper-V VMs to be addressed via UNC paths.

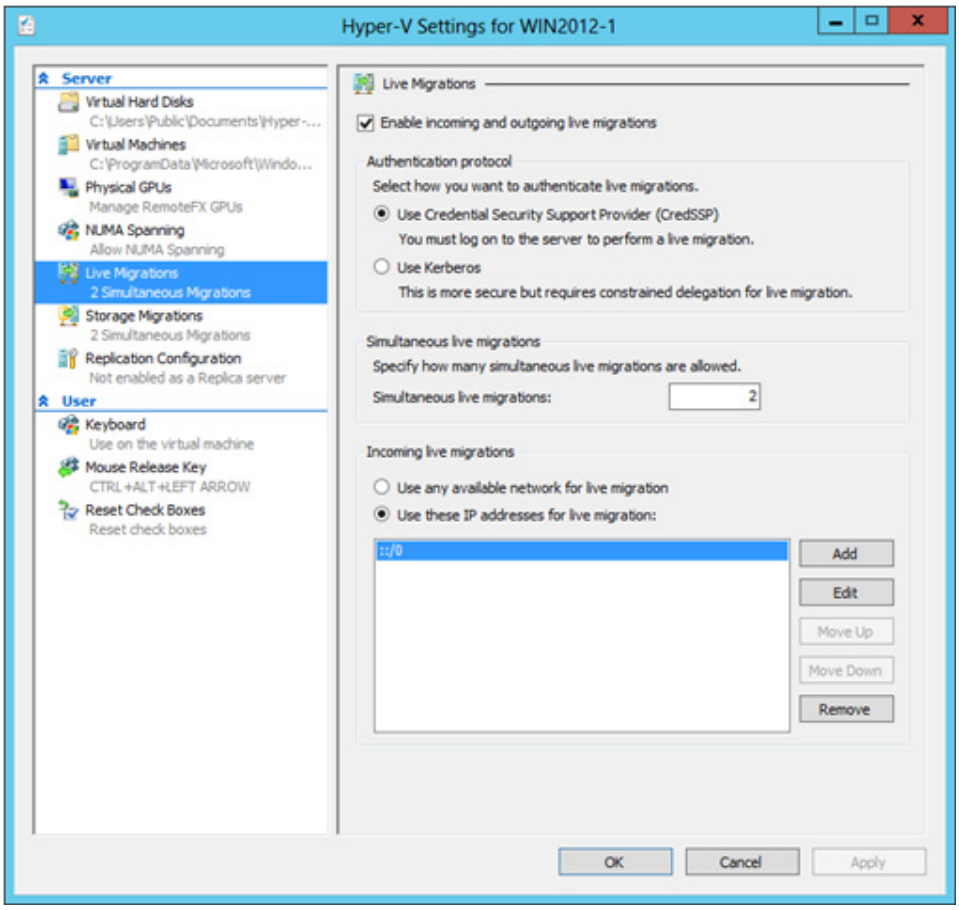

Figure 2: Live Migrations.

Live Migration gains vastly-improved flexibility by eliminating the requirement for shared storage (Figure 2). Migrating a VM's processing or its storage can be done across UNC paths and without downtime.

The Take-Away: *Considering all these advancements in Windows Server storage technology, it makes sense today to consider rethinking your storage strategy. The decisions you've made in the past might no longer be appropriate for what's available in the present.*

Question #2: Will VHDX impact your datacenter operations?

Windows Server 2012 introduces a new virtual disk format called VHDX. This format supports data corruption protection during hard failures, optimizes structural alignments that had previously inhibited performance, offers larger block and sector sizes, and increases the maximum size of virtual hard disks to 64TB.

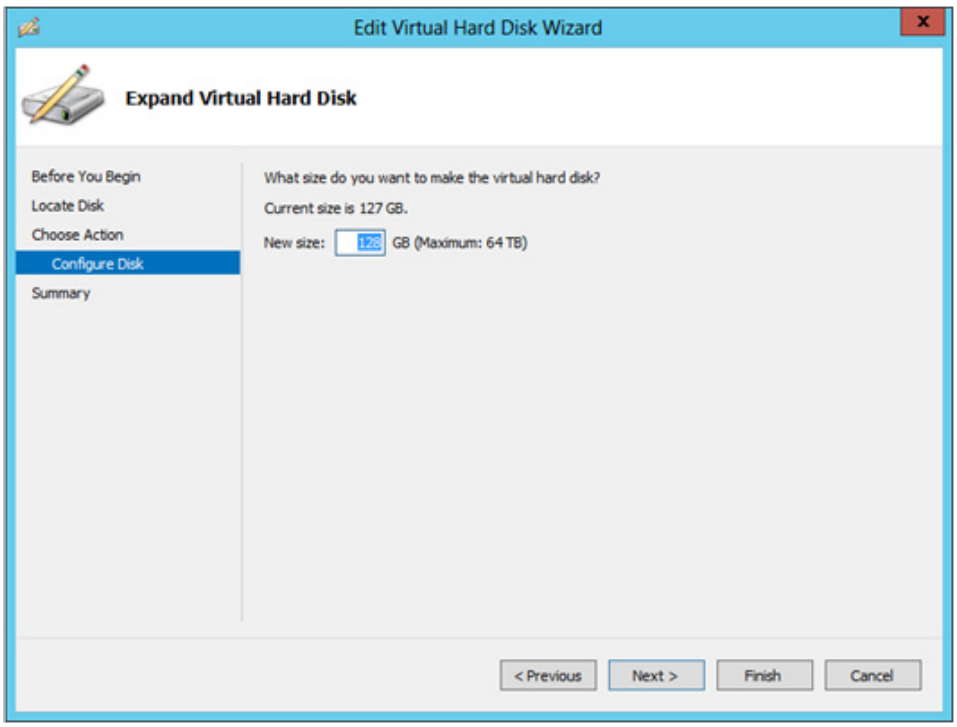

Figure 3: 64TB Maximum Disk Size.

While these improvements are certainly beneficial, they introduce the potential for negatively impacting the environment when preparations aren't made for their implementation. Two cases merit special attention: The new 4KB sector size and the significantly larger 64TB disk size maximum (Figure 3).

The storage industry is slowly shifting from a 512-byte sector size to a new standard of 4KB. This increase is necessary to support larger drive sizes that extend into the multi-TB range. That said, performance is negatively impacted when virtual disk sector sizes aren't aligned with those in the underlying physical disk. Hyper-V v3's virtual disks now use a 4KB sector alignment, making VHDX the virtual disk format of choice for 4KB drives.

Microsoft's increase to VHDX's maximum size can also have deleterious consequences in the absence of proper planning. While large disks are absolutely useful for large data sets, their sheer size can create issues with storage migration and may impact the efficacy of an unprepared backup solution.

The Take-Away: *Plan carefully for Microsoft's new disk formats. They introduce the possibility of many impacts alongside their benefits.*

Question #3: Will SMB 3.0 and SOFS impact *where* you capture backups?

Many virtual machine backup solutions have long espoused the virtual disk-centric approach for capturing backups. By capturing backups from the perspective of the virtual disk, those disks can be easily restored should an entire-VM recovery become necessary. Historically, the location for capturing these backups has been from the virtual host.

Microsoft's significant investment in SMB 3.0 and SOFS offers a new architecture where Windows Server can operate as both virtual host and storage host. That configuration introduces a new location from where backups can be captured: *The storage host*. Doing so with the right backup solution can reduce the overhead in translation and transmission from virtual host to backup media, which has the effect of increasing performance while decreasing resource impact on running virtual machines.

The Take-Away: *Datacenters considering Hyper-V v3 should pay careful attention to the enhancements to SMB and SOFS. They may introduce new architectures that offer superior data protection for running virtual machines.*

Question #4: Will your Hyper-V backups support deduplication?

Another of Windows Server 2012's new features is its optional support for deduplication on primary data volumes. This feature is enabled on a per-volume basis, and includes management control for excluding certain folders and file types. Microsoft estimates that volumes which support combinations of user documents, OS deployment shares, and virtualization libraries might see up to a 50-60% space savings as a result of deduplication activities.

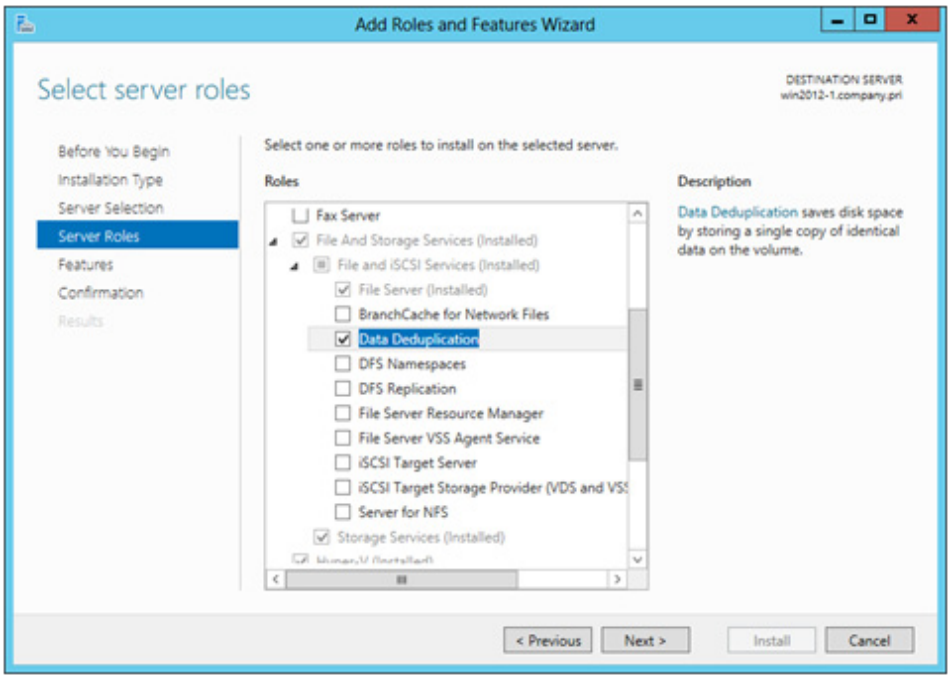

Figure 4: Enabling the Deduplication Role Service.

While this native deduplication (Figure 4) can and will reduce the size of non-running virtual machines, its activities will have no impact on running VMs. The feature's default settings require data to rest unchanged for a period of five days before they're marked for deduplication. As a result, the virtual disk files for running virtual machines will never be deduplicated.

The Take-Away: *Deduplication of backup data is a key component of the disk-based backup approach. This capability is necessary to reduce the amount of storage required for storing a backup data set's various restore points. If Microsoft's native solution cannot support deduplication on running virtual machines, can yours?*

Question #5: Is now the time to implement disaster recovery?

Disaster recovery in the pre-virtualization era was a complex and expensive undertaking. Standing up a fully-functioning alternate site required an equal number of servers and careful coordination of changes. Virtual servers and their virtual disks changed DR's requirements significantly. These days, doing disaster recovery requires virtual disk backups and a replication mechanism to send them offsite.

Hyper-V v3 now comes equipped with both. Its built-in backup solution can capture virtual disks and store them elsewhere as files on disk. It now also includes a built-in VM replica technology for replicating VMs elsewhere in near-real time. While Hyper-V's VM replica technology is ostensibly designed for low-complexity situations, it is an extensible interface that can be part of an enterprise-ready disaster recovery solution.

The Take-Away: *More than anything, the incorporation of replication as a Windows native solution highlights the notion that disaster recovery is swiftly becoming an absolute datacenter requirement. Considering these advancements, as well as the others in data protection, the diligent organization should strongly consider prioritizing a disaster recovery implementation with the shift to Windows Server 2012.*

Question #6: Which is right for me: Multisite Clustering or VM replication?

Windows Server 2012's Hyper-V Replica feature is only one of the options available in support of disaster recovery. Notably, Hyper-V Replica appears to exist as a platform solution. It has been designed with the kinds of extensibility that enables third parties to wrap additional automation and workflow around its core replication functions.

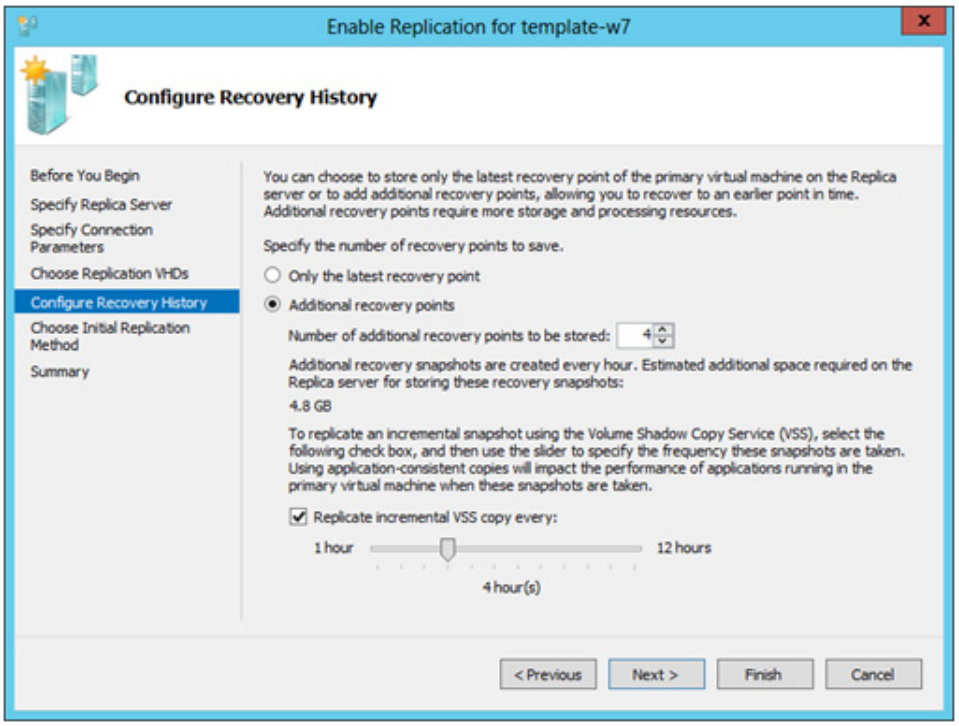

Figure 5: Configuring Recovery History for Hyper-V Replica.

Hyper-V Replica also fills a key omission in Microsoft's multisite clustering portfolio. Previous versions of Windows Failover Clustering supported multisite failover, but only in combination with an external replication solution. Pairing these two technologies together offers a more-complete solution for multisite VM failover.

That said, the requirements in hardware, software, and experience for successfully implementing multisite clustering are very much a superset of those for VM replication. While multisite clustering supports greater automation across the range of potential failure states, its administration may prove too cumbersome for certain use cases.

The Take-Away: *Environments considering incorporating disaster recovery should pay careful attention to both multisite clustering and simple VM replication as candidates for implementation.*

Question #7: Is your site-to-site network sufficient?

Whether your disaster recovery architecture focuses on replicating running virtual machines or merely recent backups of those machines, a limiting factor in its implementation will be the network conditions between sites. Available network throughput will very obviously determine how much data can transfer over a given period of time – and, hence, how many virtual machines. Other conditions are also important such as bandwidth and latency.

The Hyper-V Replica feature in Windows Server 2012 leverages asynchronous replication. This approach reduces the impact of poor network conditions like low bandwidth and latency on replication success. It is important to realize, however, that replication success and replication performance can be two very different things.

The Take-Away: *Datacenters considering disaster recovery should measure and validate network sufficiency prior to implementing any replication in production.*

Hyper-V is ready. Is your datacenter?

With the latest generation of Hyper-V one gets a production-worthy virtualization platform that now includes notable storage, backup, and disaster recovery capabilities. While the native solutions for backup and recovery by themselves won't be the right choice for every datacenter, they do provide a worthy platform on which Microsoft's robust third-party ecosystem can layer additional functionality.

Does your datacenter have good answers to these questions? If not, now is the time to find them as you prepare for Hyper-V in Windows Server 2012.

About the Author

Greg Shields, Microsoft MVP and VMware vExpert, is an independent author, speaker and IT consultant, as well as a Partner and Principal Technologist with Concentrated Technology. With 15 years in information technology, Greg has developed extensive experience in systems administration, engineering and architecture.

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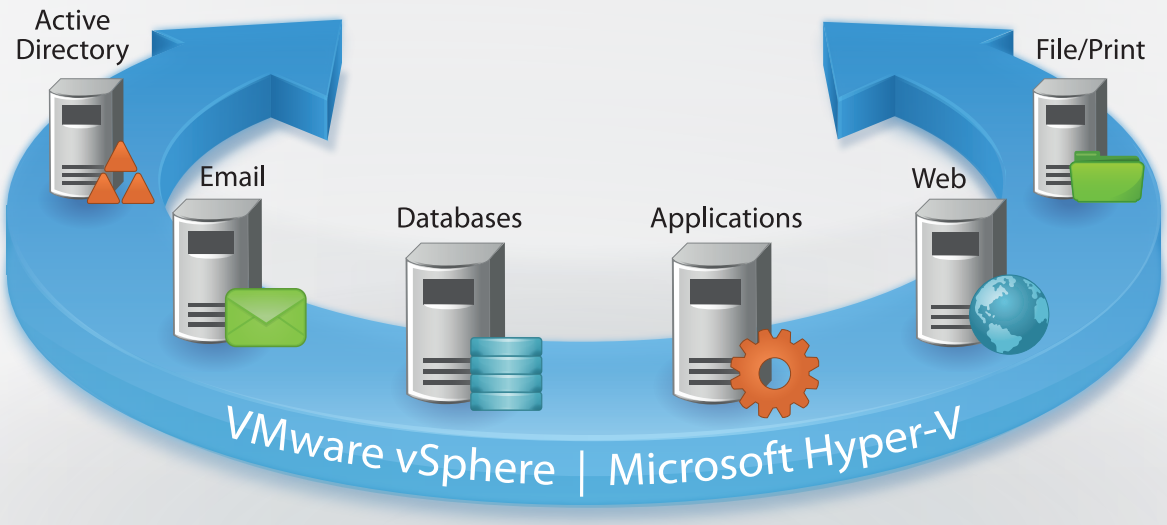

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