Migration to Hyper-V with Near-Zero Downtime

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As datacenters continue to virtualize their server workloads, more organizations are realizing the benefits of Windows Server 2012 R2 Hyper-V virtualization. For many organizations, the challenge in moving off existing physical servers or servers virtualized on other hypervisors and taking advantage of Hyper-V is the fear of the migration itself. There are several possible barriers to migration, including cost, complexity, downtime, and risk. Traditional ground-up rebuilding or restore from backup migration methods are no longer feasible for the dozens, hundreds, or thousands of servers in today's datacenters. Free tools can automate some of the process but still require servers to be offline and are not flexible in handling complex datacenters with many different hardware and virtual platforms. There are, however, inexpensive software solutions like Double-Take Move from Vision Solutions that eliminate most of the complexity, downtime, and risk associated with migrations.

Double-Take Move is built on real-time, byte-level replication technology which Double-Take popularized for high availability, disaster recovery and prevention of planned and unplanned downtime.

For migrations, the same real-time replication is used to eliminate the downtime usually incurred when data is synchronized between the source and target servers during the migration. Double-Take Move simply does all of the data synchronization in real-time, while the source production server continues to be online. The downtime, which would have been measured in either hours or days, is reduced to minutes, and now only occurs when performing final migration cutover tasks such as booting/rebooting the target virtual machine.

Not only does Double-Take Move perform synchronization while the server stays in production, it also uses WAN optimizations like data compression, scheduled bandwidth limiting, and encryption to optimize data transfer across WAN networks over any distance. This makes Double-Take Move optimal for both local migrations as well as site-to-site migrations.

For Hyper-V migrations, Double-Take Move offers two methods for server migration. The first and most efficient method automatically provisions the

Hyper-V virtual machine that is used as the migration target. All of the data from the source server is replicated directly into offline target server's VHDs or VHDXs via the target Hyper-V host server. Agents installed on the source server and the target Hyper-V host maintain a continuous flow of data synchronization all the way up to the point where migration cutover is initiated. The target virtual machine is then booted up and is identical to the source, with the exception of the hardware drivers, which are now virtualized for Hyper-V and optionally the network configuration, depending on the destination network environment. When going across subnets, the DNS may be automatically updated.

The auto-provisioned target Hyper-V virtual machine can be customized for the migration in terms of size and resources. The default provisioned machine will be identical to the source server in terms of CPU count, RAM, and volume sizes. The defaults can be adjusted up or down, depending on the desired size of the target virtual machine. This tuning is particularly useful when migrating from under-utilized or over-utilized physical servers. Test migration is also available in a "test and undo" automated fashion to test the viability of one or more virtual machines in the target Hyper-V environment before final cutover.

The second migration method is similar to the first solution in that it captures the source server in real-time, including system state, applications, and data, but differs in that it relies on the target Hyper-V virtual machine being pre-provisioned as a running VM with a Windows OS matching the source in version. Differences in hotfix or service pack levels don't

matter, but the versions must match, e.g. Windows Server 2008 R2 to Windows Server 2008 R2. The target virtual machine must also be provisioned with the appropriate storage as well, including volumes that match to the drive letters of the source, e.g. C:\ D:\ X:\ to C:\ D:\ X:\. This migration method requires more manual setup, but may be used when the target virtual machine requires detailed customizations. This style of migration can also be used between any physical, virtual, and cloud platform, so it is an ideal solution if you need to move individual servers back out to physical platforms, for example, or continue your virtualization path up into a cloud IaaS platform like Windows Azure.

These migrations to Hyper-V can be managed from the Double-Take Management Console which can be run on Windows server or desktop UIs. The console also provides push installation capabilities for the Double-Take agents as well as some license management features. For organizations that use System Center 2012 to manage their datacenter, Double-Take Move offers the System Center Integration Toolkit which is specifically designed for end-to-end management of auto-provisioned migrations to Hyper-V.

The System Center Integration Toolkit integrates heavily with System Center Orchestrator to automate the migration process, which is managed through System Center Service Manage and SharePoint. Several automated processes discover servers managed by System Center, including VMware virtual machines, for migration to Hyper-V. A backend SQL database stores configuration information for the toolkit, which provides workflows for either a single migration or multiple migrations. The toolkit also provides full removal of VMware Tools from virtual machines being migrated to Hyper-V. The workflows in the Double-Take

Move System Center Integration Toolkit are also customizable to change manual approval points and to add or skip steps as required.

For organizations that are not using System Center 2012, but would like a similar level of customizable automation, Double-Take Move has a set of PowerShell scripts offered as part of the Microsoft Migration Automation Toolkit for migration of servers into Hyper-V. These tools can be used in a similar fashion to automate the migrations, but without the need to implement a full enterprise management solution.

Without the right tools, migrating to Hyper-V can be a daunting task. Project costs can balloon due to the downtime, complexity, and risk all associated with the failure of inferior tools and processes. Using a flexible and powerful tool like Double-Take Move can eliminate the unnecessary costs and burdens and speed up the transition to Hyper-V.

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