Adding value to your Hyper-V environment. Server virtualization technology, like Microsoft Hyper-V, is typically driven by IT cost reduction initiatives, resulting in server consolidation, reduced operating expenses (OPEX) and reduced system management. Mainstream adoption of virtualization technology has also enabled organizations to more easily and economically establish reliable disaster recovery strategies which can assist in providing real-time data protection, rapid data recovery and improved data and system availability.

Once an organization adopts this technology, most realize it adds a new level of complexity to achieve their data protection, system availability and disaster recovery goals. Protecting virtual servers is not exactly the same as protecting physical servers – but there are solutions in the market that do both.

Arcserve® Replication and Arcserve High Availability

Arcserve Replication software is used to address a number of IT and Business needs. It provides continuous data protection for Windows, Linux and UNIX environments on both physical and virtual servers. You get real-time data replication (between your Production server and Replica server) whether on-premise, off-premise or in the Cloud, to complement any periodic backup or Snapshot solution. It includes 128-bit SSL encryption across the network without the need for VPN or an IPSEC tunnel for added security. Its data rewind feature enables fast and easy data recovery after accidental or malicious loss and damage so organizations can recover data and databases faster and easier between periodic backups, and meet more demanding recovery point objectives. Arcserve Replication is also used to quickly and easily copy backups offsite for disaster recovery, eliminating the risk, cost and complexity of physical media transport. Use it to migrate from old servers to new servers and from physical servers to virtual servers. When combined with your backup solution, you get total data protection. And now, you get integration with the Amazon Cloud (AWS/EC2) so you can leverage a third-party disaster recovery facility, services and support with a defined service level agreement.

Arcserve High Availability software is used to reduce business downtime due to unplanned system and application outages on both physical and virtual servers. It’s built on top of Arcserve Replication and adds server and application monitoring with automated and push-button failover for high availability. You also get push-button failback, used after the production server has been repaired or replaced. And of course, Arcserve High Availability includes data rewind for continuous data protection (CDP). It also offers Full System Protection (Replication and Failover) for Windows servers and

Assured recovery®
virtual machines that replicates the operating system, system state, application and data to an offline Hyper-V server, or other VMware or XenServer virtual server, to help ease and speed deployment while reducing costs. Automated and push-button failover automatically stands up the offline Hyper-V server when needed. To quickly restore the production server/VM, you use the hardware independent Bare Metal Recovery (BMR) process, run reverse synchronization from the Replica server/VM and then reboot and redirect end-users. Full System Protection may also be used to help migrate from a physical server or VMware virtual server to a Microsoft Hyper-V server.

And both Arcserve Replication and Arcserve High Availability include an automated, non-disruptive recovery testing feature called Arcserve® Assured Recovery™ that helps ensure your systems, applications and data are ready for use on the Replica (Failover) server.

In the following sections, we discuss some of the commonly deployed use cases for Arcserve Replication and Arcserve High Availability in Microsoft Hyper-V Server environments. Remember that both Arcserve Replication and High Availability also support VMware ESX and vSphere along with Citrix XenServer.

**Physical to Virtual (Guest) Replication and High Availability**

A common deployment scenario when building any data protection and disaster recovery strategy with Arcserve Replication and Arcserve High Availability, is to replicate data residing on physical servers (Production server) to virtual servers (Replica server) located at the same location or to a remote site like a data center, remote office, MSP hosting facility and even a private Cloud or Amazon Cloud (AWS/EC2), that is acting as a disaster recovery (DR) site. After the Production Server and Replica server are synchronized, byte-level changes to application, database and file data on the production servers, are continuously captured and replicated to an active virtual machine/Guest running on the Microsoft Hyper-V server – delivering continuous onsite or offsite data protection. And for security, you get built-in 128-bit SSL encryption over the network without having to use a VPN or IPSEC tunnel. When using Arcserve High Availability, in the event of an application, system or hardware outage, application services on the Replica Server Guest are automatically started and users and application workloads are automatically redirected, reducing business downtime. Alternatively, push-button failover may be set so IT staff can investigate issues first and then perform failover if deemed necessary.

In this configuration, a Arcserve Replication or Arcserve High Availability license, based on the Operating System type (Windows, Linux, UNIX) and level (Standard, Enterprise, Cluster) is required for each physical server or cluster resource group from which data will be replicated. In addition, each of the virtual machines (Guests) used as replication targets would require a Arcserve Replication or Arcserve High Availability Windows or Linux Virtual Machine license. It should be noted that Virtual Machine licenses are discounted for additional cost savings.

This configuration can be attractive because the services for the protected applications installed on the virtual machines are not always online or running and they may be considered by the software manufacturer to be offline, cold or in a stand-by mode. For this reason there may not be additional operating system or application licensing required. Verify your licensing agreements and/or consult with your various operating system and application vendors to ensure software license compliance.

**Virtual Machine (Guest) to Virtual Machine (Guest) Replication and High Availability**
When both your Production and Replica servers are virtualized, the replication and failover processes work almost identically to the process described above. The exception is Arcserve Replication or Arcserve High Availability are installed and configured on each of the individual virtual machines (VMs/Guests) on both the Production and Replica Servers. The Arcserve Replication and Arcserve High Availability unified, web-based management console makes it quick and easy.

In this scenario, customers purchase the lower priced Arcserve Replication and Arcserve High Availability Virtual Machine licenses for both the Production server and Replica server. Like we discussed in the previous scenario, please check your operating system and application license agreements to determine your actual operating system and application licensing requirements for the Replica server VMs/Guests.

**Full System Protection**

In addition to its core data replication and system failover features, Arcserve High Availability r16.5 provides Full System Protection (replication and failover) that performs replication of a complete physical or virtual Windows server (including the operating system, system state, application and data), to an offline virtual machine (Guest) residing on a different Microsoft Hyper-V Server (Host). Because the Replica VM/Guest is effectively a clone of the Production server/VM, it must remain in an offline state until failover to prevent IP, name and or network conflicts. This configuration supports a larger set of applications and environments because it is protecting the entire system, plus, it’s much easier to deploy because you are not required to first manually provision the Replica server. In this scenario, standard Arcserve Replication and Arcserve High Availability licensing applies.

**Hypervisor (Host) to Hypervisor (Host) Replication and High Availability**

When protecting Hyper-V servers, you might consider the advantages gained through Hypervisor-level replication. In this scenario, Arcserve Replication and Arcserve High Availability provide replication and failover for all (or selected) VMs/Guests on the Production Server but only one license is required per virtual server (Host), reducing deployment time and costs as the software is only installed on the Microsoft Hyper-V parent partition on the Production and Replica servers.

Arcserve Replication and Arcserve High Availability are able to auto-discover all the underlying VMs and continuously replicate the changes. If the Production Hyper-V server fails, Arcserve High Availability will automatically bring the Replica Hyper-V server online and redirect users and workloads. In the event of an individual VM/Guest outage it automatically starts the appropriate VM/Guest on the Replica Hyper-V server (Host).

Additional benefits of this scenario include reduced CPU and memory usage and lower licensing costs because each VM no longer requires its own locally installed copy of Arcserve Replication or Arcserve High Availability. Only one physical server license (based on the appropriate Windows Server level) would be required for each Production server (Host) and Replica server (Host). Because the Replica server (Host) is a complete copy of the Production server (Host), virtually any application may be protected. Finally, since each of the VMs on the Replica server are offline until a failover occurs, it is much more likely to fit the varied definition of a cold site which could further reduce OS and application licensing costs. As mentioned previously, you should check your licensing agreements and/ or consult with the various OS and application vendors to ensure compliance.

It should be noted that when using Arcserve Replication and Arcserve High Availability at the Hypervisor level, some features may be unavailable or have limited functionality. For example, the Arcserve Replication and High Availability
Assured Recovery feature is unavailable and the Data Rewind function offers reduced granularity when selecting a rewind point. When these features are required, a hybrid scenario (discussed below) can offer the best of both Hypervisor and Guest-level replication.

**Hybrid “Mixed” Hypervisor (Host) and Virtual Machine (Guest) Level Replication and High Availability**

A hybrid scenario is one where you might identify a handful of VMs/Guests such as a Microsoft Exchange Server or SQL Server that would benefit from having Arcserve Assured Recovery and the more granular data rewind features available. All other VMs would be configured as part of the Hypervisor-level protection scenario.

Licensing in this scenario is simple with Arcserve Replication and High Availability Host-based Virtual Machine licensing. This licensing option offers the flexibility to protect the Host (at the Hypervisor level) as well as an unlimited number of Windows VMs (Guests) on that host which delivers significant costs savings depending on the number of VMs/Guests being protected. Note that a Host-based license is only valid for a single virtual server (Host) and VM/Guest licenses cannot be split across multiple host systems.

**Summary**

Clearly there are a wide range of data protection and system availability tools on the market, as well as those capabilities included in the core operating system and virtualization platforms too. One important consideration in choosing your solution is ensuring that it equally protects both physical and virtual server environments (and multiple virtual server platforms)—as most organizations have both, and managing multiple point solutions can make it more expensive, complex and challenging. Leveraging virtualization technology for replication and high availability makes perfect sense, to help reduce data protection, availability and disaster recovery costs.

**Next Steps**

To learn more about Arcserve, visit arcserve.com/products.
Try Arcserve Replication and Arcserve High Availability for free at arcserve.com/software-trials.