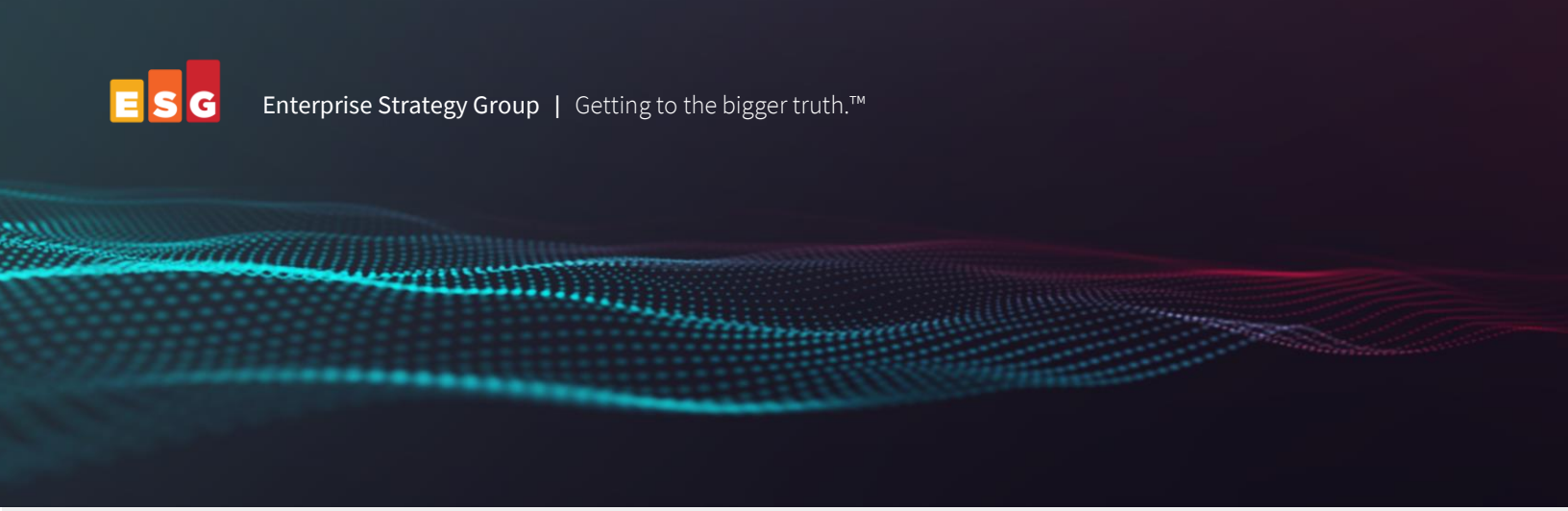

ESG WHITE PAPER

Enterprise Data Protection at Scale with Veeam and Cisco

Veeam Backup & Replication and the Cisco UCS S3260, Better Together

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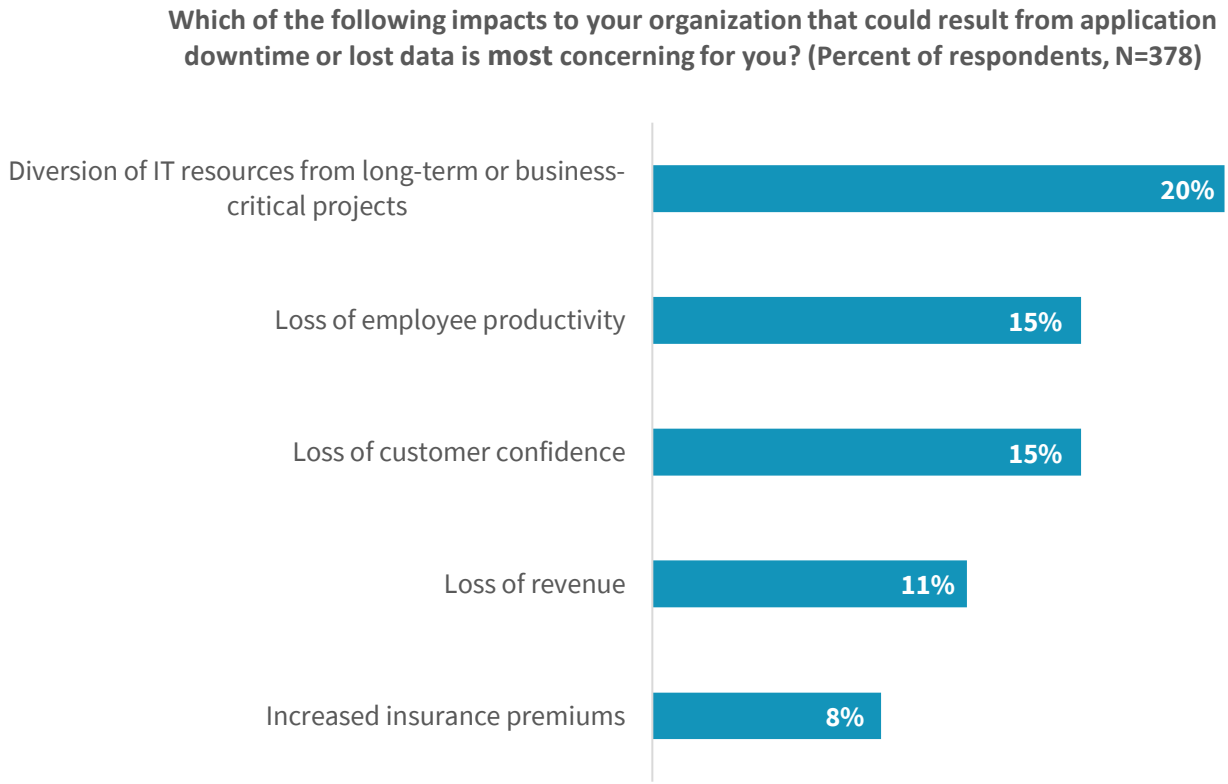
Introduction

Data in most organizations has become one of the core business assets over the past few years. This focus on the value in the data itself and the requirement to have continuous accessibility for utilization have forced organizations to reassess their data protection strategies, highlighting how critical a function they have become to the business. This is coupled by the dramatic increase in security challenges such as ransomware, which can paralyze an organization. Data protection reassessment has led organizations to look for vendor partners and solutions that meet today's needs and prepare them for the future. In an ESG research survey, when respondents were asked about potential impacts of downtime or data loss, a fifth felt that diversion of IT resources from longer term, more strategic business-critical projects was the most concerning potential impact, as shown in Figure 1.[1] This emphasizes how organizations now view IT organizations as a critical business function. Other important concerning impacts identified in the survey were a loss of employee productivity, loss of customer confidence, and a loss of revenue. The speed at which an organization can recover from a downtime event can have a major impact on the organization.

Figure 1. Top Five Most Concerning Impacts of Downtime and Data Loss



Source: Enterprise Strategy Group

Modern data protection done the right way reduces vulnerabilities in an organization. Whether it is a single file recovery or return to normal operations after a full-scale ransomware attack, resiliency and automation are needed in order to mitigate risks. This is accomplished by using the right vendors and solutions to reduce or eliminate the impact. Approaches to data protections vary. Far too many organizations modernize their protection environments reactively after discovering their legacy backup solutions have become inadequate. To address these challenges, Veeam and Cisco have come together with an enhanced solution. As separate systems they are industry leaders, but they are even better together.

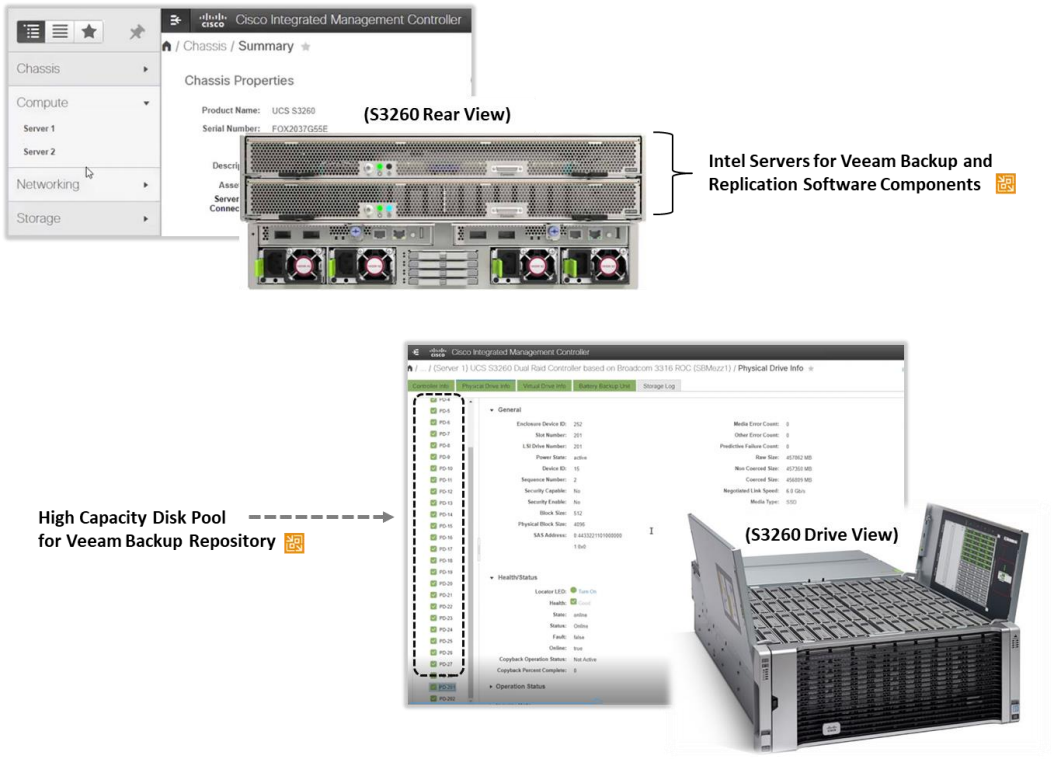
[1] Source: ESG Master Survey Results, *Real-world SLAs and Availability Requirements*, August 2020.

Enterprise Architecture and Management

Veeam Backup & Replication, which is part of the Veeam availability suite, and Cisco UCS storage servers deliver modern data protection that is fast, reliable, and proven. The solutions are easy to deploy, manage, and use with pre-validated configurations, providing a highly scalable combination designed to meet the ever-increasing demands placed on today's enterprises and IT staff. As shown in Figure 2, one such architecture configuration is the Cisco UCS S3260 Storage Server with Veeam Backup & Replication software.

The Cisco UCS S3260 storage server combines dual-node processing that is based on the 2nd Gen Intel Xeon Scalable and Intel Xeon Scalable processors to run the Veeam software in high availability mode, while interfacing with 56 drives and up to 840 TB of local storage (that can scale to petabytes with Cisco UCS Manager software) in compact 4-rack-unit form factors. The drives can be configured with enterprise-class Redundant Array of Independent Disks (RAID) or with a pass-through Host Bus Adapter (HBA) controller. Network connectivity is provided with dual-port 40-Gbps nodes in each server, with expanded unified I/O capabilities for network-attached storage (NAS) and SAN environments.

Figure 2. Architecture Overview



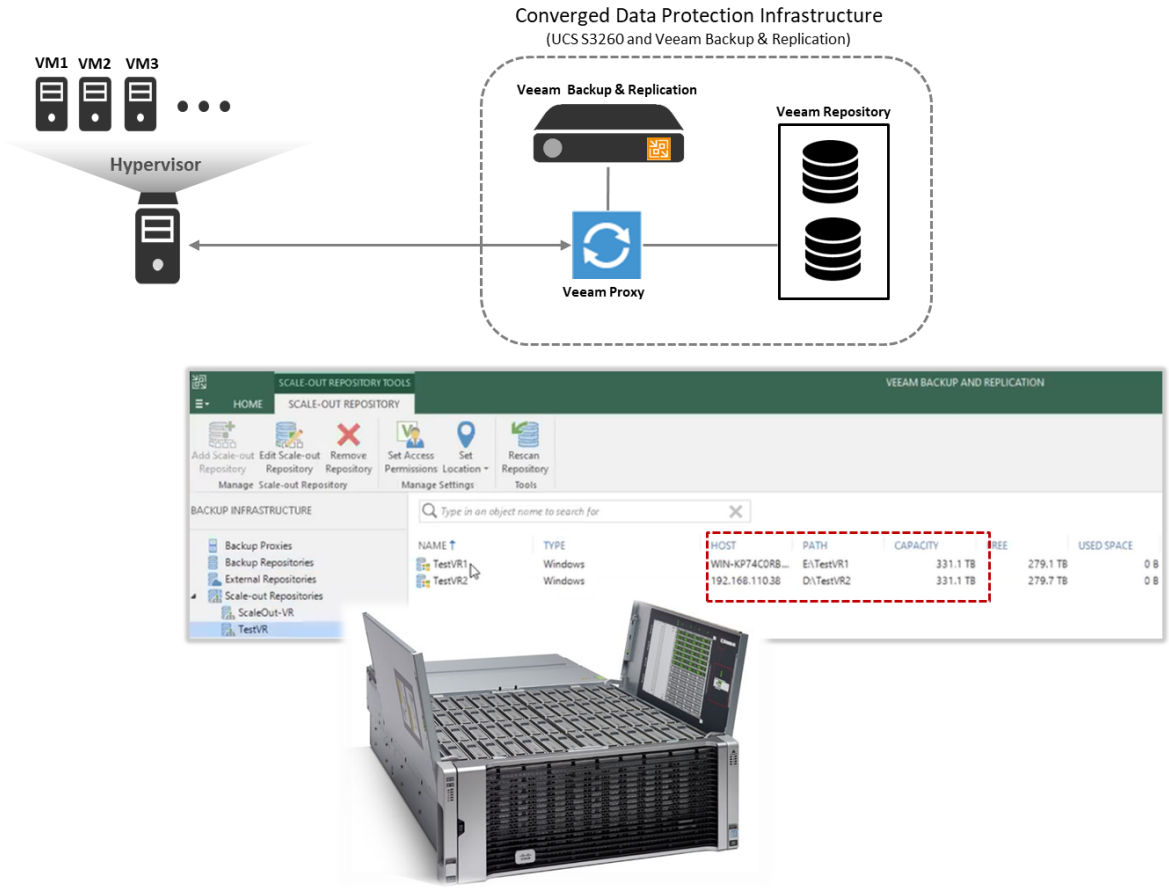
Source: Enterprise Strategy Group

For data protection with Veeam Backup & Replication, high capacity disk pools are created as targets for protection jobs. Management of the Cisco UCS is centralized on the UCS Manager software, which oversees all UCS deployments across the enterprise network. It enables server, fabric, and storage provisioning as well as device discovery, inventory, configuration, diagnostics, monitoring, fault detection, auditing, and statistics collection. The pre-validated solution offers customers:

- Fast, easy deployments with immediate scalability.
- Data protection readiness with a pre-configured solution ID available in Cisco Commerce Workspace.
- Enhanced, integrated functionality from two industry leaders.

Veeam Backup & Replication with Cisco UCS is a converged data protection solution. At the heart of this solution is the Veeam Backup & Replication software, as illustrated in Figure 3. From the Veeam console, all backup and recovery operations are orchestrated. For virtual environments, Veeam proxies can be leveraged to process jobs and manage backup and recovery traffic for better performance, resulting in shorter data protection windows. The storage targets are data pools created on UCS storage that become the Veeam backup repositories. In this example, we have two storage pools set up, each with 331 TB of available capacity as the targets.

Figure 3. Integration & Management



Source: Enterprise Strategy Group

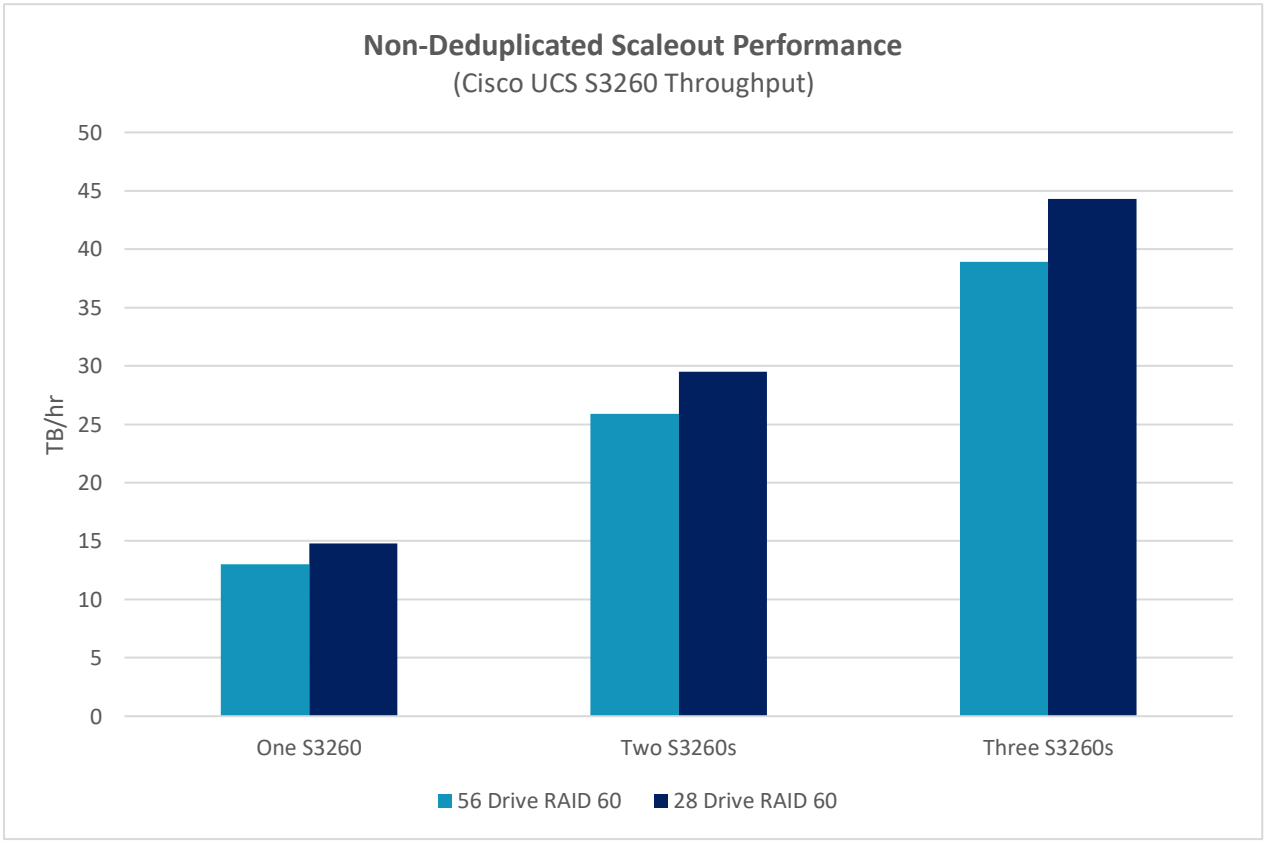
The increasing percentage of virtualized workloads, the dramatic increase in the size and amount of data, and the changes in the ways that companies work with data have had an immense impact on haw data protection is managed. The time available for backup operations has been reduced to minutes and recovery-point-objective (RPO) and recovery-time-objective (RTO) requirements are becoming more stringent every year. Customers interviewed by ESG for this paper indicate that the tight integration between Cisco UCS and Veeam Backup & Replication in this converged solution increases the features and functions available and creates a powerful solution for fast backup and fast restore operations. Customers also told ESG that the modular approach to the converged architecture simplifies deployment, makes the results more consistent, and eliminates the interoperability headaches related to creating a data protection solution on DIY infrastructure.

"The converged Cisco and Veeam solutions allow us to send pre-configured systems to our data center and be operational in minutes, giving us fast time to value."

Enterprise Performance and Scale

The Cisco UCS has the flexibility to conform to most any IT environment and scale as required. One physical system can manage up to 840TB in a single environment with the ability to add systems for scalability. To test this, ESG looked at the performance of systems in a test environment running Windows 2019, processing data with 100% writes and with no deduplication enabled. Figure 4 demonstrates throughput at scale. The systems were tested using a single 56 drive RAID 60 group and two 28 drive RAID 60 groups. We observed no degradation in throughput as workloads were distributed across a second or even third S3260 system.

Figure 4. Throughput at Scale



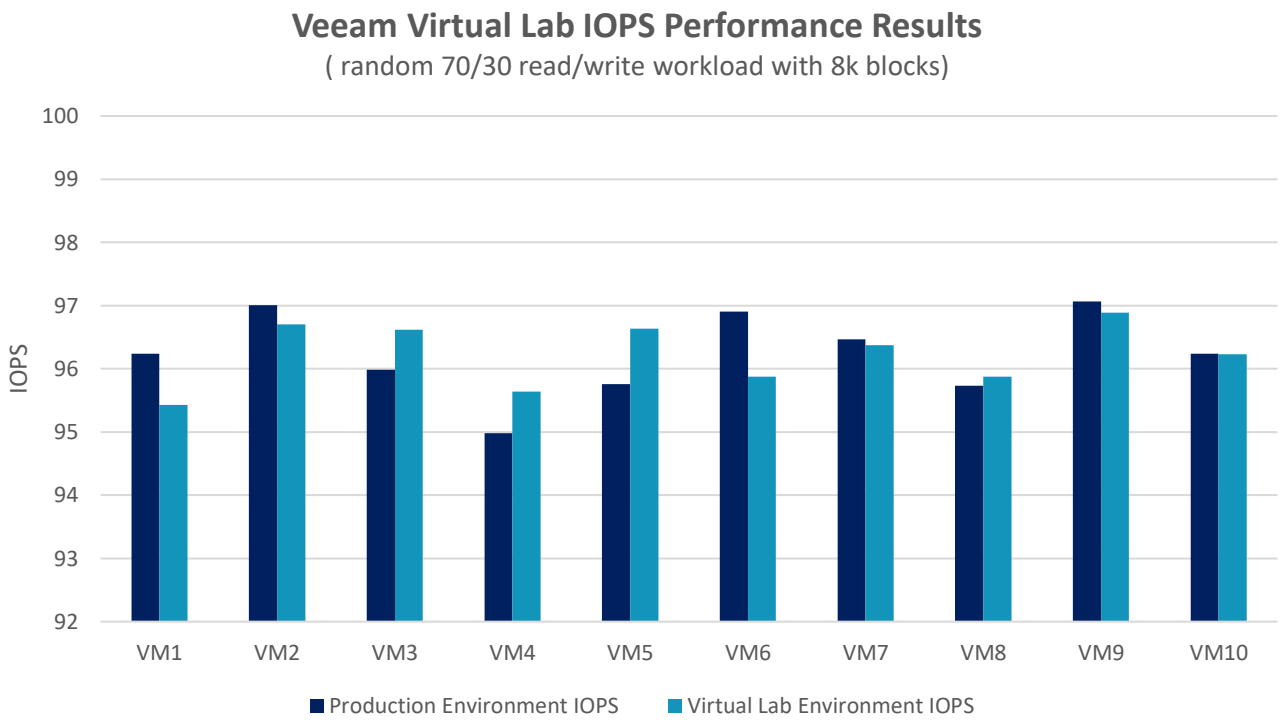
Source: Enterprise Strategy Group

What the numbers mean:

- **Performance –** Using a 56 drive RAID group, performance was 13TB/hour for one system, 25.9TB/hour with two, and 38.9TB/hour with three. Using two 28 drive RAID groups, the performance was 14.8TB/hour for one system, 29.5TB/hour with two, and 44.3TB/hour with three. There was no sign of reduced performance as more capacity was added. On average, the 56-drive system processed 3.6GB per second with the 28-drive system processing 4.1GB per second.
- **No deduplication –** Veeam customers see minimum deduplication and compression savings of 2x, with many seeing 3x or higher. Adding deduplication would have shown a multiple of two or more times the overall throughput seen in these tests. Deduplication was not added since the tests were focused on determining whether there was any reduction of performance with scale, which was not seen.

ESG evaluated the performance of ten virtual machines in a test environment as shown in figure 5. The comparison looked at IOPS performance of VMs running in a production environment versus the same VMs hosted on a Cisco UCS 3620 in a virtual lab environment. The goal was to consider if performance in a production environment was substantially different than in the virtual lab environment. In both cases, the environments had a 70/30 read/write workload with 8k data blocks. We found that 50% of the time, the virtual lab performance was actually higher than in the production environment, and when we took an average, the production environment average was 96.24 IOPS versus the virtual labs at 96.23.

Figure 5. IOPS Performance



Source: Enterprise Strategy Group

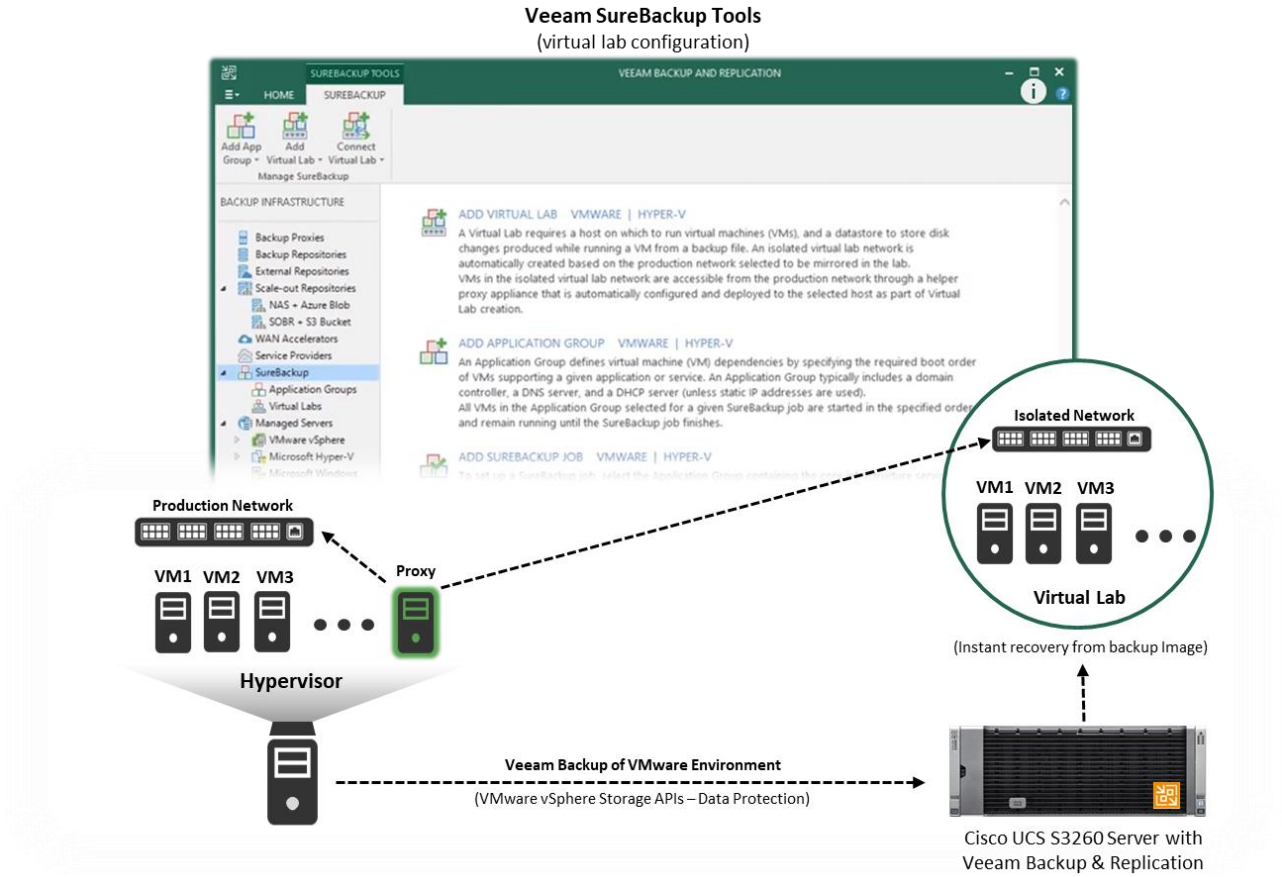
The results show nearly identical performance between a production environment and the virtual lab. Some of these performance results can be attributed to Cisco UCS and Veeam being a converged solution running in a single environment with high speed processing and read/write to storage with no network latency, along with Veeam WAN optimization to increase the flow of traffic. For enterprises, the numbers demonstrate that the virtual lab test environment is a good indication of the performance to be expected in a full production mode, which should provide strong confidence to IT managers deploying this backup and replication solution in production. When interviewed for this paper, Veeam/Cisco customers cited good performance as another sought-after capability and told ESG they'd found Cisco UCS and Veeam both offer consistently excellent speed. Too many people think that all Intel-based servers boast similar performance. Cisco UCS users know better. For their initial projects, they'd leveraged legacy, already-owned servers. As they started seeking out better performance, reliability, and manageability for their second-wave efforts, they determined that continuing to purchase other vendors' servers would no longer suffice.

"We moved to Cisco UCS running Veeam for performance, and scalability. It takes only minutes to add capacity or a new system and performance is never an issue."

Enterprise Features and Capabilities

The combined Cisco/Veeam solution delivers enterprise-grade data protection for any workload—physical, virtual, or cloud-based—to ensure data and applications are always available or recoverable while meeting the most stringent RTOs and RPOs. For test and development scenarios, Veeam offers virtual labs (the underpinnings of data labs) with SureBackup Tools to verify and test backup assets in an isolated and safe environment. As shown in Figure 6, a virtual lab is decoupled from production and allows backup images to be started without impacting the production environment. The SureBackup Tool within virtual labs automatically tests and verifies the backed-up VM for recoverability by running the VM directly from the backup file (no full VM restore is required), including support for custom application test scripts. The virtual lab relies on a Veeam Proxy server to control the flow of data to the isolated network, which is set up with virtual machines and interfaces from backup images hosted on the Cisco UCS S3260 converged system with compute and storage resources. The proxy server acts as a gateway for the guests inside the virtual lab, allowing them to operate without any network reconfiguration, while avoiding duplicate IP addresses on the production network. To allow communication between the inside and outside world, the proxy server will set up translation rules to masqueraded IP addresses.

Figure 6. Virtual Labs

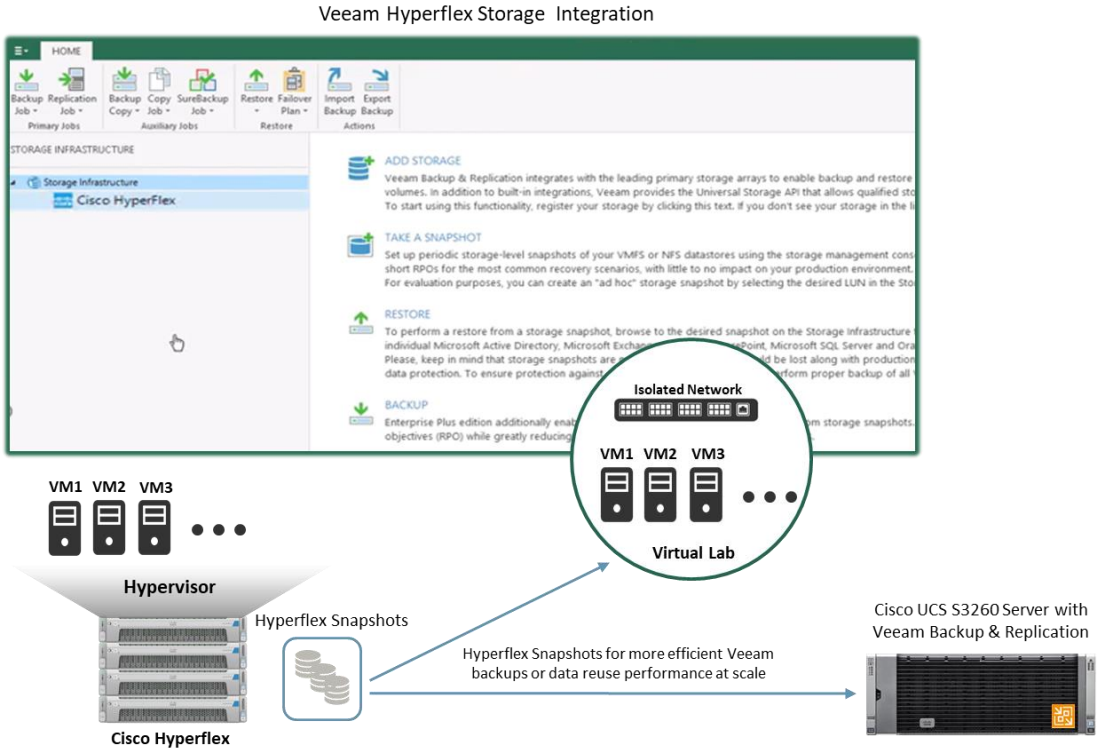


Source: Enterprise Strategy Group

An enterprise can run one or many VMs directly from a backup image and troubleshoot, test, and train on a working copy of the production environment without impacting business operations. In a more advanced configuration, the virtual lab can be interfaced back into production and even connect to multiple production environments.

For enterprises using Cisco Hyperflex servers in production, even greater performance can be achieved. As shown in Figure 7, Veeam Backup & Replication integrates with Cisco Hyperflex and allows you to back up VMware virtual machines hosted on Cisco Hyperflex with Hyperflex-native capabilities. For these VMs, Veeam Backup & Replication does not use VMware vSphere snapshots to preserve the VM in a consistent state suitable for backup or replication. Instead, it relies on native Cisco Hyperflex snapshots. This avoids the overhead produced by VMware vSphere snapshots. The snapshots created using Hyperflex can be backed up with Veeam to the Cisco UCS S3260 or directly accessed and used for the virtual lab environment. Enterprises benefit from higher performance and tighter integration into their data protection environment.

Figure 7. Storage Snapshot Integration



Source: Enterprise Strategy Group

Data reuse generates or is expected to generate broad efficiencies that point to a combination of direct business and technical benefits. ESG's research shows that intelligent data management/data reuse is the future of backup and recovery. Specifically, when asked for their perspectives on the future of data management in their organizations, more than half (59%) of respondents expect data reuse to be an extension of their overall data protection strategy.[2] In fact, customers interviewed by ESG for this paper reinforced this sentiment, indicating that the advanced data management, ease of management, and automation capabilities provided by the Cisco UCS with Veeam Backup & Replication solution helped enable efficient data reuse for schemas for their organizations.

> **"We focus on hosting business critical infrastructure (IaaS), but can't do it without advanced recovery, DR and data reuse capabilities, which is why we have standardized on Cisco UCS with Veeam."**

[2] Source: ESG Research Report, *The Evolution from Data Backup to Data Intelligence*, February 2020.

The Bigger Truth

In efforts to be more agile, businesses are evolving their IT environments to take advantage of highly virtualized, hyperconverged infrastructure. In the process, however, they may well find their current backup and recovery tools can't keep up. Traditional solutions that were born before virtualization are being asked to back up virtual machines and virtualized storage systems, often times with lackluster results. Such tools can't always deliver on the recovery time objectives (RTOs) and recovery point objectives (RPOs) that "always-on" businesses demand. The combination of Cisco UCS for converged storage and compute power with Veeam data protection delivers performance at scale for enterprises with the flexibility to deploy on-premises, at the edge in ROBO environments, or in the cloud with centralized management and automation. Through the use of APIs, they can extend features and functionality into additional applications an enterprise may require for management, reporting, monitoring, and even billing if acting as a service provider.

With more than 50x growth in data over the past decade and organizations operating as always-on, data protection needs to be automated and deliver the RTOs and RPOs that the organization demand today and in the future. If you are looking to be proactive and modernize your data protection with leaders focused on meeting today's objectives while planning for what's next, ESG recommends that you consider Cisco UCS and Veeam, which is truly a better together solution.

Enterprise Strategy Group is an IT analyst, research, validation, and strategy firm that provides market intelligence and actionable insight to the global IT community.

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