

QNAP Backup and Recovery Solutions Brief

Accelerating Data Availability with Veeam and Flash



Overview

QNAP has made numerous efforts to integrate multiple technologies and work with several partners to deliver a total solution for QNAP customers. Recently QNAP announced they've furthered their Veeam relationship, becoming Veeam Ready. This means all of the backup, recovery, DR, replication, and high availability benefits of Veeam can now be realized on qualified enterprise QNAP NAS systems. In order to become Veeam Ready, QNAP had to prove their devices are capable of the performance needed to meet Veeam backup and recovery objectives.

Veeam's Backup & Replication service is designed to enable constant availability for any app or data on any cloud. Veeam Ready is a qualification and testing certification for storage products that verifies that all features of Veeam Availability can be met. The Veeam Ready program not only makes storage devices more appealing to potential customers looking to leverage all the benefits of Veeam Rack & Recovery, it also gives vendors such as QNAP the opportunity to jointly market the solutions, reaching a much larger audience than otherwise possible.

Name/Alias	Status	Type	Snapshot	Snapshot No.	Capacity	Percent Used
Storage Pool 1	Ready	Thick volume	--	--	72.68 TB	
DataV01 (System)	Ready	Thick volume	--	--	9.96 TB	
Storage Pool 2	Ready	Thick volume	--	--	2.33 TB	
DataV02	Ready	Thick volume	--	--	1.98 TB	
veeam_0 (Mapped)	Ready	Block-based Thick LUN	--	--	200.00 GB	

Solution

To highlight the benefits of Veeam on the QNAP NAS platform, we populated a TS-1685 with spinning media and flash, both of which are key to how QNAP positions storage types in their NAS platforms. QNAP has been a leader when it comes to not only adopting flash, but offering ways for customers to leverage different types of flash across most of the QNAP portfolio.

With the TS-1685, for example, QNAP includes twelve 3.5" bays for high-capacity storage as well as four dedicated 2.5" SSD bays. In addition to the front-accessible storage, QNAP also supports up to six SATA-based m.2 SSDs internally. These design elements allow customers to leverage flash for a variety of use cases with their QNAP NAS, no matter if it's for primary or secondary storage in areas such as backup.

Equipped with the robust hardware configuration offered by the QNAP TS-1685, we used twelve 8TB Seagate Enterprise NAS HDDs and four 960GB Samsung 860 DCT SSDs. This gives us about 73TB of RAID6 spinning media, and 2.3TB of RAID5 flash capacity. To further complement the flash, we leveraged the embedded QNAP "SSD Extra Over-provisioning" feature which gives users an intuitive way of reserving space on each drive for additional performance and endurance. The QNAP QTS operating system can evaluate the SSDs, which helps users find the proper rate of over-provisioning for their use, while leaving enough capacity for the intended workloads.

While Samsung already provides a high level of performance in their products, additional over-provisioning helps to maintain performance of writes even when the drive is almost out of space. Over-provisioning will also increase the endurance of the drive. Increasing the lifespan of the drive lowers total cost of ownership, as the drives will have to be replaced less often.

Samsung's 860 DCT was designed based on extensive feedback from IT Managers, and is aimed at read-intensive, or light/medium use deployment scenarios. The 860 DCT is available in capacities ranging from 960GB to 3.84TB and offers specific data center firmware to deliver high IOPS consistency and sustained performance across various queue depths.

Test Configuration and Performance Data

Leveraging Veeam Backup & Replication with QNAP storage is a great way to deliver increased performance with the Scale-Out Backup Repository. The Veeam Scale-Out Backup Repository is a way to aggregate backup storage as well as introduce some storage-management policies. From an aggregation standpoint, multiple, dissimilar storage resources can be combined as one

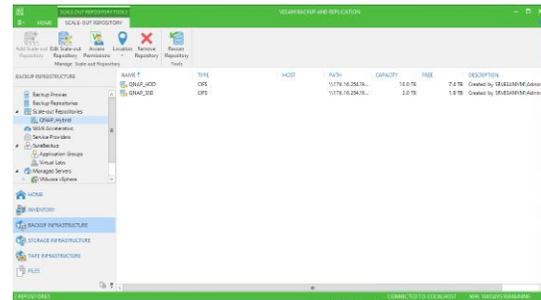
logical target for all backup jobs. This is very helpful when it comes to migrating backup storage, as well dealing with backup storage that may have run out of capacity as data continues to grow.

From a storage management perspective, the Scale-Out Backup Repository with QNAP storage introduces a unique set of capabilities. With hard-drive-backed and solid-state-drive-backed shares, QNAP storage can be pooled together in a policy for Veeam Backups to get increased performance options. This is done through two key policies in the Scale-Out Backup Repository:

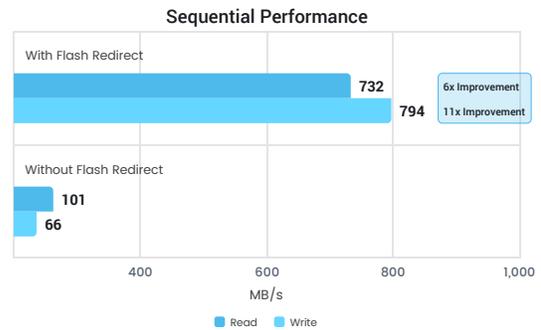
- **Performance:** The performance policy would have the Veeam backup job send full backups and incremental backups to specific storage resources. A QNAP solid-state-drive-backed share, for example, would serve incremental backups better (higher speed, more random I/O, lesser overall capacity), whereas a QNAP hard-drive-backed share would serve full backup files better (larger files, less manipulation of the contents).
- **Placement:** The placement policy could optionally put all backup chains of a job together (not separating full backups from increments as prescribed above).

One of the key capabilities of the Veeam Scale-Out Backup Repository is the ability to put an individual storage resource (called an extent) into maintenance mode. This means that no subsequent backups will go to that individual extent – and the remaining storage resources will receive a backup. This works well with QNAP storage systems to provide multiple storage resources and shares to the Veeam backup infrastructure. This enables organizations to obtain the best backup performance and have the highest availability of the backup storage so that recovery points are not missed.

Utilizing the Scale-Out Backup Repository on the QNAP TS-1685, a 10TB volume was provisioned from the hard drive storage pool for an HDD extent, and a 2TB volume was provisioned from the flash storage pool for the SSD extent. An additional 200GB LUN was carved out from the remaining flash storage pool to utilize during recovery processes.



When it comes time to perform a recovery, the flash capabilities inside the QNAP NAS are leveraged again, giving IT administrators the ability to instantly recover VMs with a minimal hit to performance compared to primary storage. Using Veeam’s Instant Recovery option, users are able to redirect virtual disk updates to a different datastore. From the QNAP TS-1685, a 200GB SSD-backed LUN (provisioned as an iSCSI Datastore) is selected to accelerate virtual disk updates. Using this combination, we saw sequential read and write performance measure 732 MB/s and 794 MB/s, compared to 101 MB/s and 66 MB/s without the flash-backed redirect used. Random access performance was also higher, measuring 7500 IOPS read and 6900 IOPS write with the flash redirect enabled, versus 4800 IOPS read and 702 IOPS write without.



Small organizations everywhere are struggling with how best to protect their organizations as data demands continue to grow. In this paper, we’ve highlighted best practices for using Veeam with QNAP NAS, in addition to the best ways to leverage Samsung SSDs as part of that formula. Thanks to QNAP’s innovative hardware design, SSD-centric software like their Extra Over-provisioning and third-party partnerships, enterprise-grade data availability is attainable by all.

Learn more about QNAP solutions at www.qnap.com/veeam