vmware PRESS

Official Cert Guide

Learn, prepare, and practice for exam success

vSphere 6 Foundations Exam

VMware Certified Professional 6 (Exam #2V0-620)

- Master the #2V0-620 exam with this official study guide
- Assess your knowledge with chapter-opening quizzes
- Review key concepts with Exam Preparation Tasks
- Practice with realistic exam questions on the CD-ROM

BILL FERGUSON

PEARSON

vSphere 6 Foundations Exam Official Cert Guide (Exam #2V0-620)

There are many hardware requirements in regard to VSAN. They generally fall into the categories of storage, memory, and CPU. As you can imagine, the storage-related requirements are by far the most stringent and detailed, as shown in Table 8-2.

Table 8-2 Hardware Requirements for VSAN

Key Topic

Storage Component	Requirements
Cache	One SAS or SATA solid state disk (SSD) or PCIe flash device.
	Cache devices must not be formatted with VMFS or any other file system.
Virtual Machine Data Storage	Either one magnetic disk (for hybrid configuration) or one SAS or SATA solid state disk (SSD) or PCIe flash device.
Storage Controllers	SAS, SATA, or RAID in passthrough or RAID 0 mode.

In general, you need two disks; both can be SSD, or one can be magnetic and the other SSD. One disk will be used for storage capacity while the other will be used only for read caching and write buffering to improve performance.

In addition, each host should contain a minimum of 32 GB of memory. This will accommodate the maximum configuration of five disk groups (capacity and caching) and seven devices per group, per host.

Finally, you should consider that VSAN will place a load on the CPU of the host. The actual load will vary depending on your configuration and use of the VSAN. The additional load should not be more than 10 percent of current CPU load on the host. It should also be mentioned that hosts in the cluster that do not participate in the VSAN can still benefit from storing associated VM files in the VSAN.

Virtual SAN Network Requirements

In addition to general hardware requirements, there are many network requirements and considerations with regard to VSAN. Many of these may already be met, just by the fact that you have a vSphere cluster in place, but you will need to meet all of them to support VSAN. Table 8-3 shows the networking requirements for VSAN in vSphere 6.0.

Key Topic

Table 8-3 Network Requirements for VSAN

Networking Component	Requirement
Host bandwidth	Dedicated 1 Gbps for hybrid configurations.
	Dedicated or shared 10 Gbps for all-flash configurations.
Connection between hosts	Each host must be part of the VSAN cluster to use the resources provided by the VSAN.
Host network	All hosts must be connected to the same Layer 2 network.
Multicast	Multicast must be enabled on all switches and routers that will handle VSAN traffic.
IPv4 and IPv6 support	VSAN is currently supported for only IPv4. IPv6 is not supported at this time.

Use Cases for VSAN Configurations

In essence, VSAN provides the same opportunity for storage management that the vSphere provides for compute resource management—software-based control with a "single pane of glass." For a business that is experiencing tremendous growth, VSAN can add storage capacity every time the business purchases a new host. In addition, VSAN removes a layer of complexity associated with creating partitions and logical unit numbers (LUNs) that may or may not be used, depending on what transpires for the business in the future. Instead, each vmdk and snapshot can be individually controlled for redundancy and performance within the same aggregated datastore. It's truly a new and different way of looking at storage that will begin to transform both server and virtual desktop interface (VDI) environments in the years to come.

Configuring and Managing Virtual Volumes (VVOLs)

Much like VSAN, VVOLs provide a software-based policy management solution. The difference is that this storage solution can extend well beyond the local disk capacity of your hosts. VVOLs allow you to do away with Gold, Silver, and Bronze storage type "guessing games" that might cause you to overprovision some levels of storage while underprovisioning others. With VVOLs, the right level of storage can be provisioned automatically when each VM is created. In the long run, this also saves time because you (or your storage admin) will not have to create the partitions and the LUNs that go with the traditional storage guessing games.

However, configuring VVOLs for the first time requires that you follow a series of steps to provide for the resources and the connections for acquiring and managing

them. It's important that you understand each of these steps and perform them in the right order. This section covers the steps necessary to configure and manage VVOLs. I start with the general steps and then cover each one in more detail.

The general steps required to configure VVOLs are as follows:

Step 1. Register storage providers for virtual volumes.

Step 2. Create a virtual datastore.

Step 3. Review and manage protocol endpoints.

Step 4. Optionally, modify multipathing policies.

Registering Storage Providers for Virtual Volumes

Third-party storage vendors provide software that works through VMware APIs for Storage Awareness (VASA). This software is referred to as Storage Provider (not the vendor). Your VVOLs will use this software to provide communication between the vSphere and the storage. The storage characteristics appear in the VM Storage Policies interface so you can use them to create storage policies for the VMs. These policies can then be enforced to provide for the redundancy of the VM files and their performance characteristics. To use VVOLs, you must first register these storage providers. You can register a new Storage Provider on the Manage/Storage Providers tab of the vCenter Server in your vSphere Web Client, as shown in Figure 8-5. The credentials that you will use to authenticate to a specific provider URL can be obtained from your storage vendor or your storage administrator.

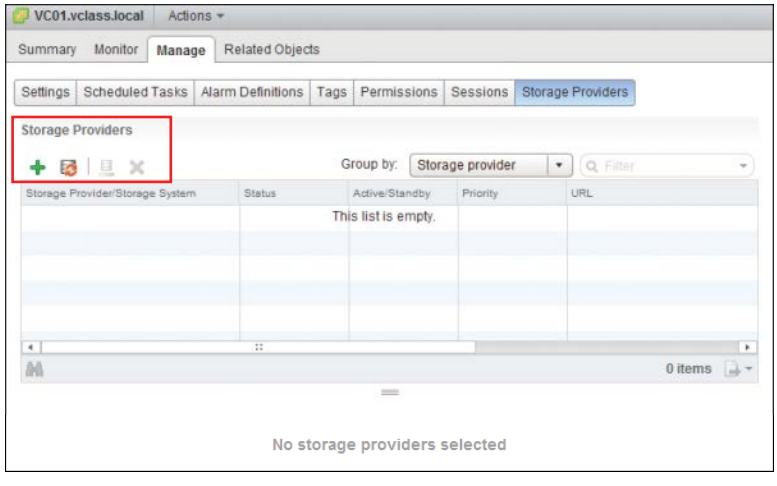


Figure 8-5 Registering a New Storage Provider

Create a Virtual Datastore

After you have registered the Storage Providers to be used with your VVOLs, you then need to create a datastore that will represent the logical connection to the physical volumes that provide the storage. You begin to create a new VVOL in much the same way that you create any other datastore, by right-clicking your data center in Datastores view, then clicking **Storage** and then **New Datastore**, as shown in Figure 8-6. You should then select **Next** and then **VVOL**, as shown in Figure 8-7. Then it's just a matter of associating the backing storage container to your new datastore, as shown in Figure 8-8.

Key Topic

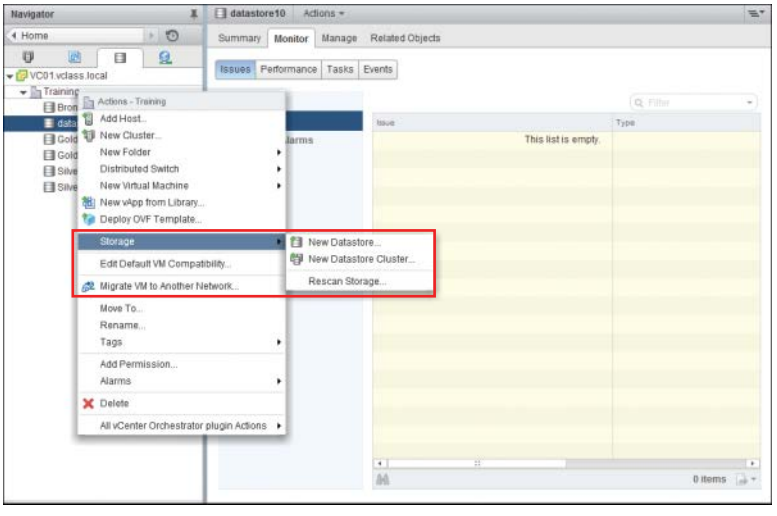


Figure 8-6 Creating a New Datastore

Key Topic

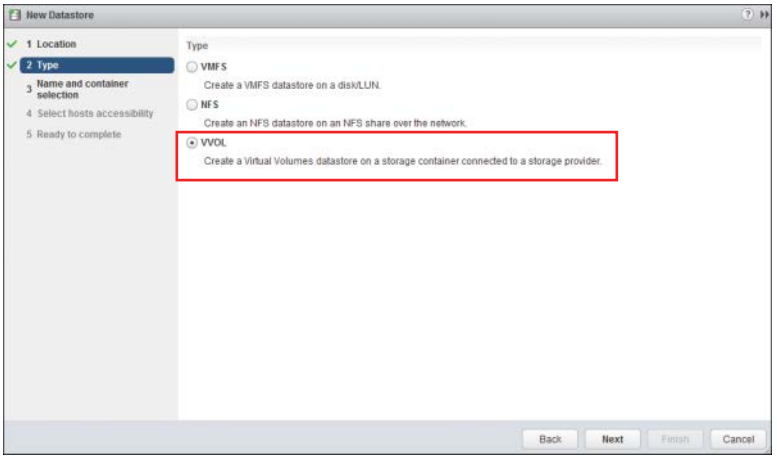
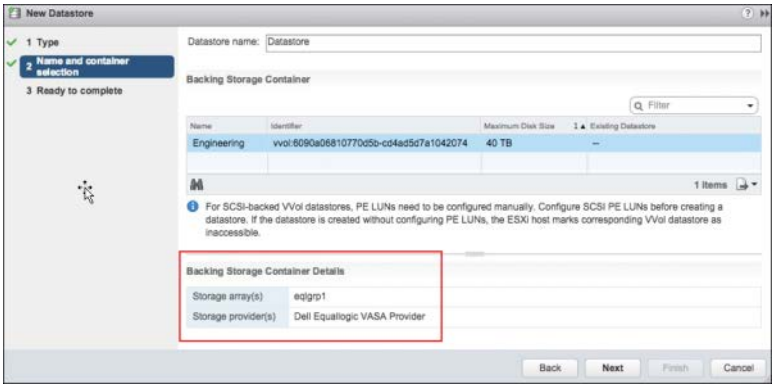


Figure 8-7 Choosing VVOL for New Datastore Type

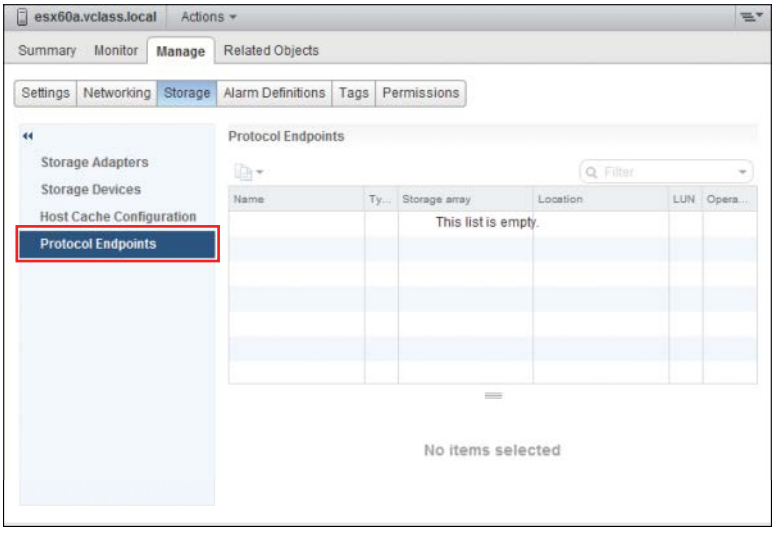


Key Topic

Figure 8-8 Associating Backing Storage to New Virtual Datastore

Review and Manage Protocol Endpoints

Much like iSCSI uses targets or storage processors to provide a connection of the host to the underlying storage, the VVOL system uses an entity called a protocol endpoint (PE). Protocol endpoints are exported, along with their associated storage containers, by the storage system through the storage provider software. They become visible in the vSphere Web Client after you map a storage container to a virtual datastore. You can view and modify the protocol endpoints as needed by clicking the **Manage** and then **Storage** tabs of the host, as shown in Figure 8-9.



Key Topic

Figure 8-9 The Protocol Endpoints Link

Summary

This chapter covered the following main topics:

- The benefits of NFS v4.1—in particular, its capabilities in regard to multipathing and authentication.
- An overall discussion of VSAN, including VSAN hardware requirements, VSAN networking requirements, and general use cases for VSAN.
- Creating and managing VVOLs in vSphere. This included a brief discussion on the purpose of VVOLs as well as the overall steps included in creating them.

Exam Preparation Tasks

Review All the Key Topics

Review the most important topics from the chapter, noted with the Key Topic icon in the outer margin of the page. Table 8-4 lists these key topics and the page numbers where each is found. Know the main differences between storage types, such as VMFS and NFS. Understand the differences between storage technologies, such as Fibre Channel, iSCSI, NAS, and vSAN. Know how to create, configure, expand, and delete datastores.

Key Topic

Table 8-4 Key Topics for Chapter 8

Key Topic Element	Description	Page Number
Figure 8-1	Configuration Wizard Warning	188
Figure 8-2	Configuring Multiple Addresses for Multipathing	189
Figure 8-3	Confirming Multiple Addresses for Multipathing	189
Figure 8-4	Enabling Kerberos Authentication for NFS 4.1	190
Table 8-2	Hardware Requirements for VSAN	191
Table 8-3	Network Requirements for VSAN	192
Step list	Steps required for configuring VVOLs	193
Figure 8-5	Registering a New Storage Provider	193