AltaVault Cloud Integrated Storage 4.4.1

Installation and Service Guide for Virtual Appliances

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Contents

System requirements and supported models

Installing an AltaVault virtual appliance requires an understanding of the hypervisor and system hardware requirements.

Supported AltaVault virtual appliance models

AltaVault virtual appliances are available in the following models: AVA-v2, AVA-v8, AVA-v16, and AVA-32. Models vary by local storage capacity, which ranges from to 2 TB to 32 TB.

Hypervisor requirements

AltaVault virtual appliances are available for VMware ESXi, Linux KVM, and Microsoft Hyper-V. The Interoperability Matrix contains the complete list of supported hyperevisor versions.

NetApp Interoperability Matrix Tool

For KVM, the hypervisor must include the following software packages: kvm, qemu-kvm, libvirt, and virt-manager.

Hardware requirements

The following table displays the minimum mandatory hardware requirements supported for AltaVault virtual appliances. As an example, when you configure an AVA-v8 with 8 TB of usable cache, the virtual machine should have a disk LUN mapped that provides extra capacity to store the metadata that the system generates. To use a maximum of 8 TB, you would provision a disk LUN of 10 TB (10,000,000,000,000 bytes or 10 TB base 10).

Component	Description
Virtual CPUs	4 minimum for AVA-v2 4 minimum for AVA-v8 8 minimum for AVA-v16 12 minimum for AVA-v32
Physical CPUs	Intel E5-2680v2 or similar
Memory	AVA-v2: requires 6 GB of RAM AVA-v8: requires 24 GB of RAM AVA-v16: requires 48 GB of RAM AVA-v32: requires 96 GB of RAM **Note:** For systems experiencing heavy loads, provisioning additional memory can help the overall system operation.
Networking	10 GbE network adapters are supported on all AVA models

Component	**Description**
Disk	AVA-v2: 2.5 TB: • 2 TB for data cache • 500 GB for system metadata AVA-v8: 10 TB: • 8 TB for data cache • 2 TB for system metadata AVA-v16: 20 TB: • 16 TB for data cache • 4 TB for system metadata AVA-v32: 40 TB: • 32 TB for data cache • 8TB for system metadata In addition: • Minimum 150 GB for the AltaVault OS disk. • Use RAID-6 high throughput disk subsystem. Use separate disk subsystems from the one used for backed-up servers. • Disk space provisioned beyond the above mentioned limits is not utilized.

Guidelines for deploying AltaVault virtual appliance

For successful deployment of your AltaVault appliance, you must follow a number of deployment guidelines.

- Use at least a Gigabit link (**`1 Gbps`**) for interfaces.
- Do not share virtual switches.
- Always reserve virtual CPUs:
  - Reserve the number of virtual CPUs and the number of clock cycles (in terms of CPU MHz).
  - Reserve the number of virtual CPUs and the percentage of allocated CPU for VM.
- Do not over-provision the physical CPUs.
  The total virtual CPUs needed by all running VMs should not be greater than the physical CPUs on the system.
- Use a server-grade CPU for the Hyper-V host.
- Always reserve RAM:
  - Reserve the RAM that is needed by the AltaVault virtual appliance model plus 5 percent more RAM for the Hyper-V overhead.
  - Do not enable Dynamic Memory for the AltaVault virtual appliance.
  - Use high memory weight for the memory attached to the VM.
- Do not use low-quality storage for the data store disk.
  The disk store should support a high number of Input/Output Operations Per Second (IOPS). For example, use high performance storage such as NAS, SAN (Storage Area Network), or DAS (Direct Attached Storage).
- Always use thick-provisioned LUNs for the data partition for the cache.
- Use a dedicated physical drive for the Virtual AltaVault datastore.
  Sharing this drive with other VMs can impact the overall performance of the AltaVault virtual appliance.
- AltaVault appliances cannot be moved using vMotion or other similar virtual machine tools.
  These tools can disrupt the configuration of the AltaVault.
- AltaVault virtual appliances require a static MAC address.
  The MAC address for the primary interface should not change.
- When using Hyper-V, do not use dynamic MAC addresses for AltaVault virtual appliances.

Installing AltaVault virtual appliance on Microsoft Hyper-V

Installing AltaVault virtual appliance requires configuring a virtual switch, downloading the image from NetApp, configuring the appliance through the Hyper-V manager, and powering on the machine.

About this task

Complete the following tasks in the order presented.

Steps

1. Configuring a virtual switch on page 7
2. Downloading the VM package and running the AltaVault script on page 8
3. Configuring the VM using the Hyper-V Manager on page 9

Configuring a virtual switch

Installing an AltaVault virtual appliance on Microsoft Hyper-V requires configuration of a virtual switch to support the appliance interfaces.

About this task

If no virtual switch exists for the AltaVault virtual appliance, your must create one.

Steps

1. Open the Virtual Switch Manager.
2. Under **Virtual Switches**, select **New virtual network switch**.
3. Under **Create virtual switch**, select the type of virtual switch that you want to create, and then click **Create Virtual Switch**.

   The new virtual switch is displayed on the left under Virtual Switches.
4. Complete the configuration:

Control	Description
Name	Specify the name of the virtual switch.
Notes	Optionally, specify notes that apply to the virtual switch.
Connection type	Select the switch type of the virtual switch configuration that was not provided during the installation script. Use the Hyper-V switch manager to configure the v- switch that need to be connected to the interface.

Control	Description
VLAN ID	Identifies the V host to use with this virtual switch. Leave the box unchecked for Enable virtual LAN identification for the management operating system.

5. Click **Apply**.
6. Click **Yes** to confirm your changes.

Downloading the VM package and running the AltaVault script

For Hyper-V installations, you must download and install the AltaVault virtual appliance.

Before you begin

Your system must meet the hardware requirements and address the guidelines for the AltaVault model. See *System requirements and supported models* on page 4.

A virtual switch must already exist. See *Configuring a virtual switch* on page 7.

Steps

1. Download the VM package.

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2. Unzip the package.
3. Open a Windows PowerShell session, change to the directory of the unzipped package, and change the execution policy:

```
w2k12r2 > Set-ExecutionPolicy Unrestricted
 Do you want to change the execution policy? : y
 w2k12r2 > ALTAVAULT_INSTALL.ps1
```

   `w2k12r2` refers to Microsoft Hyper-V Server 2012 R2, which is the Hyper-V server.

4. Complete the configuration:

Question	Response
Do you want to run?	r
Enter the VM name:	Provide a name for the VM.
Enter the location to install the VM:	Enter the location where you want to install the VM.
Enter number of Virtual Processors:	Specify the number of virtual CPUs as required by the VM being deployed.
Enter the amount of RAM (GB):	Specify the amount of RAM as required by the VM being deployed.
Enter vSwitch name to attach Primary or blank to skip:	Specify the virtual switch created for use with the primary interface of the VM.

Question	Response
Enter vSwitch name to attach e0a or blank to skip:	Specify the virtual switch created for use with the e0a interface of the VM, or press Enter.
Enter vSwitch name to attach e0b or blank to skip:	Specify the virtual switch created for use with the e0b interface of the VM, or press Enter.
Enter vSwitch name to attach e0c or blank to skip:	Specify the virtual switch created for use with the e0c interface of the VM, or press Enter.

Configuring the VM using the Hyper-V Manager

For Hyper-V installations, use the Hyper-V Manager to complete the virtual machine settings for the AltaVault appliance.

Steps

1. Open Hyper-V Manager.
2. From the left pane, under **Hyper-V Manager**, select **machine name** for the VM that was created.
3. From the right pane, under **Virtual Machines**, select **name of the virtual machine**.
4. Right-click the name, and then select **Settings**.

   The Settings page appears.
5. To add a hard drive to the IDE controller, from the left pane, select **IDE Controller 0**.
6. From the right pane under **IDE Controller**, select **Hard Drive**, and then click **Add**
7. From the right pane under **Hard Drive**, verify that the Location is set to **1** and the **Virtual hard disk** radio button is selected
8. Click **New** to launch the **New Virtual Hard Disk Wizard**.
9. When the **Virtual Hard Disk Wizard** starts, click **Next**.
10. From the **New Virtual Hard Disk Wizard** page, select the **VHDX disk format** radio button.
11. Click **Next**.
12. Select the **Fixed size** radio button, and then click **Next**.
13. From the **New Virtual Hard Disk** Wizard, under **Specify Name and Location**, click **Browse**, and then navigate to the location.
14. Click **Next**.
15. Select the **Create a new blank virtual hard disk** radio button, and then specify the size.
16. Click **Next**.
17. Select **Summary** to review your configuration settings, and then click **Finish**.
18. Start the virtual machine.

Related tasks

Starting AltaVault virtual appliance on page 14

Installing AltaVault virtual appliance on VMware ESXi

Installing AltaVault virtual appliance requires downloading the image from NetApp, configuring the appliance through the vSphere web client, and powering on the machine.

About this task

Complete the following tasks in the order presented.

Steps

1. Downloading the virtual appliance package and deploying the OVA on page 10
2. Configuring the VM using the vSphere web client on page 11

Downloading the virtual appliance package and deploying the OVA

For ESXi installations, you must download and install the AltaVault virtual appliance.

Before you begin

Your system must meet the requirements and address the guidelines for the AltaVault model. See *System requirements and supported models* on page 4.

About this task

The AltaVault virtual appliance image is an installable Open Virtual Appliance (OVA) package. The image contains the files necessary to create the virtual machine.

Steps

1. Download the OVA package.

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2. Install the package using the VMware vSphere web client.

   Alternatively, you can use the VMware OVF Tool.

3. From the **Hosts and Clusters** page, select **Deploy OVF template**.
4. Type a name for the virtual machine.
5. Select the appropriate network setting for your environment.

   The AltaVault appliance comes with four network interfaces.

6. Verify the deployment settings, and then click **Finish**.
7. Click **Close**.

   The new virtual machine is displayed under the host name or host IP address in the virtual machine inventory.

Configuring the VM using the vSphere web client

For ESXi installations, use the vSphere web client to complete the virtual machine settings for the AltaVault appliance.

Before you begin

The latest AltaVault VM package must be installed on the ESXi server.

Steps

1. From the vSphere web client, edit the virtual machine settings.
2. Add a new hard disk to the virtual machine.
3. Specify the disk size for the new virtual hard drive.

   Use RAID for a high-throughput disk subsystem. See *System requirements and supported models* on page 4.
4. Save the configuration.
5. Start the AltaVault virtual machine.

Related tasks

Starting AltaVault virtual appliance on page 14

Installing AltaVault virtual appliance using the Linux Virtual Machine Manager

Installing AltaVault virtual appliance requires downloading the image from NetApp, configuring the appliance through the Linux KVM Virtual Machine Manager, and powering on the machine.

Before you begin

Your system must meet the hardware requirements and address the guidelines for the AltaVault model. See *System requirements and supported models* on page 4.

A bridge network must be configured so that AltaVault can connect to the public cloud.

https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/6/html/deployment_guide/s2-networkscripts-interfaces_network-bridge

Steps

1. Download the VM package, and then extract it.

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2. Open the Linux Virtual Machine Manager.
3. Click the **Create a new virtual machine** icon from the File menu.
4. In the new VM window, enter a name for the virtual machine, select “Import existing disk image”, and then click **Forward**.
5. Click **Browse** next to the “Provide the existing storage path” field.
6. Click **Browse Local**.
7. Select the `.qcow2` file from the extracted files, and then click **Open**.
8. Click **Forward**.
9. In the **Choose Memory and CPU settings** page, configure the memory size to correspond with the requirements specified in *System requirements and supported models* on page 4.
10. Click **Forward**.
11. Select the **Customize configuration before install** check box.
12. Click **Advanced options**, and then select the bridged network.
13. Click **Finish**.
14. In the virtual machine window for your appliance, select **Disk 1**.
15. Set the Storage format to **`qcow2`**, and then click **Apply**.
16. Click **Add Hardware**.
17. In the **Add New Virtual Hardware** dialog box:
    a. Change the Device type from **`Storage`** to **`IDE Disk`**.
    b. Configure the disk size to correspond with the requirements specified in *System requirements and supported models* on page 4.
18. Click **Finish**.

19. In the **Add New Virtual Hardware** dialog box, click **Add Hardware**.
20. To add additional network interface cards (NICs), click **Network**.
21. Click **Finish** to create the new NIC.
22. Repeat Step *19* and *20* to add up to 5 total NICs.

    These NICs represent the primary interface and the e0a, e0b, e0c, and e0d data interfaces.
23. When you are done adding NICs, click **Begin Installation**.
24. Start the AltaVault virtual machine.

Related tasks

Starting AltaVault virtual appliance on page 14

Starting AltaVault virtual appliance

After installing the AltaVault virtual machine image, you power on the system to access the initial configuration wizard.

Steps

1. Power on the virtual machine.

   When you start AltaVault virtual appliance for the first time, the initial booting process can take several minutes. During this time, the system does not display any debugging messages on the console, and it might seem like the system has stopped responding. Do not hard power reset the appliance during initial booting because doing so corrupts the file system and displays the following error in the system logs:

   ```
   Jul 21 15:55:40 localhost rbtinit: mount: can't find /data in /etc/
   fstab or /etc/mtab
   Jul 21 15:55:50 altavault statsd[3083]: [statsd.NOTICE]: Alarm
   triggered for rising error for event datastore_disk
   ```

   Note: If you inadvertently interrupted the AltaVault virtual appliance boot process, you must delete and then add the second disk again, and then wait until the system completes its boot process.

2. Select the **Console** tab.

   The AltaVault virtual appliance starts and the login prompt is displayed.

   Note: You can release the cursor from the console by pressing Ctrl+Alt.

3. Log in to the AltaVault virtual appliance using the default login (**`admin`**) and default password (**`password`**).

   The initial configuration wizard appears. The AltaVault administration guide contains system configuration information.

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Changing models of AltaVault virtual appliance

If you need additional capacity, you can change from your current AltaVault virtual appliance model to an AVA-v8, AVA-v16, or AVA-v32.

Before you begin

You must have a licensed installation or 90-day trial period installation to change models.

The *AltaVault Cloud Integrated Storage Administration Guide* contains details about upgrading to a later version of software.

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About this task

The procedure you use for changing models is based on your installation:

- *Changing to a higher model virtual appliance for licensed installations* on page 15
- *Changing to a higher model virtual appliance during the 90-day trial period* on page 16

Changing to a higher model virtual appliance for licensed installations

You can upgrade the storage capacity for AltaVault virtual appliances by moving to a higher model and provisioning the additional CPU and memory space required for that model.

Steps

1. Install a new valid license key for the appropriate model.

   The “Managing Licenses” section of the *AltaVault Cloud Integrated Storage Administration Guide* contains details.

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2. Shut down the AltaVault appliance from the **Maintenance > Reboot/Shutdown** > page.
3. Edit the virtual machine settings.

   You should review the system requirements and provision the required CPU, memory, and disk space for the virtual appliance model that you want to install. See *System requirements and supported models* on page 4.

In this environment	Do this...
Hyper-V or ESXi	Provision the required CPU and disk space

In this environment	Do this...
KVM	**a.** From the hardware details information in KVM, identify the image Source path listed for IDE Disk 2. **b.** Provision the required CPU and memory space for the AltaVault virtual appliance model that you want to install, and then click **Apply**. **c.** Access the Linux system terminal and, using the Source path listed for IDE Disk 2, provision the disk space for the AltaVault virtual appliance model that you want to install. For example, to update the disk space to 10 TB for the specified path: `qemu-img resize /var/lib/libvirt/images/rtp-kvm-1.img +10T`

4. Provision the required CPU and memory space for the AltaVault virtual appliance model that you want to install, and then click **Apply**.

Changing to a higher model virtual appliance during the 90-day trial period

When you install the AltaVault virtual appliance, the default AVA-v2 model is deployed. You can upgrade the storage capacity for AltaVault virtual appliances by moving to a higher model and provisioning the additional CPU and memory space required for that model.

Steps

1. On the AltaVault virtual appliance, specify the model you want to move to by entering the CLI command:

   `license virtual-model <v8/v16/v32>`

2. Stop the service, and then power off the virtual appliance.
3. Edit the virtual machine settings.

   You should review the system requirements and provision the required CPU, memory, and disk space for the virtual appliance model that you want to install. See *System requirements and supported models* on page 4.

In this environment	Do this...
Hyper-V or ESXi	Provision the required CPU and disk space.
KVM	**a.** From the hardware details information in KVM, identify the image Source path listed for IDE Disk 2. **b.** Provision the required CPU and memory space for the AltaVault virtual appliance model that you want to install, and then click **Apply**. **c.** Access the Linux system terminal and, using the Source path listed for IDE Disk 2, provision the disk space for the AltaVault virtual appliance model that you want to install. For example, to update the disk space to 10 TB for the specified path: `qemu-img resize /var/lib/libvirt/images/rtp-kvm-1.img +10T`

Migrating a SteelStore virtual appliance to AltaVault virtual appliance

Migration from SteelStore 3.x to AltaVault 4.1.1 involves exporting the configuration from the SteelStore, deploying a new AltaVault virtual appliance, importing the configuration archive, and moving the data disk from the SteelStore to AltaVault.

About this task

Direct migration from SteelStore 3.x to the latest AltaVault release is not supported. You must first upgrade to AltaVault 4.1.1. After the migration to AltaVault 4.1.1 is complete, you can upgrade to later versions of AltaVault software.

Steps

1. Verify that SteelStore 3.x virtual appliance is upgraded to the latest 3.x software version.

   The NetApp Support Site contains the available software downloads for the latest SteelStore software versions.

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2. Select **Configure** > **Setup Wizard**, and then export the configuration from 3.x, storing it in a safe location.

3. Select **Maintenance** > **Reload/Shutdown** to shut down the 3.x virtual appliance.

4. Using your hypervisor client, disassociate the datastore disk from the 3.x virtual machine.

   Make a note of the path to the disk file.

   Note: Be careful not to delete the disk image. You can associate the disk image with the new VM in a later step.

5. Deploy a new 4.1.1 AltaVault virtual appliance from the OVA file.

   Do not configure a second disk for AltaVault appliance datastore, because you can import the 3.x appliance datastore instead.

6. Start the new AltaVault virtual appliance.

7. Log in to AltaVault virtual appliance using the default login (**`admin`**) and default password (**`password`**).

   The initial configuration wizard is displayed.

8. Use the **Import configuration** wizard to import the configuration into the 4.1.1 AltaVault virtual appliance:

   a. Select **Configure** > **Setup Wizard**.

   b. Select **Import Configuration**.

   c. Select the **Import Shared Data Only** option, while specifying the configuration file to import.

9. Reset the Megastore GUID on the 4.1.1 AltaVault virtual appliance.

Example

```
hostname> enable
hostname# config t
hostname (config) # megastore guid reset
```

10. In the AltaVault **Management Console**, shut down the AltaVault appliance from the **Maintenance > Reboot/Shutdown** page.
11. Using your Hypervisor client, associate the existing 3.x datastore disk noted in Step *4* on page 17 above with the 4.1.1 AltaVault virtual appliance.
12. From your hypervisor client, power on the 4.1.1 AltaVault virtual appliance.
13. Log in to the AltaVault VM and start the optimization service if its not already running.

    Note: The cloud configuration cannot be modified unless the local datastore is empty. Therefore, it is important to import the configuration before attaching the disk from the SteelStore in Step *4*.

Example

```
hostname> enable
hostname# config t
hostname (config) # service enable
```

14. Upgrade AltaVault software to the current release.

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