NetApp® AltaVault™ OST Plug-in 1.2.3

Deployment Guide

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CHAPTER 1   AltaVault OST Plug-in Overview

This chapter provides information for implementing OST for the AltaVault appliance. It includes the following sections:

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AltaVault OST Plug-in

Veritas OST (OpenStorage) is an API that delivers optimized backup integration between NetBackup and storage appliances such as NetApp AltaVault. AltaVault leverages the OST framework to provide NetBackup the ability to efficiently stream backups to AltaVault as well as manage lifecycle policy of copies of backups stored on AltaVault and in the cloud.

Using the AltaVault OST Plug-in, the AltaVault appliance appears to the backup server as a shared disk. When it is time for a backup, the backup server contacts the backup client. Next, the backup server contacts the backup media (in this case, AltaVault) and starts writing an image of the clients or objects it is backing up.

OST implemented features with AltaVault

AltaVault support for OST consists of two features:

- Support for the OST communication protocol.
- Support of OST optimized duplication of backups triggered by NetBackup storage lifecycle policies (SLP), allowing NetBackup to have visibility and control of backups stored on AltaVault and in the cloud.

Key benefits

- Availability of data where you need it. With OST, NetBackup administrators can now ensure that critical datasets that are needed for short term use are locally available on the AltaVault appliance cache. Optimized duplicate copies for long term recovery and compliance can be managed and driven via secondary retention separately in the cloud. AltaVault intelligently manages the retention of the two copies in accordance with SLP.

- Off-site replication validation. Prior to OST support, NetBackup administrators could not determine via the NetBackup management console if backups to AltaVault had indeed been protected to off-site cloud storage. The addition of OST now allows NetBackup to have visibility into where backups are stored: either on AltaVault or in the cloud.

- Enhanced optimization of resources end to end. AltaVault intelligently deduplicates, compresses and encrypts NetBackup data to cloud storage, reducing the costs of transmission and storage while simultaneously easing management of backups. With the addition of OST, NetBackup can now further extend optimization techniques to additional duplicate copies with minimal impact on NetBackup media servers or appliances, corporate networks, and cloud storage.

Recommended deployments

AltaVault supports the fan-in of multiple NetBackup media servers or appliances using OST, allowing for AltaVault to provide optimal deduplication across all sources. It is recommended to configure a separate OST share for each NetBackup media server or appliance.

Summary deployment steps

Description	Procedure
Install AltaVault OST Plug-in on the NetBackup media server or appliance.	Chapter 2, "Installing AltaVault OST Plug-in."
Configure AltaVault OST shares and user accounts.	Refer to the section "Configuring OST" in the latest *NetApp AltaVault Cloud Integrated Storage Administration Guide*.
Configure the NetBackup media server or appliance for AltaVault OST.	Chapter 3, "Deploying Veritas OST with AltaVault."

CHAPTER 2   Installing AltaVault OST Plug-in

This chapter covers the following procedures:

- "Installing and configuring AltaVault OST Plug-in on Windows" on page 7
- "Installing and configuring AltaVault OST Plug-in on Linux" on page 9
- "Configuring AltaVault OST" on page 12

Refer to the Interoperability Matrix Tool (IMT) on the NetApp Support site to validate the exact product and feature versions described in this document are supported for your specific environment.

Installing and configuring AltaVault OST Plug-in on Windows

This section covers the following procedures:

- "To install the OST plug-in for Windows" on page 7
- "To configure the AltaVault OST Plug-in for SSL on Windows" on page 8

Before you begin the installation process, verify that you have the following:

- NetApp AltaVault 4.4 or higher
- Veritas NetBackup version 7.6 or higher
- Microsoft Visual C++ 2015 Redistributable (x64) package: https://www.microsoft.com/en-us/download/details.aspx?id=48145
- Write permission to create the folder C:\ntapav, which contains the AltaVault's OST Plug-in configuration and log files

To install the OST plug-in for Windows

1. Download the AltaVault OST Plug-in installer from the downloads section of the NetApp Support Site (https://mysupport.netapp.com).

2. Copy the plug-in installer file onto the NetBackup media server.

3. Shut down the NetBackup services on the media server host.

4. Launch the AltaVault OST Plug-in installer ost_installer.msi file.

5. Accept the license agreement presented.

6. Click Install.

7. Click Finish.

8. Start up the NetBackup services on the media server host.

9. To verify that the AltaVault OST Plug-in is installed properly, open a command prompt and enter the following:

```
C:\Program Files\Veritas\NetBackup\bin\admincmd> bpstsinfo.exe -pi -sp NetAppAltaVault
Plugin Info:
    Plugin Name: libstspiAltaVaultDisk.dll
    Prefix: NetAppAltaVault
    Label: NetApp AltaVault Plugin
    Build Version: 11
    Build Version Minor: 1
    Operating Version: 11
    Vendor Version: v1.2.3 4237972/29-Mar-2018
```

To configure the AltaVault OST Plug-in for SSL on Windows

SSL is optional on Windows and is disabled by default. To enable SSL, perform the following steps.

Note: If the NetBackup media server will be communicating with multiple AltaVault appliances using SSL, this procedure must be repeated for each targeted AltaVault appliance.

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1. In the Management Console, select Configure > OST > Global OST Settings.

2. Check the box to enable SSL.

3. Choose Maintenance > Service and restart the optimization service.

4. Choose Configure > Web Settings.

5. Under the Web Certificate section, select the PEM tab and copy the certificate.

6. On the Windows NetBackup media server where you installed AltaVault OST Plug-in, navigate to the folder C:\ntapav.

7. Create a text file called <hostname>_cert.pem if the file does not exist. Open the file in a text editor and paste the certificate contents from Step 5. If the file already contains the web certificate of an existing AltaVault, you can append the new AltaVault certificate information to the end of the file starting on a new line. Here, <hostname> refers to the storage server hostname or IP address specified while creating the storage server for which SSL connection is needed.

Note: If you are upgrading from a previous AltaVault OST Plug-in version, you must update your cert.pem file. For instructions, see Appendix A, "Upgrading AltaVault OST Plug-in."

Installing and configuring AltaVault OST Plug-in on Linux

This section covers the following procedures:

Before you begin the installation process, verify that you have the following:

- NetApp AltaVault 4.4 or higher

- Veritas NetBackup 7.6 or higher

- Write permission to create the directory /usr/ntapav, which contains AVA OST Plug-in configuration and log files.

- For NetBackup appliances, write permission to create the directory /usr/ntapav, which contains directories that are links to directories mentioned below.

- For NetBackup appliances, permission to create the directories /usr/openv/ostconf and /log/OST which contain AVA OST Plug-in configuration and log respectively.

To install the AltaVault OST Plug-in for Linux media servers

1. Download the AltaVault OST Plug-in from the downloads section of the NetApp Support Site (https://mysupport.netapp.com).

2. Extract the archive file to a temporary directory on the NetBackup media server:

   ```
   >tar zxvf AltaVaultOSTPlugin_1.2.3_OST_redhat_64.tar.gz
   ```

   The file name may be different depending on the version downloaded from the support site.

3. Shut down the NetBackup services on the media server host.

4. Go to the temporary directory and run the script `installer.sh` to copy the libraries:

   ```
   >./install.sh
   ```

5. Start up the NetBackup services on the media server host.

6. To verify that the AltaVault OST Plug-in is installed properly, enter the following:

   ```
   # /usr/openv/netbackup/bin/admincmd/bpstsinfo -pi -sp NetAppAltaVault
   Plugin Info:
       Plugin Name: libstspiNetAppAltaVaultMT.so
       Prefix: NetAppAltaVault
       Label: NetApp AltaVault Plugin
       Build Version: 11
       Build Version Minor: 1
       Operating Version: 11
       Vendor Version: v1.2.3 4237972/29-Mar-2018
   ```

To configure AltaVault OST Plug-in for SSL on Linux

SSL is optional on Linux and is disabled by default. To enable SSL, perform the following steps.

Note: If the appliance will be communicating with multiple AltaVault appliances using SSL, this procedure must be repeated for each targeted AltaVault appliance.

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1. In the Management Console, select Configure > OST > Global OST Settings.

2. Check the box to enable SSL.

3. Choose Maintenance > Service and restart the optimization service.

4. Choose Configure > Web Settings.

5. Under Web Certificates section, select the PEM tab and copy the certificate.

6. On the Linux NetBackup media server or appliance, navigate to /usr/ntapav.

7. Create a text file called <hostname>_cert.pem if the file does not exist.

8. Open the file in a text editor and paste the certificate contents from Step 5.

    If the file already contains the web certificate of an existing AltaVault, you can append the new AltaVault certificate information to the end of the file starting on a new line. Here, <hostname> refers to the storage server hostname or IP address specified while creating the storage server for which SSL connection is needed.

Note: If you are upgrading from a previous AltaVault OST Plug-in version, you must update your cert.pem file. For instructions, see Appendix A, "Upgrading AltaVault OST Plug-in."

To install the AltaVault OST Plug-in for NetBackup appliances

1. Download the AltaVault OST Plug-in from the downloads section of the NetApp Support Site (https://mysupport.netapp.com).

2. On the NetBackup appliance, choose Main Menu > Manage > OpenStorage.

3. Select **Share Open**. The NetBackup appliance provides CIFS and NFS mount points.

4. Map the mount points on remote clients from where you need to copy the AltaVault OST Plug-in 1.2.3.

5. Copy the downloaded plug-in package to the NetBackup appliance and select **Share Close**.

6. Select **List Available** and verify from the output that AltaVault OST Plug-in 1.2.3 package is getting listed.

7. Select **Install AltaVaultOSTPlugin_1.2.3_OST_redhat_64.tar.gz**.

    This extracts the files from the package and installs the plug-in.

8. Select **List Installed** and verify that AltaVault OST Plug-in 1.2.3 is installed.

To configure AltaVault OST Plug-in for SSL on NetBackup appliances

SSL is optional on NetBackup appliances and is disabled by default. To enable SSL, perform the following steps.

Note: If the appliance will be communicating with multiple AltaVault appliances using SSL, this procedure must be repeated for each targeted AltaVault appliance.

---

1. On the NBU appliance, configure root access:

   a. From Main_Menu, enter Maintenance mode:

   ```
   Main_Menu> Support
   Support> Maintenance
   ```

   The appliance prompts you for the password.

   b. Temporarily override the system protection on the NBU appliance to provide root access:

   ```
   maintenance-!> /opt/Symantec/sdcssagent/IPS/sisipsoverride.sh
   ```

   The appliance prompts you to enter additional information to complete the override.

   c. Enable root access:

   ```
   maintenance-!> elevate
   ```

2. In the AltaVault Management Console, select **Configure > OST > Global OST Settings**.

3. Check the box to enable SSL.

4. Select **Maintenance > Service** and restart the optimization service.

5. Select **Configure > Web Settings**.

6. Under the **Web Certificates** section, select the **PEM** tab and copy the certificate.

7. On the NBU appliance, navigate to the directory where the local configuration information for the NetApp OST Plugin will be stored:

   ```
   maintenance-!> cd /usr/ntapav
   ```

8. Create a text file called <hostname>_cert.pem if the file does not exist.

9. Open the file in a text editor and paste the certificate contents from Step 6.

   If the file already contains the web certificate of an existing AltaVault, you can append the new AltaVault certificate information to the end of the file starting on a new line. Here, <hostname> refers to the storage server hostname or IP address specified while creating the storage server for which SSL connection is needed.

10. Exit maintenance mode.

Note: If you are upgrading from a previous AltaVault OST Plug-in version, you must update your cert.pem file. For instructions, see Appendix A, "Upgrading AltaVault OST Plug-in."

Configuring AltaVault OST

After installing the plug-in on the NetBackup media server or appliance, configure OST shares on AltaVault for access by NetBackup. OST shares are available in two types:

- Regular Shares: Regular shares treat incoming data by AltaVault the same as traditional SMB shares or NFS exports by writing the data on cache, and replicating the data to the cloud. A minimum of one regular share is required for OST to move data to AltaVault.

- Cloud Shares: Cloud shares are used to create an optimized duplicate of data in regular shares replicated in the cloud that are managed via NetBackup storage life-cycle policies (SLP). One or more cloud shares can be created to extend duplication of regular or cloud shares for policies requiring longer retention.

AltaVault OST shares and user account creation is described in the section "Configuring OST" in the latest *NetApp AltaVault Cloud Integrated Storage Administration Guide.*

After setting up OST shares and user accounts, configure NetBackup media servers or appliances for AltaVault OST as described in Chapter 3, "Deploying Veritas OST with AltaVault."

CHAPTER 3 Deploying Veritas OST with AltaVault

This chapter provides information for setting up the NetBackup media server or appliance for OST communication with the AltaVault appliance.

Prerequisites

Prior to setting up communication between the NetBackup media server or appliance and AltaVault, you must configure regular shares, cloud shares, or both on the AltaVault. Additionally, OST shares must have associated local user accounts set up on AltaVault to be used by NetBackup storage server. To configure OST shares and users on AltaVault, see the section "Configuring OST" in the latest *NetApp AltaVault Cloud Integrated Storage Administration Guide*.

Run the NetBackup Storage Server Wizard

The NetBackup Storage Server Wizard configures the necessary storage devices, including the storage server, disk pool, and storage unit, enabling OST communications to AltaVault. Since each share created on AltaVault is associated with one storage server, disk pool and storage unit, you will perform the following procedure once per share you wish to enable with NetBackup OST.

1. Start the NetBackup Storage Server Wizard. On the Add Storage Server page, fill in the following fields:

Field	Description
Media Server	Specify the media server or NetBackup appliance that has the AltaVault OST Plug-in installed.
Storage server type	If NetAppAltaVault does not appear in the drop down list, manually type in the value **NetAppAltaVault**. The value does not appear in the drop down list.
Storage server name	Enter in a name to call this storage server. This name is constructed using the OST share name configured on AltaVault, followed by an underscore (_) character, followed by the AltaVault data interface DNS name or IP address. For example, if the OST share is called OSTshare1, and the AltaVault data interface e0a entry in DNS is AltaVaultDataInterface, the constructed name for the field is OSTshare1_AltaVaultDataInterface.

Field	Description
User name	Provide the name of the OST user associated with the AltaVault OST share. Refer to the AltaVault OST page for the credentials.
Password	Provide the password of the OST user associated with the AltaVault OST share. Refer to the AltaVault OST page for the credentials.

2. Click **Next.**

3. Complete the storage server setup wizard. Ensure the **Create a disk pool using the storage server you have just created** checkbox is selected.

4. Click **Next.**

5. In the Disk Pool and Volumes page, select the appropriate pool type, and select the volume to add to the disk pool by clicking the check box next to the logical name of the AltaVault volume in the table:

    ■   Replication Source

        Use this type when configuring a disk pool for AltaVault regular OST shares.

    ■   Replication Target

        Use this type when configuring a disk pool for AltaVault cloud OST shares.

Note: The size of an OST share on AltaVault is set at 1.78 PB and cannot be changed. This value is reflected on the page. If you require additional storage, configure additional shares and add them to the OST disk pool.

6. Click **Next.**

7. In the Additional Disk Pool Information page, enter a disk pool name. Do not select the Limit I/O streams checkbox:

Selection	Description
Disk Pool name	Provide the name of the disk pool you are creating.
High water mark	Leave this value at its default value of 98 percent.
Low water mark	Leave this value at its default value of 80 percent.
Limit I/O streams	Leave this checkbox unselected for best AltaVault performance.

8. Click **Next.**

9. When the disk pool task is done, select the checkbox Create a storage unit using the disk pool that you have just created.

10. Click **Next**.

11. In the Storage Unit Creation page, fill in the fields as follows.

Field	Description
Storage unit name	Provide a name for the storage unit you are creating.
Only use the selected media servers or appliances	Identify the NetBackup media servers or appliances which are enabled with the AltaVault OST Plug-in to perform data movement of backups.
Maximum concurrent jobs	This establishes how many writers are allowed by data protection clients. Tune performance by setting a value higher than 1. The value will depend on your available resources and infrastructure environment. Adjust the number of streams accordingly based on your observed performance.
Maximum fragment size	The fragment size is the maximum-size object that NetBackup can create to store backups. The recommended fragment size is 20480 MB (20 GB).

12. Click **Next**.

13. The Storage Server Configuration Wizard completes. Click **Finish** to close.

Create a Storage Lifecycle Policy

You will need to create at least one backup operation in an SLP representing the primary backup to AltaVault. Additional optimized duplication operations can be created as tiered operations under a backup operation to reflect the longer term retentions of backups according to your business needs.

Create a backup operation

1. Open the Storage Lifecycle Policies page in the NetBackup Administration Console, and click Add to add a backup step to the SLP.

2. In the page that appears, fill in the fields as follows:

Field	Description
Operation	Select Backup to identify a backup job that will be sent to the AltaVault OST share.
Destination Storage	Select the storage unit configured to use the regular AltaVault OST share.
Retention type	Specify your retention requirements.
Retention period	Specify your retention time frame to maintain the backup. Backups after this time elapse expire from AltaVault and will be deleted.

3. Click **OK** to complete the backup operation creation.

Create an optimized duplication operation

Optionally, if you are using Cloud shares, you must

1. Select the backup operation created previously, and then click **Add** to add an optimized duplication operation.

2. In the page that appears, fill in the fields as follows.

Field	Description
Operation	Select Duplication to identify a duplication operation will be performed to a cloud-based AltaVault OST share.
Destination Storage	Select the storage unit configured to use the cloud-based AltaVault OST share.
Retention type	Specify your retention requirements.
Retention period	Specify your retention time frame to maintain the backup. Backups after this time elapse expire from AltaVault and will be deleted.
Alternate read server	You can specify an additional Media Server or appliance if you wish to read duplicated backups from a separate media server or appliance. This media server or appliance must also have the AltaVault OST Plug-in installed.

Note: The operation type should default to Duplication if you properly selected the backup operation in the previous step.

3. Click **OK** to complete the optimized duplication operation creation.

Summary of AltaVault OST best practices

Practice	NetApp Recommendation	Notes
Disk pool maximum I/O streams	Do not enable and provide a value for maximum I/O streams.	Use maximum concurrent jobs under the Storage Unit settings instead.
Assigning media servers or appliance to a storage unit	Manually select the appropriate media servers or appliances with the AltaVault OST Plug-in installed.	
Maximum concurrent jobs	Set appropriately according to your available media server or appliance resources.	Tune this setting rather than the maximum I/O streams value at the disk pool level. Set to 0 if you are switching cloud providers, or are experiencing intermittent cloud connectivity issues. The highest it can be set is 128.
Maximum fragment size	20480 MB.	This can be left at the default if desired by your business, but is not recommended to be set lower than 20480 MB.
NetBackup Catalog backups	AltaVault OST can be used for NetBackup catalog backup operations.	

APPENDIX A   Upgrading AltaVault OST Plug-in

If you have previously installed the AltaVault OST Plug-in and require an upgrade for compatibility with AltaVault as indicated in the IMT, refer to the following procedures:

- "Upgrading AltaVault OST Plug-in for Windows" on page 17
- "Upgrading AltaVault OST Plug-in for Linux" on page 18

Upgrading AltaVault OST Plug-in for Windows

Note: The AltaVault OST Plug-in requires compatibility with the AltaVault version running in your environment. Refer to the Interoperability Matrix Tool (IMT) on the NetApp Support site to validate compatible versions.

To upgrade the AltaVault OST Plug-in for Windows

1. Uninstall the existing AltaVault OST Plug-in from the Windows server:

    a. Go to Control Panel.

    b. Double-click on Programs and Features.

    c. Select NetApp AltaVault Plug-in for NetBackup.

    d. Right click on the selection, and click Uninstall.

2. Install the AltaVault OST Plug-in as described in the procedure "To install the OST plug-in for Windows" on page 7.

3. If needed, configure or re-configure the plug-in for SSL as described in the procedure "To configure the AltaVault OST Plug-in for SSL on Windows" on page 8.

Note: If you are upgrading to AltaVault OST Plug-in version 1.2.3 from a pre-1.2 release, you must rename your cert.pem file to <AVA IP>_cert.pem for SSL to be available after the upgrade.

Upgrading AltaVault OST Plug-in for Linux

To upgrade the AltaVault OST Plug-in for Linux

1. Install the AltaVault OST Plug-in as described in the procedure "To install the AltaVault OST Plug-in for Linux media servers" on page 9.

2. If needed, configure or re-configure the plug-in for SSL as described in the procedure "Configuring AltaVault OST" on page 12.

Note: If you are upgrading to AltaVault OST Plug-in version 1.2.3 from a pre-1.2 release, you must rename your cert.pem file to <AVA IP>_cert.pem for SSL to be available after the upgrade.

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