

# VAST Data & Veritas<sup>®</sup> NetBackup

**Configuration and Best Practice Guide** 

VERITAS

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# Introduction

VAST Data, for the first time, redefines the economics of flash storage, making flash affordable for all applications, from the highest performance databases to the largest data archives. The concept blends game-changing storage innovations to lower the acquisition cost of flash with an exabyte-scale file and object storage architecture breaking decades of storage tradeoffs.

With the advantage of new, enabling technologies that weren't available before 2018, this new Universal Storage concept can achieve a previously impossible architecture design point. The system combines low-cost hyperscale flash Drives and Storage Class Memory with stateless, containerized storage services all connected over new low-latency NVMe over Fabrics networks to create VAST's Disaggregated Shared Everything (DASE) scale-out architecture. Next-generation global algorithms are applied to this DASE architecture to deliver new levels of storage efficiency, resilience, and scale.

As a market leader in enterprise backup and recovery software, Veritas NetBackup<sup>™</sup> reduces cost and complexity while keeping data secure, compliant and available. NetBackup can scale to any size workload and deliver breakthrough capabilities for virtualized and cloud based deployments that go well beyond what traditional backup practices can achieve. It empowers organizations by improving the resiliency of their applications and infrastructure from edge to core to cloud. From threats such as a ransomware attack to unplanned downtime, NetBackup offers rapid recovery of business-critical data across hybrid, physical, virtual and multi-cloud environments.

VAST Clusters with Veritas NetBackup jointly deliver an unprecedented level of performance and scalability that's built for today's complex environments. Veritas NetBackup's ability to scale to petabytes in a single domain is a match made in heaven with the VAST Cluster and its exabyte scale single namespace. In addition, the VAST Cluster introduces Similarity-Based Data Reduction, which reengineers data reduction algorithms to deliver unprecedented storage efficiency. When combined, the result is a fast and highly scalable data protection solution, providing unparalleled levels of restore performance.

This document covers basic configuration steps to integrate NetBackup with a VAST Data cluster. It covers minimalclick VAST Cluster configuration for both NFS and S3 and highlights several examples of data backup and recovery.

This guide will assist individuals who are responsible for the design and deployment of data protection and disaster recovery solutions of virtual machines deployed on a VAST Cluster.

# **VAST Configuration**

This section presents basics steps to be performed on the VAST cluster UI prior to configuring the Veritas NetBackup Cloud Connector.

## **Create VAST NFS View**

The NFS view created in the following steps can be used for mounting to a Linux system. Then during Advanced Disk Storage Server creation the disk pool can be pointed to this path.

0	ų Variastiniai	) Online 5.0-sp7-903954	10.01				V	V A S T	÷ -		a <sup>8</sup>		-	🗸 🇑 admin 🗸
8	Dashboard Infrastructure	ent Store											. (+	Create View
٠	Element Store		e Rules (	Quotas N	IFS Locks									(\$)
۲	Network Access	View Policies			Alias 🔿	Share 🔿	Bucket		Bucket Owner 💠	Policy name 🗘	Proto 🗘	Physical Capac 🗘	Logical Capacity 🗘	Actions
0	Data Protection	Lifecycle Rules			Search	Search	Search		Search	Search	Select P 💙			
-10 -10	User Management	Quotas								veritas-s3	S3 ENDPOI	0 Bytes	0 Bytes	
•	Alarms & Events	NFS Locks					clab-bucket1		veritas	veritas-s3	S3 BUCKET	0 Bytes	0 Bytes	
		INTUK MELZ					clab-bucket2		veritas	veritas-s3	S3 BUCKET	0 Bytes	0 Bytes	

Figure 1 - Creating a New View

To create a new view go to the left column and select *Element Store* and select *Views* (Figure 1).

Add View		×
General S3		
Path* /partnersoln/veritas	Protocols * NFS	~
	NFS alias Type NFS alias	
	Policy name * spock-nfs	<b>`</b>
Create Directory		
	Create	

Figure 2 - Add View Wizard

This brings a new *Add View* window as shown in Figure 2. Enter in a path that is appropriate for the organization of data within the VAST cluster, select the NFS protocol and assign it to a policy. If this is a new path, slide the *Create Directory* toggle over and click *Create*.

This path can now be mounted to a Media Server and used for the data path during disk pool creation.

### Create a VAST S3 User



Figure 3 - Selecting Users Category

The *Add User* window appears and a username is entered along with any desired UID. This user is granted full S3 credentials but that is not necessary during the Veritas process of adding an S3 repository.

Add User			×
Name * veritas		uio* 032123	
Leading group Select Group	~	Allow Create Bucket 🔲 Allow Delete Bucket 🛑 S3 Superuser 🍋	
	~		~
	Cre	ne	

Figure 4 – Creating a New User for S3

After clicking *Create* the user will show up in the User Management window Figure 5.

User	Man	agement	•	1		1		<u>.</u> 2	(e 19 (g. <sub>1)</sub> :	• 30					(+ Cr	eate User
LDAP	NIS	Active Directo	ry	Identity Pol	icies	Users	Groups							. (	Local 🔊 🤆	
Name ver		Login name Search	٥	UID ≎ Search	SI Si	earch			Leading Group 💲 Search	Leading Group GID 💠 Search	Groups ≎ Search	Group Count Search	Create Bu ≎ Select Create ❤	Delete Bu 🗘 Select Delete 🌱	S3 Supe ↑ Select S3 S ❤	Actions .
veritas				32123	S-	-1-111-912193-2	941566004-297172	622				0	• Yes	• Yes	• No	:



Now that the user is created it needs to be edited to create and capture the active and secret keys. On the far right of the user under the action column click on the three dots and select edit (Figure 6).

User Management												+ Create User					
LDAP	NIS	Active Dire	ctory	Identii	y Polic	ies Users	Groups								Local (	<u>ම</u> ල	
No ne		Login Name		UID		SID			Leading Group 💠	Leading Group GID 🛇	Groups 🗢	Group Count	Create Bu 💠	Delete Bu	S3 Supe		Actions
ver		Search		Search		Search			Search	Search	Search		Select Create 💙	Select Delete	Y Select S	s ~	
veritas				32123		S-1-111-34276739	79-106192481-357302	028					• Yes	• Yes	• No		:
															🖌 Edit		
															× Remove	-	

Figure 6 - Update the User

In the **Update User** window (Figure 7) click on the **Create new key** button to create a new **Access Key**. Now copy the active key and secret key some place for later. This is the only time when the secret key will be accesible so be sure to store in a safe location. Click Update to close the window.

Update User User: veritas		×
Name *	UID* 32123	
Leading group Select Group	Allow Create Bucket 🍋 Allow Delete Bucket 🥌 S3 Superuser 🗩	
Groups Select Groups		
Access key Status Actions Y4Z3A2CPQWD11QP9812A  Create new key		
The secret key is: C1JT0ifS0QEIGwLdBnOJZqFMfSmQ/mOoY22h78Eb This is your opportunity to make a copy, it will forever disappear after closing this window		
	Update	

Figure 7 - Capturing Active and Secret Keys

The user will now be used in the creation of a bucket, endpoint or view within the VAST UI. Just as before, when creating a view, from the dashboard go to *Views* as shown in Figure 1 and then click *Create View*. This view is configured as an endpoint only using the S3 Endpoint protocol. Multiple protocols (NFS, S3) can be used on a view. Figure 8 shows the all the settings needed to create the new endpoint. Since this is a new view the create directory toggle is selected.

Add View	,
General S3 Share-level ACL	
Path* /veritas	Protocols * S3 Endpoint Y
	Policy name* s3_default_policy
	Create Directory
	Greate

Figure 8 - S3 Endpoint Configuration

The user created previously needs to be given access or ownership of this view. This is done on the S3 tab as shown in Figure 9. When finished click Create from either tab.

Add View	>
General S3 Share-level ACL	
S3 Features	
S3 Versioning O	Riteration Mode None
S3 Access Control Bucket Creators (Users) veritas@24	Bucket Creators (Groups) Type
Anonymous access	
	Create

Figure 9 - Adding Bucket Owner (User)

The view (bucket) now shows up in the Element Store as shown in Figure 10.

Element Store			'n		1									eate View
Views	View Policies	Lifecycle R	ules Qu	otas NFS Lo	cks Tenants	QOS Policies								\$
Path verit		Alias ≎ Sear	Share 🗘 Search	Bucket ≎ Search	Bucket O ≎ Search	Policy N 🗘 Search	Proto ≎ Select P ❤	Physical Cap ≎ Search	Logical Cap ≎ Search	Live Mo 🗘 Select Live 🌱	Created Time Choose a date YYYY/MM/DD >	Tenant ≎ Search	QOS Po ≎ Search	Actions
/veritas						s3_default	S3 ENDPOINT	0 Bytes	0 Bytes	• No	2023/05/12   10:29:2	default		:

Figure 10 – S3 Bucket Created

# **Veritas NBU Configuration**



Figure 11 - VAST/Veritas Deployment Scenarios

This document was written using a NetBackup deployment consisting of one master server and several Linux media servers (Figure 11).

Some prerequisites are needed for NetBackup to function properly with a VAST cluster, specifically, when using S3 to create an MSDP-Cloud (MSDP-C) storage pool. Make sure to review the following sections pertaining to the Cloud Configuration Package and the Device Mapping Files.

#### **Adding Cloud Configuration Package**

Before creating any S3 storage server, it's important to install a package provided by Veritas that integrates VAST into their workflow process. Refer to the Veritas Hardware and Cloud Storage Compatibility List for versions 9.x and 10.x support<sup>1</sup>. The cloud package is provided for both Windows and Linux Master Server systems. This procedure only needs to be completed on the master server.

After downloading the appropriate package to a temporary folder follow these instructions:

1. https://www.veritas.com/support/en\_US/article.100040093

#### Windows Installation

1. Copy the existing CloudProvider.xml and CloudInstance.xml files from the following location to an alternate location so you can revert back to these files if needed.

Default file location in NetBackup 9.x versions:

C:\Program Files\Veritas\NetBackup\var\global\wmc\cloud

Default file location in NetBackup 10.x and later versions:

C:\Program Files\Veritas\NetBackup\var\global\cloud

2. Extract the zip file package that is in the temporary folder. This will create two files:

- CloudProvider.xml
- cacert.pem

3. Copy the *new* CloudProvider.xml file from the temporary location, in step 2, to the default location mentioned in step 1.

4. Run the following command:

<NB \_ INSTALL \_ PATH>\NetBackup\bin\admincmd\csconfig reinitialize

5. Run the following CLI command to confirm that the installation was successful. The command should return a list of cloud providers including VAST Data.

<NB \_INSTALL \_ PATH>\NetBackup\bin\admincmd\csconfig cldprovider -l

The command should output all of the cloud providers including VAST Data. If the command does not output a list of cloud providers or outputs an error message, refer to the troubleshooting section on Veritas page where the package was downloaded.

#### Linux Installation

These instructions assume that NetBackup is installed at the default location of /usr/openv/. If NetBackup is installed at a different location, substitute that path for /usr/openv/ in the instructions below:

1. Copy the existing CloudProvider.xml and CloudInstance.xml files from the following location to an alternate location so you can revert back to these files if needed.

Default file location in NetBackup 9.x versions:

/usr/openv/var/global/wmc/cloud

Default file location in NetBackup 10.x and later versions:

/usr/openv/var/global/cloud

2. Download and extract the tar file package to the temporary folder. This will create two files in the temporary location:

- CloudProvider.xml
- cacert.pem

3. Copy the *new* CloudProvider.xml file from the temporary location, in step 2, to the default location mentioned in step 1.

4. Run the following command:

<NB \_ INSTALL \_ PATH>/NetBackup/bin/admincmd/csconfig reinitialize

5. Run the following CLI command to confirm that the installation was successful. The command should return a list of cloud providers including VAST Data.

<NB INSTALL PATH>/NetBackup/bin/admincmd/csconfig cldprovider -1

The command should output all of the cloud providers including VAST Data. If the command does not output a list of cloud providers or outputs an error message, refer to the troubleshooting section on Veritas page where the package was downloaded.

### **Adding Device Mapping Files**

In addition to the Cloud Configuration package there are additional files which integrate VAST more deeply into NetBackup. Device Mapping files are also available and are used by the NetBackup Enterprise Media Manager database to determine which protocols and settings to use to communicate with storage devices. They are also used by the Device Configuration Wizard to automatically configure new devices.

Along with the cloud configuration package it is essential to install these files for proper functionality of the S3 MSDP-C storage server. The file only needs to be installed on the Master Server however the Device Manager (Itid) needs to be restarted for all Media Servers.

Note: This installation only highlights installation of the external\_types.txt file and not the external\_robotics.txt for robotics devices. See the Device Mappings download page for instructions on installing the robotics file.

Ensure the file downloaded is for the appropriate NetBackup version and operating system. As of publication there are two versions available, one for NetBackup 10.x and higher and one for NetBackup 7.x-9.x. The installation location on NetBackup versions is the same for all of them.

#### Windows Installation of Device Mapping Files

#### C:\Program Files\Veritas\Volmgr\bin

The instructions below assume that NetBackup is installed in the default location of **C:\Program Files\Veritas\**. If NetBackup is installed in a different location, substitute that path for **C:\Program Files\Veritas\**in the instructions below:

#### 1. Download and extract the new mappings file package to a temporary directory:

C:\temp\Mapping Files - Windows>dir										
Volume in drive C has no label.										
Volume Serial Number is F0A5-7B7A										
Directory of C:\temp\Mapping Files - Windows										
05/10/2023 09:20 AM <dir> .</dir>										
05/10/2023 09:20 AM <dir></dir>										
05/10/2023 09:18 AM 23,299 Mappings _ CRC _ v1174.zip	< NetBackup 10.x									
05/10/2023 09:18 AM 23,345 Mappings v1174.zip	< NetBackup 9.x									

#### This will create three files in the temporary location:

- Readme.txt
- external\_types.txt
- external\_robotics.txt

#### 2. Copy the external\_types.txt file from the temporary location to the master server at:

C:\Program Files\Veritas\NetBackup\var\global\

If desired, backup or move the existing file to a safe location in case there is a need to revert back.

(For NetBackup High Availability environments, copy the file to the shared disk.)

3. Update the NetBackup Enterprise Media Manager database with the new device mappings version. This only needs to be done once and must be run from the Master/EMM Server. Use the command format below:

C:\Program Files\Veritas\Volmgr\bin\tpext -loadEMM C:\Program Files\Veritas\Volmgr\bin\tpext -get dev mappings

4. Restart Device Manager (Itid) on each Media Server.

5. Verify that the version that is now stored in the Enterprise Media Manager database is the same as that which is in the file stored on the Media Server:

C:\Program Files\Veritas\Volmgr\bin>tpext -get \_ dev \_ mappings \_ ver device mappings version in the EMM database is 1.174 device mappings version from the local file is 1.174 Local device mappings file is up-to-date

#### Linux Installation of Device Mapping Files

The instructions below assume that NetBackup is installed in the default location of **/usr/openv/**. If NetBackup is installed in a different location, substitute that path for **/usr/openv/** in the instructions below:

6. Download and extract the new mappings file package to a temporary directory and run:

tar -xvf Mappings \_ CRC \_ v1174.tar

(Above command is for NetBackup 10.x. NetBackup 9.x file is Mappings\_v1174.tar)

This will create three files in the temporary location:

- Readme.txt
- external\_types.txt
- external\_robotics.txt

7. Copy the external\_types.txt file from the temporary location to /usr/openv/var/global on the Primary/EMM Server. If desired, backup or move the existing file to a safe location in case there is a need to revert back.

cp /temp \_dir/external \_types.txt /usr/openv/var/global/

(For NetBackup High Availability environments, copy the file to the shared disk.)

8. Update the NetBackup Enterprise Media Manager database with the new device mappings version. This only needs to be done once and must be run from the Master/EMM Server. Use the command format below:

/usr/openv/volmgr/bin/tpext -loadEMM
/usr/openv/volmgr/bin/tpext -get dev mappings

9. Restart Device Manager (Itid) on each Media Server.

10. Verify that the version that is now stored in the Enterprise Media Manager database is the same as what is in the file stored on the Media Server:

/usr/openv/volmgr/bin/tpext -get \_dev \_mappings \_ver

#### Adding Private Cloud CA Certificate

To ensure that an S3 Storage server can be created the CA Certificate that is on the VAST cluster (See https://support. vastdata.com for more information on creating a CA Certificate) must be added to the Veritas file *cacert.pem*.

To query the VAST cluster for the current CA certificate chain an openssl command can be used both from Linux or Windows (installation of the package may be necessary). An example command is given below with the format –

Virtual IP Pool.VAST Cluster.domain

openssl s \_client -connect veritas.tmphx-10.vastdata.lab:443 -showcerts

The returned output should contain the certificate chain as in the text below.

----BEGIN CERTIFICATE----MIIF+jCCBOKgAwIBAgITQwAAAAQAWcgmumCZ1wAAAAAABDANBgkqhkiG9w0BAQsF

#### Data Removed for Brevity

upyH+npXDdvJKrzUsUPWJQ18gZDqMBULApmqyF58is2umozjYTXTT19qEM2lnejd iZE9lNcTvjiO9fWVSQJbU8Ntj3Gh4+daoacajTK1Oqv2e45ENxn0R/bh+N9gyw== -----BEGIN CERTIFICATE-----MIIDgzCCAmugAwIBAgIQXID1vrrk64xDyI3G+jrc2DANBgkqhkiG9w0BAQsFADBT

#### Data Removed for Brevity

MRMwEQYKCZImiZPyLGQBGRYDbGFiMRgwFgYKCZImiZPyLGQBGRYIdmFzdGRhdGEx dJyJsSPurVUiFH0dlnSd602mNvIpWVlGAYlW+nufAckQJaAPmfmX -----END CERTIFICATE----- Now, simply append the certificate in the cacert.pem file. The file will need to be modified temporarily with proper write permissions. This only needs to be done on the media server(s) that will access the bucket. As with all certificates copy everything and include the header and footer of the certificate.

Note: The location of the cacert.pem varies based on the platform and the NetBackup version. They are all addressed next.

#### Windows Configuration

#### NetBackup 9.x:

The location of the cacert.pem file for NetBackup 9.x is:

<installation-path>NetBackup\var\global\wmc\cloud\cacert.pem

#### NetBackup 10.x:

The location of the cacert.pem file for NetBackup 10.x is:

<installation-path>\NetBackup\var\global\cloud

#### Linux Configuration

#### NetBackup 9.x:

The location of the cacert.pem file for NetBackup 9.x is:

/usr/openv/var/global/wmc/cloud/

#### NetBackup 10.x:

The location of the cacert.pem file for NetBackup 10.x is:

/usr/openv/var/global/cloud/

#### **Adding Media Servers**

The NetBackup architecture and data flow involve backing up data to storage that is connected to servers, designated as media servers. A few quick steps are discussed here to highlight the basics of setting up a media server.

One of the most important installation steps is to ensure that any media server is reachable through their IP address, hostname and FQDN. Ensure that both forward and reverse lookups are possible. Once the media server software is installed it may not show up automatically within the NetBackup Master Server. If that is the case the following CLI commands can help resolve the issue and add the new media server.

To ensure the media servers are properly resolving hostname and IP address use the following from the Master Server:

C:\Program Files\Veritas\NetBackup\bin>**bpclntcmd -hn linmedia-04** host linmedia-04: LINMEDIA-04.SLI.VASTDATA.COM at 10.61.206.60 aliases: LINMEDIA-04.SLI.VASTDATA.COM linmedia-04 10.61.206.60

The above command confirms that the media server is resolving from its hostname. Similar to an ping command, this command ensures the host is simply reachable

C:\Program Files\Veritas\NetBackup\bin>**bpcIntcmd -ip 10.61.206.60** host 10.61.206.60: 10.61.206.60 at 10.61.206.60 aliases: 10.61.206.60

To manually add the new media server perform the following command:

C:\Program Files\Veritas\NetBackup\bin\admincmd>nbemmcmd -addhost -machinename linmedia-11.sli.vastdata.com -machinetype media -masterserver nbuwin2.sli.vastdata.com -NetBackupversion 9.1.0.1 -operatingsystem linux NBEMMCMD, Version: 9.1.0.1 Command completed successfully.

The media server should now show as in Figure 12 but the following command can also be issued:

```
C:\Program Files\Veritas\NetBackup\bin\admincmd>nbemmcmd -listhosts
NBEMMCMD, Version: 9.1.0.1
The following hosts were found:
server
                       nbuwin2
master
                       nbuwin2
media
                       linmedia-01.sli.vastdata.com
virtual machine
                       selab-vcenter.sli.vastdata.com
media
                       winmedia-02.sli.vastdata.com
client
                       nbulin-204-9.sli.vastdata.com
media
                       linmedia-04.sli.vastdata.com
```

Command completed successfully.

_												
Eil	e <u>E</u> dit <u>V</u> iew <u>Actions</u> <u>H</u> elp											
nt	ouwin2.sli.vastdata.com (Master Server)	4 Media Servers for nbuwin2.s	i.vastdata.com (1 selected)			Search	- 7 -					
۲	nbuwin2.sli.vastdata.com (Master Server	∠ Host	Operating System	OS Type	e Host Type	•	Version					
	Activity Monitor	linmedia-01.sli.vastdata.com	Linux(5.17.7-200.fc35.x86 64)	UNIX	Media Server	9.1.0.	1					
0	NetBackup Management	linmedia-04.sli.vastdata.com	Linux(3.10.0-1160.66.1.el7.x86	UNIX	Media Server	9.1.0.	1					
	► El Reports	💀 nbuwin2	Windows2019(10)	Windows	Master Server	9.1.0.	1					
	- 🔍 Policies	vinmedia-02.sli.vastdata.c	Windows2019(10)	Windows	Media Server	9.1.0.	1					
	🕶 📼 Storage											
	- 🌇 Catalog											
	♀-  ♀ Host Properties											
	- 🗐 Master Servers											
	- 🗐 Media Servers											
	- En Clients	1										



### **Adding Client Servers**

Adding a client server through the command line is essentially the same as adding a media server except the *'machinetype'* is different as in the following command:

C:\Program Files\Veritas\NetBackup\bin\admincmd>**nbemmcmd -addhost -machinename** nbulin-204-9.sli.vastdata.com -machinetype client -masterserver nbuwin2.sli.vastdata.com

Note: Clients may not even show up even with the above command until added into a policy.

#### **Adding Data Sources**

The example below is the simple task of adding a vCenter Server to the Master Server.

#### Adding a vCenter Server



Figure 13 - Adding a New Virtual Machine Server



Figure 14 - Adding the Virtual Machine Server

New Virtual Machine Server - selab-vc	enter.sli.vastdata.com X
Virtual Machine Server Name: selab-v	center.sli.vastdata.com
Credentials	
Virtual Machine Server Type:	
VMware Virtual Center Server	-
<u>U</u> ser name:	
administrator@vastdata.local	
Password:	
•••••	
Validate using <u>b</u> ackup host: Any	-
Connect using Port number	
443 🗘	
	<u>O</u> K <u>C</u> ancel <u>H</u> elp

Figure 15 - Credentials for the Virtual Machine Server

file Edit View Actions Help	<b>&amp;</b> ≭ ≪ ≿ ⊋ <b>∀</b>		
nbuwin2.sli.vastdata.com (Master Server)	1 Virtual Machine server(s) (0 selected)	Virtual Machine	Server Type
Backup, Archive, and Restore     Activity Monitor     NetBackup Management     Backup Management     Device Monitor     Device Monitor     Devices     Credentials     Disk Array Hosts     NDMP Hosts     Storage Servers     Nitual Machine Servers	Buselab-vcenter.sli.vastdata.com	Villware Virtual Center Server	

Figure 16 - Successfully Added Virtual Machine Server

### Adding VAST as a Target

The work flow for adding storage begins in the Credentials section of Veritas and proceeds

- Credentials → Storage Servers
- Devices → Diskpool
- NetBackup Management → Storage Units

Veritas NBU UI walks the user through all of the steps in the creation process but pausing after each step is also available.

#### Advanced Disk with VAST NFS

Using an Advanced Disk configuration optionwith VAST is a simple way to backup to storage but keep in mind that a lot of the Veritas functionality is not available for Advanced Disks. If data simply needs to be backed up then this is a reasonable option.



Figure 17 - Create New Storage Server

To start, right click on *Storage Servers* underneath *Credentials* and a select *New Storage Server* (Figure 17). A Storage Server Configuation Wizard window opens up (Figure 18). Select *AdvancedDisk* and click *Next*.

Storage Server Confi	guration Wizard	×
	<ul> <li>Welcome to the Storage Server Configuration Wizard!</li> <li>The wizard helps you create and configure a storage server and a disk pool. Before you begin the storage server configuration, ensure that the following prerequisites are met: <ul> <li>The disk devices are deployed and configured as per the instructions by the storage system vendors.</li> <li>All necessary software plug-ins are installed on the NetBackup Media Servers.</li> <li>Details about the storage servers and credentials to access these servers are added in NetBackup.</li> </ul> </li> <li>Select the type of disk storage that you want to configure. <ul> <li> <ul> <li>Megia Server Deduplication Pool</li> <li>Qpen Storage</li> </ul> </li> </ul></li></ul>	
	PureDisk Deduplication Pool  Note: The AdvancedDisk storage lets you combine the disk storages that ar directly attached to a NetBackup Media Server into a single disk pool. supports the advanced features like storage lifecycle policy and intelli capacity management.  Next> Cancel	e It igent

Figure 18 - Selecting Storage Server Type as Advanced Disk

On the next window (Figure 19), select the Media Server that will be used to write to the VAST cluster.

storage server Configuratio	on Wizard	8
Add Storage Server Provide storage serv	er details.	
The media server select	ed below will be marked in NetBackup's device database as a media	
server that hosts Advand	edDisk storage.	
server that hosts Advanc <u>M</u> edia server:	edDisk storage. linmedia-11.sli.vastdata.com	•
server that hosts Advanc Media server: S <u>t</u> orage server type:	edDisk storage. linmedia-11.sli.vastdata.com AdvancedDisk	•

Figure 19 - Selecting the Media Server

The next window (Figure 20) is a summary of the settings. Review the setings and click **Next**.

storage Server Configuration Wizard		×
Storage Server Configuration Summa Verify the storage server configu	ary ration.	C
Review the storage server configuration configuration, if required.	tion summary. You can change the	
Storage server type:	AdvancedDisk	
-	Repaired and a Repaired data and	
Storage server name:	linmedia-11.sii.vastdata.com	

Figure 20 - Review Storage Server Settings

In Figure 21, it shows the successful creation of the Storage Server. It also allows the user to exit the workflow or continue on creating the Disk Pool. Click **Next** to continue on.

Storage Server Config	uration Wizard	×
Storage Server Cont Perform required	iguration Status I task to create storage server.	
Status Creating	Performing tasks storage server linmedia-11.sli vastdata.com	Details
1	1	
Storage server "linn	nedia-11.sli.vastdata.com" is successfully cre	ated.
Create a disk po	ol using the storage server that you have just (	created
Click Close to compl	ete the storage server configuration and close	e the wizard.

Figure 21 - Successfully Created Storage Server

The next step is the process of selecting the VAST Data volume that's been mounted to the Media Server. If this has not been completed yet then visit the section - Create VAST NFS View.

folume Selection Select volumes to us	e in the dis	sk pool.					
torage server type: Ad elect storage server vo	lvancedDis blumes to a	sk add to the a	disk pool.				
Volume Name		Availabl	Raw Size	Replicat.	WORM	Minimu	Maximu
		10.75 GB	37.05 GB	None	No		
/boot		708.21	993.88 MB	None	No		
/dev		4.0 MB	4.0 MB	None	No		
/dev/hugepages		0.0 Bytes	0.0 Bytes	None	No		
/dev/mqueue		0.0 Bytes	0.0 Bytes	None	No		
/dev/shm		191 GB	191 GB	None	No		
/mnt/vast		2.89 PB	3.02 PB	None	No		
/run		781.96	783.62 MB	None	NO		
/run/user/0		391.69	391.81 MB	None	No		
/run/user/0/gvfs		0.0 Bytes	0.0 Bytes	None	No		
/run/user/42		391.75	391.81 MB	None	No		
Disk Pool Size Fotal available space:	Add new v	rolume on	the selecte	d storage	server(s)	<u>A</u> dd Ne	w Volume
Total raw size:	3.02 PB						

Figure 22 - Select Storage Server Volume for Disk Pool

Once an appropriate volume is mounted to the Media Server but does not show in the list in Figure 22 then click **Add** *New Volume*. This will bring up a window as shown in Figure 23.

to the folding filling	made available for the s	storage server(s) you hav	e selected in the
previous step.			
Please make sure	the volume name you are	e providing here, have be	en configured on the
duancod Diek eto	-240		
lew volume name:	/mnt/vast		

Figure 23 - Adding New Volume

Enter in the appropriate path and click *Validate and Add*. The volume should now show as in Figure 22. Check the box for that volume and click *Next*.

Additional Disk Pool Information Provide additional disk pool information.			
Storage server type: AdvancedDisk			
Disk Pool Size			
Total available space: 2.89 PB			
Total raw size: 3.02 PB			
Disk Pool name: VAST-NFS-AdvDiskPool			
High water mark: 98 🗳 %			
Low water mark: 00 1%			
2011 100100 - 10			
Maximum I/O Streams			
Maximum I/O Streams     Concurrent read and write jobs affect	disk performanc	:e.	
A when ment and a set of the	disk performanc	e.	
Maximum I/O Streams  Concurrent read and write jobs affect Limit I/O streams to prevent disk overload. Limit I/O streams:	disk performanc volume	e.	
Maximum I/O Streams Concurrent read and write jobs affect Limit I/O streams to prevent disk overload. Limit I/Q streams:	disk performanc volume	e.	

Figure 24 - Adding Disk Pool Name

In the next window (Figure 24), add a name for the Disk Pool and review the other settings if needed and then click Next.

Storage Server Con	figuration Wizard					>
Disk Pool Configu Perform disk	ration Status pool creation task.					
Status		P	erformina t	asks		
<ul> <li>✓</li> </ul>	NetBackup Disk Po	ol created				
DISK POOL VAST-	VFS-AdVDISKPOOL IS S	uccesstully	created.			
Create a stor	ige unit using the disk	pool that you	J nave just	created		
Click 'Close' to co Click 'Next' to cre	mplete the disk pool o ate storage unit.	configuration	and close	the wizard.		
					-	

Figure 25 - Successful Creation of the Disk Pool

Figure 25 shows the successful creation of the Disk Pool. Click **Next** to continue on to the Storage Unit creation.

Storage Server Configura	tion Wizard				×
Storage Unit Creation Enter details to crea	ate storage unit.				
Disk pool:	VAST-NFS-AdvDiskPo	ol			
Storage unit name:	VAST-NES-AdvDiekPo	ol-stu			
	Use WORM	or-stu			
Modia Server					
	se the selected media se Med nmedia-11.sli.vastdata.co	ervers: ia Servers m			]
Magimum concurren Maximum fragment s	tjobs: 5 ize: 524288 Meg	abytes			
		< Back	<u>N</u> ext >	Cancel	Help

Figure 26 - Configuration of the Storage Unit

Enter a name for the Storage Unit as shown in Figure 26. Also, here is where the user can select which and how many Media Servers are able to write to the storage unit. In this example, only one specific Media Server has been given access to transport the data. Click *Next* to continue.

storage server Conin	guration Wizard	>
Finished.		
You have success	fully completed the NetBackup Disk Pool Configuration Wizard.	

Figure 27 - Successful Creation of the Storage Unit

The next window (Figure 27) simply highlights the successful creation of the Storage Unit.

Éile Edit View Actions Help	8	<b>4.</b> 7 <i>7 ≈</i> 16 × 16 6	ð ta 🔁 🖬 📫						
nbuwin2.sli.vastdata.com (Master Server)		1 Storage Units (0 selected)							
nbuwin2.sli.vastdata.com (Master Server)			Disk Pool	A Media Servers	Storage I In	Disk Type	On Demand	Fragment S	Max Conc
Backup, Archive, and Restore     Activity Monitor		VAST-NFS-AdvDiskPool-stu	VAST-NFS-AdvDiskPool	linmedia-11.sli.vastdata.com	Disk	AdvancedDisk	Yes	524,288	5
P      NetBackup Management     P      Reports									
Potorage     Storage Units     Storage Units     Storage Unit Groups									

Figure 28 - Verfication of the Storage Unit

Looking under **NetBackup Management** → **Storage** and then highlighting **Storage Units** verifies that the Storage Unit is now available for backups (Figure 28) and can be assigned to policies.

#### **Cloud Storage with VAST S3**

Cloud storage with S3 is similar to an Advanced Disk in its functionality. It is a basic backup destination with limited NetBackup features, but works well for most environments.

The process for creating an S3 Storage Unit starts the same as was described for an Advanced Disk but in this scenario *New Cloud Storage Server* is selected instead (Figure 29).



Figure 29 - Create New Cloud Storage Server

The next window (Figure 30) brings to attention a number of prerequisites that are needed for creating a Cloud Storage Server. Most of the concerns were addressed in previous sections of this document, specifically:

- Security Certificate Section: Adding Private Cloud CA Certificate
- Credentials Section: Create a VAST S3 User
- Storage Provider Section: Adding Cloud Configuration Package

#### Not listed in the prerequisite list but is also needed is:

Device Mapping - Section: Adding Device Mapping Files

Cloud Storage Server Config	guration Wizard - NetBackup	×
	Welcome to the Cloud Storage Server Configuration Wizard	
	This wizard helps you to create a cloud storage server and a disk pool.	
目分	The storage server and disk pool you create will enable NetBackup to send your data to your cloud storage provider.	
	Note the following points before you configure the cloud storage server:	
	<ul> <li>You must have deployed the security certificate to the media server in order for the media server to be available for cloud deployment. Click Help or refer to the NetBackup Cloud Administrator's Guide for instructions to deploy the security certificate.</li> </ul>	
	<ul> <li>You need to provide the credentials to access your cloud storage account when prompted. If you do not have an account, you can select a cloud storage provider and create an account using the wizard.</li> </ul>	
	<ul> <li>If your existing cloud storage provider is not listed in the wizard screen, click Help or refer to the NetBackup Cloud Administrator's Guide.</li> </ul>	

Figure 30 - Key Points Before Creating Cloud Storage Server

#### Once the key points have been addressed click **Next**.

Cloud Storage Server Config	uration Wizard - NetBackup		>
	Add Storage Server Select cloud provider Storage API type: Cloud storage providers	All cloud storage provider types	<b>•</b>
	vast		×
	VAST Universal Storage		

Figure 31 - Selecting VAST Data as the Storage Provider

In the next window (Figure 31) search for VAST as the cloud provider by either typing in a name to filter or simply scroll through the list to find VAST. Select it and then click **Next**.

Cloud Storage Server Config	uration Wizard - NetBackup						>
	Add Storage Server Select a media ser	rver and provide clou	d storage serv	rice credenti	als.		
$\square \land \lor$	Cloud storage provide	er - VAST Data					
	Service host:	veritas.tmphx-10.va	istdata.lab			-	
	<u>Storage server name:</u>	VAST				-	
					Add Cloud <u>S</u> tor	rage	
	Media server name:	linmedia-01.vastdat	ta.lab			•	
	Access details for VA	ST Data account					
	Access key ID:	9SM5DZSCSV9AS7	97TGQA				
	Secret access key:	•••••	•••••	•••••	•••		
	If you do not h Create an acc	ave VAST Data accou count with VAST Data.	nt				
					dvanced Setti	ings	
	To continue all i way						
	To continue, click Nex	it.					
			< Back	Next>	Cancel	Help	

Figure 32 - Configuring the Cloud Storage

Figure 32 highlights several tasks needed to configure the Cloud Storage. The fields show an already configured setup so we'll return to this figure in a bit. To create one click on the *Add Cloud Storage* button as shown in the figure.

General Settings Reg	gion Settings
Provider type:	VAST Data
Ser <u>v</u> ice host:	veritas.tmphx-10.vastdata.lab
Service endpoint:	
HTTP port:	80
HTT <u>P</u> S port:	443
Storage server name:	VAST
Endpoint <u>a</u> ccess style:	Path Style

Figure 33 - Adding VAST Cloud Storage

This brings up the Add Cloud Storage window as shown in Figure 33. The service host here is the VAST VIP appended to the DNS name of the cluster. On the VAST cluster, a simple S3 Endpoint was created without any alias, therefore the Service Endpoint is left empty. Using an endpoint allows NetBackup to create and delete buckets from within the software. A single service host can be used multiple times to connect to but it is only created once.

Note: Creating multiple service hosts would be a way to segregate various backup groups within the same VAST cluster. This would be achieved by creating various VIPs within VAST and then creating the corresponding NetBackup Service Hosts.

General Settings	Region Settings		
Regions:			
Region name	Location constrai	nt <u>Service host</u>	
			<u> ※ A</u> dd
vast-1	vast-1	veritas.tmphx-10.va	X Delete
vast-1	vast-1	veritas.tmphx-10.va	X <u>D</u> elete
vast-1	vast-1	veritas.tmphx-10.va	X Delete
vast-1	vast-1	veritas.tmphx-10.va	X <u>D</u> elete
vast-1	vast-1	veritas.tmphx-10.va	X Delete
vast-1	vast-1	veritas.tmphx-10.va	X <u>D</u> elete
vast-1	vast-1	veritas.tmphx-10.va	X Delete

Figure 34 - Configuring the Region

Clicking on the Region Settings brings up the window as shown in Figure 34. Make sure to use 'vast-1' as both the region name and location constraint. The Service host entry should match the same from the General Settings tab.

Note: It is critical that the region name and location constraint be 'vast-1' or 'VAST-1'.

Once both tabs are filled out, click **OK**. The options that are shown for **Service Host** and **Storage Server Name** should now be available as shown in Figure 32.

Enter the access and secret access keys that were created for the S3 User (See - Create a VAST S3 User). Finally click on the *Advanced Settings* button. This will bring up the window as show in Figure 35.

Advanced Server Configuration	×
General Settings Proxy Settings	
Use SSL Use SSL Lateral Authentication Only Data Transfer Check Certificate Revocation HTTP Headers:	
Header	Value
	OK Cancel Help

Figure 35 - Advanced Server Configuration

Ensure that the *Check Certificate Revocation* box is unchecked, the *Use SSL* is selected with the *Data Transfer* option and then click OK. Then click *Next* to move onto the next window.

Cloud Storage Server Configu	ration Wizard - NetBackup	×
	Add Storage Server         Specify compression settings         ▲ Once configured, these settings cannot be changed.         Object Size (MB):       4 ↓ (4194304 Bytes)         Compression         □ Compress data before writing to cloud storage	

Figure 36 - Configuring Additional Settings

Figure 36 allows the user to configure object size and compression. Here the object size was left as the default and compression was left off, as the VAST cluster has compression enabled by default. The compression setting is specific to each customer's environment and careful thought should be used in addressing this setting. Accept the warning window (not shown) that compression object size settings cannot be changed later. Review all of the settings in the next window and click **Next** and the Storage Server creation will begin.



Figure 37 - Successful Creation of S3 MSDP Storage Server

When the Storage Server creation completes you will receive the message shown in Figure 37.

Note: To ensure that the second phase completes properly make sure the VAST CA Certificate has been appended to the cacert.pem file. This is discussed in the section – Adding Private Cloud CA Certificate.

Cloud Storage Server Conf	Cloud Storage Server Configuration Wizard - NetBackup	
	Storage Server Creation Confirmation Check status and proceed to the next step	
	Storage server VAST successfully created.	

Figure 38 - Confirmation Storage Server Created

An additional confirmation is shown in Figure 38 and allows the user to exit the workflow if desired. However, click **Next** to continue creating the Disk Pool.

ish i con conniguite.	IOTT WIZETU				
/olume Selection Select volumes	to use in the disk	pool.			
Storage server type Select storage serv	e: vastdata_raw	1 to the disk po	ool.		
Volume Name	Availabl Raw S	Size Replica	NORM Minin	nu Maximu	Region
🛃 enginering		None N	lo		VAST-1
Add	new volume on t	he selected st	prage server(s	Add New	Volume
Add	I new volume on t	he selected st	orage server(s	) <u>A</u> dd New	Volume
Add Disk Pool Size Total available spa	i new volume on ti	he selected st	orage server(s	) <u>A</u> dd New	Volume
Add Disk Pool Size Total available spa Total raw size:	I new volume on the second sec	he selected st	prage server(s	Add New	Volume
Add Disk Pool Size Total available spa Total raw size: Before selecting servers.	l new volume on ti ice: g a volume, you m	he selected st	brage server(s	Add New	Volume

Figure 39 - Select Disk Pool Volume (Bucket)

Figure 39 shows the volume (bucket) selection window and one already selected. If there are none available then one needs to be created and that is done by clicking the *Add New Volume* button.

Bucket name must be at least 3 and no more than 63 characters long.     It can contain lowercase letters, numbers, and hyphens.     Each label must start and end with a lowercase letter or a number and can contain dashes.  Bucket name Region finance VAST-1 Cloud Volume Name Capacity Region enginering VAST-1	Configure buckets for VAST Data			
Bucket name         Region           finance         VAST-1         Image: Capacity         Add           Cloud Volume Name         Capacity         Region           enginering          VAST-1	Bucket name must be at le     It can contain lowercase le     Each label must start and     dashes.	east 3 and no more than 6 etters, numbers, and hyphe end with a lowercase lette	3 characters ens. r or a numbe	long. r and can contain
finance VAST-1 Cloud Volume Name Capacity Region enginering VAST-1	Bucket name	Region		_
Cloud Volume Name Capacity Region enginering VAST-1	finance	VAST-1		▼ Add
enginering VAST-1	Cloud Volume Name	Capacity		Region
	enginering		VAST-1	

Figure 40 - Create Bucket

In the *Create Buckets* window (Figure 40), enter a Bucket Name and Region and then Click *Add*. The bucket will appear in the lower part of the window. Create as many buckets as needed and then click *Create*. This will now return to the Disk Pool wizard (Figure 39) where the newly created bucket(s) are now available. Select the bucket and click *Next*.

Note: Only one volume should be used for a disk pool. Do not select multiple volumes.

Disk Pool Configuration Wizard	×
Additional Disk Pool Information Provide additional disk pool information.	
Storage server type: vastdata_raw Disk Pool Size Total available space: Total raw size:	
Disk Pool name: VASTS3-DiskPool Comments:	
High water mark:       98 5 %         Low water mark:       80 5 %         The High water mark and Low water mark values are not applicab group.	le for this disk
Maximum I/O Streams         Image: Concurrent read and write jobs affect disk performance.         Limit I/O streams to prevent disk overload.         Limit I/O streams:         Image: Concurrent read and write jobs affect disk performance.	
< <u>Back</u> <u>Next&gt;</u> <u>C</u> an	cel <u>H</u> elp

Figure 41 - Naming the Disk Pool

In Figure 41 the Disk Pool was given a name. There are some additional limit settings that are configurable but are left at their defaults. After clicking **Next** confirm everything on the summary window and then click **Next** again.



Figure 42 - Successful Creation of the Disk Pool

When the Disk Pool creation finishes the result appears as in Figure 42. This window is also another opportunity to exit the workflow but click Next so the final step of creating the Storage Unit can be completed.

Storage Unit Creation			
Enter details to cre	ite storage unit.		
Disk pool: Storage server type:	VASTS3-DiskPool		
Storage unit name:	VASTS3-DiskPool-stu		
Modia Server			
media Server			
<ul> <li><u>U</u>se any available</li> </ul>	nedia server to transport data	1	
Only use the selection	ted media servers:		
	Media Servers		
✓ linmedia-01.v	astdata.lab		
A			
Ma <u>x</u> imum concurren	ijobs: 5		 
Ma <u>x</u> imum concurren Maximum fragment s	ijobs: 5 +	2	
Ma <u>x</u> imum concurren Maximum fragment s	i jobs: 5 \$	'S	
Ma <u>x</u> imum concurren Maximum fragment s	ijobs: 5 🛫	'S	
Ma <u>x</u> imum concurren Maximum fragment s	tjobs: 5 + ize: 524288 Megabyte	'S	
Ma <u>x</u> imum concurren Maximum fragment s	tjobs: 5 🗘 ize: 524288 Megabyte	'S	

Figure 43 - Storage Unit Configuration

In the **Storage Unit Creation** window (Figure 43) give the Storage Unit a name or accept the default name. The Media Server selection is identical to the process when creating an Advanced Disk where specific Media Servers can be selected to transport data. The maximums that are at the bottom are environment specific. In this setup it can easily support 5 concurrent jobs so that setting has been increased accordingly. Click **Next** to continue.

Disk Pool Configu	iration Wizard		×
Finished.			
You have succe	ssfully completed the Net	Backup Disk Pool Co	nfiguration Wizard.
You may view or Management or	change the current conf Storage Unit Manageme	iguration settings wit nt.	hin Device

Figure 44 - Successful Storage Unit Creation

Successful creation of the Storage Unit is highlighted in Figure 44 and then verified under Storage  $\rightarrow$  Storage Units (Figure 45).

<u>File Edit View Actions Help</u>									
nbu10-master.vastdata.lab (Master Server)	1 Storage Units (0 selected)								
hu10-master.vastdata.lab (Master Server)	Name	Media Servers	Storage Un Disk Type	Robot Type Robot Num	Density Or	Demand Fragment S., Mult			
- R Activity Monitor	VASTS3-DiskPool-stu	linmedia-01.vastdata.lab	Disk vastdata_raw		Yes	5 524,288			
🕈 🔟 NetBackup Management									
► E Reports									
- Storage									
- E Storage Units									
Storage Unit Groups						)			

Figure 45 - Confirmation Cloud Storage Unit Creation

#### **MSDP Cloud with VAST S3**

A relatively new concept for Veritas NetBackup is MSDP Cloud or MSDP-C, which incorporates many of the benefits of the Media Server Deduplication Pool (MSDP) with the disk pool created from cloud storage. This is a direct result of the VAST cloud connector that is discussed in the section – Adding Cloud Configuration Package.

Note: Check the latest Veritas NetBackup HCL for a list of the current functionality that MSDP Cloud offers since not all of the MSDP benefits are currently available.

Below is an example of how to configure an MSDP Cloud Storage Server, a disk pool with a VAST S3 Bucket and a storage unit. This will be done from the Web UI since the cloud disk pool creation is not available through the JAVA UI.

Starting on the left side of the Web UI go to Storage and select Storage configuration (Figure 46).



Figure 46 - Select Storage Configuration

This will bring up the Storage configuration window. Click on the Add button to add a new storage server (Figure 47).

Ē	Veritas NetBackup™						
«		Storag	e configuration				
đ	VMware	St	orage servers	Disk pools	Storage	units	Universal shares
🚍 s	torage ,	- + Ad	d Search				
Į,	Storage configuration		Name	Storage set	ver type	Category	
<	Storage lifecycle policies		VAST-cloud	vastdata_ra	wc	Cloud	
	atalog		linmedia-01.vas	tdata PureDisk		MSDP	

Figure 47 - Add Storage

The Add Storage server window appears and, in this example, select *Media Server Deduplication Pool (MSDP)* as shown in Figure 48.



Figure 48 - MSDP Selected

In the *Add MSDP Storage server window* (Figure 49) select the media server to be used and this will pop up the Select Media Server shown in Figure 50. Select the appropriate media server and then click *Select*.

Basic properties	2 Storage server options
Media server *	
linmedia-03.vastdata.lab	Q
Storage server name	
linmedia-03.vastdata.lab	
Username * admin	
Password *	
•••••	
Re-enter password *	

Figure 49 - Media Server and storage server credentials

Add a username and login credentials. The user name and password are only particular to this storage but make note of the credentials in case maintenance is needed later. Click *Next* when finished.

elect m	edia server	3
elect a m eduplicatio	nedia server that will host the MSDP storage on can negatively affect primary server operations. Configuring a primary server as a deduplication storage server is n led.	ot
		۹
	Name	
0	linmedia-01.vastdata.lab	
0	linmedia-02.vastdata.lab	
۲	linmedia-03.vastdata.lab	
0	linmedia-04.vastdata.lab	
0	nbu10-master.vastdata.lab (Primary server)	led
Showing	1-5 of 5 (1 selected) Rows per page: 100 V K >	×
	Cancel Se	lect

Figure 50 - Selecting Media Server for MSDP

On the next window (Figure 51) add the Storage path for the installation of the deduplication engine and other files.

dd MSDP storage server	
Basic properties	Storage server options
These attributes cannot be modified once the storage se	erver is created.
Storage path *	
/mnt/msdp	
Use alternate path for deduplication database	
Enter alternate path for deduplication database	
You can optimize performance if you place the deduplication database on a se	sparate, faster diak atorage system.
Use specific network interface	
Enter interface	
Key Management Service (KMS) is not available.	To enable KMS refer to the NetBackup Security and Encryption Guide.
Encryption for local storage	
Enable encryption	
Use KMS	
USERMIS	

Figure 51 - Storage Path for MSDP installation

Here encryption is disabled. If you choose to enable encryption, the VAST cluster will not be able to deduplicate the data, resulting in more usable storage being consumed. The benefit of using S3 in this scenario is that the connection to the bucket and cloud are already secure. Disabling encryption maximizes VAST deduplication and similarity data reduction for better storage utilization.

NOTE: There are often scenarios where encrypting data is required for security purposes. Please consult with your IT Security team if you have questions.

The next screen (Figure 52) is simply another chance to add additional media servers to this storage server for additional compute and to handle the initial NetBackup deduplication.



Figure 52 - Option to Add Additional Media Servers

Review the settings on the next window (not shown) and click *Save*. Once the storage server has been created it will show up as in Figure 53.

torage	configuration		0	Storage server successfully	created. Add disk pool	]					
Stor	age servers Disk	pools Storage u	nits Universal shares	Server groups							
+ Add	Search							Q	T	C	 ‡≣ ∽
	Name	Storage server type	Category	Media servers	Supports Accelerator	Supports snapshot	Supports A.I.R.	WOR	И сара	ble	
	linmedia-01.vastdata	PureDisk	MSDP	1	Yes	No	Yes		(	9	1
	linmedia-03.vastdata	PureDisk	MSDP	1	Yes	No	Yes		(	9	:
	linmedia-04.vastdata	AdvancedDisk	AdvancedDisk	1	No	No	No				1

Figure 53 - MSDP Storage Server Successfully Created

Taking the easy handoff and clicking the green *Add disk pool* button at the top immediately pops up the Add disk pool window (Figure 54). The media server should already be selected. Give the disk pool a name and click *Next*.

Add disk pool			X
1 Disk pool options	Volumes	③ Replication	(4) Review
Storage server name *	Features		
linmedia-03.vastdata.lab	Accelerator, A.I.R., Instant access, WORM capable		Change
Disk pool name *			
VAST-MSDP-Cloud-Diskpool	0		
Description			
Enter description			
Concurrent read and write jobs affect disk performance. Limit	UO atreama to prevent diak overload.		
The following options do not apply if you select a clo	oud MSDP disk volume in the next step.		
High water mark *			
98			
Low water mark *			
80 🗘 %			

Figure 54 - Disk Pool Name

The next window (Figure 55) is where a volume is selected for the disk pool. The default volume is the disk used by the media server. To create an S3 volume click on *Add volume*.

Add MSD	OP disk pool									×
🕑 Disk p	oool options			2 Volumes		3	Replication		(	4 Review
Volume Select volume Add volume							0			
	Name	Available space	Total size	Encryption	Replication	Bucket name	WORM capable	Minimum lock duration	Maximum lock du	iration
۲	PureDiskVolume	11.09 GB	33.34 GB	No	None					
Showin	ng 1-1 of 1 (1 selected)							Rows per page: 100 V	к < >	К

#### Figure 55 - Add Volume to Disk Pool

Now in the *Add MSDP disk pool* window (Figure 56) give the volume a name and then click on *Cloud storage provider*. This will open up another window where a text search for VAST brings up the choice as shown in Figure 57.

Disk pool options	2 Volumes	③ Replication
Volume		
Add volume 🗸		
Volume name *		
VAST-Cloud-Volume	0	
Cloud cache properties		
Cloud cache properties	mance. Verify that the required space to create this pool is available.	
Cloud cache properties A request value lower than 1,017 GB may affect perfor Available disk space	mance. Verify that the required space to create this pool is available. Request cloud cache disk space *	
Cloud cache properties A request value lower than 1,017 GB may affect perfor Available disk space 9.4 GB	mance. Verify that the required space to create this pool is available. Request cloud cache disk space * 5	GB
Cloud cache properties A request value lower than 1,017 GB may affect perfon Available disk space 9.4 GB	mance. Verify that the required space to create this pool is available. Request cloud cache disk space * 5 Enter a value between 4 08 and 8 08.	GB
Cloud cache properties A request value lower than 1,017 GB may affect perfor Available disk space 9.4 GB	mance. Verify that the required space to create this pool is available. Request cloud cache disk space * S Enter a value between 4 08 and 8 08.	GB

Figure 56 - Volume Name and Cloud Storage Provider

Sele	ect cloud storage provider					×
v	ast				Q	0
	Cloud storage provider	Description	Storage	API type		
	VAST Data	VAST Universal Storage	S3			
1	Records (1 selected)					
				Cancel		Select

Figure 57 - Selecting VAST Data Cloud Provider

After selecting VAST and scrolling further down the page the *Region* is selected (Figure 58). If one is not available then it can be added in the same way as shown and described for Figure 33 and Figure 34.

F	Region			
		Service host	Region name	Region identifier
		veritas.tmphx-10.vastdata.lab	VAST-1	VAST-1
	0	netbackup.tmphx-10.vastdata.lab	vast-1	vast-1

Figure 58 - Selecting VAST Data Configured Service Host

Scrolling ever further down the *Add MSDP disk pool window*, enter the S3 user credential and confirm the Check certificate revocation is unchecked.

Access datails for the account
Access key ID *
9SM5DZSCSV9AS797TGQA
Secret access key *
Advanced settings
Security
Vse SSL
<ul> <li>Authentication only</li> </ul>
Authentication and data transfer
Check certificate revocation (IPv6 not supported for this option)
Proxy
Use proxy server

Figure 59 - User Credentials for VAST Data Service Host

Finally, at the bottom of the window is the Cloud bucket selection (Figure 60). A known bucket can just be entered or a list of buckets can be generated by clicking the **Retrieve list**. Clicking **Retrieve list** will test the S3 connection settings and bring up a list of buckets that that particular S3 user is able to see.

ſ	Cloud buckets
	C Enter an existing cloud bucket name
	Select or create a cloud bucket
	Complete all required fields to view available cloud buckets.
	Retrieve list

Figure 60 - Selecting VAST Cloud Bucket

Select an existing bucket or add one by clicking the plus button (not shown). Clicking the add button brings up the *Add a bucket* window shown in Figure 61. Enter a bucket name and VAST-1 as the region and click *Add*.

Add a bucket			×
Bucket name vast-bucket			
Provide a name that uses 3 to 63 lowercase characters,	numbers, or hyphens. Do	o not begin or end the name w	rith a hyphen.
Region			
VAST-1			
		Cance	Add

Figure 61 - Adding Bucket to VAST

Now that the bucket has been added it will show up in the list (Figure 62). Select it and click Next.

(	Cloud bi	uckets ter an existing cloud bucket name	
(	Se Se	lect or create a cloud bucket	
1			
		Name	Region
	0	primary-bucket	VAST-1
	۲	vast-bucket	VAST-1
	0	vast-cloud-dp	VAST-1

Figure 62 - Selecting Newly Created VAST Bucket

Review the settings for the disk pool and click *Finish* when ready.

Storage configuration				Disk pool successfully cr	eated. Add storage uni	it						×
Storage servers	Disk pools	Storage units	Universal shares	Server groups								
+ Add Search								Q	т	C	□~	‡≣∽
Name	U	Ised space	Volumes	Storage server type	Category	Storage server	WORM capable	Minimum lock du	ration	Мах	imum lo	ck
VAST-MSDP-	Cloud-Diskpool 0.	.00 KB	VAST-Cloud-Volume	PureDisk	MSDP	linmedia-03.vastdata.lab						ı
vast-cloud-d	4.	.9 GB	VAST-Cloud	PureDisk	MSDP	linmedia-01.vastdata.lab						1

Figure 63 - Disk Pool Successfully Created on VAST Cloud

The disk pool is now created as shown in Figure 63. Click on the green **Add storage unit** button at the top. This brings up the window as shown in Figure 64. Give the storage unit a name and adjust the other settings as needed and then click Next.

dd MSDP storage unit		
1 Basic properties		
Name *		
VAST-MSDP-StorageUnit		
Maximum concurrent jobs		
5	$\hat{}$	
Maximum fragment size		
	0	MD

Figure 64 - Creating Storage Unit

Select the disk pool (Figure 65) that was created in the previous step and click Next.

Select a disk pool											
	Name	Used space	Volumes	Storage type	Storage server	Replication					
۲	VAST-MSDP-Cloud-Diskpool	0.00 KB of 8.00 PB use	VAST-Cloud-Volume	PureDisk	linmedia-03.vastdata.lab	None					
0	vast-cloud-dp	4.9 GB of 8.00 PB used	VAST-Cloud	PureDisk	linmedia-01.vastdata.lab	None					
<											
Showin	ng 1-2 of 2 (1 selected)										

Figure 65 - Selecting Disk Pool for Storage Unit

Select the appropriate media server access (Figure 66) and click **Next**, review the settings and click **Save** when ready.

Se	Select media server										
0	) Allow Manu	NetBackup to automatically select ally select									
	~	Name	NetBackup version	OS platform							
		linmedia-03.vastdata.lab	10.1.1	Linux							



Storage configuration															
	Storage servers	Disk pools	Storage units	Universal sh	ares Serv	er groups									
+ 4	dd Search										Q	т	C	□~	t≣ ~
	Name	Me	edia servers	Category	Disk pool used	Fragment size	Disk pool	High water mark	Low water mark	Use WORM	On dema	ind on	Max	kimum c	0
	VAST-MSDP-C	oud-stu linr	nedia-01.vastdata.lab	MSDP	4.9 GB	50 GB	vast-cloud-dp						5		:
	VAST-MSDP-St	orageUnit linr	nedia-03.vastdata.lab	MSDP	0.00 KB	50 GB	VAST-MSDP-Cloud						5		I

Figure 67 - Storage Unit Successfully Created

Once the storage unit is created, it will look like the one highlighted in Figure 67. The MSDP-Cloud storage server can now be assigned to policies.

# **Advanced Solutions**

This section covers concepts beyond the creation of storage servers, disk pools and storage units looking at topics such disaster recovery, replication and duplication (not deduplication).

### NetBackup Image sharing

Image sharing is a NetBackup concept that allows for the import and recovery of a backup catalog and the backup image from a cloud backup when access to the primary server is compromised. This is possible because not only is the data image backed up into the cloud but so is the catalog. This allows full access to the backed-up data.

The recovery requires a single-purpose, fully installed NetBackup Master Server, called a Cloud Recovery Server, which can either be run in the cloud or on a physical server. It is configured as a unique option of an MSDP storage server with access to the exact same Volume Name and bucket in the disk pool of the data that needs to be recovered.

The following sections highlight how to create a Cloud Recovery Server and how to recover data using it.

#### **Configuring a Cloud Recovery Server**

Currently, this server can only be installed on Linux. The installation process is very similar to any other Linux install, however, check the Veritas NetBackup documentation for the latest specifications and installation tips for this server.

Once installed bring up the WEB UI to complete the configuration. This server will need the same tasks discussed earlier:

- 1. CloudProvide.xml See section Linux Installation Adding Cloud Configuration Package
- 2. Device Mappings See section Adding Device Mapping Files
- 3. CA Certificate Since this server will be both the Master and Media Server it will need the CA certificate appended in the cacert.pem file. See section Adding Private Cloud CA Certificate

Once those tasks are complete a storage server needs to be created starting off in the same way discussed in the section - MSDP Cloud with VAST S3. The only difference for this storage server is it will be configured as shown in Figure 68. The selection is specific to a Cloud Recovery Server and only one can be configured on this server as it is single purpose system.

Add	storage server		×
Selec	t the type of storage that you want to configure		
$\bigcirc$	AdvancedDisk Media server local storage		
0	Cloud storage Direct backup to cloud		
0	Media Server Deduplication Pool (MSDP) Deduplication to local storage and cloud		
$\bigcirc$	Media Server Deduplication Pool (MSDP) for image sharing Recover existing images from the cloud		
0	OpenStorage		
		Cancel	Start

Figure 68 - Cloud Recovery Server Configured for Image Sharing

After selecting *Media Server Deduplication Pool(MSDP) for Image Sharing* click *Start*. This continues the same process for an MSDP-Cloud Storage Server creation as before. Once completed it will look like what is shown in Figure 69. The *Category* column shows, *MSDP for Image sharing*, which is specific for a cloud recovery server.

S	Storage configuration Storage server successfully created. Add disk pool												×
	Sto	rage servers Disk	pools Storage	units Universal share	s Server groups								
	+ Add	Search							۹	Ŧ	C	□~	‡≣ ∽
		Name	Storage server type	Category	Media servers	Supports Accelerator	Supports snapshot	Supports A.I.R.	WORM	l capab	le		
		nbu-cldrecdemo.vast	PureDisk	MSDP for image sharing	1	Yes	No	Yes		C	>		ı

Figure 69 - Successful Creation of Cloud Recovery Storage Server

The last step to compete is the creation of a cloud disk pool pointing to the exact same Volume Name and bucket that is being used to backup data with an MSDP-Cloud storage server.

For ease, simply click on the green *Add disk pool* at the top and complete the disk pool creation process. This again, is the exact same process as when creating the MSDP-C disk pool. In this example, shown in Figure 70, the volume name matches the volume shown previously in Figure 56.

Note: It is imperative that the Volume selected matches the volume of the MSDP-C disk pool where data needs to be recovered.

Storage configuration			0	Disk pool successfully crea	Add storage unit	]						×
Storage servers	Disk pools	Storage units	Universal shares	Server groups								
+ Add Search								Q	τ	<b>с</b> с	□~	t≣ ~
Name		Used space	Volumes	Storage server type	Category	Storage server	WORM capable	Minimun	n lock	duration	Max	xiı
Cloud-Reco	very-Diskpool	0.00 KB	VAST-Cloud-Volume	PureDisk	MSDP for image sharing	nbu-cldrecdemo.vastdata.lab						1

Figure 70 - Successful Creation of Cloud Recovery Disk Pool

A storage unit does not need to be created to recover data from the cloud. At this point the Cloud Recovery Server is ready to recover from this particular volume and bucket.

#### **Restoring Data with Cloud Recovery Server**

To recover data that has been backed up into the cloud with an MSDP-C storage server it is amazingly simple with a Cloud Recovery Server. If the primary server is unavailable use the following steps to recover the data with the Cloud Recovery Server.

Cloud-Recovery-Diskpool				×
Details Activity				
Storage server				^
Server name		Features		
nbu-cldrecdemo.vastdata.lab		Accelerator, A.I.R., Instant acces	s, WORM capable	
Disk pool options				^
				Edit
Volume options				^
Volumes				
Name	Encryption	Replication	Bucket name	
VAST-Cloud-Volume	No	None	vast-bucket	<b>_</b> 1
1 Records				Fast Import

Figure 71 - Selecting Fast Import for Volume

Login to the Cloud Recovery Server Web UI and go to the Disk Pool tab (Figure 70). Click on the **Name** of the disk pool and this will open the Details window of that disk pool. Scroll down to the **Volume** options section and find the Volume where the data has been backed up to and on the far right of the volume there are three vertical dots, click on that and select **Fast Import** (Figure 71).

Fas	Fast import images									
Select backup images to import										
,	X 1 item selected									
1		Backup image	Policy type	Schedule type	Policy name	Backup time	Import status			
t	2	linclient01.vastdata.lab_1686084671	Standard	Full	Backup-Client01	June 6, 2023 1:51 PM	Not Imported			
		linclient01.vastdata.lab_1686085387	Standard	Full	Backup-Client01	June 6, 2023 2:03 PM	Not Imported			

Figure 72 - Selecting the Appropriate Backup to Import

The recovery server will then scan the bucket looking for catalog files of backup images and will list them as shown in Figure 72. Select the appropriate backup image and then click *Import* (not shown in image). Now that the image has been imported, data can be recovered.

ecover	
C Regular recovery	NetBackup catalog recovery
Restore assets that are protected by policies. (Files and folders, databases, etc.)	In the event of a disaster, use this wizard to recover the NetBackup catalog.
Start recovery	Start recovery

Figure 73 - Starting a Regular Recovery

To do a recovery, click on *Recovery* on the left side of the Web UI and then select *Start recovery* under *Regular Recovery* (Figure 73). Now a little knowledge of the backup policy is necessary to complete the form shown in Figure 74.

ecover				
Basic properties	(2) Recovery details			
Policy type *				
Standard	~			
Restore type *				
Normal Backups	~			
Source client *				
linclient01.vastdata.lab	Select client			
Destination client *				
nbu-cldrecdemo.vastdata.lab	Select client			

Figure 74 - Specifying Source and Destination of Recovered Data

The Java UI assists the user in filling out this form but knowing the **Policy Type** is the critical piece of information. In this example some files were backed up with a **Standard** policy. The recovery destination is going to a local directory on this recovery server but it could be restored to an NFS mount from another VAST cluster or another NetBackup client. Click **Next** when completed with this form.

Recover X									
Basic properties		Recovery details		3 Recovery options -					(4) Review
Date range Jun 6, 2023 1:51:11 PM — Jun 6, 2023 1:51:11 PM Ed	lit	Keyword phrase Enter keyword phrase							
V Inclient01.vastdata.lab	«				(A)   Q	Most recent	All backups	C	□~
v mnt		Name	Backup date		Size				
✓ <mark>■</mark> dataset		300 - Trailer.mp4	Jun 6, 2023 1:51 PM		50.01 MB				
✓ ✓ H264		Amaze-Dolby-thedigitaltheater.mp4	Jun 6, 2023 1:51 PM		38.17 MB				
> ✓ MKV > ✓ MP4		Avatar - Trailer.mp4	Jun 6, 2023 1:51 PM		239.94 MB				
		Countdown-v1-Dolby-thedigitaltheater.mp4	Jun 6, 2023 1:51 PM		13.15 MB				
		Countdown-v2-Dolby-thedigitaltheater.mp4	Jun 6, 2023 1:51 PM		12.56 MB				
		DOLBY_CINEMA_ELEMENT_1080_AC3_51-thedi	Jun 6, 2023 1:51 PM		46.11 MB				
		Fantastic Four - Rise of the Silver Surfer - Trailer	Jun 6, 2023 1:51 PM		90.02 MB				

Figure 75 - Selecting Data to Restore

A directory structure now shows all the contents of the data. After selecting the top-level directory to select all of the data, click **Next**. Keeping things simple all the files will be restored to a different location as shown in Figure 76. The rest of settings are left as default and **Next** is clicked.

Reco	ver k			×
<b>O</b> B	asic properties	Recovery details	3 Recovery options	(4) Review
Res	tore target options			
0	Restore everything to original location			
	Restore everything to a different location			
	/mnt/restore	_		
0	Restore individual directories and files to different locations			
0	Create and restore to new virtual hard disk file			

Figure 76 - Selecting Location to Restore Files

Review the restore information on the summary page (not shown) and then click *Start Recovery*. The recovery can be monitored from the Activity monitor. Once it completes, check the directory and all of the selected files should be recovered to that location.



For more information on the VAST Data Platform and how it can help you solve your application problems, reach out to us at hello@vastdata.com.