

BlueXP Disaster Recovery

NetApp Solutions

NetApp August 30, 2024

This PDF was generated from https://docs.netapp.com/us-en/netapp-solutions/ehc/bxp-scv-hybrid-solution.html on August 30, 2024. Always check docs.netapp.com for the latest.

Table of Contents

| BlueXP Disaster Recovery | | . 1 |
|--|---|-----|
| 3-2-1 Data Protection for VMware with SnapCenter Plug-in and BlueXP backup and recovery for VM | S | . 1 |
| DR using BlueXP DRaas | | 42 |

BlueXP Disaster Recovery

3-2-1 Data Protection for VMware with SnapCenter Plug-in and BlueXP backup and recovery for VMs

The 3-2-1 backup strategy is an industry accepted data protection method, providing a comprehensive approach to safeguarding valuable data. This strategy is reliable and ensures that even if some unexpected disaster strikes, there will still be a copy of the data available.

Author: Josh Powell - NetApp Solutions Engineering

Overview

The strategy is comprised of three fundamental rules:

- 1. Keep at least three copies of your data. This ensures that even if one copy is lost or corrupted, you still have at least two remaining copies to fall back on.
- Store two backup copies on different storage media or devices. Diversifying storage media helps protect against device-specific or media-specific failures. If one device gets damaged or one type of media fails, the other backup copy remains unaffected.
- 3. Finally, ensure that at least one backup copy is offsite. Offsite storage serves as a fail-safe against localized disasters like fires or floods that could render onsite copies unusable.

This solution document covers a 3-2-1 backups solution using SnapCenter Plug-in for VMware vSphere (SCV) to create primary and secondary backups of our on-premises virtual machines and BlueXP backup and recovery for virtual machines to backup a copy of our data to cloud storage or StorageGRID.

Use Cases

This solution addresses the following use cases:

- Backup and restore of on-premises virtual machines and datastores using using SnapCenter Plug-in for VMware vSphere.
- Backup and restore of on-premises virtual machines and datastores, hosted on ONTAP clusters, and backed up to object storage using BlueXP backup and recovery for virtual machines.

NetApp ONTAP Data Storage

ONTAP is NetApp's industry leading storage solution that offers unified storage whether you access over SAN or NAS protocols. The 3-2-1 backup strategy ensures on-premises data is protected on more than one media type and NetApp offers platforms ranging from high-speed flash to lower-cost media.



For more information on all of NetApp's hardware platform's check out NetApp Data Storage.

SnapCenter Plug-in for VMware vSphere

The SnapCenter Plugin for VMware vSphere is a data protection offering which is tightly integrated with VMware vSphere and allows easy management of backup and restores for virtual machines. As part of that solution, SnapMirror provides a fast and reliable method to create a second immutable backup copy of virtual machine data on a secondary ONTAP storage cluster. With this architecture in place, virtual machine restore operations can easily be initiated from either the primary or secondary backup locations.

SCV is deployed as a linux virtual appliance using an OVA file. The plug-in now uses a remote plug-in architecture. The remote plug-in runs outside of the vCenter server and is hosted on the SCV virtual appliance.

For detailed information on SCV refer to SnapCenter Plug-in for VMware vSphere documentation.

BlueXP backup and recovery for virtual machines

BlueXP backup and recovery is a cloud based tool for data management that provides a single control plane for a wide range of backup and recovery operations across both on-premises and cloud environments. Part of the NetApp BlueXP backup and recovery suite is a feature that integrates with the SnapCenter Plugin for VMware vSphere (on-premises) to extend a copy of the data to object storage in the cloud. This establishes a third copy of the data offsite that is sourced from the primary or secondary storage backups. BlueXP backup and recovery makes it easy to set up storage policies that transfer copies of your data from either of these two on-prem locations.

Choosing between the primary and secondary backups as the source in BlueXP Backup and Recovery will result in one of two topologies being implemented:

Fan-out Topology – When a backup is initiated by the SnapCenter Plug-in for VMware vSphere, a local snapshot is immediately taken. SCV then initiates a SnapMirror operation that replicates the most recent snapshot to the Secondary ONTAP cluster. In BlueXP Backup and Recovery, a policy specifies the primary ONTAP cluster as the source for a snapshot copy of the data to be transferred to object storage in your cloud provider of choice.



Cascading Topology – Creating the primary and secondary data copies using SCV is identical to the fan-out topology mentioned above. However, this time a policy is created in BlueXP Backup and Recovery specifying that the backup to object storage will originate from the secondary ONTAP cluster.



BlueXP backup and recovery can create backup copies of on-premises ONTAP snapshots to AWS Glacier, Azure Blob, and GCP Archive storage.







AWS Glacier Azure GCP and Deep Glacier Blob Archive Archive Storage

In addition, you can use NetApp StorageGRID as the object storage backup target. For more on StorageGRID refer to the StorageGRID landing page.

Solution Deployment Overview

This list provides the high level steps necessary to configure this solution and execute backup and restore operations from SCV and BlueXP backup and recovery:

- 1. Configure SnapMirror relationship between the ONTAP clusters to be used for primary and secondary data copies.
- 2. Configure SnapCenter Plug-In for VMware vSphere.
 - a. Add Storage Systems
 - b. Create backup policies
 - c. Create resource groups
 - d. Run backup first backup jobs
- 3. Configure BlueXP backup and recovery for virtual machines
 - a. Add working environment
 - b. Discover SCV and vCenter appliances
 - c. Create backup policies
 - d. Activate backups
- 4. Restore virtual machines from primary and secondary storage using SCV.
- 5. Restore virtual machines from object storage using BlueXP backup and restore.

Prerequisites

The purpose of this solution is to demonstrate data protection of virtual machines running in VMware vSphere and located on NFS Datastores hosted by NetApp ONTAP. This solution assumes the following components are configured and ready for use:

- 1. ONTAP storage cluster with NFS or VMFS datastores connected to VMware vSphere. Both NFS and VMFS datastores are supported. NFS datastores were utilized for this solution.
- 2. Secondary ONTAP storage cluster with SnapMirror relationships established for volumes used for NFS datastores.
- 3. BlueXP connector installed for cloud provider used for object storage backups.
- 4. Virtual machines to be backed are on NFS datastores residing on the primary ONTAP storage cluster.
- Network connectivity between the BlueXP connector and on-premises ONTAP storage cluster management interfaces.
- 6. Network connectivity between the BlueXP connector and on-premises SCV appliance VM and between the BlueXP connecter and vCenter.
- 7. Network connectivity between the on-premises ONTAP intercluster LIFs and the object storage service.
- 8. DNS configured for management SVM on primary and secondary ONTAP storage clusters. For more information refer to Configure DNS for host-name resolution.

High Level Architecture

The testing / validation of this solution was performed in a lab that may or may not match the final deployment environment.



Solution Deployment

In this solution, we provide detailed instructions for deploying and validating a solution that utilizes SnapCenter Plug-in for VMware vSphere, along with BlueXP backup and recovery, to perform the backup and recovery of Windows and Linux virtual machines within a VMware vSphere cluster located in an on-premises data center. The virtual machines in this setup are stored on NFS datastores hosted by an ONTAP A300 storage cluster. Additionally, a separate ONTAP A300 storage cluster serves as a secondary destination for volumes replicated using SnapMirror. Furthermore, object storage hosted on Amazon Web Services and Azure Blob were employed as targets for a third copy of the data.

We will go over creating SnapMirror relationships for secondary copies of our backups managed by SCV and configuration of backup jobs in both SCV and BlueXP backup and recovery.

For detailed information on SnapCenter Plug-in for VMware vSphere refer to the SnapCenter Plug-in for VMware vSphere documentation.

For detailed information on BlueXP backup and recovery refer to the BlueXP backup and recovery documentation.

Establish SnapMirror relationships between ONTAP Clusters

SnapCenter Plug-in for VMware vSphere uses ONTAP SnapMirror technology to manage the transport of secondary SnapMirror and/or SnapVault copies to a secondary ONTAP Cluster.

SCV backup policies have the option of using SnapMirror or SnapVault relationships. The primary difference is that when using the SnapMirror option, the retention schedule configured for backups in the policy will be the same at the primary and secondary locations. SnapVault is designed for archiving and when using this option a separate retention schedule can be established with the SnapMirror relationship for the snapshot copies on the secondary ONTAP storage cluster.

Setting up SnapMirror relationships can be done in BlueXP where many of the steps are automated, or it can be done using System Manager and the ONTAP CLI. All of these methods are discussed below.

Establish SnapMirror relationships with BlueXP

The following steps must be completed from the BlueXP web console:

Begin by logging into the BlueXP web console and navigating to the Canvas.

1. Drag and drop the source (primary) ONTAP storage system onto the destination (secondary) ONTAP storage system.

| My working environments | My estate | | |
|--|---|--|---|
| ronment | | | |
| | | | |
| | NTAPSelect On-Premises ONTAP 1.3 ITIB | On-Premises ONTAP 173.74TiB Capacity | |
| | Capacity | | ots-demo On-Premises ONTAP 3TIB Capacity |
| E13A300 On-Premises ONTAP 75.21T/B | | | |
| Capacity | | | ANF |

2. From the menu that appears select **Replication**.



3. On the **Destination Peering Setup** page select the destination Intercluster LIFs to be used for the connection between storage systems.

| Replication Setup | | Destination | Peering Setup | | |
|---|--|---|--|--|-----------------------|
| | Replication requires | Select the destination LIFs you wou an initial connection between the two w For more information about LIF select | Id like to use for cluster peering setup. orking environments which is called a clu ions, see Cloud Manager documentation. | ster peer relationship. | |
| CVO_InterCluster_B traphci-a300-02: a0a-3510 172.21.254.212/24 up | CVO_InterCluster_A traphcl-a300-01: a0a-3510 172.21.254.211/24 up | zoneb-n1 p ntaphci-a300-01 : a0a-3484 172.21.228.21/24 up | zoneb-n2 */******************************** | intercluster_node_1 𝔥 ntaphcl-a300-01 : a0a-181 10.61.181.193/24 up | ✓ intercluster_node_2 |

4. On the **Destination Volume Name** page, first select the source volume and then fill out the destination volume name and select the destination SVM and aggregate. Click on **Next** to continue.

| | | Select the volume that you want to re | eplicate |
|---|--|--|---------------------|
| E13A300 | | | |
| CDM01 | CONLINE | B Data | CONLINE |
| FO torage VM Name F502 learing Policy None olume Type RW | CAPACITY 206 GB Aflocated Capacity S3,72 MB Disk Used | tHFO CAPP Storage VM Name F502 Thering Policy None Volume Type RW | S12 GB Allocated |
| Demo | | Demo02_01 | R ONLINE |
| FO torage VM Name zonea lieting Policy None | 250 GB Allocated | INFO CAPA Storage VM Name Demo Tiering Policy None Volume Type RW | SOD GB Allocated |

Destination Volume Name

Destination Volume Name

Demo_copy

Destination Storage VM

EHC_NFS

Destination Aggregate

EHCAggr01

5. Choose the max transfer rate for replication to occur at.

| | Max | fransier na | acc | |
|------------------------------------|---------------------------------|---------------------------------------|----------------------------|-------------------|
| You should limi negatively impa | it the transfe act the perfo | r rate. An unlimit rmance of other | ted rate mi application | ight ns and it |
| might impact v | our Internet | performance. | all described | |
| inight inipact y | our meetinee | | | |

6. Choose the policy that will determine the retention schedule for secondary backups. This policy can be created beforehand (see the manual process below in the **Create a snapshot retention policy** step) or can be changed after the fact if desired.

| Replication Setup | | Replication Policy | |
|---|---|---|---|
| ↑ Previous Step | | Default Policies Additional Policies | |
| Clou Original Pe Creates a 5 following (houry () (# of retain | dBackupService-1674046623282 Ilicy Name: CloudBackupService-1674046623282 inapVault relationship which replicates Snapshot copies with the beles to the destination volume: , abil(1): St, weekly (4) ed Snapshot copies in parenthesis) | CloudBackupService-1674047424679 Custom Policy - No Comment More info | CloudBackupService-1674047718637 Custom Policy - No Comment More Info |

7. Finally, review all information and click on the **Go** button to start the replication setup process.

| Replication Setup | | | Review & Ap | prove | | |
|-------------------|---------|-------------------|-----------------------------------|------------------------|-------------------------|---------------|
| ↑ Previous Step | | | Review your selection and start | the replication proces | 55 | |
| | Source | Destination | Source Volume Allocated Size: | 250 GB | Destination Aggregate: | EHCAggr01 |
| | | | Source Volume Used Size: | 1.79 GB | Destination Storage VM: | EHC_NFS |
| | E13A300 | ntaphci-a300e9u25 | Source Thin Provisioning: | Yes | Max Transfer Rate: | 100 MB/s |
| | - | → S | Destination Volume Allocated Size | e: 250 GB | SnapMirror Policy: | Mirror |
| | | | Destination Thin Provisioning: | No | Replication Schedule: | One-time copy |
| | Demo | Demo_copy | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Establish SnapMirror relationships with System Manager and ONTAP CLI

All required steps for establishing SnapMirror relationships can be accomplished with System Manager or the ONTAP CLI. The following section provides detailed information for both methods:

Record the source and destination Intercluster logical interfaces

For the source and destination ONTAP clusters, you can retrieve the inter-cluster LIF information from System Manager or from the CLI.

1. In ONTAP System Manager, navigate to the Network Overview page and retrieve the IP addresses of Type: Intercluster that are configured to communicate with the AWS VPC where FSx is installed.

| Buckets | | | | | | | | | | | | |
|----------------|-----|--------------------|----------|------------|---------|---------------|--------------|--------------|---------|-------------------|---------------------------------|-------|
| Qtrees | | | | | | | | | | | | |
| Quotas | | Network Interfaces | Portsets | | | | | | | | | |
| Storage VMs | | -t- a.44 | | | | | | | | O Search | autout William Chourth | - |
| Tiers | | 1.100 | | | | | | | | A SURIOR T DO | ennouse | ide + |
| NETWORK | ~ | Name | Status | Storage VM | IPspace | Address 0 | Current Node | Current Port | Portset | Protocols | Туре | Thre |
| Overview | | veeam_/epo | 0 | Backup | Default | 10.61.103.179 | E13A300_1 | a0a-181 | | SMB/CIPS, NFS, 53 | Data | 0 |
| Ethernet Ports | | CM01 | 0 | | Default | 10.01.181.180 | E13A300_1 | 202-181 | | | Cluster/Node Mgmt | 0 |
| FC Ports | | | | | | | | | | | | 1 |
| EVENTS & JOBS | .*. | HC_N3 | 0 | | Default | 10.61.181.183 | E13A300_1 | a0a-181 | | | Intercluster, Cluster/Node Mgmt | 0 |
| PROTECTION | ~ | HC_N2 | ۲ | | Default | 10.61.181.184 | E13A300_2 | 181-60tt | | | Intercluster, Cluster/Node Mgmt | ಂ |
| HOUTE | 122 | lif_ora_svm_614 | 0 | Ora_tvm | Default | 10.61.181.185 | E13A300_1 | a0a-181 | | SMB/CIFS, NFS, FL | Data | 0 |

2. To retrieve the Intercluster IP addresses using the CLI run the following command:

ONTAP-Dest::> network interface show -role intercluster

To establish cluster peering between ONTAP clusters, a unique passphrase entered at the initiating ONTAP cluster must be confirmed in the other peer cluster.

1. Set up peering on the destination ONTAP cluster using the cluster peer create command. When prompted, enter a unique passphrase that is used later on the source cluster to finalize the creation process.

```
ONTAP-Dest::> cluster peer create -address-family ipv4 -peer-addrs
source_intercluster_1, source_intercluster_2
Enter the passphrase:
Confirm the passphrase:
```

2. At the source cluster, you can establish the cluster peer relationship using either ONTAP System Manager or the CLI. From ONTAP System Manager, navigate to Protection > Overview and select Peer Cluster.



- 3. In the Peer Cluster dialog box, fill out the required information:
 - a. Enter the passphrase that was used to establish the peer cluster relationship on the destination ONTAP cluster.

- b. Select Yes to establish an encrypted relationship.
- c. Enter the intercluster LIF IP address(es) of the destination ONTAP cluster.
- d. Click Initiate Cluster Peering to finalize the process.

| Local | | • | Rem |
|--|-----|---|--|
| STORAGE VM PERMISSIONS | | PASSPHRASE (?) | |
| All storage VMs (incl × | | | |
| Storage VMs created in the future also will be giv permissions. | ven | It cannot be determined from the this relationship was encrypted encrypted? | e passphrase whethe . Is the relationship |
| | | To generate passphrase, La | unch Remote Cluster |
| | | Intercluster Network Interfac | es IP Addresses |
| | | 172.30.15.42 | |
| | | 172.30.14.28 | |
| | | | Cancel |
| 4 | | + Add | |
| | | | |

4. Verify the status of the cluster peer relationship from the destination ONTAP cluster with the following command:



The next step is to set up an SVM relationship between the destination and source storage virtual machines that contain the volumes that will be in SnapMirror relationships.

1. From the destination ONTAP cluster, use the following command from the CLI to create the SVM peer relationship:

```
ONTAP-Dest::> vserver peer create -vserver DestSVM -peer-vserver
Backup -peer-cluster OnPremSourceSVM -applications snapmirror
```

- 2. From the source ONTAP cluster, accept the peering relationship with either ONTAP System Manager or the CLI.
- 3. From ONTAP System Manager, go to Protection > Overview and select Peer Storage VMs under Storage VM Peers.



- 4. In the Peer Storage VM's dialog box, fill out the required fields:
 - The source storage VM
 - The destination cluster
 - The destination storage VM



5. Click Peer Storage VMs to complete the SVM peering process.

SnapCenter manages retention schedules for backups that exist as snapshot copies on the primary storage system. This is established when creating a policy in SnapCenter. SnapCenter does not manage retention policies for backups that are retained on secondary storage systems. These policies are managed separately through a SnapMirror policy created on the secondary FSx cluster and associated with the destination volumes that are in a SnapMirror relationship with the source volume.

When creating a SnapCenter policy, you have the option to specify a secondary policy label that is added to the SnapMirror label of each snapshot generated when a SnapCenter backup is taken.



On the secondary storage, these labels are matched to policy rules associated with the destination volume for the purpose of enforcing retention of snapshots.

The following example shows a SnapMirror label that is present on all snapshots generated as part of a policy used for daily backups of our SQL Server database and log volumes.

| Select secondary replication options | 6 |
|--------------------------------------|---|
| Select secondary replication options | |

Update SnapMirror after creating a local Snapshot copy.

Update SnapVault after creating a local Snapshot copy.

| Secondary policy label | Custom Label - 1 |
|------------------------|------------------|
| | sql-daily |
| Error retry count | 3 🗘 🚺 |

For more information on creating SnapCenter policies for a SQL Server database, see the SnapCenter documentation.

You must first create a SnapMirror policy with rules that dictate the number of snapshot copies to retain.

1. Create the SnapMirror Policy on the FSx cluster.

ONTAP-Dest::> snapmirror policy create -vserver DestSVM -policy PolicyName -type mirror-vault -restart always

2. Add rules to the policy with SnapMirror labels that match the secondary policy labels specified in the SnapCenter policies.

```
ONTAP-Dest::> snapmirror policy add-rule -vserver DestSVM -policy
PolicyName -snapmirror-label SnapMirrorLabelName -keep
#ofSnapshotsToRetain
```

The following script provides an example of a rule that could be added to a policy:

```
ONTAP-Dest::> snapmirror policy add-rule -vserver sql_svm_dest
-policy Async_SnapCenter_SQL -snapmirror-label sql-ondemand -keep 15
```



Create additional rules for each SnapMirror label and the number of snapshots to be retained (retention period).

Create destination volumes

To create a destination volume on ONTAP that will be the recipient of snapshot copies from our source volumes, run the following command on the destination ONTAP cluster:

```
ONTAP-Dest::> volume create -vserver DestSVM -volume DestVolName
-aggregate DestAggrName -size VolSize -type DP
```

Create the SnapMirror relationships between source and destination volumes

To create a SnapMirror relationship between a source and destination volume, run the following command on the destination ONTAP cluster:

```
ONTAP-Dest::> snapmirror create -source-path
OnPremSourceSVM:OnPremSourceVol -destination-path DestSVM:DestVol -type
XDP -policy PolicyName
```

Initialize the SnapMirror relationships

Initialize the SnapMirror relationship. This process initiates a new snapshot generated from the source volume and copies it to the destination volume.

To create a volume, run the following command on the destination ONTAP cluster:

ONTAP-Dest::> snapmirror initialize -destination-path DestSVM:DestVol

Configure the SnapCenter Plug-in for VMware vSphere

Once installed, the SnapCenter Plug-in for VMware vSphere can be accessed from the vCenter Server Appliance Management interface. SCV will manage backups for the NFS datastores mounted to the ESXi hosts and that contain the Windows and Linux VMs.

Review the Data protection workflow section of the SCV documentation for more information on the steps involved in configuring backups.

To configure backups of your virtual machines and datastores the following steps will need to be completed from the plug-in interface.

Discover the ONTAP storage clusters to be used for both primary and secondary backups.

1. In the SnapCenter Plug-in for VMware vSphere navigate to **Storage Systems** in the left-hand menu and click on the **Add** button.

SnapCenter Plug-in for VMware vSphere INSTANCE 10.61.181.201:8080 v

| 🔄 Dashboard | Storage Syster | ns |
|--------------------|-----------------|-----------------------|
| 🍺 Settings | 🛖 Add 🥖 🗄 | dit 🗙 Delete 🕞 Export |
| BResource Groups | Name | Display Name |
| Policies | E 10.61.181.180 | E13A300 |
| Storage Systems | Anthos | Anthos |
| | Backup | Backup |
| Guest File Restore | Demo | Demo |
| e. | 172.21.146.13 | FS02 |
| | 170 0414046 | 6 oro cum |

2. Fill out the credentials and platform type for the primary ONTAP storage system and click on Add.

| Add | Storage | System |
|-----|---------|--------|
|-----|---------|--------|

| Platform | All Flash FAS | |
|-------------------------|--|---------------|
| Authentication Method | Credentials | O Certificate |
| Username | admin | |
| Password | ••••• | |
| Protocol | HTTPS | |
| Port | 443 | |
| Timeout | 60 | Seconds |
| Preferred IP | Preferred IP | |
| Event Management System | (EMS) & AutoSupport Setting | g |
| Log Snapcenter server e | vents to syslog cation for failed operation to st | orage system |

Policies specify the retention period, frequency and replication options for the backups managed by SCV.

Review the Create backup policies for VMs and datastores section of the documentation for more information.

To create backup policies complete the following steps:

1. In the SnapCenter Plug-in for VMware vSphere navigate to **Policies** in the left-hand menu and click on the **Create** button.

SnapCenter Plug-in for VMware vSphere INSTANCE 10.61.181.201:8080 v

| 🔄 Dashboard | Policies | |
|----------------------|---------------------|----------------|
| 😰 Settings | 🕂 Create 🥒 Edit 🗙 R | emove 🕞 Export |
| 🛗 Resource Groups | <i>▲Name</i> | VM Co |
| Policies | Daily | No |
| Storage Systems | FCD | No |
| | Hourly | No |
| 🔯 Guest File Restore | Monthly | No |
| | Companya di | h1- |

2. Specify a name for the policy, retention period, frequency and replication options, and snapshot label.

New Backup Policy

| Name | Daily |
|-----------------------|---|
| Description | description |
| Retention | Days to keep 🔹 30 🖕 🚺 |
| Frequency | Daily |
| Replication | 🗌 Update SnapMirror after backup 🕧 |
| | 🗹 Update SnapVault after backup 🗊 |
| | Snapshot label Daily |
| Advanced \checkmark | VM consistency () |
| | Include datastores with independent disks |
| | Scripts 🕦 |
| | Enter script path |
| | |

When creating a policy in the SnapCenter Plug-in you will see options for SnapMirror and SnapVault. If you choose SnapMirror, the retention schedule specified in the policy will be the same for both the primary and secondary snapshots. If you choose SnapVault, the retention schedule for the secondary snapshot will be based on a separate schedule implemented with the SnapMirror relationship. This is useful when you wish longer retention periods for secondary backups.

(j)

(;)

Snapshot labels are useful in that they can be used to enact policies with a specific retention period for the SnapVault copies replicated to the secondary ONTAP cluster. When SCV is used with BlueXP Backup and Restore, the Snapshot label field must either be blank or <u>match</u> the label specified in the BlueXP backup policy.

3. Repeat the procedure for each policy required. For example, separate policies for daily, weekly, and monthly backups.

Create resource groups

Resource groups contain the datastores and virtual machines to be included in a backup job, along with the associated policy and backup schedule.

Review the Create resource groups section of the documentation for more information.

To create resource groups complete the following steps.

and the second se

1. In the SnapCenter Plug-in for VMware vSphere navigate to **Resource Groups** in the left-hand menu and click on the **Create** button.

| 🔄 Dashboard | Resource Groups | | |
|----------------------|--------------------|---------|--|
| 🔂 Settings | Greate | Run Now | |
| Resource Groups | Name | Des | |
| Policies | SMBC | | |
| 🚐 Storage Systems | Oracle_Servers | | |
| 😤 Guest File Restore | Demo | | |
| Cuest the Restore | SQL Servers Weekly | | |

- 2. In the Create Resource Group wizard, enter a name and description for the group, as well as information required to receive notifications. Click on **Next**
- 3. On the next page select the datastores and virtual machines that wish to be included in the backup job and then click on **Next**.

Create Resource Group

| 1. General into & nouncation | Scope: | Datastores | Image: A set of the set of the | | |
|------------------------------|------------------|------------------|---|-------------|-------------------|
| 2. Resource | Datacenter | Datastores | | | |
| 3. Spanning disks | butacenter. | Virtual Machines | | | |
| 4. Policies | | Tags | ntity name | | |
| 5. Schedules | Available entiti | es | | | Selected entities |
| 6. Summary | 🗐 Demo | | | | B NFS_SCV |
| | E DemoD | S | | | B NFS_WKLE |
| | 📒 destinat | ion | | > | |
| | 🗐 esxi7-ho | :-01 Local | | ~ | |
| | 🗐 esxi7-ho | -02 Local | | / | |
| | 🛢 esxi7-ho | :-03 Local | | < | |
| | 🖾 aqui7 ba | 041.0001 | | « | |



You have the option to select specific VMs or entire datastores. Regardless of which you choose, the entire volume (and datastore) is backed up since the backup is the result of taking a snapshot of the underlying volume. In most cases, it is easiest to choose the entire datastore. However, if you wish to limit the list of available VMs when restoring, you can choose only a subset of VMs for backup.

4. Choose options for spanning datastores for VMs with VMDKs that reside on multiple datastores and then click on **Next**.

Create Resource Group

| 1. General info & notification | Always exclude all spanning datastores |
|--|--|
| 2. Resource | This means that only the datastores directly added to the resource group and the primary datastore of VMs directly added to the resource group will be backed up. |
| 3. Spanning disks | directly added to the resource group will be backed up |
| 4. Policies | Always include all spanning datastores |
| 5. Schedules | All datastores spanned by all included VMs are included in this backup |
| 6. Summary | Manually select the spanning datastores to be included |
| | You will need to modify the list every time new VMs are added |
| | There are no spanned entities in the selected virtual entities list. |
| | |

(i)

i

BlueXP backup and recovery does not currently support backing up VMs with VMDKs that span multiple datastores.

5. On the next page select the policies that will be associated with the resource group and click on **Next**.

Create Resource Group

| 1. General info & notification | + Cre | eate | | | |
|--|-------|-----------|---------------|------------------------|----------------|
| 2. Resource | | Name 🔺 | VM Consistent | Include independent di | Schedule |
| 3. Spanning disks | | Daily | No | No | Daily |
| 4. Policies | | FCD | No | Yes | On Demand Only |
| 5. Schedules | | Monthly | No | No | Monthly |
| 6 Summary | | On Demand | No | No | On Demand Only |
| | | Weekly | No | No | Weekly |

When backing up SCV managed snapshots to object storage using BlueXP backup and recovery, each resource group can only be associated with a single policy.

6. Select a schedule that will determine at what times the backups will run. Click on Next.

| Create Resource Gro | oup | | | |
|--|-------|---|----------|--------------|
| 4. General info & notification | | | | |
| 2. Resource | Daily | • | Туре | Daily |
| 3. Spanning disks | | | Every | 1 Day(s) |
| 4. Policies | | | Starting | 06/23/2023 |
| 5. Schedules | | | | |
| < 6. Summary | | | At | 07 🗘 00 🖨 PM |

7. Finally, review the summary page and then on **Finish** to complete the resource group creation.

Run a backup job

In this final step, run a backup job and monitor its progress. At least one backup job must be successfully completed in SCV before resources can be discovered from BlueXP backup and recovery.

- 1. In the SnapCenter Plug-in for VMware vSphere navigate to **Resource Groups** in the left-hand menu.
- 2. To initiate a backup job, select the desired resource group and click the **Run Now** button.

SnapCenter Plug-in for VMware vSphere INSTANCE 10.61.181.201:8080 ~

| Dashboard | Resource Groups | | | | | |
|--------------------|----------------------------|---------|-----------|--|--|--|
| 🔁 Settings | 📥 Create 🥒 Edit 🛛 💥 Delete | Run Now | C Suspend | | | |
| Resource Groups | Name | De | scription | | | |
| Policies | Win01 | | | | | |
| Storage Systems | SMBC | | | | | |
| Guest File Restore | Oracle_Servers | | | | | |
| Ouest the Restore | Demo | | | | | |
| > | SQL_Servers_Daily | | | | | |
| | SQL_Servers_Weekly | | | | | |

3. To monitor the backup job, navigate to **Dashboard** on the left hand menu. Under **Recent Job Activities** click on the Job ID number to monitor the job progress.

| Job Details : 2614 | Ċ X |
|--|-------------------------|
| Validate Retention Settings | |
| Quiescing Applications | |
| 🤣 Retrieving Metadata | |
| Creating Snapshot copy | |
| Onquiescing Applications | |
| 🤣 Registering Backup | |
| Backup Retention | |
| 🤣 Clean Backup Cache | |
| 🤣 Send EMS Messages | |
| (Job 2616)SnapVault Update | |
| Running, Start Time: 07/31/2023 07:24:40 PM. | ~ |
| | CLOSE DOWNLOAD JOB LOGS |

Configure Backups to Object Storage in BlueXP backup and recovery

For BlueXP to manage the data infrastructure effectively, it requires the prior installation of a Connector. The Connector executes the actions involved in discovering resources and managing data operations.

For more information on the BlueXP Connector refer to Learn about Connectors in the BlueXP documentation.

Once the connector is installed for the cloud provider being utilized, a graphic representation of the object storage will be viewable from the Canvas.

To configure BlueXP backup and recovery to backup data managed by SCV on-premises, complete the following steps:

The first step is to add the on-premises ONTAP storage systems to BlueXP

1. From the Canvas select Add Working Environment to begin.

| Canvas My working environments + Add Working Environment | n Ne | tApp BlueXP | |
|---|------|--------------------|-------------------------|
| ↔ + Add Working Environment | - | Canvas | My working environments |
| | 9 | + Add Working Envi | ronment |

2. Select **On-Premises** from the choice of locations and then click on the **Discover** button.

| | Choose a Location | | | | | |
|-----------|-------------------|--------------------------------------|-----------------------|-------------|--|--|
| | Microsoft Azure | aws Amazon Web Services Select | Google Cloud Platform | On-Premises | | |
| On-Premis | ses ONTAP | | | Discover 🗸 | | |

3. Fill out the credentials for the ONTAP storage system and click the **Discover** button to add the working environment.

| 10.61.181.180 | | |
|---------------|---------|--|
| | | |
| User Name | | |
| admin | | |
| | | |
| Password | | |
| ••••• | \odot | |

To discover the on-premises datastore and virtual machine resources, add info for the SCV data broker and credentials for the vCenter management appliance.

1. From the BlueXP left-hand menu selection **Protection > Backup and recovery > Virtual Machines**

| 1 | NetApp BlueXP | | |
|----|--------------------------|---|------------------|
| 8 | Storage | • | ironment |
| 9 | Health | • | |
| Ŧ | Protection | ¥ | |
| | Backup and recovery | 습 | Volumes |
| | Disaster recovery (Beta) | 습 | Applications |
| | Replication | ☆ | Virtual Machines |
| ବ | Governance | • | Kubernetes |
| ۲ | Mobility | • | Job Monitoring |
| •• | Extensions | • | Reports |

2. From the Virtual Machines main screen access the **Settings** drop down menu and select **SnapCenter Plug-in for VMware vSphere**.

| SnapCenter | Plug-in for VMware vSphere |
|------------|----------------------------|
| Policies | |
| | SnapCenter Policies |

3. Click on the **Register** button and then enter the IP address and port number for the SnapCenter Plugin appliance and the username and password for the vCenter management appliance. Click on the **Register** button to begin the discovery process.

| SnapCenter Plug-in for VMware vSphere | Username |
|---------------------------------------|-----------------------------|
| 10.61.181.201 | administrator@vsphere.local |
| Port | Password |

4. The progress of jobs can be monitored from the Job Monitoring tab.

| | Job Name. | Job Id: 559 | 167ba-8876-45db-9131-b918a16 | i5d0a1 | e vopriere | |
|-----------|---|--------------------------------------|------------------------------|----------------------|-----------------------|--------------|
| | Other Job Type | Jul 31 2023, 9:18:22 p Start Time | m Jul 31 2023, End Time | 9:18:26 pm | Success Job Status | |
| b-Jobs(2) | | | | | | Collapse All |
| lob Name | | 🗘 Job ID | Start Time | End Time | Duration | ÷ G |
| Discover | r Virtual Resources from SnapCenter Plu | . 🗇 559167ba-8876-450 | db Jul 31 2023, 9:18:22 pr | n Jul 31 2023, 9:18: | 26 pm 4 Seconds | |
| | Discovering Virtual Resources | 99446761-f997-4c8 | 0-8 Jul 31 2023, 9:18:22 pr | n Jul 31 2023, 9:18: | 24 pm 2 Seconds | |
| | Registering Datastores | b7ab4195-1ee5-40f | f-9a Jul 31 2023, 9:18:24 pr | n Jul 31 2023, 9:18: | 26 pm 2 Seconds | |

5. Once discovery is complete you will be able to view the datastores and virtual machines across all discovered SCV appliances.

| | orking Environments | Datastores 12 | al Machines | V 4 Protected | 9 2 Unprotected |
|------------|---------------------|--------------------------|------------------|---------------------|---------------------------|
| Datastores | | | | | |
| ilter By + | | | | Q 💮 VM View | Settin |
| Datastore | 🗧 🕴 Datastore Type | ⊖ vCenter | Policy Name | 0 Protection Status | |
| NFS_SCV | NFS | vcsa7-hc.sddc.netapp.com | | Unprotected | •• |
| OTS_DS01 | NFS | 172.21.254.160 | 1 Year Daily LTR | Protected | •• |
| SCV_WKLD | NFS | vcsa7-hc.sddc.netapp.com | 1 Year Daily LTR | Protected | •• |
| NFS_SQL | NFS | vcsa7-hc.sddc.netapp.com | 1 Year Daily LTR | Protected | •• |
| NFS_SQL2 | NFS | vcsa7-hc.sddc.netapp.com | 1 Year Daily LTR | Protected | • |
| SCV DEMO | NFS | vcsa7-hc.sddc.netapp.com | | Unprotected | |

In BlueXP backup and recovery for virtual machines, create policies to specify the retention period, backup source and the archival policy.

For more information on creating policies refer to Create a policy to back up datastores.

1. From the BlueXP backup and recovery for virtual machines main page, access the **Settings** drop down menu and select **Policies**.



- 2. Click on Create Policy to access the Create Policy for Hybrid Backup window.
 - a. Add a name for the policy
 - b. Select the desired retention period
 - c. Select if backups will be sourced from the primary or secondary on-premises ONTAP storage system
 - d. Optionally, specify after what period of time backups will be tiered to archival storage for additional cost savings.

| Policy Details | Policy Name | | |
|------------------------|--|---|----------------|
| | 12 week - daily backups | | |
| | | | |
| Retention () | | | |
| | Daily | | ^ |
| | Backups to retain SnapMirror | r Label | |
| | 84 Daily | | |
| | | | |
| | Weekly | Setup Refention Weekly | ~ |
| | Monthly | Setup Retention Monthly | ~ |
| | ⊖ Secondary | | |
| Archival Policy | Backups reside in standard storage for frequently ac | cessed data. Optionally, | |
| | you can tier backups to archival storage for further c | ost optimization. | |
| | Tier Backups to Archival Archival After (Daulo) | | |
| | | | |
| | Cancel Create | | |
| | | | |
| The Snaply policy too. | lirror Label entered here is used to i The label name must match the labe | dentify which backups to ap al name in the corresponding | oly t J on- |
The final step is to activate data protection for the individual datastores and virtual machines. The following steps outline how to activate backups to AWS.

For more information refer to Back up datastores to Amazon Web Services.

1. From the BlueXP backup and recovery for virtual machines main page, access the settings drop down for the datastore to be backed up and select **Activate Backup**.

| 6 Datastores | | | | | | |
|--------------------|-----------------|------------------|---------------------|-------------------|------------------|--------------|
| Filter By 🕂 | | | | | Q 🕒 VM View | Settings ∣ ▼ |
| Datastore | ≎ Datastore ' | lype 🗘 vCenter | 0 Poli | cy Name 🗘 🏻 🗘 P | rotection Status | ≎ |
| NFS_SCV | NFS | vcsa7-hc.sd | ldc.netapp.com | | Unprotected | ••• |
| OTS_DS01 | NFS | 172.21.254 | .160 1 Ye | ar Daily LTR | Protected | View Details |
| SCV_WKLD | NFS | vcsa7-hc.sd | ldc.netapp.com 1 Ye | ar Daily LTR | Protected | ••• |
| Assign the po | licy to be used | for the data pro | nments 3 sele | tion and click on | Next. | 5) Review |
| 21 Policies | olicy Name | SnapMirror Label | Retention Count | Backup Source | Archiva | I Policy |
| 5 | Year Daily LTR | daily | daily : 1830 | Primary | Not Acti | /e |
| | | daily | daily : 1830 | 5. | Not Activ | |
| 5 | Year Daily LTR | duny | duny : 1000 | Primary | NOTACIN | e |

3. At the **Add Working Environments** page the datastore and working environment with a check mark should appear if the working environment has been previously discovered. If the working environment has not been previously discovered you can add it here. Click on **Next** to continue.

| Assign I | Policy 2 Add Working Envir | onments ③ Select Provider | (4) Configure Provider | 5 Review |
|-----------------------------------|--|---|---|---------------------------------------|
| | Add | Working Environments | | |
| Provide ONTAP cluster (wo on t | orking environment) details that you wa the same cluster. You will need to ente | ant Cloud Manager to discover. Working r multiple working environments when ve | environment details will appe olumes reside on different clu | ar for all volumes that reside sters. |
| SVM | Volume | Working Enviro | onment | |
| EHC_NFS | NFS_SCV | OnPremWo | rkingEnvironment-6MzE27u1 | Edit |
| | | | | |

4. At the Select Provider page click on AWS and then click on the Next button to continue.

| Assign Policy | Add Working Environments | 3 Select Provider 4 Cor | figure Provider (5) Review |
|---------------------|--------------------------|-------------------------|----------------------------|
| | Sele | ect Provider | |
| aws | | ۵ | StorageGRID |
| Amazon Web Services | Microsoft Azure | Google Cloud Platform | StorageGRID |

5. Fill out the provider specific credential information for AWS including the AWS access key and secret key, region, and archival tier to be used. Also, select the ONTAP IP space for the on-premises ONTAP storage system. Click on **Next**.

| Assign Policy Add Working Environme | nts Select Provider 4 Configure Provider 5 Revie |
|-------------------------------------|--|
| Cloud Manager needs the | onfigure Provider following details to connect with the cloud provider. |
| Provider Information | Location and Connectivity |
| AWS Account | Region |
| • | US East (N. Virginia) |
| AWS Access Key | IP space for Environment OnPremWorkingEnvironment-6MzE27u1 |
| Enter AWS Access Key Required | Default |
| AWS Secret Key | |
| Enter AWS Secret Key | Archival Tier |
| Required | Glacier |

6. Finally, review the backup job details and click on the **Activate Backup** button to initiate data protection of the datastore.



 (\checkmark)

Review

| Folicy | | 5 Tear Daily LIN |
|--------------------------|-----------|-----------------------------------|
| SVM | | EHC_NFS |
| Volumes | | NFS_SCV |
| Working Environment | | OnPremWorkingEnvironment-6MzE27u1 |
| Backup Source | | Primary |
| Cloud Service Provider | | AWS |
| AWS Account | | |
| AWS Access Key | | |
| Region | | US East (N. Virginia) |
| IP space | | Default |
| Tier Backups to Archival | | No |
| | | |
| | | |
| | | |
| | Previous | Activate Backup |
| | 1 TOYIOUS | |
| | | |

Restoring Virtual Machines in the case of data loss

Ensuring the safeguarding of your data is only one aspect of comprehensive data protection. Equally crucial is the ability to promptly restore data from any location in the event of data loss or a ransomware attack. This capability is vital for maintaining seamless business operations and meeting recovery point objectives.

NetApp offers a highly adaptable 3-2-1 strategy, providing customized control over retention schedules at the

primary, secondary, and object storage locations. This strategy provides the flexibility to tailor data protection approaches to specific needs.

This section provides an overview of the data restoration process from both the SnapCenter Plug-in for VMware vSphere and BlueXP backup and recovery for virtual machines.

Restoring Virtual Machines from SnapCenter Plug-in for VMware vSphere

For this solution virtual machines were restored to original and alternate locations. Not all aspects of SCV's data restoration capabilities will be covered in this solution. For in depth information on all that SCV has to offer refer to the Restore VMs from backups in the product documentation.

Complete the following steps to restore a virtual machine restore from primary or secondary storage.

- 1. From the vCenter client navigate to **Inventory > Storage** and click on the datastore that contains the virtual machines you wish to restore.
- 2. From the **Configure** tab click on **Backups** to access the list of available backups.

| vSphere Client Q, Search in at environments | | | | | C & | Administrator | EVSPHERELOCAL ~ | • | 0 |
|--|--|---|----------------------|-----------------------|------------------------------|---------------|-----------------|---------|---------|
| | Summary Monitor | Permission Files Hosts VMs | | | | | | | |
| South State State (Second State Sta | Alarm Defections Tacheduled Tasks Genetal | Backups | (+ lopint | | | | (m) | | |
| Demo05 | Device Backing | Name Same | Locatoria | Stati Tate | End Trees | Mounted | Policy | SMapp S | lapahó, |
| destruction | Connectivity with Hosts | soc.mm, may 67.112023, 112430.0751. Compared | Pitmary & Secondary | 1012020 7 24 35 PM | 1/19/2003 7 24 10 PM | No | Dwly | No | |
| exi3-8c-01 cocal | Hardware Acceleration | routine pay, 57-11 2021, 09 200000. Ourganst | Premary & Secondary | TOD 2023 IS 25:00 AM | T19/2023 9 28:02 AM | No | Detty | No | |
| epi7-to-02 Local | Capatility sets | 10-, mm, mm, 01 10 2023, 04 30:00 ft. Compared | Promary & Security | 700/2022 9:29:00 AM | 1130/2023 939402 AM | No | Dely | 160 | |
| eso7 ac-03 Local | SnapCenter Plug in for VMwa | ico men.min.07/29-2023.09/380005. Completed | Premary & Secondary | P29/2023 8 39:00 AM | 109/2023 9:39 02 AM | hip | Daty | No | |
| E essi7-hc-041.ocal | Beauty area Catavata | 104, mere, may 07 38 2071, 24 76 00 8. Compared | Primary & Secondary | 7/20/2023 (9.28 00 AM | 7/20/2023 9:39:02 AM | 340.1 | Dively | No. | |
| exo7-bc-05 Local | The second s | soc.mmil.mety.0123.2023.3025.5020. Completed | Primary & Successivy | 1/2//2023 10 29:10 AM | 7/27/2023 10:25:52 XM | No | Deely | 100 | |
| eso7-ac-06 Local | Electrical - | scy, mine, may \$177,2021, 39,5728.06. Completed | Prenary & Secondary | 7/21/2023 US7.28 AM | 7272023 85730 AM | No | Dety | No | |
| 🗐 iso | | 10x, mms, may, 07.27.2022, 00.39.00.05. Completed | Primary & Secondary | 7/27/2023 8:38:00 AM | WA 65464 (19272023 k34825 AM | tio | Dwy | .No. | |
| 目 NPS_SCV | | and strength of 22 2022, 00 24 h Dark Completed | Primary & Secondary | 7/21/2023 8 34 Yi AM | 7/27/2023 9.3412 AM | No | Dety | 1911 | |
| I NPS_SOL | | | | | | | | | |
| ER SOV DEMO | | | | | | | | | |

3. Click on a backup to access the list of VMs and then select a VM to restore. Click on **Restore**.

| SCV_DEMO | NS | | | |
|---|--|---|--|--|
| Summary Monitor Configur | e Permissions File | es Hosts | VMs | |
| Alarm Definitions Scheduled Tasks General Device Backing Connectivity with Hosts Hardware Acceleration | Name: scv_dem Time Stamp: Mon Jul 3 Mounted: No Policy: Daily VMware snapshot No Entities | io_daily_07-31-202 31 2023 19:24:36 G | 3_19.24.36.0755 MT-0400 (Eastern Daylight Time) | |
| Capability sets SnapCenter Plug-In for VMwa ↓ Resource Groups | The following entities are inclused on the following enti | uded in the backup: ore to restore it. | sov_demo_daily_07-31-2023_19.24.36.0755 | |
| Баскирз | Entity Name | Quiesced | UUID | Location |
| | SQLSRV-07 | No | 5032d1f2-2591-7f7b-46e3-8dbd4a6b2fb4 | [SCV_DEMO] SQLSRV-07/SQLSRV-07.vmx |
| | scv_restore_test | Yes | 50323c8e-04a3-5acf-a2df-a6bc0ced0419 | [SCV_DEMO] scv_restore_test/scv_restore_test.vmx |
| | SQLSRV-06 | No | 50327515-8cce-5942-0f85-350ad39bce42 | [SCV_DEMO] SQLSRV-06/SQLSRV-06.vmx |
| | SQLSRV-08 | No | 5032b2a9-e1af-c56a-6923-6dbd0eeb6327 | [SCV_DEMO] SQLSRV-08/SQLSRV-08.vmx |
| | SQLSRV-05 | No | 50326625-dd29-af23-2fd5-fe04e0a57a69 | [SCV_DEMO] SQLSRV-05/SQLSRV-05.vmx |
| | SCV_DEMO | No | netfs://172.21.118.112///SCV_DEMO | SCV:/vol/SCV_DEMO |

 From the Restore wizard select to restore the entire virtual machine or a specific VMDK. Select to install to the original location or alternate location, provide VM name after restore, and destination datastore. Click Next.

| 1. Select scope | Restore scope | Entire virtual machine | • |
|--|----------------------------|--|--|
| 2. Select location | Restart VM | | |
| 3. Summary | Restore Location | Original Location | |
| | | (This will restore the entire VM to the settings. Existing VM will be unregis Alternate Location (This will create a new VM on select customized settings.) | e original Hypervisor with the original tered and replaced with this VM.) ed vCenter and Hypervisor with the |
| | Destination vCenter Server | 10.61.181.210 | • |
| | Destination ESXi host | esxi7-hc-04.sddc.netapp.com | • |
| | Network | Management 181 | • |
| | VM name after restore | SQL_SRV_08_restored | |
| | Select Datastore: | NFS_SCV | • |
| | | | |
| Choose to backup fro Restore | om the primary or second | BACH ary storage location. | K NEXT FINISH CAN |
| Choose to backup fro Restore | om the primary or second | BACK ary storage location. | K NEXT FINISH CAN |
| Choose to backup fro Restore < 1. Select scope 2. Select location | om the primary or seconds | BACH ary storage location. cations | K FINISH CAN |
| Choose to backup fro Restore < 1. Select scope 2. Select location 3. Summary | om the primary or seconds | BACH ary storage location. | NEXT FINISH CAN |

Restoring Virtual Machines from BlueXP backup and recovery for virtual machines

BlueXP backup and recovery for virtual machines allows restores of virtual machines to their original location. Restore functions are accessed through the BlueXP web console.

For more information refer to Restore virtual machines data from the cloud.

To restore a virtual machine from BlueXP backup and recovery, complete the following steps.

1. Navigate to **Protection > Backup and recovery > Virtual Machines** and click on Virtual Machines to view the list of virtual machines available to be restored.

| Backup and recovery | Volumes | Restore | Applications | Virtual M | lachines | Kubernet | es Job Monitoring | Reports |
|---------------------|------------|-----------------|--------------|-----------|------------------------|----------|-------------------------|---------|
| | | | | | | | | |
| | \bigcirc | 4 Working En | vironments | | 6 Datastores | | J14 Virtual Machines | |
| | | | | | | | | |

2. Access the settings drop down menu for the VM to be restored and select

| 4 Virtual Machines | | | | | |
|--------------------|------------------|---------------------|------------------|-------------------------------------|----------------|
| ilter By + | | | | Q 🛑 VM Vie | w Settings V |
| Virtual Machine | O Datastore Type | ≎ vCenter ∽ | Policy Name | ≎ Protection Status ≎ Last Bacl | kup ⊜ |
| SQLSRV-08 | NFS | vcsa7-hc.sddc.netap | | Unprotected | ••• |
| SQLSRV-04 | NFS | vcsa7-hc.sddc.netap | 1 Year Daily LTR | Protected Jul 31, 20 | 23, 7:2 |
| OracleSrv_03 | NFS | vcsa7-hc.sddc.netap | | Unprotected | Restore |

3. Select the backup to restore from and click on Next.

| | Backup Name | Backup Time | |
|---|--|--------------------------|--|
| 0 | SQL_Servers_Daily_07-31-2023_19.23.39.0938 | Jul 31, 2023, 7:23:42 PM | |
| | SQL_Servers_Daily_07-31-2023_16.40.00.0661 | Jul 31, 2023, 4:40:03 PM | |
| | SQL_Servers_Daily_07-30-2023_16.40.00.0690 | Jul 30, 2023, 4:40:03 PM | |

- 4. Review a summary of the backup job and click on **Restore** to start the restore process.
- 5. Monitor the progress of the restore job from the **Job Monitoring** tab.

| | Job Name: Restore 17 files from Cloud Job Id: ec567065-dcf4-4174-b7ef-b27e6620fdbf | | | | | | | | |
|-----|---|----------------------------|---------------------------|--|--|-------|--|--|--|
| | Restore Files Job Type | NFS_SQL Restore Content | 17 Files Content Files | NFS_SQL) Restore to Job | n Progress Status | | | | |
| | | | | | | Expan | | | |
| 5 | Restore Content | | | | | ^ | | | |
| aws | ots-demo Working Environment Name | NAS_VOLS SVM Name | NFS_SQL Volume Name | SQL_Servers_Daily_07-31-202 Backup Name | 3 Jul 31 2023, 7:24:03 pr Backup Time | n | | | |
| 5 | Restore from | | | | | ^ | | | |
| aws | AWS | us-east-1 | 982589175402 | netapp-backup-d56250b0-24a | id | | | | |

Conclusion

The 3-2-1 backup strategy, when implemented with SnapCenter Plug-in for VMware vSphere and BlueXP backup and recovery for virtual machines, offers a robust, reliable, and cost-effective solution for data protection. This strategy not only ensures data redundancy and accessibility but also provides the flexibility of restoring data from any location and from both on-premises ONTAP storage systems and cloud based object storage.

The use case presented in this documentation focuses on proven data protection technologies that highlight the integration between NetApp, VMware, and the leading cloud providers. The SnapCenter Plug-in for VMware vSphere provides seamless integration with VMware vSphere, allowing for efficient and centralized management of data protection operations. This integration streamlines the backup and recovery processes for virtual machines, enabling easy scheduling, monitoring, and flexible restore operations within the VMware ecosystem. BlueXP backup and recovery for virtual machines provides the one (1) in 3-2-1 by providing secure, air-gapped backups of virtual machine data to cloud based object storage. The intuitive interface and logical workflow provide a secure platform for long-term archival of critical data.

Additional Information

To learn more about the technologies presented in this solution refer to the following additional information.

- SnapCenter Plug-in for VMware vSphere documentation
- BlueXP documentation

DR using BlueXP DRaas

Overview

Disaster Recovery is foremost in the minds of every VMware administrator. Because

VMware encapsulates entire servers into a series of files that make up the virtual machine; administrators take advantage of block storage-based techniques such as clones, snapshots and replicas to protect these VMs. ONTAP arrays offer built-in replication to transfer volume data, and therefore the virtual machines residing on the designated datastore LUNs, from one site to another. BlueXP DRaaS integrates with vSphere and automates the entire workflow for seamless failover and failback in the event of disaster. By combining storage replication with intelligent automate, and test disaster recovery plans, but the means to easily run them in the case of a disaster.

Most time-consuming parts of a DR failover in a VMware vSphere environment is the execution of the steps necessary to inventory, register, reconfigure, and power up VMs at the DR site. An ideal solution has both a low RPO (as measured in minutes) and a low RTO (measured in minutes to hours). One factor that is often overlooked in a DR solution is the ability to test the DR solution efficiently on a periodic interval.

To architect a DR solution, keep the following factors in mind:

- The recovery time objective (RTO). The RTO is how quickly a business can recover from a disaster, or, more specifically, how long it takes to execute the recovery process to make business services available again.
- The recovery point objective (RPO). The RPO is how old the recovered data is after it has been made available, relative to the time that the disaster occurred.
- Scalability and adaptability. This factor includes the ability to grow storage resources incrementally as demand increases.

For more technical information on the available solutions, please see:

- DR using BlueXP DRaaS for NFS Datastores
- DR using BlueXP DRaaS for VMFS Datastores

DR using BlueXP DRaaS for NFS Datastores

Implementing disaster recovery through block-level replication from the production site to the disaster recovery site is a resilient and cost-effective method for safeguarding workloads against site outages and data corruption events, such as ransomware attacks. Using NetApp SnapMirror replication, VMware workloads running on on-premises ONTAP systems with NFS datastore can be replicated to another ONTAP storage system located in a designated recovery datacenter where VMware is also deployed.

This section of the document describes the configuration of BlueXP DRaaS to set up disaster recovery for onpremises VMware VMs to another designated site. As part of this setup, the BlueXP account, BlueXP connector, the ONTAP arrays added within BlueXP workspace which is needed to enable communication from VMware vCenter to the ONTAP storage. In addition, this document details how to configure replication between sites and how to setup and test a recovery plan. The last section has instructions for performing a full site failover and how to failback when the primary site is recovered and bought online.

Utilizing the BlueXP disaster recovery service, integrated into the NetApp BlueXP console, companies can easily discover their on-premises VMware vCenters and ONTAP storage. Organizations can then create resource groupings, create a disaster recovery plan, associate it with resource groups, and test or execute failover and failback. SnapMirror provides storage-level block replication to keep the two sites up to date with

incremental changes, resulting in a Recovery Point Objective (RPO) of up to 5 minutes. Additionally, it is possible to simulate disaster recovery procedures without affecting production or incurring additional storage costs.

BlueXP disaster recovery leverages ONTAP's FlexClone technology to create a space-efficient copy of the NFS datastore from the last replicated Snapshot on the disaster recovery site. After completing the disaster recovery test, customers can easily delete the test environment without impacting actual replicated production resources. In case of an actual failover, the BlueXP disaster recovery service orchestrates all the necessary steps to automatically bring up the protected virtual machines on the designated disaster recovery site with just a few clicks. The service will also reverse the SnapMirror relationship to the primary site and replicate any changes from the secondary to the primary for a failback operation, when needed. All these capabilities come at a fraction of the cost compared to other well-known alternatives.



Getting started

To get started with BlueXP disaster recovery, use BlueXP console and then access the service.

- 1. Log in to BlueXP.
- 2. From the BlueXP left navigation, select Protection > Disaster recovery.
- 3. The BlueXP disaster recovery Dashboard appears.

| RetApp BlueXP | C Buert Starts Account * | Workspace * Connector * 600 00 00 00 00 00 00 00 00 00 00 00 00 |
|-------------------------|---|--|
| P Storage | VOTY Dashboard Sites Replication plans. Resource groups Job monitoring | Free trial (55 days left) - View details - |
| 🗘 Health | | |
| Protection | s (2) Replication plans (3) | Activity |
| Backup and recovery | ≥ 2 ⊗ 0 ▲ 0 ⊘ 1 ⊙ 2 unring Otwor feaut Ready Failed | Beckup on to Replication Plan DemoRPS04 14 Jugo |
| Disaster recovery 3 | Dashbeard | Initiature Backup of DemoRP004 for every 5 minutes The apr |
| Replication 1 | Replication plans | Inchap job for Replication Plan RPVMF503 I == spc |
| Ransomware protection (| Resource groups 21 0 117 | Initiative Backup of RPVN/FS03 for every 5 microles 3 mags |
| Covernance | Job munitoring Protected VMs Unprotected VMs | Backup Job for Heplication Plan 9PNF5001 Xing son |
| Mobility | ew resource groups View protected VMs View unprotected VMs | View all jobs |
| Contensiona | | |
| | 1 Palitacks 2 O Migrations | |
| | | |

Before configuring disaster recovery plan, ensure the following pre-requisites are met:

- BlueXP Connector is set up in NetApp BlueXP.
- BlueXP connector instance have connectivity to the source and destination vCenter and storage systems.
- NetApp Data ONTAP cluster to provide storage NFS datastores.
- On-premises NetApp storage systems hosting NFS datastores for VMware are added in BlueXP.
- DNS resolution should be in place when using DNS names. Otherwise, use IP addresses for the vCenter.
- SnapMirror replication is configured for the designated NFS based datastore volumes.
- Make sure that the environment has supported versions of vCenter Server and ESXi servers.

Once the connectivity is established between the source and destination sites, proceed with configuration steps, which should take couple of clicks and about 3 to 5 minutes.



NetApp recommends deploying the BlueXP connector in the destination site or in a third site, so that the BlueXP connector can communicate through the network with source and destination resources.

| TI No | tApp BlueXP | | Q BuexP Search | Account ~ | Workspace 🐣 Connector 🎽 🛵 🌣 🥝 🤤 |
|-------|-------------------|-----------------------------------|--------------------------------------|------------------------|---|
| 8 | Oisaster recovery | Dashboard Sites Rep | lication plans Resource g | roups Job monitorin | Free trial (68 days left) - View details - |
| 9 | | | | | |
| | Sites (2) | | Replication plans (2) | | Activity |
| ¢ | ⊙ 2 Running | Otwn haue | ⊙2 Ready | S o Failed | Backup job for Replication Plan DemoRPVMFS03 In progress |
| • | View si | 23 | View plans | | Initialize Backup of DemoRPVMFS03 for every 10 minutes 7 s spo |
| | Ciew resour | urce groups De groups View protec | cted VMs Ted VMs View Test fallowers | 117 Unprotected VMs | Discovery of resources in host 172.21166.190 #1 seg #1 seg |

BlueXP disaster recovery configuration

The first step in preparing for disaster recovery is to discover and add the on-premises vCenter and storage resources to BlueXP disaster recovery.

Open BlueXP console and select **Protection > Disaster Recovery** from left navigation. Select **Discover vCenter servers** or use top menu, Select **Sites > Add > Add vCenter**.

| III Ne | rtApp BlueXP | Q BlueXP Search Account ~ Workspace ~ Connector ~ & |
|--------|---|--|
| | Disaster recovery | Dashboard Sites Replication plans Resource groups Job monitoring |
| ۵ | 0 | |
| • | U see | |
| ¢ | | Add site |
| | | A site is a collection of vCenter servers, either on-premises or in the cloud. |
| 4 | | Site DemoSiti |
| | | Location |
| | | On-premi · |
| | | Aws On-prem |
| | | (Add) Cancel |
| | | |
| | | |
| | The second se | |

Add the following platforms:

• Source. On-premises vCenter.

| | Q BlueXP Search Account " Vorkspace nimopise interpose | Connector 🖌 👍 🌣 😗 😝 |
|-------------------------------|---|--|
| Oisaster recovery base | onard Sites Replication plans Resource proops Job monitoring | Free trial (55 days left) - View details 🃋 + |
| 2 mm | Add vCenter server | (Add) |
| o mimDernoSrc | Enter connection details for the vCenter server that is accessible from the BlueXP Connect Site BlueXP Connector | tor. |
| • | nimDemoSrc = GISABXPCorn | y Jama (1 |
| | vCenter IP address 172.21.166.165 | 0 |
| 172 233 506.51 () Internet | vCenter user name vCenter password administrator@hmcdc.local | Jama (I) |
| | Z Use self-signed certificates | |
| | Add Can | |
| | | |

• **Destination**. VMC SDDC vCenter.

| Oisaster recovery p | skiboard Sites Replication plane Resource gro | supe Job inicitating | Free trial (55 days left) - View details |
|---|---|---------------------------------------|--|
| 2 sites | Add vCenter server | | Add; |
| mimDemo | Enter convection details for the vCenter server that is | accessible from the BlueXP Connector. | 0 |
| (i) | Life Diluex | ABXPCorn * | tenn (1) |
| | vCenter IP address 172.21.188.190 | | |
| aimDemo | VCenter user name vCent | ter password | 0 |
| () | administrator@hmedc.local ++++ | | -sen |
| | Use self-signed certificates | | · · · · · · · · · · · · · · · · · · · |
| | | Add Cancel | |

Once the vCenters are added, automated discovery is triggered.

Configuring Storage replication between source site array and destination site array

SnapMirror provides data replication in a NetApp environment. Built on NetApp Snapshot® technology, SnapMirror replication is extremely efficient because it replicates only the blocks that have been changed or added since the previous update. SnapMirror is easily configured by using either NetApp OnCommand® System Manager or the ONTAP CLI. BlueXP DRaaS also creates the SnapMirror relationship provided cluster and SVM peering is configured beforehand.

For cases in which the primary storage is not completely lost, SnapMirror provides an efficient means of resynchronizing the primary and DR sites. SnapMirror can resynchronize the two sites, transferring only changed or new data back to the primary site from the DR site by simply reversing the SnapMirror relationships. This means replication plans in BlueXP DRaaS can be resynchronized in either direction after a failover without recopying the entire volume. If a relationship is resynchronized in the reverse direction, only new data that was written since the last successful synchronization of the Snapshot copy is sent back to the destination.



If SnapMirror relationship is already configured for the volume via CLI or System Manager, BlueXP DRaaS picks up the relationship and continues with the rest of the workflow operations.

How to set it up for VMware Disaster Recovery

The process to create SnapMirror replication remains the same for any given application. The process can be manual or automated. The easiest way is to leverage BlueXP to configure SnapMirror replication by using simple drag & drop of the source ONTAP system in the environment onto the destination to trigger the wizard that guides through the rest of the process.



BlueXP DRaaS can also automate the same provided the following two criteria's are met:

- · Source and destination clusters have a peer relationship.
- · Source SVM and destination SVM have a peer relationship.

| III Ne | etApp BlueXP | Q: BlueXP Search Account Vorkspace Connector V & 💩 🌣 📀 🕒 |
|--------|----------------------|---|
| 47 | Add replication plan | VCenter servers Applications S Resource mapping (4) Recurrence (5) Review |
| 9 | | Failover mappings Test mappings |
| • | | Compute resources ⊘ Mapped |
| 6 | | Virtual networks 📀 Mapped |
| 4 | | Virtual machines 🖉 Mapped |
| | | Datastores |
| | | RPO for all datastores in minutes () Retention count for all datastores 5 30 |
| | | Source datastore Target datastore Src_NFS_DS03 (svm_NFS:Src_NFS_DS03) Src_NFS_DS03 (svm_nim_nim_nts:Src_NFS_DS03_CP) Transfer schedule(RPD) : hourty, async |
| | | Previous Next |

If SnapMirror relationship is already configured for the volume via CLI, BlueXP DRaaS picks up the relationship and continues with the rest of the workflow operations.

What can BlueXP disaster recovery do for you?

 (\mathbf{i})

After the source and destination sites are added, BlueXP disaster recovery performs automatic deep discovery and displays the VMs along with associated metadata. BlueXP disaster recovery also automatically detects the networks and port groups used by the VMs and populates them.

| III Ne | tApp BlueXP | Q. BlueXP Search | Account ~ | Workspace 🗢 🛛 C nimspace G | onnector ISABXPCenn 🎽 👆 😽 | 0 0 |
|---------------|-----------------------------------|------------------------|------------------------------|-------------------------------|------------------------------|------------------|
| | Disaster recovery Dashboard Sites | Replication plans Reso | ource groups Job monit | toring | Free trial (83 days left) | View details + |
| | 2 sites | | | | Q Add | |
| ¢ | nimDemoSrc | | | | 1 | |
| 9 4 | 172,21.166.155 | 72 W/a | 13 1 Dutarbrus Rec gro | source Current | ISABXPConn | |
| | nimDemoDest | | | | 0 | |
| | 572.21.166.190 () Hearthy | 61 vtvia | a o Datashires Rec gro | corree Not | ISABXPConn | |
| | | | | | | _ |
| | | | | | | |

After the sites have been added, VMs can be grouped into resource groups. BlueXP disaster recovery

resource groups allow you to group a set of dependent VMs into logical groups that contain their boot orders and boot delays that can be executed upon recovery. To start creating resource groups, navigate to **Resource Groups** and click **Create New Resource Group**.

| III NetA | pp BlueXP | Q: BlueXP Search | Account ~ W nimogiaa n | Norkapace 🎽 | Connector 👻 GISABXPCann | 40 0 0 |
|----------|--|-----------------------------------|----------------------------------|-------------|------------------------------|-----------------------------------|
| 8 | Disaster recovery cast 1 resource groups | Add resource group | | | Anna trial (S | t dogs lett) - View details [+] |
| • | America podel | Name DemoNFSDS03R0 | vCenter 172.21.166.155 | - | | ···· |
| • | - | Select virtual machines | Selected VMs (5) | | | |
| | | VFS_DemoA_VM02 NFS_DemoA_VM03 | NES_DemoA_VM03 | ×××× | | |
| | | MFS_DemoA_VM04 | NFS_DemoA_VM04 NFS_DemoA_VM05 | × | | |
| | | | | | | |
| | | | Add | Cancel | | |

| 0 | Disaster recovery Dashboard Si | tes Replication plans Resource grou | Job monitoring | Free trial (51 days left) - View details |
|---|--------------------------------|-------------------------------------|------------------------------------|--|
| | 2 resource groups | | | Q Add |
| | Resource group | C Source site | Source vCenter | ÷ () |
| | DemoRG01 | nimDemoSrc | 172.21.100.155 | |
| | DemoNFSDSD3RG | nimDemoSco | 172.31.166,155 | |
| | | | | |
| | | | | |

The resource group can also be created while creating a replication plan.

The boot order of the VMs can be defined or modified during the creation of resource groups by using simple drag and drop mechanism.

(i)

| III Ne | tApp BlueXP | Q BlackP Sear | oh Account ~ Workspace ~ | Connector GISABXPCann ~ 🍋 🌣 📀 😂 |
|--------|---|--|---|--|
| | Disaster recovery Deal Disaster recovery Deal Disaster recovery Disasterery Disaster recovery Disasterery Disasterery Dis | C Buck/R Sear | Account Workspace orimopies vCenter 172.21.166.155 selected VMs (6) NFS_DemoA_VMS1 X NFS_DemoA_VMS1 X | Connector GISARXPConn Pris trial (Et clays left) - View details (+ |
| | | ISCSI_DemoCvm04 ISCSI_DemoCvm05 UbuntuVM01 Win2K19vM05 | NFS_DemoA_VM04 X NFS_DemoA_VM05 X Save Cancel | |

Once the resource groups are created, the next step is to create the execution blueprint or a plan to recover virtual machines and applications in the event of a disaster. As mentioned in the prerequisites, SnapMirror replication can be configured beforehand or DRaaS can configure it using the RPO and retention count specified during creation of the replication plan.

| NetApp BlueXP Q BlueXP | eerch Account " Workspace nimopisa nimspace | 👻 🔤 Connector GISAZXPConn |
|--|--|--|
| Canvas My working environments My estate | | Go to Tabular View |
| + Add Working Environment | C Enable Services () | Working Environments |
| NTAP915_SPC On-Phormass ONTAP | | 3 On-Premises ONTAP 11.16 TB Provisioned Capacity |
| Cassody | | Amazon 53 A Buckets |
| NTAP915_Destin | Amazee S3 | |
| On-Premises ONTAP 1.20118 Capacity | 4 Buchets aws | |
| | - | |
| NTAP915,127 On-Premises ONTAP 7.99718. | | |
| | •• | |

| 0 | Replication | | | | | | | | | | |
|---|----------------------|-------------------------------|----|--------------------------------------|---|-----------------------|--------|----|--------------|---|---------------------------------|
| | Volume Relationships | (8) | | | | | | | | | a C |
| | Health Status 🕴 | Source Volume | ٤1 | Target Volume | : | Total Transfer Time 🗘 | Status | ۳١ | Mirror State | : | Last Successfu |
| | * | NIAPHTO_STE | | NIAPSTO_Destri | | | | | | | av.a mo |
| | ø | Demo_TPS_DS01 NTAP915_Src | | Demo_TPS_DS01_Copy NTAP915_Destn | | 13 seconds | ide | | snapmirrored | | Aug 5, 2024, 6:15 386.63 M/B |
| | \odot | Src_25G_Vol01 NTAP915_Src | | Src_25G_Vol01_Copy NTAP915_Destn | | 4 seconds | idle | | snapmirrored | | Aug 16, 2024, 12= 79-23 MiB |
| | 0 | Src_NFS_DS03 NTAP915_Sic | | Src_NF5_DS03_CP NTAP915_Destn | | 12 seconds | ide | | snapmirrored | | Aug 16, 2024, 12: 24.84 Mill |
| | 0 | Src_NFS_DS04 NTAP915_Src | | Sic_NF5_D504_CP NTAP915_Destn | | 3 seconds | ide | | snapmirrored | | Aug 16, 2024, 12± 47.38 MiB |
| | \odot | Src_ISCSI_DS04 NTAP915_Src | | Src_ISCSI_DS04_copy NTAP915_Destn | | 4 seconds | ide | | snapmirrored | | Aug 16, 2024, 12× 108.87 Mi8 |
| | 0 | nimpra NTAP915_Src | | nimpra_dest NTAP915_Destn | | 2 seconda | ide | | stupmirrored | | Aug 16, 2024, 12± 3,48 KiB |

Configure the replication plan by selecting the source and destination vCenter platforms from the drop down and pick the resource groups to be included in the plan, along with the grouping of how applications should be restored and powered on and mapping of clusters and networks. To define the recovery plan, navigate to the **Replication Plan** tab and click **Add Plan**.

First, select the source vCenter and then select the destination vCenter.

| NetApp BlueXP | Q BlueXP Search Account Vorkspace GliSABN | nor 🎽 | ۰ 🔹 | 08 |
|---|---|-------|-----|----|
| Add replication plan | vCenter servers | | | × |
| | Personal in the second s | | | |
| | DemoNFSD503RP | | | |
| | | | | |
| T I I I I I I I I I I I I I I I I I I I | | _ | | |
| | Select a source vCenter where your data exists, to replicate to the selected target vCenter. | | | |
| | | | | |
| | | | | |
| | | | | |
| | Source vCenter Target vCenter | ÷i I | | |
| | 17223,106,199 | 2 | | |
| | | | | |
| | Cancel Next | | | |
| | | | | |

The next step is to select existing resource groups. If no resource groups created, then the wizard helps to group the required virtual machines (basically create functional resource groups) based on the recovery objectives. This also helps define the operation sequence of how application virtual machines should be

restored.

(;`

÷.



Resource group allows to set boot order using the drag and drop functionality. It can be used to easily modify the order in which the VMs would be powered on during the recovery process.

Each virtual machine within a resource group is started in sequence based on the order. Two resource groups are started in parallel.

The below screenshot shows the option to filter virtual machines or specific datastores based on organizational requirements if resource groups are not created beforehand.

| I N | tApp BlueXP | C Bust? Search Account * Workspace * C nincipies intergers 0 | innector 🖌 🖡 🏟 😨 😌 |
|------------|----------------------|---|------------------------|
| 4 D D 0 V | Add replication plan | | 21.186.190 DemoDest |
| | | v0TV3422Node SQ_DenwVM0T Previous Hear | |

Once the resource groups are selected, create the failover mappings. In this step, specify how the resources from the source environment maps to the destination. This includes compute resources, virtual networks. IP customization, pre- and post-scripts, boot delays, application consistency and so on. For detailed information, refer to Create a replication plan.

| Add replication plan | 🕑 vCenter servers 🛛 🖉 A | pplications 3 Resource mapping | (4) Recurrence (5) Review | | |
|----------------------|---|--------------------------------|---------------------------|---|--|
| | Use same mappings for failover and test m | happings | | | |
| | Fallover mappings Test mapping | 95 | | | |
| | Compute resources | | | | |
| | Source cluster | Target cluster wkid | 04-Cluster01 ~ | | |
| | Virtual networks | | | ~ | |
| | Source virtual LAN VM_3420 | Target segment | .3422 ~ | | |
| | | | - | | |

By default, same mapping parameters are used for both test and failover operations. To set different mappings for test environment, select the Test mapping option after unchecking the checkbox as shown below:

(i)

| And an elimitate star | 0.000 | and the second | | | | | ant di Strago | |
|-----------------------|--------------------|-----------------------|----------------|-------------|--------------------------------------|---|---------------|--|
| Add replication plan | Virtual machines | ervers O Ap | pressoris C | Resource ma | opping (a) Hecuric | oce (3) Hendew | ~ | |
| | | | | | | | | |
| | IP address type | Target IP | | | | | | |
| | Static | * Same at | source 👻 | | | | | |
| | Use the same cred | Same Same | as source | | | | | |
| | Use the same scrip | pt for all VI Differe | nt from source | | | | | |
| | Q | | | | | 111 | | |
| | Source VM | CPUs | RAM | | Boot delay(mins between 0 and 10) | Create application consistent replicas | | |
| | DemoNFSDS03RQ | | | | | | | |
| | NFS_DemoA_VM01 | 2 | 4 | 68 ~ | 0 |] 0 | | |
| | NFS_DemoA_VM02 | 2 | 4 | GB ~ | 0 | | | |
| - | NFS_DemaA_VM02 | 2 |][4 | G8 ~ | 0 | | | |

Once the resource mapping is complete, click Next.

| 1 | dd replication plan | VCenter ser | vers 🕑 Applications | 3 Resource mapping | (4) Recurrence | (5) Review | | × |
|---|---------------------|--|--------------------------|--------------------|----------------|-------------------------------|---|---|
| | | 172.21.166.165 nimDemoSirc | | • | (| 172.21.166.190 nimDemaDest |] | |
| | | | | | | | | |
| | | Use same mappings for to | alover and test mappings | | | | | |
| | | Failover mappings | Nover and test mappings | | | | | |
| | | Generative mappings for the Failover mappings Compute resources. | Test mappings | | | ÷ | | |
| | | Ose same mappings for th Failover mappings Compute resources. Virtual networks | Test mappings | | | | | |

Select the recurrence type. In simple words, select Migrate (one time migration using failover) or recurring continuous replication option. In this walkthrough, Replicate option is selected.

| IN No | etApp BlueXP | | Q BueXP Search | Account 🛩 Workspace nimogisti nimspace | e 🌱 🛛 Connector 🌱 🔤 | 4 • • | 9 8 |
|--------------|----------------------|--------------------|---|---|---------------------|--------------|-----|
| | Add replication plan | VCenter servers | Applications 📿 Re | source mapping 🕜 Recurre | nce (5) Review | | × |
| ø | | | | | | | |
| ٠ | | (a) 172.21.166.155 | | | (a) 172.21.166.190 | | |
| Ŷ | | 0 | | | 0 | | |
| 0 | | | | | | | |
| * | | | - | | | | |
| | | | Migrate | Peoloate | | | |
| | | Migrate age | olication data one time from source to target. | Replicate application data to keep spinor data with the source | a the target | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | Previous | Mart | | | |
| | | | | | | | |

Once done, review the created mappings and then click on Add plan.

VMs from different volumes and SVMs can be included in a replication plan. Depending on the VM placement (be it on same volume or separate volume within the same SVM, separate volumes on different SVMs), the BlueXP disaster recovery creates a Consistency Group Snapshot.

| mN | etApp BlueXP | | Q. BlueXP Search Account ~ | Workspace Connector GISABXPConn | 40 0 0 |
|----|----------------------|--------------------|----------------------------|---------------------------------|---------------|
| | Add replication plan | 🖉 vCenter servers | Applications | Recurrence Review | × |
| 9 | | | | | |
| | | (a) 172.21.166.165 | | (a) 172.21.166.190 | |
| ¢ | | | Replicate | 0 | 1 |
| | | Plan details | Fallover mapping | Virtual mochines | 1 |
| -: | | | | | |
| | | Plan name | DemoNFSDS03RP | | |
| | | Recurrence | Replicate | | |
| | | | | | |
| | | | Previous Add plan | | |

 (\mathbf{i})

| III No | etApp BlueXP | | Q BlueXP Search | Account ~ W nimopiae n | forkspace ~ | Connector ClisA8XPConn | 1 0 * 0 0 |
|--------|-------------------|------------------------------|----------------------|---------------------------|-------------|------------------------|-------------------------------|
| | Disaster recovery | Dashboard Sites Replic | ation plans Resource | groups Job monitoring | ¢. | Free trial (51 | days left) - View details 📔 - |
| 9 | 1 plans | - | | | | ۹ 🗖 | Add |
| • | Plan | Compliance check Plan status | T Protected alle | The second groups (| Personal C. | (Fallow ate) | |
| | DemoNF\$0503RP | Healthy Ready | nimDemoSrc | DemoNFSD503RG | Replicate | rimDemoDest | |
| - | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 3! | | | | | | | |

BlueXP DRaaS consists of the following workflows:

- Test failover (including periodic automated simulations)
- Cleanup failover test
- Failover
- Failback

Test failover

Test failover in BlueXP DRaaS is an operational procedure that allows VMware administrators to fully validate their recovery plans without disrupting their production environments.

| II Net | etApp BlueXP | Q BlueXP Search Account " Workspace " nimogica | Connector GISABXPConn |
|--------|-----------------------------------|---|--|
| | Disaster recovery Dashboard Sites | Replication plans Resource groups Job monitoring | Free trial (51 days left) - View details 🛛 + |
| a | 1 plans | | Q. NAddi |
| • | Plan 🔶 Compliance check | Plen status : Protected site : Resource groups : Recurrence : | Fallocar site |
| 0 | DemioNFSD503RP 💮 Healthy | Ready nimDemoSrc DemoNFSDS03RG Replicate | vimDemoDest |
| 4 | | | Run compliance check |
| | | | Dean log tallower test |
| | | | Feil over Feil loach |
| | | | Edit schedules Take snapshot now |
| | | | Disable |
| | | | Delete |

BlueXP DRaaS incorporates the ability to select the snapshot as an optional capability in the test failover operation. This capability allows the VMware administrator to verify that any changes that were recently made in the environment are replicated to the destination site and thus are present during the test. Such changes include patches to the VM guest operating system

| | Q: BlueXP Search Account " Workspace " Connector nimogica nimogica GISABXPCenv | . ⊂ 1 1 1 1 1 1 1 1 1 1 |
|--|--|--|
| Oisaster recovery | Test failover: DemoNFSDS03RP | risi (St days left) - View details 👔 - |
| I plans I plans I plans Pum Demotyl#SDSD3M I plans | Warning: This test will create 5 VMs in the site nim/DemoDest. The test won't affect the site nim/DemoSrc. tinapshot copy for volume recovery The support of the superstand of the selected support of the site nim/DemoSrc. Warning: The corresponding volume will be restored with the selected support copy. All the changes made after this support copy was created will be lost. f support name | Add |
| | | |

When the VMware administrator runs a test failover operation, BlueXP DRaaS automates the following tasks:

- Triggering SnapMirror relationships to update storage at the destination site with any recent changes that were made at the production site.
- Creating NetApp FlexClone volumes of the FlexVol volumes on the DR storage array.

- Connecting the NFS datastores in the FlexClone volumes to the ESXi hosts at the DR site.
- Connecting the VM network adapters to the test network specified during the mapping.
- Reconfiguring the VM guest operating system network settings as defined for the network at the DR site.
- Executing any custom commands that have been stored in the replication plan.
- Powering on the VMs in the order that is defined in the replication plan.



Cleanup failover test Operation

The cleanup failover test operation occurs after the replication plan test has been completed and the VMware administrator responds to the cleanup prompt.

| III Ne | etApp BlueXP | Q BueXP Search Account " Workspace nimopics | Connector 🖌 🚺 🍋 🌣 😗 😆 |
|--------|----------------------------------|--|--|
| 8 | Disaster recovery Dashboard Site | s Replication plans Resource groups Job monitoring | Free trial (51 days left) - View details 🗍 🛩 |
| | 1 plans | | Q, Add |
| ¢ | Plan Compliance chec | A Plan status 2 . Protected site C Resource groups 2 . Recur | mose 2 / Followerste 2 |
| 0 | DemioNF\$D503RP @Healthy | Test fallover nimDemoSit: DemoNFSDS03RG Repli | View plan details |
| 4 | | | Run compliance check Text failurer |
| | | | Clean up failover test |
| | | | Fud bach |
| | | | Edit schedules |
| | | | Take snapshot now |
| | | | Inable |
| | | | Delete |
| o | | | |

This action will reset the virtual machines (VMs) and the status of the replication plan to the ready state.

When the VMware administrator performs a recovery operation, BlueXP DRaaS completes the following process:

- 1. It powers off each recovered VM in the FlexClone copy that was used for testing.
- 2. It deletes the FlexClone volume that was used to present the recovered VMs during the test.

Planned Migration and Fail over

BlueXP DRaaS has two methods for performing a real failover: planned migration and fail over. The first method, planned migration, incorporates VM shutdown and storage replication synchronization into the process to recover or effectively move the VMs to the destination site. Planned migration requires access to the source site. The second method, failover, is an planned/unplanned failover in which the VMs are recovered at the destination site from the last storage replication interval that was able to complete. Depending on the RPO that was designed into the solution, some amount of data loss can be expected in the DR scenario.

| III Ne | tApp Bk | JeXP | | 9 | BlueXP Search n | ccount 🌱 We mogisa nin | mispace 🔪 | Connector ~ GISABXPCann | • | 08 |
|--------|---------|-------------------|------------------|---------------|---------------------|-------------------------------|-----------|---|---------------------|-------------|
| | O Dis | aster recovery Da | shboard Sites | Replication p | alans Resource grou | ps Job monitoring | | Free trial (5 | 1 days left) - View | details - |
| 9 | | 1 plans | | | | | | ۹ 🗖 | Add | |
| • | | Pan (a) | Compliance sheet | Plan status : | Protected alter | Resource groups () | Normers : | Follower site | - ji - L | |
| 8 | | DemioNF\$D\$03RP | Healthy | Ready | nimDemoSrc | DemoNFSD503RG | Replicate | nimDemoDest View plan det | | |
| ٩ | | | | | | | | Run compliane Test fallover Dean up take | re check | |
| | | | | | | | | Fail over | | |
| | | | | | | | | Fed back Edit schedules Take snapshot Disable Disable Delete | i now | |

When the VMware administrator performs a failover operation, BlueXP DRaaS automates the following tasks:

- Break and fail over the NetApp SnapMirror relationships.
- Connect the replicated NFS datastores to the ESXi hosts at the DR site.
- Connect the VM network adapters to the appropriate destination site network.
- Reconfigure the VM guest operating system network settings as defined for the network at the destination site.
- Execute any custom commands (if any) that have been stored in the replication plan.
- Power on the VMs in the order that was defined in the replication plan.

| vSphere Client Q. Search in all environment | | | | C & | Administrator@HMCDCLO | cal. ~ 🛛 🙄 | 0~ |
|--|---|---|---|-----------|--|--------------------------------|--------|
| Src | NFS_DS03 Exchon Monitor Configure P Notes Type Hosts Vehast machines VM templates Server Folder Location | s Aermessions Files Hosts NP5.3 2 5 172.21.565.566 //wc.14P5_0503_CP stu///emt//volumescaltStite 5ac.44536/ | VMs Capacity and Usa Last actains at 704 AM Storage 55. VIEW STATS BEFREEN | ige | 100 | 3.06 GB free | ٩ |
| Task Name + Target + | Status T | Details 7 | Notation . | Outried y | Start Time 2 4 | Completion Time | . 10 |
| Power On virtual machine @ <u>MPS_DemoA_VM02</u> | O Completed | Powering on the new Virtual Machine | HHCDCLOCAL\Adminutrator | 4 105 | 08/16/2024, 7:04:07 A. M | 06/16/2024, 7:041 M | 12 A |
| Power On virtual mactions 🖗 <u>MPS_Demok_VMDS</u> | Completized | Powering on the new Virtual Machine | HMCDCLOCAL Momentinator | 3 ms | 08/16/2028, 7:04:07 A M | 08/16/2024, 7:041 M | IZA I |
| Power Or virtual mactime (@ <u>NP5_Demos_VMO</u> 4 | O Completed | | HMODELOCAL\Administrator | 2001 | osnov2024, tro4.06 A M Activiate Wi | 08/6/2024, 7:043 M ndows | 07 A |
| Power Ot vitual nucline | Pi concerned | Powering on the new Virtual | HMCDCLOCAL Valmentington | 2 mil | ouncooli foi ol an | 05/6/2004 704 | tian , |

Failback

A failback is an optional procedure that restores the original configuration of the source and destination sites after a recovery.

| III Ne | tApp | BlueXP | | | | | Q BlueXP Search |) 2 | count 👻 🔤 | Norkspace 🎽 | Connector ~ GISABXPCann | 10 * | 08 |
|--------|------|----------|-----------|------|-----------------|---------------|-----------------|------------|------------------|-------------|----------------------------|----------------------|---------------|
| | 0 | Disaster | recovery | De | shboard Site | s Replication | plans Reso | ince group | s Job monitoring | K. | Free trial (! | 51 days left) - Viev | v details - |
| 9 | | 1 | plans | | | | | | | | Q. | Add | |
| • | | | Plan | 181 | Compliance cher | Fien status | Protected al | n d | Resource groups | Rearrance : | Fallower site | • | |
| | | | DemoNFSDS | 13RP | Healthy | G Falled over | rimDemoSr | | DemoNFSDS03RG | Replicate | rimDemoDest | | |
| ٩ | | | | | | | | | | | Run compliar | ce check | |
| | | | | | | | | | | | Dean up tak | ver heit : | |
| | | | | | | | | | | | Fail back | _ | |
| | | | | | | | | | | | Edit scheduk | 4 | |
| | | | | | | | | | | | Take shapsh | it now | |
| | | | | | | | | | | | Disable | | |
| | | | | | | | | | | | Delete | | |
| | | | | _ | | | | | | | | | |

VMware administrators can configure and run a failback procedure when they are ready to restore services to the original source site.

NOTE: BlueXP DRaaS replicates (resyncs) any changes back to the original source virtual machine before reversing the replication direction. This process starts from a relationship that has completed failing over to a

target and involves the following steps:

- Power off and unregister the virtual machines and volumes on the destination site are unmounted.
- Break the SnapMirror relationship on the original source is broken to make it read/write.
- Resynchronize the SnapMirror relationship to reverse the replication.
- Mount the volume on the source, power on and register the source virtual machines.

For more details about accessing and configuring BlueXP DRaaS, see the Learn about BlueXP Disaster Recovery for VMware.

Monitoring and Dashboard

From BlueXP or the ONTAP CLI, you can monitor the replication health status for the appropriate datastore volumes, and the status of a failover or test failover can be tracked via Job Monitoring.

| Net | tApp BlueXP | | | | Q: BlueXP Search Account * | Workspace ~ | Connector GISA8XPCann | 🍬 🌣 🔞 🛛 |
|-----|-----------------------|---------|------------|--------------|--|------------------|--------------------------|-------------------------------|
| P | Oisaster recovery | Dashb | ocard Site | s Replicatio | an plana Resource groups Job mon | itoring | Free trial (50 | days left) - View details - |
| | 26515 jobs | | | | | | | Q |
| | 10 | e i | Status : | Workford : | Hame 2 | Stanum D | End time : C | |
| | CF d923e507-b3 | ±2-401 | 🕄 in pra | Backup | Backup job for Replication Plan.DemoNF | 08/16/2024, 04:5 | | Cancel job? |
| | () 3549cc9c-aa | 4e-45e | Succe | Backup | Initialize Backup of DemoNFSD503RP for | 68/16/2024, 04:5 | 08/16/2024, 04:5 | |
| | 5cb01bcc-9e | a6-4afi | Succe | Backup | Backup job for Replication Plan.DemoNF | 08/16/2024, 04:4 | 08/16/2024, 04:5 | |
| | () 921225d9-67 | be-4c21 | Succe | Backup | Initialize Backup of DemoNFSDS03RP for | 06/16/2024, 04:4 | 08/16/2024, 04:4 | |
| | Ø 258544d4-45 | #2-46t | Succe | Compliance | Compliance check for Replication Plan: D., | 08/15/2024, 04:4 | 08/16/2024, 04:4 | |
| | ₫ 398bc6a3-at | a8-45d | Succe | Compliance | Initialize Compliance of DemoNFSDSD3R | 08/16/2024, 04:4 | 08/16/2024, 04:4 | |
| | 0 97/dbed8-80 | 17-459: | Succe | Backup | Backup job for Replication Plan.DemoNF | 06/16/2024, 04:4 | 08/16/2024, 04:4 | |
| | CP bffc016e-cx3 | a-409d | Succe | Backup | Initialize Backup of DemoNFSDS03RP for _ | 08/16/2024, 04:4 | 08/16/2024, 04:4 | |
| | 🗇 cde759a8-eb | et-498+ | Succe | Backup | Backup job for Replication Plan.DemoNF | 08/16/2024, 04:3 | 08/16/2024, 04:4 | |
| | 🗇 a414daba-96 | 30-4c5 | Succe | Backup | Initialize Backup of DemoNFSDS03RP for | 68/16/2024, 04:3 | 68/16/2024, 04:3 | |

 (\mathbf{i})

If a job is currently in progress or queued, and you wish to stop it, there is an option to cancel it.

With the BlueXP disaster recovery dashboard, confidently evaluate the status of disaster recovery sites and replication plans. This enables administrators to swiftly identify healthy, disconnected, or degraded sites and plans.

| INetApp | BlueXP Disaster recovery | Dashboard Sites Re | Q BlueXP Search | Account | vimipsce Connector diSAEXPConn & a Constant of the second |
|---------|-----------------------------|---------------------|-----------------------------------|-------------------------|---|
| | Sites (2) 2 Running | So Ao Down Issue | Replication plann 2 1 Ready | e (1) So 0 Failed | Activity Backup job for Replication Plan Demok/FSDS03RP Timage |
| | View site | roe groups 5 Prot | ected VMs | 130 Unprotected VMs | Vitilate Backup of DemoNFSDS03RP tor every 5 minutes 4 mage witilating DR Scense compliance check film age Backup job-for Replication Plan.DemoNFSDS03RP film age film age witilate Backup of DemoNFSDS03RP for every 5 minutes bin age bin age |
| | S 1 Failous | n 🛞 1 Faitbacks | ⊘ 1 Test fallowers | O Migrations | View all jobs |

This provides a powerful solution to handle a tailored and customized disaster recovery plan. Failover can be done as planned failover or failover with a click of a button when disaster occurs and decision is made to activate the DR site.

To learn more about this process, feel free to follow the detailed walkthrough video or use the solution simulator.

DR using BlueXP DRaaS for VMFS Datastores

Disaster recovery using block-level replication from production site to disaster recovery site is a resilient and cost-effective way of protecting the workloads against site outages and data corruption events, like ransomware attacks. With NetApp SnapMirror replication, VMware workloads running on-premises ONTAP systems using VMFS datastore can be replicated to another ONTAP storage system in a designated recovery datacenter where VMware resides

This section of the document describes the configuration of BlueXP DRaaS to set up disaster recovery for onpremises VMware VMs to another designated site. As part of this setup, the BlueXP account, BlueXP connector, the ONTAP arrays added within BlueXP workspace which is needed to enable communication from VMware vCenter to the ONTAP storage. In addition, this document details how to configure replication between sites and how to setup and test a recovery plan. The last section has instructions for performing a full site failover and how to failback when the primary site is recovered and bought online.

Using the BlueXP disaster recovery service, which is integrated into the NetApp BlueXP console, customers can discover their on-premises VMware vCenters along with ONTAP storage, create resource groupings, create a disaster recovery plan, associate it with resource groups, and test or execute failover and failback. SnapMirror provides storage-level block replication to keep the two sites up to date with incremental changes, resulting in a RPO of up to 5 minutes. It is also possible to simulate DR procedures as a regular drill without impacting the production and replicated datastores or incurring additional storage costs. BlueXP disaster recovery takes advantage of ONTAP's FlexClone technology to create a space-efficient copy of the VMFS datastore from the last replicated Snapshot on the DR site. Once the DR test is complete, customers can

simply delete the test environment, again without any impact to actual replicated production resources. When there is a need (planned or unplanned) for actual failover, with a few clicks, the BlueXP disaster recovery service will orchestrate all the steps needed to automatically bring up the protected virtual machines on designated disaster recovery site. The service will also reverse the SnapMirror relationship to the primary site and replicate any changes from secondary to primary for a failback operation, when needed. All of these can be achieved with a fraction of cost compared to other well-known alternatives.



Getting started

To get started with BlueXP disaster recovery, use BlueXP console and then access the service.

- 1. Log in to BlueXP.
- 2. From the BlueXP left navigation, select Protection > Disaster recovery.
- 3. The BlueXP disaster recovery Dashboard appears.

| RetApp BlueXP | | | | (4 4 | Account Account renogee | " Workspace " Connector " 🏚 🌣 🤨 😆 |
|----------------------|-----|--------------------|---------------------|----------------------------|-------------------------|--|
| B Storage | | very Dashboard | Sites Replication p | alans Resource groups | Job monitoring | Free trial (55 days left) - View details + |
| 🗢 Health | | | | | | |
| Protection | | s (2) | | Replication plans (I | | Activity |
| Backup and recovery | Ŷ | 2 Oo | A o tasue | 1 Ready | () 2 Faired | Backup Job for Replication Plan DemoRP304 14 Jugs |
| Disaster recovery | ÷ | Dashboard Silve | | | | Initiature Backup of DemoRP004 for every 5 Initiates Lin age |
| Replication. | ŵ | Replication plana | | siew parts | | tackup job for Replication Plan RPVMP503 3 m app |
| Ransomware protectio | n ⊈ | Resource groups | 2 1 | | 117 | Wollakize Backup of RPVMFS03 for every 6 Section Section |
| Covernance | | Job monitoring | Protecta | a wws | Citiziani yan | Backup Job for Heplication Plan SPNF5001 30 m Jop |
| Mobility | 1 | en resource groups | View protected | VMs | lew unprotected VMs | View all jobs |
| Extensions | | | | | | |
| | | 1 Fatowers | Pathacks | 2 Test fallowers | O Migration | |
| | | | | | | |

Before configuring disaster recovery plan, ensure the following pre-requisites are met:

- BlueXP Connector is set up in NetApp BlueXP. The connector should be deployed in AWS VPC.
- BlueXP connector instance have connectivity to the source and destination vCenter and storage systems.
- On-premises NetApp storage systems hosting VMFS datastores for VMware are added in BlueXP.
- DNS resolution should be in place when using DNS names. Otherwise, use IP addresses for the vCenter.
- SnapMirror replication is configured for the designated VMFS based datastore volumes.

Once the connectivity is established between the source and destination sites, proceed with configuration steps, which should take about 3 to 5 minutes.



NetApp recommends deploying the BlueXP connector in the disaster recovery site or in a third site, so that the BlueXP connector can communicate through the network with source and destination resources during real outages or natural disasters.

| TI Ne | tApp BlueXP | | Q BluexP Search |) Account ~ | Workspace 🐣 Connector 🎽 🛵 🌣 🧿 😂 |
|-------|--|----------------------|--|---|--|
| | tApp BluexP Control Disaster recovery Sites (2) Control Control Con | Dashboard Sites Repl | Q BULKYP Search Ication plans Repou O 2 Ready View plans | ce groups Job monitoring (2) Failed | Activity Activity Backup job for Replication Plan.DemoRPVMP503 In progress Initiatize Backup of DemoRPVMP503 for revery 10 minutes 7 raise Discources in host 172.21360.190 41 s.app Descources in host 172.21360.190 41 s.app |
| | View resources | ers | ed VMs | Verprotected VMs | Falback of resources using the replication plan "DemoRPVMF503" till s age Discovery of resources in host 172.21.166.190 9 m age View all jobs |

Support for on-premises to on-premises VMFS datastores is in technology preview while writing this document. The capability is supported with both FC and ISCSI protocol based VMFS datastores.

BlueXP disaster recovery configuration

The first step in preparing for disaster recovery is to discover and add the on-premises vCenter and storage resources to BlueXP disaster recovery.



(i)

Ensure the ONTAP storage systems are added to the working environment within the canvas. Open BlueXP console and select **Protection > Disaster Recovery** from left navigation. Select **Discover vCenter servers** or use top menu, Select **Sites > Add > Add vCenter**.

| NetApp | BlueXP Q BlueXP Se | erch Account ~ Workspace ~ | GISAEXPConn |
|---|---|--|--|
| * | Disaster recovery Dashboard Sites Replication plans | Resource groups Job monitoring | Free trial (55 days left) - View details + |
| (a) | Disaster recovery Deshboard Sites Replication plane 2 sites 2 sites Add site A site is a collection of vCenter servers, either Site minDemoSec minDemoDe T2221306.11 Comment T2221306.11 T2221306.11 Comment T2221306.11 Comment T2221306.11 Comment T2221306.11 Comment T2221306.11 Comment T2221306.11 Comment T2221306.11 Comment T2221306.11 Comment | Insecuros (proces Sob monitoriog) r on-premises or in the cloud. | Pres trial (55 days loft) - View defails - |
| | | | |

Add the following platforms:

• **Source**. On-premises vCenter.

| R NetApp BlueXP | Q BlueXP Search ninogisa Workspace ~ | Connector 🖌 👍 🌣 🥝 🔒 |
|-------------------------|--|--|
| Oisaster recovery David | and Sites Replication plans Resource groups Job monitoring | Free trial (55 days left) - View details + |
| U 2 mm | Add vCenter server | Addi |
| • | | |
| 🔿 🚍 nimDernoSte | Enter connection details for the vCenter server that is accessible from the BlueXP Connector. Site BlueXP Connector | 0 |
| 9 172,21,306.31 | nimDemoSrc * GISABXPCoren * | tonn (1) |
| | vCenter IP address | |
| alimDemoDe | 172.21.166.165 | 0 |
| 172.21.308.3 | vCenter password | term |
| Carrier () mana | administratorginincoc.occai | (U) |
| | Use self-signed certificates | |
| | Add Cancel | |
| | | |

• **Destination**. VMC SDDC vCenter.

| RetApp BlueXP | Q BlueXP Search | Account ~ Workspace ~ nimogisa nimopoce - | Connector 🖌 🛛 🍖 🌣 🤗 😆 |
|--------------------------|---|--|---|
| Oisaster recovery Dashbe | and Sites Profication plans Resou | rce (proces | Free trial (55 days left) - View details + |
| 2 | Add vCenter server | | Add |
| • | | | |
| 🗢 🔲 nimDemoSre | Enter connection details for the vCenter server | that is accessible from the BlueXP Connector. | 1 |
| 9 172.23.306.11 | Sile | BlueXP Connector | Senn |
| | HIRDERIOSE | Uddet-Com + | ۲ |
| | vCenter IP address | | |
| nimDemoDe | 172.21.166.190 | | 0 |
| | vCenter user name | vCenter password | |
| () instre | administrator@hmcdc.local | | 3ann (1) |
| | 🛛 Use self-signed certificates 🍘 | | |
| | | | |
| | | Add Cancel | |
| | | | |

Once the vCenters are added, automated discovery is triggered.

Configuring Storage replication between source and destination site

SnapMirror makes use of ONTAP snapshots to manage the transfer of data from one location to another. Initially, a full copy based on a snapshot of the source volume is copied over to the destination to perform a baseline synchronization. As data changes occur at the source, a new snapshot is created and compared to the baseline snapshot. The blocks found to have changed are then replicated to the destination, with the newer snapshot becoming the current baseline, or newest common snapshot. This enables the process to be repeated and incremental updates to be sent to the destination.

When a SnapMirror relationship has been established, the destination volume is in an online read-only state, and so is still accessible. SnapMirror works with physical blocks of storage, rather than at a file or other logical level. This means that the destination volume is an identical replica of the source, including snapshots, volume settings, etc. If ONTAP space efficiency features, such as data compression and data deduplication, are being used by the source volume, the replicated volume will retain these optimizations.

Breaking the SnapMirror relationship makes the destination volume writable and would typically be used to perform a failover when SnapMirror is being used to synchronize data to a DR environment. SnapMirror is sophisticated enough to allow the data changed at the failover site to be efficiently resynchronized back to the primary system, should it later come back online, and then allow for the original SnapMirror relationship to be re-established.

How to set it up for VMware Disaster Recovery

The process to create SnapMirror replication remains the same for any given application. The process can be manual or automated. The easiest way is to leverage BlueXP to configure SnapMirror replication by using simple drag & drop of the source ONTAP system in the environment onto the destination to trigger the wizard that guides through the rest of the process.

| R NetApp BlueXP | Commetter Account * Workspace * Commetter . Commetter @GABERTComm |
|---|---|
| Canvas My working environments My estate | 🖽 Go to Tabular View |
| Add Working Environment | C Enable Services () () () () () () () () () () () () () |
| e • | On-Premises ONTAP SERVICES Backup and 65,34 cm (1) Protocted Data |
| y Intargets, Sre Di-Preninses (DirTah Enable this service (R) Volume satisfies | |
| Replication Copy & sync NITAP915_127 On Phoneses O4704P | Citereffication • Off • Off |
| 9.39TB County | Replication 1 Santouring Target |

BlueXP DRaaS can also automate the same provided the following two criteria's are met:

- Source and destination clusters have a peer relationship.
- Source SVM and destination SVM have a peer relationship.

| mine | etApp BlueXP | C. Bust? Search ninnigse Vortagese Connector BABLOPCover | 8 |
|------|----------------------|---|---|
| | Add replication plan | VCenter servers V Applications S Resource mapping (4) Recurrence (5) Review | × |
| ø | | | |
| ٠ | | vvCSA8-Cluster01 wkldD4-Cluster01 ~ | |
| ¢ | | | |
| | | Virtual networks 📀 Mapped 🗸 | |
| 4 | | Virtual mathines 🖉 Mapped | 1 |
| | | Datastores A | |
| | | RPO for all datastores in minutes Retention count for all datastores 30 30 Required Target datastore Source datastore Target datastore Src_NFS_DS01 (svm_NFS:Src_NFS_Vol01) Src_NFS_DS01 (svm_nm_strs_Src_NFS_DS01_co) Transfer schedule(RPO) ; , | |
| | | Previous Heat | |

If SnapMirror relationship is already configured for the volume via CLI, BlueXP DRaaS picks up the relationship and continues with the rest of the workflow operations.

(i)


Apart from the above approaches, SnapMirror replication can also be created via ONTAP CLI or System Manager. Irrespective of the approach used to synchronize the data using SnapMirror, BlueXP DRaaS orchestrates the workflow for seamless and efficient disaster recovery operations.

What can BlueXP disaster recovery do for you?

After the source and destination sites are added, BlueXP disaster recovery performs automatic deep discovery and displays the VMs along with associated metadata. BlueXP disaster recovery also automatically detects the networks and port groups used by the VMs and populates them.

| 2 sites | | | | Q | Add |
|-------------------------------|-------------|-----------------|--------------------------|--------------------------|-----|
| nimDemoSrc | | | | | 1 |
| 172.21.196.155 () 194a027g | 72 W41a | 13 Deterbres | 1 Nessarce groups | GISABXPConn Currector | 1 |
| nimDemoDest | | | | | 1 |
| 572.21.166.190 () feasibly | 61 Vibia | 3 Outastures | 0 Resource private | GISABXPConn Connector | 1 |
| L | | | | | |

After the sites have been added, VMs can be grouped into resource groups. BlueXP disaster recovery resource groups allow you to group a set of dependent VMs into logical groups that contain their boot orders and boot delays that can be executed upon recovery. To start creating resource groups, navigate to **Resource Groups** and click **Create New Resource Group**.

| III Net | tApp BlueXP | Q. BueXP Search m | nopisi "Workspace " nopisi nimpoce | Connector ~ | • |
|---------|-----------------------------------|----------------------------------|---------------------------------------|-------------------|-----------------------------|
| | Disaster recovery Dashboard Sites | Replication plans Resource group | Job monitoring | Free trial (83 da | ys left) - View details 🛛 + |
| 9 | 2 resource aroups | | | Q D | Add |
| ٠ | Resource group | 2 Dourse site | 🗧 🕴 Source vCenter | | E. |
| Ŷ | DemsR001 | nimDemoSits | 172.21.166.158 | | |
| 9 | DemoRGVMF503 | nimDemoSre | 172.21.168.158 | | |
| * | h | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | Added the res | iource group . | | × | |
| | | | | | |
| | | | | | |

The resource group can also be created while creating a replication plan.

The boot order of the VMs can be defined or modified during the creation of resource groups by using simple drag and drop mechanism.

| RetApp BlueXP | Q: BlueXP Se | erch Account " Workspace " nimogise nimopoce | GISAEXPConn 🖌 🖣 🏟 🤣 🥹 |
|---|---|--|---|
| Oisaster recovery | Add resource group | | Trein trial (B3 days left) - View details 🗍 + |
| 1 ressures proces Toressures proces | Name | vCanter | Q |
| CemtiBQ01 | DemoRGVMFS03 Select virtual machines | 172.21.166.155 * | ••• |
| * | Q iscsi SCSI_DemoVM31 SCSI_DemoVM03 | Selected VMs (5) ISCSI_DemoVM01 X ISCSI_DemoVM03 X | |
| | SISSI, DemoVM02 SISSI, DemoVM04 SISSI, DemoVM05 | ISCSI_DemoVM09 X | |
| | | Use dag and drop from to modify the boot order Ndd Canor | ni |

Once the resource groups are created, the next step is to create the execution blueprint or a plan to recover virtual machines and applications in the event of a disaster. As mentioned in the prerequisites, SnapMirror replication can be configured beforehand or DRaaS can configure it using the RPO and retention count specified during creation of the replication plan.

(i)

| 2 | Carivas My working environments | My estate | | E Go to Tabular View |
|--------|--|---------------------------|------------|---|
| | + Add Working Environment | C Enable 5 | ervices () | Working Environments |
| i V | NTAP On-Pi | R0_Sec | | 3 On-Premises ONTAP 11.16 TIB Provisioned Capacity |
| | 2.011 Cased | | | Amazon 53 A Buckets |
| | NTAP915, Destin | | | |
| | On-Premiese ONTAP 1.28T/8 Capecity | Amazon 53 4 Buchels | aws | |
| | | | | |
| | NTAP | H5_127 | | |
| | On-Pt | B CHINE | | |

| IN Net | App BlueXP | Q. BlackP Sear | th Account * | Workspace ~ | Connector GISABXPConn | ° 👆 ✿ ଡ ϴ |
|--------|-----------------------------------|------------------------------------|---------------------------|------------------|--------------------------|-------------------------------------|
| | Replication | | | | | |
| a | 6 Volume Relationships | 495.27 GiB Replicated Capacity | O Currently Transfer | ning 💿 | 6 Healthy | O Failed |
| ٠ | | | | | | |
| Ŷ | Volume Relationships (6) | | | | | a e |
| 9 | Health Status 🕇 Source Volume 🛟 | Target Volume | 🗧 Total Transfer Time 🗘 | Status $ 	au $ | Mirror State | Last Successfu |
| * | ORas5_stc | DRaa5_src_copy NTAP915_Destn | 5 seconds | idie | snapmirrored | Jul 15, 2024, 8:05:05 28:41 MB |
| | Src_NFS_D503 NTAP915_Src | Src_NFS_DS03_CP NTAP915_Destn | 13 seconds | ide | snapmirrored | Jul 15, 2024, 8:07:13 183.41 MiB |
| | Src_NF5_D504 NTAP915_Src | Src_NFS_D504_CP NTAP915_Destri | 6 seconds | ide | snapmirrored | Jul 15, 2024, 8-05-06 183.38 MiB |
| | Srt_NE5_Vol01 NTAP915_Src | Src_NFS_DS01_cp NTAP915_Destn | 14 seconds | ide | snapmirrored | Jul 15, 2024, 8-43:22 546.23 MB |
| | Sre_JSCSL_DS01 NTAP915_Src | Src_ISCSI_DS01_cp NTAP915_Destn | 20 seconds | idie | snapmirrored | Jul 12, 2024, 4:24:34 22:35 M6 |
| 5 | Sre_ISCSLD603 NTAP915_Src | Src_ISCSL_0503_CP NTAP915_Destn | 6 seconds | idle | snapmirrored | Jul 15, 2024, 8:05:06 254.89 MiB |

Configure the replication plan by selecting the source and destination vCenter platforms from the drop down and pick the resource groups to be included in the plan, along with the grouping of how applications should be restored and powered on and mapping of clusters and networks. To define the recovery plan, navigate to the **Replication Plan** tab and click **Add Plan**.

First, select the source vCenter and then select the destination vCenter.

| m Ne | etApp BlueXP | | Q BlueXP See | ch Account ~ | Workspace 🗢 nimspace | Connector ~ GISABXPConn | 🍓 🌣 | 08 |
|-------------|----------------------|----------------------------------|--------------------------|--------------------|--|----------------------------|-----|----|
| | Add replication plan | () vCenter servers | Applications | 3 Resource mapping | (4) Recurrence | (5) Review | | × |
| 9 | | - | | | | | | |
| ٠ | | DemoRPVMFS03 | | | | | | |
| Ŷ | | | | | | | | |
| | | | | | | | | |
| * | | Select a source vCenter where y | our data exista, to repl | Replicate | Center | | | |
| | | Source vCenter 172.21.166.155 | J | Tarp Bei | et vCenter lect a target vCenter 2.21.166.155 mDemoSiti | * | | |
| | | | Cance | 17 | 2.21.166.190 mDemoDest | | | |

The next step is to select existing resource groups. If no resource groups created, then the wizard helps to group the required virtual machines (basically create functional resource groups) based on the recovery objectives. This also helps define the operation sequence of how application virtual machines should be restored.

| TIN | tApp BlueXP | Q BueXP Search Account " Workspace " Connector 👆 🔅 🕐 | 8 |
|-----------|----------------------|---|---|
| 4 D • Q # | Add replication plan | Value Value Image: Server in Server in Applications Image: Server in Server in Applications Image: Server in Server in Applications Virtual machines Resource groups to replicate. Selected resource group (1) DemoRQVMFS03 Previous Next | × |
| 3 | | Previous | |

Resource group allows to set boot order using the drag and drop functionality. It can be used to easily modify the order in which the VMs would be powered on during the recovery process.

(i)



Each virtual machine within a resource group is started in sequence based on the order. Two resource groups are started in parallel.

The below screenshot shows the option to filter virtual machines or specific datastores based on organizational requirements if resource groups are not created beforehand.

| mine | tApp BlueXP | (Consequence) | Accession ~ | ntapace * Connector * Inspece GISABI/Conn | 10 | ٠ | 0 | 8 |
|------|----------------------|---|--|--|----|---|---|---|
| 8 | Add replication plan | d'enter servers Applications Applications | urce mapping (1) Recurrence | (B) Review | | | | × |
| • | | Select the applications on the source of | anter that you want to replicate. | | | | | |
| ¢ . | | (iii) 172.21.188.185 | • | 172.21.186.190 rein/Dema/Dest | | | | |
| 7 | | Virtual machines Resource groups Usamuk Al datastores Usamuk Al Datastores Usamuk VM01 Usamuk VM01 Usamuk VM01 Usamuk VM01 Soj_DeverVM01 | Selected VMs to replicate. Selected VMs (0) Resource(Eroup!) Select VMs to replicate. | / | | | | |
| _ | | Previous | Her | | | | | |

Once the resource groups are selected, create the failover mappings. In this step, specify how the resources from the source environment maps to the destination. This includes compute resources, virtual networks. IP customization, pre- and post-scripts, boot delays, application consistency and so on. For detailed information, refer to Create a replication plan.

| these to proceed to prime | 0 | VCenter servers | Applications | 0 | esource mapping | Recurrence (5) Ili | rview | | |
|---------------------------|------------------|-----------------------|--------------|---------|--------------------------------------|---|---------|---|--|
| | Virtual machines | | | | | | | ^ | |
| | P address type | Target IP | | | | | | | |
| | Static | · Same as | source - | | | | | | |
| | Use the same or | edentials for all VMs | | | | | | | |
| | Use the same sp | ript for all VMs | | | | | | | |
| | Q | | | | | | | | |
| | Source VM | CPUs | RAM | | Boot delay(mins between 0 and 10) | Create application consistent replicas | Scripts | | |
| | DemoR001 | | | | | | | | |
| | 50_DemoVM | 2 | 34 | ciiti v | 0 | | None 🥜 | | |
| | S0_DemoVM01 | 2 | 4 | Gi8 ~ | 0 | o | None 🧷 | | |
| | | | 11.14 | Face of | 14 | 1.000 | 1000 | | |

By default, same mapping parameters are used for both test and failover operations. To apply different mappings for test environment, select the Test mapping option after unchecking the checkbox as shown below:

| | Add replication plan | 🕑 vCenter servers 🛛 🥑 / | Applications | (a) Recurrence (b) Review | x |
|---|------------------------------|---|---|---------------------------|------------------------------|
| 9 | Replication plan Y Add plan | | | | |
| ٠ | | 100 | Resource mapping | | |
| ¢ | | | actly new resources map man the source to the | Corgen. | |
| 6 | (a) 172 | 21.166.155 DemoSrc | | (3) | 172.21.166.190 nmDempDest |
| < | | | | 0 | |
| | Z Use same n Fallover map | nappings for failover and test mappings |] | | |

Once the resource mapping is complete, click Next.

(i)

| Add replication plan | 🕑 vCenter ser | vers: | nimspece GISABXPConn ng (4) Recurrence (5) Review | · · · · · · · · · · · · · · · · · · · |
|----------------------|--|--------------------------|--|---------------------------------------|
| | 172.21.186.155 nimDemoSirc | | (ininDemoDest | |
| | Use same mappings for fa | liover and test mappings | | |
| | | | | |
| | Failover mappings | Test mappings | | |
| | Failover mappings Compute resources Virtual networks | Test mappings | ~ | |

Select the recurrence type. In simple words, select Migrate (one time migration using failover) or recurring continuous replication option. In this walkthrough, Replicate option is selected.

| TIN | APP BlueXP | Q BlueXP Seat | Account ~ Workspace ~ | Connector 🖌 👆 🦣 🏟 🤗 🔒 |
|------------|----------------------|---|--|--------------------------------|
| | Add replication plan | Overter servers O Applications | Resource mapping Recurrence (5) | Roview X |
| ۵ | | | | |
| ٠ | | (a) 172.21.166.165 | (a) | 172.21.166.190 niciDemoDest |
| Ŷ | | 0 | U | |
| 9 | | | | |
| * | | Migrate Migrate sepulication data one time to source to target. | Replicate Replicate Deplicate application data to keep the target sign-to-data with the source. | |
| | | | | |
| | | Previou | s (Next | |

Once done, review the created mappings and then click on Add plan.

| III Ne | tApp BlueXP | | Q BlueXP Search Account " | Workspace Connector GISAEXPConn | ۰ ک | 00 |
|--------|----------------------|-------------------|---------------------------|---------------------------------|-----|----|
| 8 | Add replication plan | ⊘ vCenter servers | Applications | Recurrence Review | | × |
| • | | 172.21.166.155 | | 172.21.186.190 | 1 | |
| Ŷ | | nimDemotinc | Replicate | nimDemaDest | 1 | |
| • | | Plan detaila | Fallower mapping | Virtual mochines |] | |
| * | | Plan name | DemcRPVMF503 | | | |
| | | Recurrence | Replicate | | 1 | |
| | | | | | | |
| | | | | | | |
| | | | Previous Add plan | | | |
| | | | | | | |

| III Ne | tApp BlueX | P | | (9 | BlueXP Search nim | count ~ Worl | kapace 🐃 pace | Connector ~ GISABXPConn | 🍖 🌣 | 08 |
|--------|---------------------|---------------|------------------|----------------|--------------------|------------------|--------------------|----------------------------|----------------------|-------------|
| | Disaste Disaste | er recovery D | ashboard Sites | Replication pl | ans Resource group | s Job monitoring | | Free trial (I | 33 days left) - View | details + |
| a | | 2 plans | | | | | | Q 🗖 | Add | |
| • | | Pan e | Compliance check | Plan status : | Protected alte | Resource groups | Recurrence : | failurer site | ÷ Y | |
| | | OemoRPVMF503 | Healthy | 🕗 Ready | nimDemoSrc | DemoRGVMF\$03 | Replicate | nimDemoDest | | |
| | | RPNFS001 | Healthy | Ready | nimDemoSrc | DemoRG01 | Replicate | nimDemoDest | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | _ | |

Once the replication plan is created, failover can be performed depending on the requirements by selecting the failover option, test-failover option, or the migrate option. BlueXP disaster recovery ensures that the replication process is being executed according to the plan every 30 minutes. During the failover and test-failover options, you can use the most recent SnapMirror Snapshot copy, or you can select a specific Snapshot copy from a point-in-time Snapshot copy (per the retention policy of SnapMirror). The point-in-time option can be very helpful if there is a corruption event like ransomware, where the most recent replicas are already compromised or encrypted. BlueXP disaster recovery shows all available recovery points.



To trigger failover or test failover with the configuration specified in the replication plan, click on **Failover** or **Test failover**.

| III Ne | tApp BlueXP | | Q BuexP s | Search Account | n Yorka a nimep | 19408 × 1 | Connector ~ DISA8X/PConn | 🍋 🌣 📀 | 8 |
|--------|---------------------|--------------------|-------------------|-----------------|--------------------|--------------|------------------------------------|--------------------------|------|
| | ② Disaster recovery | / Dashboard Sites | Replication plans | Resource groups | Job monitoring | | Free trial (68 d | ays left) - View details | - I- |
| 4 | 2 plans | | | | | | ۹ 🗖 | Add | |
| • | Pan | - Compliance check | Plan status | nected site | lasource groups 🗧 | Recurrence : | Fallower alte | [* | |
| | DemoRP | VMF503 🕑 Healthy | Ready nime | DemoSrc 6 | DemoRGVMF503 | Replicate | nimDemoDest. | | |
| ٠ | RPNESO | 01 🧭 Healthy | Ready nim | DemoSrc 6 | lemoRG01 | Replicate | ni Run compliance | check | |
| | | | | | | | Cean up failurer | 1971. | |
| | | | | | | | Fail that) | | |
| | | | | | | | Edit schedules Take snapshot no | w | |
| | | | | | | | Disable | | |
| | | | | | | | Delete | | |
| | | | | | | | | | - |

What happens during a failover or test failover operation?

During a test failover operation, BlueXP disaster recovery creates a FlexClone volume on the destination ONTAP storage system using the latest Snapshot copy or a selected snapshot of the destination volume.



A test failover operation creates a cloned volume on the destination ONTAP storage system.



| III Net | App BlueXP | Q BlukXP Search Account ~ Workspace ~ | Connector GISABXPConn |
|---------|------------------------------|---|---|
| - | Disaster recovery Devide | coard Siles Replication plans. Resource groups Job monitoring | Free tital (0.0 days left) - View details 🕴 - |
| v | | | |
| | Zalara | Test failover: DemoRPVMFS03 | <u></u> |
| Ŷ | P30 | | |
| | DeconPVM/503 | OR Test Fallover Update Mirror | 00m |
| 4 | 80%#5001 | SnapMirror relationship for volume :svm_ISCSI:Src_ISCBL_D503 Destination volume 'Sirc_ISCSL_D503_CP': size is less than source volume :'Src_ISCSL_D503: size SnapMirror relationship is healthy for volume :svm_ISCSI:Src_ISCSL_D503 Destination storage environment found for volume :svm_ISCSI:Src_ISCSL_D503 Take snapshot now option is not selected, primary backup & snapmirror update not performed. DR Test Failover Target Start | eDest *** |
| | | Run in background | |

During the process, BlueXP disaster recovery does not map the original target volume. Instead, it makes a new FlexClone volume from the selected Snapshot and a temporary datastore backing the FlexClone volume is mapped to the ESXi hosts.

| vSphere Clent Q, Search and K | @ wkld04-vc01.hmcdc.loc Summary Monitor Configure | al Factions Permissions Datacenters H | osts & Clusters VMs Dedestores | Administrator@HMCDCLOCAL ~ |) @* |
|---|--|--|---|--|----------|
| Wikido4-PC01 Mmcdc.local Wikido4-DC01 O4TestBed_D501 B 04TestBed_D501 Wikido4_D5tn_D501 Wikido4_Dstn_D501 | VCenter Details Version: Build: Last Updated: Last Rife-August Clusters: Heats: Virtual Machines: | 8.0.2 22385739 May 20, 2024, 3/21 AM <u>10/1 schedaed</u> 1 2 51 | Capacity and Usage Last updated at 319 AM CPU 132 Gric used Memory 26.15 GR used Storage 54.25 GR used | E 22.12 GHz free 73.44 GHz casecity 483.84 GB free 581 99 GB casecity 3.91 TB free 4 TB casecity | 0 |
| | Tags II | Custom Attributes | 1 | vCenter Health | |
| Recent Tasks Alarms | | | | | |
| Task Name y Tarpel | Y Statue Y | Details Y int | ator Y Ourved Y | Start Time 4 Y Completion Time | - T - F= |
| Rescan VMPS Sinkbd04-eset | Thince Completed | 604 | CDCLOCAL\Administrator 2 ms | 07/30/2024, 3:22:47 A 07/30/2024, 3:2 M M | 2.47.6 |
| Rescan at HBAs Control etc. | Internet O Completed | H | KDCLOCALVAdministrator 3 mil | 2//30/2035;237;47;4 \\\0000092934;32 | 247A |

(;)

| C B B D D D D D D D D D D D D D D D D D | Wkid04-vc01 Summary Monitor | .hmcdc.loc _{Configure} | al EACTIONS Permissions Datacenters | Hosts & | Quaters VMs Defeatores | Networks Unked vCenter Server System | ems |
|---|-----------------------------|------------------------------------|---|---------|--|--|--------|
| WetdPettBed_DS01 SODump SoC_SCS_DS03 wkid04_0stn_DS01 | Conten Details | | | | Capacity and Osage Lat obtained at 3/23 AM CPU (13) Girt used Memory 26:55 GB used Storage 54:25 GB used | 72,06 GHz free 73,44 GHz capacity 483,84 GB free 511,199 GB capacity 3,91 TB free 4 TB capacity | |
| | Tags | Н | Custom Attributes | | н | vCenter Health | |
| Y Recent Tasks Alarms | | | | | (Control of Control of | | |
| Task Name Tarpet Propister Virtual mechine | T Statue | 20% 0 | Detaile T Begistering Virtual Hachine o Il declination feed | System | φ For φ 20 ms | Blact Time 4 T Completion Time 07/20/2024, 3:22:43 A M | · * 5+ |
| Register initial machine | | 20% 0 | Registering Virtual Machine o In destination http: | System | 10 eng | 07/30/2024;323/43/6 Windows | |

When the test failover operation completes, the cleanup operation can be triggered using "**Clean Up failover test**". During this operation, BlueXP disaster recovery destroys the FlexClone volume that was used in the operation.

In the event of real disaster event occurs, BlueXP disaster recovery performs the following steps:

- 1. Breaks the SnapMirror relationship between the sites.
- 2. Mounts the VMFS datastore volume after resignature for immediate use.
- 3. Register the VMs
- 4. Power on VMs

| II Net | App BlueXP | Q. BLackP Search Account ~ Workspace ~ | Connector GISABXPConn |
|--------|-------------------------|--|--|
| | Disaster recovery Dawlo | oard Sites Replication plans. Resource groupe Job monitoring | Fine trial (66 days left) - Vive details - |
| ۷ | 6 5.007 | | |
| | Z plann | Failover: DemoRPVMFS03 | |
| Ŷ | (1990) (1997) | ✓ DR Failover Target Start | |
| ۲ | DecoliPr/W/503 | Breaking SnapMirror relationship for volume - Src_ISCSI_DS03. Using snapshot id 8a/61dab- 87cd-42b3-bdee-cbe91e8c9as2 | oDust +++ |
| 4 | Renaracion | Mounting volume - Src_ISCBLDS03 - In datastore - Src_ISCSLDS03 | ciDest ••• |
| | | Registering VM - ISCSI_DemoVM03 | |
| | | Registering VM - iSCSI_DemoVM04 | |
| | | Registering VM ~iSCSi_DemoVM01 | |
| | | Registering VM - ISCSI_DemoVM05 | |
| | | Powering on VM - ISCSL_DemoVM03 | |
| | | Close | |
| | | | |
| | | | |

Once the primary site is up and running, BlueXP disaster recovery enables reverse resync for SnapMirror and enables failback, which again can be performed with the click of a button.

| RetApp BlueXP | Q BlueXP Search Account ~ Workspace ~ minopise | Connector 🖌 🛵 🌣 🥱 🔒 |
|-----------------------------------|---|---|
| Contraction Disaster recovery Day | Noard Siles Replication plans. Resource groupe Job monitoring | Preventital (Ibli days left) - View details 🔰 - |
| 7 | | |
| ▼ Z starn | Failover: DemoRPVMFS03 | |
| ¢ | Powering off VM - ISCSI_DemoVM02 | |
| GeconPyter503 | Powering off VM - ISCSI_DemoVM04 | oQuit ••• |
| Returnion | Powering off VM - ISCSI_DemoVM05 | cDest +++ |
| | Powering off VM - ISCSI_DemoVM01 | |
| | Reversing SnapMirror relationship for volume - Srs_ISCSL_DS03 | |
| | O DR Failover Conveit | |
| | All resources in this resourcegroup DemoRGVMFS03 are in the same volume | |
| | | |
| | Close | |
| | | |
| | | |

And if migrate option is chosen, it is considered as a planned failover event. In this case, an additional step is triggered which is to shut down the virtual machines at the source site. The rest of the steps remains the same as failover event.

From BlueXP or the ONTAP CLI, you can monitor the replication health status for the appropriate datastore volumes, and the status of a failover or test failover can be tracked via Job Monitoring.

| n NetApp | BlueXP | ٩ | BlueXP Search Account nimogra | Workspace | Connector ~ GISA8XPConn | 🍖 🌣 🛛 🖯 |
|----------|-----------------------------|--|----------------------------------|---------------------|--------------------------------|-------------------------------|
| • | Disaster recovery Dashboard | Sites Replication p | ans Resource groups | Job monitoring | Free trial (68 | days left) - View details 📋 - |
| 9 | | | | | - | |
| | Last 24 hours 🖤 | | | | C Last updated: July 30, | 2024, 11:52 AM |
| ¢. | | | | | | |
| 0 | | 0 | 0 | 0 | 0 | 0 |
| < | 0 | Success | in progress | Queued | Warning | Faled |
| | 11102 | | | | | 0 |
| | TTIOZ jobs | | | | | ~ |
| | 10 (CS) (Statu | Control of the second se | (Manual | Start fin | e) Cill Endline | 10 |
| | 🗇 2963d7f3-7eb0-475d 🕑 S | kiccess Discovery | Discovery of resources in host 1 | 72.21.166 07/30/2 | 07/30/2024, 11:52: | |
| | 0 17ea7c0c-90d8-49b2 | uccess DRFailback | Failback of resources using the | replication 07/30/2 | 024, 11:49:07/30/2024, 11:52: | |
| | @ 47115cr2-1e97-48ca- | uccess Discovery | Discovery of resources in host 1 | 72.21.166 07/30/2 | 024, 11:43:07/30/2024, 11:44:, | |
| | The subset of the second | 1 | | | | |

This provides a powerful solution to handle a tailored and customized disaster recovery plan. Failover can be done as planned failover or failover with a click of a button when disaster occurs and decision is made to activate the DR site.

To learn more about this process, feel free to follow the detailed walkthrough video or use the solution simulator.

Copyright information

Copyright © 2024 NetApp, Inc. All Rights Reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

Trademark information

NETAPP, the NETAPP logo, and the marks listed at http://www.netapp.com/TM are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.