Veritas NetBackup™ for Microsoft Azure Stack Administrator's Guide

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VERITAS™

Veritas Microsoft Azure Stack Guide

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Contents

Chapter 1

Introduction

This chapter includes the following topics:

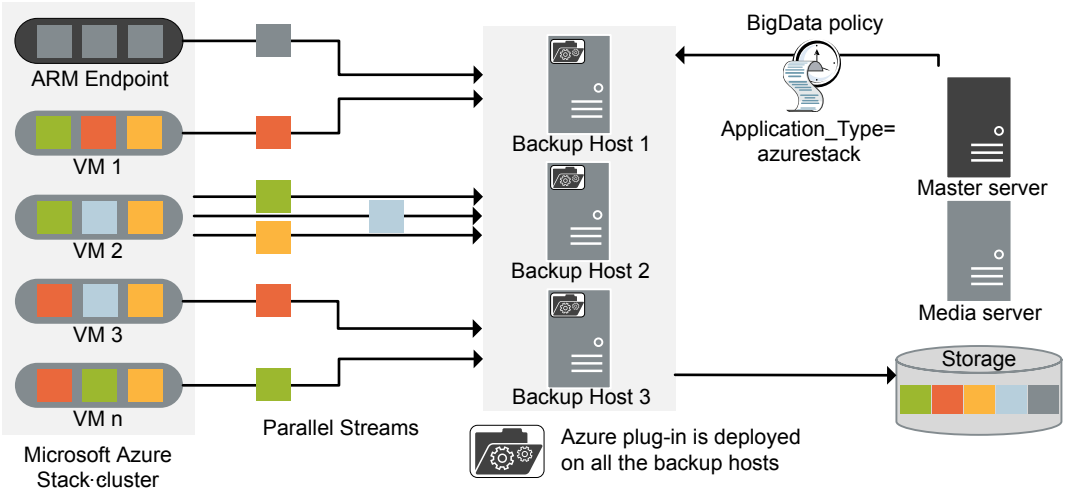
Protecting Microsoft Azure Stack VMs using NetBackup

You can use NetBackup and NetBackup Parallel Streaming Framework (PSF) to protect your Azure Stack VMs.

The following diagram provides an overview of how Microsoft Azure Stack VMs are protected by NetBackup.

Also, review the definitions of terminologies.See "NetBackup for Microsoft Azure Stack terminologies" on page 10.

Figure 1-1 Architectural overview



As illustrated in the diagram:

- The VMs are backed up in parallel streams wherein, NetBackup fetches blob storage data of VHDs. Each backup host fetches data associated with one or multiple VMs. In case of multiple backup hosts, sets of VMs are distributed to each backup host. The job processing is accelerated due to multiple backup hosts and parallel streams.

  Note: One VHD's data is not fetched parallely by multiple backup hosts.

- The communication between the Microsoft Azure Stack and the NetBackup is enabled using the NetBackup plug-in for Microsoft Azure Stack.
  For this release, the plug-in is available separately and must be installed on all the backup hosts.
- For NetBackup communication, you need to configure a BigData policy wherein, you need to use Application_Type=azurestack, and add the related backup hosts.
- You can configure a NetBackup media server, client, or master server as a backup host. Also, depending on the number of VMs, you can add or remove backup hosts. You can scale up your environment easily by adding more backup hosts.

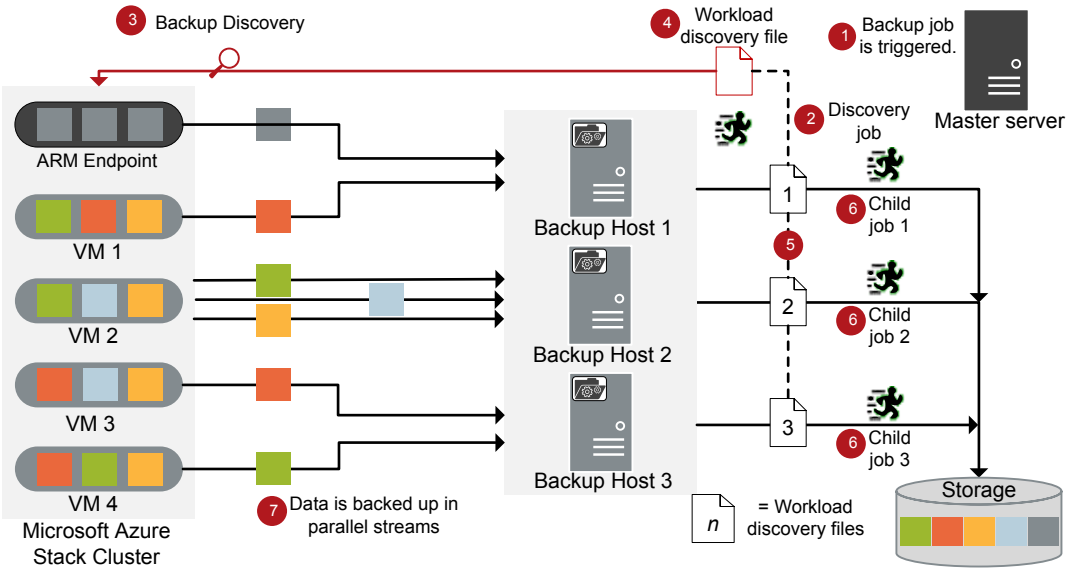
It is recommended that you use a NetBackup media server or a client as a backup host.

- The NetBackup Parallel Streaming Framework enables agentless backup wherein the backup and restore operations run on the backup hosts. There is no agent footprint on the Microsoft Azure Stack VMs. Also, NetBackup is not affected by the Microsoft Azure Stack upgrades or maintenance.

Backing up Microsoft Azure Stack VMs

The following diagram provides an overview of the backup flow:

Figure 1-2 Backup flow



As illustrated in the diagram:

1. A scheduled backup job is triggered from the master server.
2. Backup job for Microsoft Azure Stack is a compound job. When the backup job is triggered, first a discovery job runs.
3. During discovery, the first backup host connects with the Azure Resource Manager (ARM) Endpoint and performs a discovery to get details of VMs and their associated metadata that needs to be backed up.

4. A workload discovery file is created on the backup host. The workload discovery file contains the details of the data that needs to be backed up from the different VMs.
5. The backup host uses the workload discovery file get the details of data that it will backup. Individual workload discovery files are created for each backup host.
6. Individual backup jobs are executed for each backup host. As specified in the workload distribution files, data is backed up.
7. Data blocks are streamed simultaneously from different VMs to multiple backup hosts. The number of parallel streams is the same as the number of backup hosts.

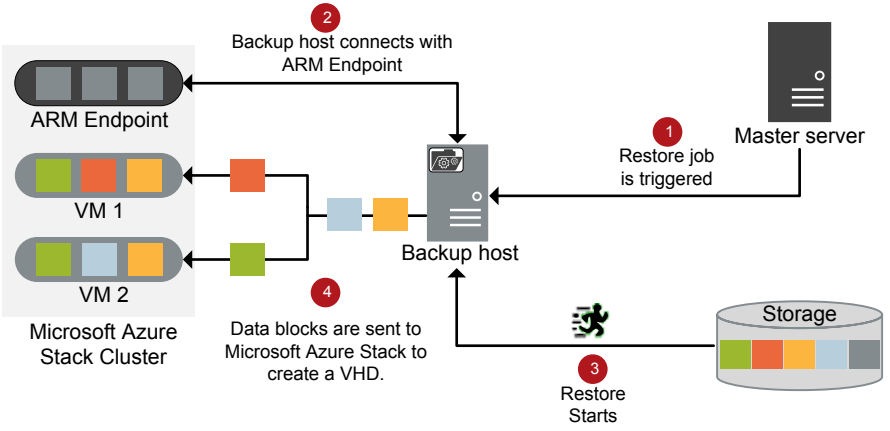
The compound backup job is not completed until all the child jobs are completed.

Restoring Microsoft Azure Stack VMs

For restore only one backup host is used.

The following diagram provides an overview of the restore flow.

Figure 1-3 Restore flow



As illustrated in the diagram:

1. The restore job is triggered from the master server.

2. The backup host connects with the Azure Resource Manager (ARM) Endpoint (source client). Backup host is the destination client.
3. The actual data restore from the storage media starts.
4. Data blocks are sent to Microsoft Azure Stack to create a VHD. After the VHD is created, VM is created and instantiated.

NetBackup for Microsoft Azure Stack terminologies

The following table defines the terms you will come across when using NetBackup for protecting Microsoft Azure stack.

Table 1-1 NetBackup terminologies

Terminology	Definition
Compound job	A backup job for Microsoft Azure Stack is a compound job. ■ The backup job runs a discovery job for getting information of the data to be backed up. ■ Child jobs are created for each backup host that performs the actual data transfer. ■ After the backup is complete, the job cleans up the snapshots on the Microsoft Azure Stack and is then marked complete.
Discovery job	When a backup job is executed, first a discovery job is created. The discovery job communicates with the ARM Endpoint and gathers information of VMs and associated VHDs. At the end of the discovery, the job populates a workload discovery file that NetBackup then uses to distribute the workload amongst the backup hosts.
Child job	For backup, a separate child job is created for each backup host to transfer data to the storage media.
Workload discovery file	During discovery, when the backup host communicates with the ARM Endpoint, a workload discovery file is created. The file contains information about the VMs and associated VHDs.
Parallel streams	The NetBackup parallel streaming framework allows multiple VMs to be backed up using multiple backup hosts simultaneously.

Table 1-1 NetBackup terminologies *(continued)*

Terminology	Definition
Backup host	The backup host acts as a proxy client. All the backup and restore operations are executed through the backup host. You can configure media servers, clients, or a master server as a backup host. The backup host is also used as destination client during restores.
BigData policy	The BigData policy is introduced to: ■ Specify the application type. ■ Allow backing up distributed multi-node environments. ■ Associate backup hosts. ■ Perform workload distribution.

Chapter 2

Installing and deploying Microsoft Azure Stack plug-in for NetBackup

This chapter includes the following topics:

About installing and deploying the Microsoft Azure plug-in

Table 2-1 Installing and deploying the Microsoft Azure plug-in

Task	Reference
Pre-requisites and requirements	See "Pre-requisites for installing the Microsoft Azure plug-in" on page 13.

Table 2-1 Installing and deploying the Microsoft Azure plug-in *(continued)*

Task	Reference
Downloading the Microsoft Azure Stack plug-in	See "Downloading the plug-in" on page 14.
Deploying NetBackup and installing the Microsoft Azure Stack plug-in	See "About deployment of NetBackup to protect Microsoft Azure Stack" on page 14. See "Installing the Microsoft Azure Stack plug-in" on page 15. See "Installing Microsoft Azure Stack plug-in on NetBackup Appliance" on page 15.

Pre-requisites for installing the Microsoft Azure plug-in

Ensure that the following pre-requisites are met before you install the Microsoft Azure plug-in:

- See "Operating system and platform compatibility" on page 13.
- See "License for Microsoft Azure Stack plug-in for NetBackup" on page 13.

Operating system and platform compatibility

For backup host (media server or NetBackup Appliance) as per your requirement:

- Red Hat Enterprise Linux (RHEL) 7.4 and later are supported

License for Microsoft Azure Stack plug-in for NetBackup

For the licensing requirements to run the backup and restore operations using the Microsoft Azure Stack plug-in for NetBackup, refer to the following page:

How to use NetBackup plug-ins and agents: download, install, and availability information

More information is available on how to add licenses.

See the NetBackup Administrator's Guide, Volume I

Downloading the plug-in

You can download the following Microsoft Azure Stack plug-in package for NetBackup from the Veritas Support site.

`NetBackup_PSFAzureStack_8.1.2_linuxR_x86.tar.gz`

To download the Microsoft Azure plug-in:

1. Go to https://www.veritas.com/support site.
2. Click **Licensing**. You are directed to the **Veritas Account Manager** page to access your Veritas account.
3. Enter your user credentials to access your Veritas account. You are directed to the *Veritas Entitlement Management System* site.
4. On the **Entitlements** menu, use your **Entitlement ID** to locate and download the following file for Microsoft Azure Stack plug-in for NetBackup.

   `NetBackup_PSFAzureStack_8.1.2_linuxR_x86.tar.gz`

   Alternatively, on the **Downloads** menu, locate

   `NetBackup_PSFAzureStack_8.1.2_linuxR_x86.tar.gz`

   The list of software or plug-in package that is available to download may vary across user accounts based on the entitlements within each account.
5. In the **Actions** column against the software or plug-in package you want to download, click **Download**.
6. Save the downloaded file in a local directory on the intended backup host.

About deployment of NetBackup to protect Microsoft Azure Stack

For the different ways of Microsoft Azure Stack deployment, ensure that you do the following steps:

- If you have deployed a multinode Microsoft Azure Stack cluster, you can deploy the NetBackup servers and the backup host outside your cluster and then configure the connection.
  See "*Configuring NetBackup and Microsoft Azure Stack*" on page 16.

Installing the Microsoft Azure Stack plug-in

You must install Microsoft Azure Stack plug-in on all the clients you want to use as backup host.

Note: Ensure that you have root privileges on the host where you will perform these operations.

To install Microsoft Azure Stack plug-in on a backup host

1. Copy the `NetBackup_PSFAzureStack_8.1.2_linuxR_x86.tar.gz` file to the `/` directory and extract the contents of the file.

   The following files are extracted on the backup host:

   - `NetBackup_PSFAzureStack_8.1.2_linuxR_x86/README`
   - `NetBackup_PSFAzureStack_8.1.2_linuxR_x86/install`
   - `NetBackup_PSFAzureStack_8.1.2_linuxR_x86/LICENSE`
   - `NetBackup_PSFAzureStack_8.1.2_linuxR_x86/pkg.tar`

2. Run the `./install` command.

   Note: Accept the Veritas license agreement to proceed with the installation.

   The following files are installed on the backup host:

   In the `/usr/openv/lib/psf-plugins/azurestack/` directory:

   - `libaapipgnazurestack.so`
   - `libazurestorage.so.4`
   - `libazurestoragewrapper.so`
   - `libcpprest.so.2.9`
   - `version.txt`

Installing Microsoft Azure Stack plug-in on NetBackup Appliance

You can deploy a signed RPM on NetBackup Appliance to install the Microsoft Azure Stack plug-in. You can then use NetBackup Appliance as a backup host.

Chapter 3

Configuring NetBackup and Microsoft Azure Stack

This chapter includes the following topics:

Overview of configuring NetBackup and Microsoft Azure Stack

The following table lists the steps for configuring NetBackup for Microsoft Azure Stack that are required for authentication:

Table 3-1 Steps for configuring NetBackup for Microsoft Azure Stack

Steps	Component	Details
1	Backup host	Create a backup host and whitelist a NetBackup client if you want to use it as a backup host. For more information, refer to: ■ See "Managing backup hosts" on page 18. ■ See "Whitelisting a backup host on NetBackup master server" on page 18.
2	Custom NetBackup role in Microsoft Azure Stack	Create a custom role in Microsoft Azure Stack for NetBackup to backup and restore VMs. For more information, refer to: See "Adding a Microsoft Azure Stack custom role to provide access permissions to NetBackup administrator" on page 19.
3	■ Microsoft Azure Stack credentials file ■ Microsoft Azure Stack plug-in configuration file	■ Create a file that contains the Azure stack credentials on the master server. See "Creating a file that contains Microsoft Azure Stack credentials" on page 25. ■ Configure the Microsoft Azure Stack plug-in using a configuration file and whitelist the configuration file path. For more information, refer to: ■ See "Configuring the Microsoft Azure plug-in using the `azurestack.conf` configuration file" on page 23. ■ See "Whitelisting the configuration file path on NetBackup master server" on page 24. ■ Add Microsoft Azure Stack credentials to NetBackup to establish communication and protect the data. For more information, refer to: See "Adding Microsoft Azure Stack credentials in NetBackup" on page 29.
4	BigData policy	Creating a BigData policy for Microsoft Azure Stack. For more information, refer to: See "Creating a BigData policy for Microsoft Azure Stack using the NetBackup Policies utility" on page 31.

Managing backup hosts

A backup host acts as a proxy client which hosts all the backup and restore operations for Microsoft Azure Stack. In case of Microsoft Azure Stack plug-in for NetBackup, backup host performs all the backup and restore operations without any separate agent installed on the Microsoft Azure Stack.

The backup host must be a RHEL 7.4 or later computer. NetBackup supports only the RHEL platform for a backup host.

Consider the following before adding a backup host:

- For backup operations, you can add one or more backup hosts.
- For restore operations, you can use only one backup host.
- A master, media, or client can perform the role of a backup host.

  Note: It is recommended that you use a NetBackup media server or a client as a backup host.

- Microsoft Azure Stack plug-in for NetBackup is installed on all the backup hosts.
- When using multiple backup host, make sure that all backup hosts are communicating with the media server.
- Azure Stack identity providers
  - For the Azure Active Directory (AAD) identity provider, all backup hosts require connectivity to https://login.microsoftonline.com, Azure Resource Manager endpoints, or Azure blob storage endpoints, which require ports 80 and 443 for communication.
  - For the Active Directory Federation Services (ADFS) identity provider, all backup hosts require connectivity to Azure Resource Manager endpoints, Azure blob storage endpoints, or ADFS endpoints, which require ports 80 and 443 for communication.

You can add a backup host while configuring **BigData** policy using the NetBackup Administration Console.

See “Creating a BigData policy for Microsoft Azure Stack using the NetBackup Policies utility” on page 31.

Whitelisting a backup host on NetBackup master server

To use the NetBackup client as a backup host, you must whitelist it. Perform the whitelisting procedure on the NetBackup master server .

Whitelisting is a security practice used for restricting systems from running software or applications unless these have been approved for safe execution.

To whitelist a backup host on NetBackup master server

- Run the following command on the NetBackup master server:
  - For UNIX

    ```
    bpsetconfig -h masterserver
    bpsetconfig> APP_PROXY_SERVER = clientname1.domain.org
    bpsetconfig> APP_PROXY_SERVER = clientname2.domain.org
    bpsetconfig>
    UNIX systems: <ctl-D>
    ```

  - For Windows

    ```
    bpsetconfig -h masterserver
    bpsetconfig> APP_PROXY_SERVER = clientname1.domain.org
    bpsetconfig> APP_PROXY_SERVER = clientname2.domain.org
    bpsetconfig>
    Windows systems: <ctl-Z>
    ```

This command sets the *APP_PROXY_SERVER = clientname* entry in the backup configuration (bp.conf) file.

For more information about the *APP_PROXY_SERVER = clientname*, refer to the *Configuration options for NetBackup clients* section in *NetBackup Administrator's Guide, Volume I*

Veritas NetBackup Documentation

Adding a Microsoft Azure Stack custom role to provide access permissions to NetBackup administrator

NetBackup requires access to Azure Stack subscriptions to protect them. You must create a custom user in Active Directory for NetBackup and grant the user the role to access the subscriptions. You can either give a co-owner role to the user or you can create a custom role with permissions that are required for backup and recovery. An Azure Stack administrator as a subscription owner can create the custom role for a subscription.

The minimum permissions that NetBackup requires are as follows:

- Microsoft.Compute/virtualMachines/*

- Microsoft.Network/networkInterfaces/*
- Microsoft.Network/networkSecurityGroups/join/action
- Microsoft.Network/networkSecurityGroups/read
- Microsoft.Network/publicIPAddresses/join/action
- Microsoft.Network/publicIPAddresses/read
- Microsoft.Network/publicIPAddresses/write
- Microsoft.Network/virtualNetworks/read
- Microsoft.Network/virtualNetworks/subnets/read
- Microsoft.Network/virtualNetworks/subnets/join/action
- Microsoft.Resources/subscriptions/resourceGroups/read
- Microsoft.Storage/storageAccounts/read
- Microsoft.Storage/storageAccounts/listKeys/action

To create a custom role, complete the following steps:

1

For Active Directory Federation Services (ADFS)	Create a user or service principal named `nbu_azst` in the Active Directory from the Active Directory Users and Computers dialog box from Microsoft Management Console.
For Microsoft Azure Active Directory (Azure AD)	Create the service principal from the Microsoft Azure Active Directory Users dialog box.

Complete the following steps on a Windows computer that has PowerShell for Azure Stack.

For more information, refer to https://docs.microsoft.com/en-us/azure/azure-stack/azure-stack-powershell-install.

2 Create a new text file `rbac_NBU_role.json` and add the following script in the file:

```
{
"Name": "NBU BnR Role",
"IsCustom": true,
"Description": "Let's you perform backup and recovery of VMs",
"Actions": [
"Microsoft.Compute/virtualMachines/*",
"Microsoft.Network/networkInterfaces/*",
"Microsoft.Network/networkSecurityGroups/join/action",
"Microsoft.Network/networkSecurityGroups/read",
"Microsoft.Network/publicIPAddresses/join/action",
"Microsoft.Network/publicIPAddresses/read",
"Microsoft.Network/publicIPAddresses/write",
"Microsoft.Network/virtualNetworks/read",
"Microsoft.Network/virtualNetworks/subnets/read",
"Microsoft.Network/virtualNetworks/subnets/join/action",
"Microsoft.Resources/subscriptions/resourceGroups/read",
"Microsoft.Storage/storageAccounts/read",
"Microsoft.Storage/storageAccounts/listKeys/action"
],
"NotActions": [],
"AssignableScopes": [
"/subscriptions/{subscription_ID_1}"
"/subscriptions/{subscription_ID_2}"
.
.
]
}
```

Note: Ensure that you add the required subscriptions under the `AssignableScopes` field so that the custom role is created with those subscriptions.

For example, in the file snippet, replace *subscription_ID_1* and *subscription_ID_2* with actual subscription IDs that you have.

3 Run the following commands:

- `Add-AzureRMEnvironment -Name AzureStackAdmin -ArmEndpoint "ArmEndpointValue"`

For example, `Add-AzureRMEnvironment -Name AzureStackAdmin -ArmEndpoint "https://management.local.azurestack.external"`

- `Add-AzureRmAccount -EnvironmentName "AzureStackAdmin"`
- `New-AzureRmRoleDefinition -InputFile "<directory_path>\rbac_NBU_role.json"`

You can use the following ARM endpoints:

- provider subscription
- tenant subscription

4 Open the Microsoft Azure Stack console and complete the following steps:

1. Click **Menu** and open the subscriptions that you want to protect with NetBackup. Click **Access Control (IAM)** > **Roles** to view the newly created role.

2. From **Subscriptions** > **Access Control (IAM)**, click **Add**. In the **Select Name** field add `nbu_azst` user (ADFS) or the display name of the service principal (AAD), in the **Type** field select **User**, and in the **Role** field select the newly added role.

5 Add the `nbu_azst` user or service principal to the `tpconfig` command to take backups.

See "Adding Microsoft Azure Stack credentials in NetBackup" on page 29.

Configuring the Microsoft Azure plug-in using the `azurestack.conf` configuration file

NetBackup master server uses the `azurestack.conf` file to save the configuration settings for communication with Microsoft Azure Stack.

You must create the `azurestack.conf` file in the `/usr/openv/var/global` directory.

Configuration definitions must be in the format of "attribute = value"; the single space before and after the '=' is required.

The options and values are case-sensitive.

Note: You must not provide a blank value for any of the parameters, or the backup job fails.

Here is a sample of the `azurestack.conf` file:

```
VM_STATE = Running
SNAPSHOT_RETRY_COUNT = <maximum_retries_count>
FETCH_STORAGE_KEYS = false
CA_FILE_PATH = //directory_path_system_CA_certificate/certificate_name.crt
SNAPSHOT_CLEANUP_MIN = 720
```

- The possible values for `VM_STATE` are `Running`, `Deallocated`, or `Stopped`.
- The value for `SNAPSHOT_RETRY_COUNT` specifies the maximum retries that can happen if a VM snapshot process fails. The value cannot exceed `3`.
- The value for `FETCH_STORAGE_KEYS` specifies whether the storage account with access key is required in the Azure Stack credentials file. The value can be either `true` or `false`. If the value is `true`, then you do not specify the storage account with access keys in the credential file.
- The value for `CA_FILE_PATH` is the directory path of the system CA certificate and the certificate name. For example, `/etc/pki/tls/certs/ca-bundle.crt`. This directory path is the default path for all system CA certificates.

Note: Do not add `VM_STATE` in the `azurestack.conf` file if you want to take a backup if all VMs.

Whitelisting the configuration file path on NetBackup master server

After you create the configuration file, you must whitelist the path of the configuration file so that NetBackup lets the backup operation to run successfully. Run the whitelisting procedure on a NetBackup master server.

Whitelisting is a security practice used for restricting systems from running software or applications unless these have been approved for safe execution.

To whitelist the configuration file path:

Run the following command on the NetBackup master server:

1. For UNIX:

   ```
   bpsetconfig -h masterserver_name
   bpsetconfig BPCD_WHITELIST_PATH = /usr/openv/var/global/
   ```

   Exit the command line

2. For Windows:

   ```
   bpsetconfig -h masterserver_name
   bpsetconfig BPCD_WHITELIST_PATH = <install_dir>\NetBackup\var\global\
   ```

   Exit the command line

For more information about `BPCD_WHITELIST_PATH`, see the *Configuration options for NetBackup servers section* in the *NetBackup Administrator's Guide, Volume I*.

Creating a file that contains Microsoft Azure Stack credentials

To communicate with Microsoft Azure Stack, the plug-in must have access to the Microsoft Azure Stack credentials. The credentials must be stored in a file on the NetBackup master server. The credentials are stored in an encrypted format and the plug-in securely accesses the information.

To create a file with the Microsoft Azure Stack credentials on the master server:

- At any location on the master server, created a file with a JSON format. For example, you can create a file named `azurestack.creds` in the `/usr/openv/var/global/` directory.
- Open the file and add the following content:

```
{
"IdentityProvider":"ADFS",
"TenantId":"tenant.domain.com",
"ClientId":"1950a258-227b-4e31-a9cf-717495945fc2",
"ClientSecret":"client_secret",
"AuthResource":
"https://management.adfs.azurestack.local/metadata/a6ad92e4-5b80-4c88-b84f-a7f25c12ba27",
"teststorageac1":
"9ghIt35bQeSvjZxXUPj8LinMs6aXPb2tMFjXVIG6N2v2FO6LRg+HzLz2LX1xR/qRkQYwNPIaE/v+QnUovzaKpQ==",
"rg1disks540":
"R6Lu3buXZ4HVtRTrNEHzzJqo2gShjQytfjX1hRkvfqMVWnvKWmEt2CUfmhlbxI7JCE0Gh5TKA9r3I88eit2FdA==",
"StorageAccount3":"asasdlfkjaasdfasdfasdfasdf09sd8fhaopisdfbanpsdf98asdfpusadf====",
"StorageAccount11":"90asdfasdfasdfasd-98fha-sdf98asdb-fau9bsdf-auy8svfasd==",
"StorageAccount19":"90asdfasdfasdfasd-98fha-sdf98asdb-fau9bsdf-auy8svfasd==",
"StorageAccount121":"90asdfasdfasdfasd-98fha-sdf98asdb-fau9bsdf-auy8svfasd==",
"StorageAccount13":"90asdfasdfasdfasd-98fha-sdf98asdb-fau9bsdf-auy8svfasd==",
"StorageAccount14":"90asdfasdfasdfasd-98fha-sdf98asdb-fau9bsdf-auy8svfasd==",
"StorageAccount12":"90asdfasdfasdfasd-98fha-sdf98asdb-fau9bsdf-auy8svfasd=="
...
}
```

Note: The `StorageAccount` details are not listed if `FETCH_STORAGE_KEYS = false`.

Option	Identity Provider	Description
`IdentityProvider`	`AAD` and `ADFS`	Values can be either `ADFS` (Active Directory Federation Services) or `AAD` (Azure Active Directory).
`TenantId`	`AAD`	Value is the tenant domain. For example, "*tenant.onmicrosoft.com*". See the section called “Obtaining the `TenantId` value for AAD” on page 27.
`ClientId`	`ADFS`	Value is *1950a258-227b-4e31-a9cf-717495945fc2*.
	`AAD`	Value is the application ID of the service principal that has the NetBackup backup and recovery role for the subscriptions that NetBackup must protect. See the section called “Obtaining the `ClientId` value for AAD” on page 27.
`ClientSecret`	`AAD`	Value is the client secret of the service principal that has the NetBackup backup and recovery role for the subscriptions that NetBackup must protect. See the section called “Obtaining the `ClientSecret` value for AAD” on page 27.

Option	Identity Provider	Description
AuthResource	AAD and ADFS	Value of the key audiences that is obtained by opening the following URL in a web browser: https://managment.{*region*}.{*azurestackFQDN*}/metadata/endpoints?api-version=2015-01-01 For example: *https://management.eng.azurestack.veritas.com/metadata/endpoints?api-version=2015-01-01* The URL returns a JSON value that is the value of the key audiences.
StorageAccount	AAD and ADFS	The storage account with the access key. If the value of fetchStorageKeys in the azurestack.conf file is *false*, then you must add this option.

Obtaining the TenantId value for AAD

1. Sign in to https://portal.azure.com.
2. Open **Azure Active Directory** > **Properties** and locate the **Directory ID** that is the TenantId.

Obtaining the ClientId value for AAD

To obtain the ClientId value, you must create a new service principal or use an existing service principal.

1. Sign in to https://portal.azure.com.
2. Open **Azure Active Directory** > **App registrations**.
3. In the **Search by name or AppID** field, search for *NBU-ASTK-1* and click the service principal **Display Name** in the results.
4. Use any of the following steps to get the ClientID:
   - Open **Settings** and locate and copy **Application ID** that is the ClientId.
   - Open **Properties** and locate and copy **Application ID** that is the ClientId.

Obtaining the ClientSecret value for AAD

To obtain the ClientSecret value, you must create a new service principal or use an existing service principal.

1. Sign in to https://portal.azure.com.
2. Open **Azure Active Directory** > **App registrations** > **New application registration**.

3. Create an application with the **Name** as *NBU-ASTK-1*.

   Select the **Application Type** as **Web App / API**.

   Enter the **Sign-on URL** as *https://astk.nbu.com*.

   Click **Create**.
4. Open **Azure Active Directory** > **App registrations**.
5. In the **Search by name or AppID** field, search for *NBU-ASTK-1* and click the service principal **Display Name** in the results.
6. Open **Settings** > **Keys** and add a new password information as follows and then save:

   Description: *Credential_1*

   Expires: *Never*

   Value: *seedvalue_1*
7. **Value** displayed is the `ClientSecret`. The value is displayed only once. If you close the window, the value is not displayed again.

Configuring proxy settings for communication with Microsoft Azure Stack

If your network requires proxy settings so that the backup hosts can connect to the Internet, use any of the following methods:

- Use standard environment variable (simple configuration) `https_proxy` to specify the proxy URL, port number, username, and password in the following format:
  `https_proxy=https://USERNAME:PASSWORD@PROXYIP_HOSTNAME:PROXYPORT`
- If you require a different proxy for the NetBackup Azure Stack plug-in or you do not want to use the `https_proxy` variable, then you can add the following proxy details in the credentials file:

Key	Description
`InternetProxyUrl`	Specify the proxy URL and port number to connect to the AAD authentication service and to `login.microsoftonline.com` over the internet. For example, `https://myproxyInternet.com:8000`.
`InternetProxyUsername`	Specify the username to authenticate the proxy internet URL, if required.

Key	Description
`InternetProxyPassword`	Specify the username to authenticate the proxy internet URL, if required.
`IntranetProxyUrl`	Specify the proxy URL and port number to connect to the Azure Stack ARM endpoint or blob service endpoint. For example, `https://myproxyInternet.com:8000`.
`IntranetProxyUsername`	Specify the username to authenticate the proxy intranet URL, if required.
`IntranetProxyPassword`	Specify the username to authenticate the proxy intranet URL, if required.

```
{
"IdentityProvider":"AAD",
"TenantId":"tenant.domain.com",
"ClientId":"1950a007-227b-4e31-a9cf-717495945fc2",
"ClientSecret":"client_secret",
"AuthResource": "https://management.adfs.azurestack.local/metadata/
a6ad92e4-5b80-4c88-b055-a7f25c12ba27",
"InternetProxyUrl":"proxy.domain.com:8080",
"InternetProxyUsrename":"myusername",
"InternetProxyPassword":"mypassword"
}
```

Adding Microsoft Azure Stack credentials in NetBackup

To establish a seamless communication between Microsoft Azure Stack clusters and NetBackup for successful backup and restore operations, you must add and update Microsoft Azure Stack credentials to the NetBackup master server.

Use the `tpconfig` command to add credentials in NetBackup master server.

For more information about the `tpconfig` command, see the NetBackup Commands Reference Guide.

To add credentials in NetBackup

1. Run `tpconfig` command from the following directory paths:

   On UNIX systems, `/usr/openv/volmgr/bin/`

2. Run the following command by providing appropriate values for each parameter to add Microsoft Azure Stack credentials:

   ```
   tpconfig -add -application_server_user_id user_ID
   -application_type application_type -application_server
   application_server_name -password password_of_the_nbu_azst_user
   -application_server_conf "/usr/<file_path>/azurestack.creds"
   ```

   - For AAD, NetBackup uses `clientID` and `clientSecret`, so enter the value for `-application_server_user_id` as `dummy` and `-password` as "`dummy`.

   Note: The user you want to add must have co-owner permissions to the subscription you want to protect.

   For example,

   ```
   tpconfig -add -application_server_user_id example_user_ID
   -application_type azurestack -application_server
   application_server_name -password password_of_the_nbu_azst_user
   -application_server_conf "/usr/openv/var/global/azurestack.creds"
   ```

   Here, the numeric value 8 can also be specified for the `-application_type` parameter that corresponds to Microsoft Azure Stack .

3. Run the `tpconfig -dappservers` command to verify if the NetBackup master server has the Azure credentials added.

   For example, here is a sample output:

```
Application Server Host Name:        management.local.azurestack.external
Application Server Type:             azurestack
Required Port:                       0
User of Application Host:            root
```

4. After you use `tpconfig` to add the credentials, you can delete the credentials file from the */usr/<file_path>/azurestack.creds* location.

5. Run the following command to update or delete the `tpconfig` credentials:

   - Delete

```
tpconfig -delete -application_server_user_id user_ID
-application_type application_type -application_server
application_server_name -password password_of_the_nbu_azst_user
-application_server_conf "/usr/<file_path>/azurestack.creds"
```

- Update
  To change the attributes or options in the credentials file, update the credentials and then use the `tpconfig -update` command.

```
tpconfig -update -application_server_user_id user_ID
-application_type application_type -application_server
application_server_name -password password_of_the_nbu_azst_user
-application_server_conf "/usr/<file_path>/azurestack.creds"
```

Creating a BigData policy for Microsoft Azure Stack using the NetBackup Policies utility

Use the following procedure to create a BigData policy with the NetBackup Policies utility.

To create a BigData policy with the NetBackup Policies utility

1. In the **NetBackup Administration Console**, in the left pane, expand **NetBackup Management > Policies**.
2. On the **Actions** menu, click **New > Policy**.
3. Type a unique name for the new policy in the **Add a New Policy** dialog box.

   Click **OK**.
4. On the **Attributes** tab, select **BigData** as the policy type.
5. On the **Attributes** tab, select the storage unit for BigData policy type.
6. On the **Schedules** tab, click **New** to create a new schedule.

   You can create a schedule for a **Full Backup** for your BigData policy. Once you set the schedule, Microsoft Azure data is backed up automatically as per the set schedule without any further user intervention.
7. On the **Clients** tab, enter the IP address or the host name of the ARM Endpoint.

   You can add the following ARM Endpoints:

   - Provider subscription
   - Tenant subscription
8. On the **Backup Selections** tab, enter the following parameters and their values as shown:

- *Application_Type=azurestack*
  The parameter values are case-sensitive.
- *Backup_Host=IP_address or FQDN*
  You can specify multiple backup hosts.
- Specify assets to backup
  - For all the VMs in a subscription: */Subscription ID*
  - For all the VMS in a resource group: */Subscription ID/Resource Group*
  - For a single VM: */Subscription ID/Resoutrce Group/VM Name*

  Note: The directory or folder specified for backup selection while defining BigData Policy with Application_Type = azurestack must not contain space or comma in their names.

9 Click **OK** to save the changes.

Chapter 4

Performing backups and restores of Microsoft Azure Stack

This chapter includes the following topics:

About backing up Microsoft Azure virtual machines

You can either schedule a backup job or run a backup job manually. See, NetBackup Administrator's Guide, Volume I

For overview of the backup process, See "Backing up Microsoft Azure Stack VMs" on page 8.

The backup process comprises of the following stages:

1. Pre-processing: In the pre-processing stage, the first backup host that you have configured with the BigData policy, triggers the discovery. At this stage, the VMs and associated metadata is discovered for backup.
2. Data transfer: During the data transfer process, one child job is created for each backup host.

About restoring Microsoft Azure Stack virtual machines

Use the **NetBackup, Backup, Archive, and Restore** console to manage restore operations.

Table 4-1 Restoring Microsoft Azure data

Task	Reference
Understanding the restore process	See "Restoring Microsoft Azure Stack VMs" on page 9.
Understanding the restore scenarios	See "About the restore scenarios for Microsoft Azure Stack VMs from the BAR interface" on page 35. See "Considerations for Microsoft Azure Stack VM restore and recovery" on page 36.
Restoring Microsoft Azure Stack VM at the same location	■ Restore Wizard See "Using the BAR interface to restore an Microsoft Azure Stack VM at the same location" on page 37. ■ Command line interface See "Using the `bprestore` command to restore Microsoft Azure Stack VM at the same location" on page 38.
Restoring Microsoft Azure Stack VM to an alternate location	■ Restore Wizard See "Using the BAR interface to restore an Microsoft Azure Stack VM with modified metadata at an alternate location " on page 40. ■ Command line interface See "Using the `bprestore` command to restore Microsoft Azure VM with modified metadata and an alternate location" on page 43.

About the restore scenarios for Microsoft Azure Stack VMs from the BAR interface

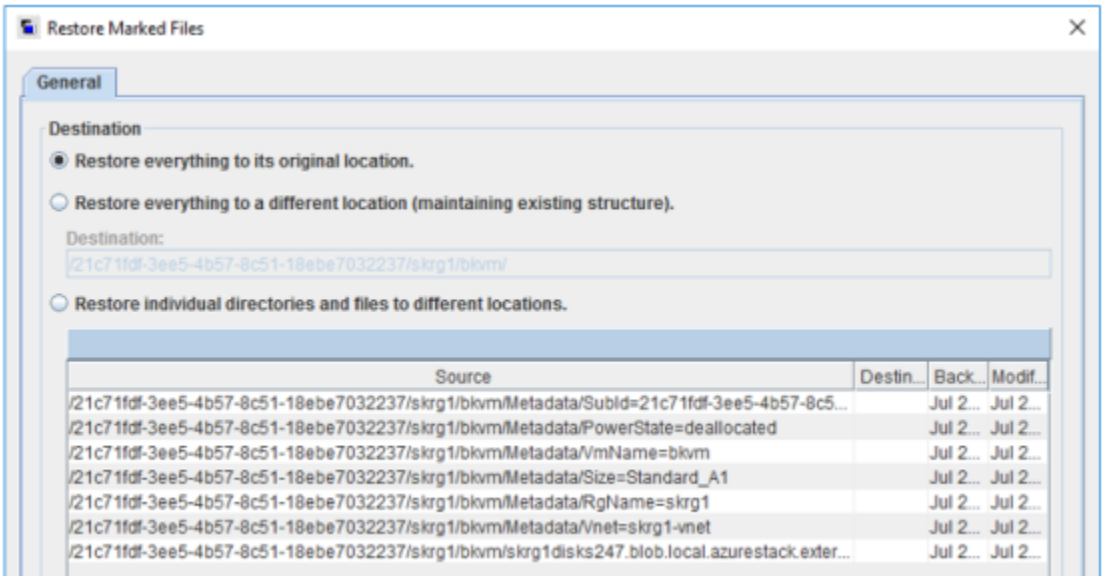
For restoring Microsoft Azure Stack VMs from the **Backup, Archive, and Restore** interface, the following scenarios are possible:

Table 4-2 Options for VM restore

Scenario	Option from the Restore Marked Files dialog box
Restore the Microsoft Azure Stack VM with the existing configuration to the same location (subscription ID and resource group)	**Restore everything to its original location.**
Restore the Microsoft Azure Stack VM with the existing configuration to an alternate location (subscription ID and resource group) **Note:** When you select this option, it is recommended that you only change the `VMName` attribute.	**Restore everything to a different location (maintaining existing structure).**
Restore the Microsoft Azure Stack VM with modified configuration (includes VM metadata and location)	**Restore individual directories and files to different locations.**

The options are available after you enter the details in the **Backup, Archive, and Restore** interface and proceed to the **Restore Marked Files** dialog box.

Figure 4-1 Restore options from the Restore Marked Files dialog box



Considerations for Microsoft Azure Stack VM restore and recovery

- NetBackup triggers the VM data restore process and if the operation is successful, NetBackup displays the status as successful. Use the Azure Stack portal to monitor the VM creation process.
- If a VM recovery operation fails, you must remove the resources that are created during the restore manually. The resources can include IP address, NIC, OS, and Data disks.
- You cannot restore a VM with the same name to its original location if the VM still exists.
- To recover a VM, the NetBackup role must have access to the specified subscription and resource group.
- NetBackup can recover the following VM properties:
  - Tags
  - OS Diagnostic Settings
- For any other properties or configuration settings, you must apply them manually after the recovery is done.

- During a recovery, the host name does not change and it remains the same as the backed-up VM. You must log on to the VM and use the OS commands to change the host name.
- When you restore at the original location, a new network configuration is created. One NIC is created and is attached to that virtual network to which the VM was connected during the backup. This step results in the change of the MAC and IP addresses.
- When you want to update the configuration during a VM recovery operation, you must select the option to change the `VMName`.
- When you want to update the configuration during a VM recovery operation, you can specify the resource group or networks security group that belong to a different resource group than the VM as follows:

  `Vnet=<ResourceGroup_Name>/<virtual_network_Name>`
  `Nsg=<ResourceGroup_Name>/<NetworkSecurityGroup_Name>`

  If *`ResourceGroup_Name`* is not specified and the virtual network or `NetworkSecurityGroup` name is same as the backed-up VM, virtual network or `NetworkSecurityGroup` of the backup time is used during the recovery operation. Otherwise, the specified virtual network is considered to be present in the same resource group as the VM.

Using the BAR interface to restore an Microsoft Azure Stack VM at the same location

This topic describes how to use the NetBackup Admin console's BAR interface to restore Microsoft Azure Stack on the same Microsoft Azure Stack.

To use the NetBackup Admin console's BAR interface to perform a restore

1. Open the **Backup, Archive, and Restore** interface.
2. On the **Specify NetBackup Machines and Policy Type** wizard, enter the source and destination details for restore.
   - Specify the Microsoft Azure Application Endpoint as the source for which you want to perform the restore operation.
     From the **Source client for restores** list, select the required Application server.
   - Specify the backup host as the destination client.
     From the **Destination client for restores** list, select the required backup host. Restore is faster if the backup host is the media server that had backed up the VM.

- On the **Specify NetBackup Machines and Policy Type** wizard, enter the policy type details for restore.
  From the **Policy type for restores** list, choose **BigData** as the policy type for restore.
  Click **Ok**.

3. Select the appropriate date range to restore the complete data set.
4. In the **Browse** directory, specify the root directory (“/”) as the path to browse.
5. From the File menu (Windows) or Actions menu (UNIX), choose **Specify NetBackup Machines and Policy Type**.
6. Go to the **Backup History** and select the backup images that you want to restore.
7. In the **Directory Structure** pane, expand the **Directory**.
   All the subsequent files and folders under the directory are displayed in the **Contents of Selected Directory** pane.
8. In the **Contents of Selected Directory** pane, select the check box for the Microsoft Azure VMs that you want to restore.
9. Click **Restore**.
10. In the **Restore Marked Files** dialog box, select the destination for restore as per your requirement.
    - Select **Restore everything to its original location** to restore your files to the same location where you performed your backup.

Note: For more information about the restore scenarios, See “About the restore scenarios for Microsoft Azure Stack VMs from the BAR interface” on page 35.

---

11. Click **Start Restore**.
12. Verify that the VM gets restored and instantiated.

Using the `bprestore` command to restore Microsoft Azure Stack VM at the same location

You can use the `bprestore` command to restore a Microsoft Azure Stack VM in the same resource group.

The `bprestore` command lets you restore a backed up or archived file or list of files. You can also name directories to restore. If you include a directory name, `bprestore` restores all files and subdirectories of that directory.

You can exclude a file or a directory path that was previously included in the restore by placing an exclamation mark (!) in front of the file or the directory path (does not apply to NDMP restores). For example, the exclude capability is useful if you want to exclude part of a directory from the restore.

To restore Microsoft Azure data on the same location as your backup location

1. Log on as an Administrator or root user based on windows or UNIX system respectively.
2. Run the following command on the NetBackup master server by providing appropriate values:

   `bprestore -S master_server -D backup_host-C client -t 44 -L progress log -f listfile | filenames "/subscription ID/resource group/VmName"`

   Where,

   `-S master_server`

   Specifies the name of the NetBackup master server.

   `-D backup host`

   Specifies the name of the backup host.

   `-C client`

   Specifies a configuration server as a source to use for finding backups or archives from which to restore files. This name must be as it appears in the NetBackup catalog.

   `-f listfile`

   Specifies a file (`listfile`) that contains a list of files to be restored and can be used instead of the file names option (`filenames`). In `listfile`, list each file path must be on a separate line.

   `-L progress_log`

   Specifies the name of whitelisted file path in which to write progress information.

   `-t 44`

   Specifies BigData as the policy type.

   `"/subscription ID/resource group/VmName"`

   Specifies the Microsoft Azure Stack VM that you want to restore.

Using the BAR interface to restore an Microsoft Azure Stack VM with modified metadata at an alternate location

NetBackup lets you restore Microsoft Azure Stack VM to another resource group or modify the VM metadata and restore to the same resource group. This type of restore method is also referred to as redirected restores.

This topic describes how to use the NetBackup Admin console's BAR interface to restore an Microsoft Azure Stack VM with modified metadata at an alternate location or another resource group on Microsoft Azure Stack.

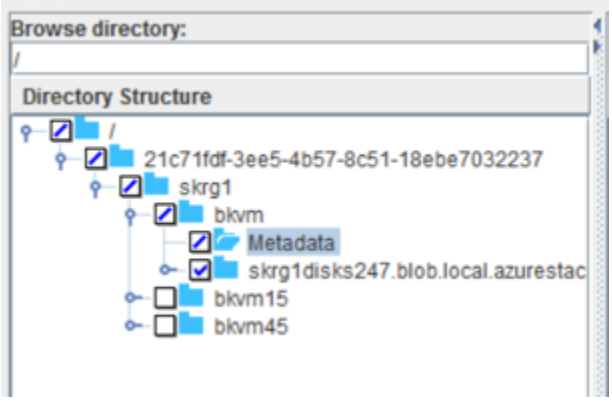
To use the NetBackup Admin console's BAR interface to perform a restore

1. Open the **Backup, Archive, and Restore** interface.
2. On the **Specify NetBackup Machines and Policy Type** wizard, enter the source and destination details for restore.
   - Specify the Microsoft Azure Application Endpoint as the source for which you want to perform the restore operation.
     From the **Source client for restores** list, select the required Application server.
   - Specify the backup host as the destination client.
     From the **Destination client for restores** list, select the required backup host.
   - On the **Specify NetBackup Machines and Policy Type** wizard, enter the policy type details for restore.
     From the **Policy type for restores** list, choose **BigData** as the policy type for restore.
     Click **Ok**.
3. Select the appropriate date range to restore the complete data set.
4. In the **Browse** directory, specify the root directory (“/”) as the path to browse.
5. From the File menu (Windows) or Actions menu (UNIX), choose **Specify NetBackup Machines and Policy Type**.
6. Go to the **Backup History** and select the backup images that you want to restore.
7. In the **Directory Structure** pane, expand the **Directory**.

   All the subsequent files and folders under the directory are displayed in the **Contents of Selected Directory** pane.

8 Select the VM that you want to restore. Ensure that the storage account directories are selected.

For example:



9 Click the selected **Metadata** directory, and in the **Contents of Selected Directory** pane, select the metadata that you want to modify.

You can modify the following metadata:

Metadata or property	Description	Default value	Valid Value
VmName	Name of the VM.	Name of the VM during backup.	Valid VM Name that is unique in the resource group.
PowerState	State of the VM after restore.	`Running`	`Poweroff`, `Deallocate`, or `Running`
VMSize	Size of the VM in the Microsoft Azure Stack recommended format. The new VM size must be part of your subscription. For more information, refer to Azure Stack VM Sizes.	Size of the VM during backup.	VM size that the target subscription ID supports.
Vnet	The virtual network that contains the VM.	*`ResourceGroup_Name`*`-vnet`	Virtual network in the target resource group.
RgName	Location or the resource group of the Microsoft Azure Stack VM.	Resource Group of the VM during backup.	Resource group that is a part of the target subscription.
Storage Account	The storage account that contains the VMs.	Storage account of the VM during backup.	Valid storage account that is a part of the target subscription.
SubId	Microsoft Azure Stack subscription ID.	Subscription ID of the VM during backup.	Subscription ID that a NetBackup role can access.

You must select the **VmName** metadata even if do not plan to change the name.

10 Click **Restore**.

11 In the **Restore Marked Files** dialog box, select **Restore individual directories and files to different locations.**.

Note: For more information about the restore scenarios, See "About the restore scenarios for Microsoft Azure Stack VMs from the BAR interface" on page 35.

For every metadata value that you want to change, select the value, click **Change Selected Destination(s)**, and in the **Destination** field modify the metadata value at the end of the URL.

For example, if you want to change the `VmName`, change:

`/21c71fdf-3ee5-4b57-8c51-18ebe7032237/SKRG/MSvm15/Metadata/VmName=`*`OldVmName`*

to

`/21c71fdf-3ee5-4b57-8c51-18ebe7032237/SKRG/MSvm15/Metadata/VmName=`*`NewVmName`*

Here, `VMName` is the key and *`OldVmName`* is the value. The metadata and its value have the `Key=Value` format. You must modify the value of all the metadata that you want to change.

Note: For the VM size metadata, specify the modified value in the Microsoft Azure Stack recommended format. The new VM size must be part of your subscription.

For more information, refer to https://docs.microsoft.com/en-us/azure/azure-stack/user/azure-stack-vm-sizes.

---

12 Click **Start Restore**.

13 Use the **Azure Stack Admin Portal** to view the VM creation process.

Using the `bprestore` command to restore Microsoft Azure VM with modified metadata and an alternate location

NetBackup lets you restore Microsoft Azure Stack data to another resource group and modify the metadata. This type of restore method is also referred to as redirected restores.

To perform redirected restore for Microsoft Azure

1 Modify the values for *rename_file* and *listfile* as follows:

Parameter	Value

rename_file	For example, to update the `VmName` metadata, add:
	change
	`/21c71fdf-3ee5-4b57-8c51-18ebe7032237/SKRG/MSvm15/Metadata/VmName=OldVmName`
	to
	`/21c71fdf-3ee5-4b57-8c51-18ebe7032237/SKRG/MSvm15/Metadata/VmName=NewVmName`
	To change the power state of the VM, add:
	change
	`/21c71fdf-3ee5-4b57-8c51-18ebe7032237/SKRG/MSvm15/Metadata/PowerState=running`
	to
	`/21c71fdf-3ee5-4b57-8c51-18ebe7032237/SKRG/MSvm15/Metadata/PowerState=deallocate`
	The file paths must start with / (slash).
	Add a new entry for all the metadata options that you want to modify.
	Note: For the VM size metadata, specify the modified value in the Microsoft Azure Stack recommended format. The new VM size must be part of your subscription.
	For more information, refer to Virtual machine sizes supported in Azure Stack.

listfile	List of all the Microsoft Azure files to be restored

2 Run the following command on the NetBackup master server using the modified values for the mentioned parameters in step 1.

```
bprestore -S master_server -D backup_host-C client -R rename_file
-t 44 -L progress log -f listfile | filenames "/subscription
ID/resource group/VmName"
```

Where,

`-S master_server`

Specifies the name of the NetBackup master server.

`-D backup_host`

Specifies the name of the backup host.

`-C client`

Specifies a configuration server as a source to use for finding backups or archives from which to restore files. This name must be as it appears in the NetBackup catalog.

`-f listfile`

Specifies a file (`listfile`) that contains a list of files to be restored and can be used instead of the file names option (`filenames`). In `listfile`, list each file path must be on a separate line.

`-L progress_log`

Specifies the name of whitelisted file path in which to write progress information.

`-t 44`

Specifies BigData as the policy type.

`-R rename_file`

Specifies the name of a file with name changes for alternate-path restores.

"*/subscription ID/resource group/VmName*"

Specifies the Microsoft Azure Stack VM that you want to restore with modified metadata or at a different location.

Note: Ensure that you have whitelisted all the file paths such as `<rename_file_path>`, `<progress_log_path>` that are already not included as a part of NetBackup install path.

For example, to change the restore location of a VM, you can run the following command:

```
bprestore.exe -S master_server_01 -D backup_host_01 -C
configuration_server_01 -t 44 -L "<install_dir>\logs\restore.log"
-R "<install_dir>\renam_file_path\restore.chg"
"/21c71fdf-3ee5-4b57-8c51-18ebe7032237/skrg1/bkvm15"
```

Here, */21c71fdf-3ee5-4b57-8c51-18ebe7032237/skrg1/bkvm15* stands for `subscription ID/resource group/VmName`.

Chapter 5

Troubleshooting

This chapter includes the following topics:

About NetBackup for Microsoft Azure debug logging

NetBackup maintains process-specific logs for the various processes that are involved in the backup and restore operations. Examining these logs can help you to find the root cause of an issue.

These log folders must already exist in order for logging to occur. If these folders do not exist, you must create them.

The log folders reside on the following directories

- On Windows: `install_path\NetBackup\logs`
- On UNIX or Linux: `/usr/openv/netbackup/logs`

Table 5-1 NetBackup logs related to Microsoft Azure

Log Folder	Messages related to	Logs reside on
`install_path/NetBackup/logs/bpVMutil`	Policy configuration	Master server
`install_path/NetBackup/logs/nbaapidiscv`	BigData framework, discovery, and Microsoft Azure configuration file logs	Backup host
`install_path/NetBackup/logs/bpbrm`	Policy validation, backup, and restore operations	Media server
`install_path/NetBackup/logs/bpbkar`	Backup	Backup host
`install_path/NetBackup/logs/tar`	Restore and Microsoft Azure configuration file	Backup host

For more details, refer to the NetBackup Logging Reference Guide.

Backup fails with error 6662

Backup fails with the following error:

```
(6662) Unable to find the configuration file.
```

Workaround:

Ensure that you have created a credential file, whitelisted the path to the file, and the file path is specified in the `tpconfig` command.

See “Adding Microsoft Azure Stack credentials in NetBackup” on page 29.

Backup fails with error 6661

Backup fails with the following error:

```
(6661) Unable to find the configuration parameter.
```

Workaround:

Verify that the right configuration options are added in the credential file that is specified in the `tpconfig` command.

See "Adding Microsoft Azure Stack credentials in NetBackup" on page 29.

Backup fails with error 6646

Backup fails with the following error:

```
(6646) Unable to communicate with the server.
```

Workaround:

Run the backup operation again. The error might be because of the Azure Stack being overloaded.

Backup fails with error 6629

Backup fails with the following error:

```
(6629) Unable to complete the operation. Failed to authorize
the user or the server.
```

Workaround:

- Validate the configuration options and the values in the credential file.
- Verify the values when you run the `./tpconfig -dappservers` command.
- Verify the values for the Azure Stack user name and password.

See "Adding Microsoft Azure Stack credentials in NetBackup" on page 29.

Backup fails with error 6626

Backup fails with the following error:

```
(6626) The server name is invalid.
```

Workaround:

Verify the name of the ARM endpoint.

Backup fails with error 6630

Backup fails with the following error:

```
(6630) Unable to process the request because the server resources
are either busy or unavailable. Retry the operation.
```

Workaround:

- Verify the value of the backup selection from the Azure Stack portal.
- Verify the values of the `AuthResource` in the credentials file for the backup selection.
- Verify that you have added the appropriate ARM endpoint in the backup policy and the credentials file for the backup selection.
- Ensure that you have created a custom role for your Azure Stack subscription.

Run the `tpconfig -update` command after you make changes to the credential file.

See "Adding Microsoft Azure Stack credentials in NetBackup" on page 29.

Restore fails with error 2850

Restore fails with the following error:

```
(2850) Restore error.
```

Workaround:

Specify a valid and supported VM size.

Backup fails with error 1

Backup fails with the following error:

```
(1) The requested operation was partially successful.
```

The error details also describe the VHDs that are not backed up.

Workaround:

Ensure that the following parameters are configured properly:

- If FETCH_STORAGE_KEYS=true, ensure that the NetBackup administrator has permissions for fetching and accessing storage account and access keys for Azure Stack.

- If FETCH_STORAGE_KEYS=false, ensure that you have added required storage accounts with the access keys in the credential file.
  Run the `tpconfig -update` command after you make changes to the credential file.

See "Adding a Microsoft Azure Stack custom role to provide access permissions to NetBackup administrator" on page 19.

See "Adding Microsoft Azure Stack credentials in NetBackup" on page 29.

Adding Azure Stack credentials to NetBackup fails with error 9101

This error occurs if there is a conflict in the double quotes format provided for the file path in the `tpconfig` command.

For example, `application_server_conf "/usr/openv/var/global/azure.conf"`

Workaround:

Specify the file path without double quotes or enter the double quotes manually in the command prompt.

See "Adding Microsoft Azure Stack credentials in NetBackup" on page 29.

Adding Azure Stack credentials to NetBackup fails with error 7610

This error occurs when there is a formatting error in the credentials file.

Workaround:

Check the syntax or formatting in the credentials file.

Run the `tpconfig -update` command after you make changes to the credential file.

See "Adding Microsoft Azure Stack credentials in NetBackup" on page 29.

Known limitations for Microsoft Azure protection using NetBackup

The following table lists the known limitations for Microsoft Azure protection using NetBackup:

Table 5-2 Known limitations

Limitation	Workaround