Storage

User's Guide

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CHAPTER 1

About Storage

Storage is a software-defined storage optimized for storing large amounts of data. It provides data redundancy (replication and erasure coding), high availability, self-healing, and storage sharing.

1.1 Supported Storage Types

Your service provider can configure Storage to keep your data in three storage types:

- S3 object storage for storing an unlimited number of files.
- iSCSI block storage for virtualization, databases, and other needs.
- NFS shares.

The following sections describe the ways to access data in Storage in detail.

CHAPTER 2

Accessing Storage S3 Buckets

To access Storage S3, get the following information (credentials) from your system administrator:

- User panel IP address
- DNS name of the S3 endpoint
- Access key ID
- Secret access key

Storage S3 allows you to access your data in several ways:

- Via Storage user panel
- Via a third-party S3 application like Cyberduck, Mountain Duck,Backup Exec, etc

This sections describes how to use the aforementioned applications to access data in S3.

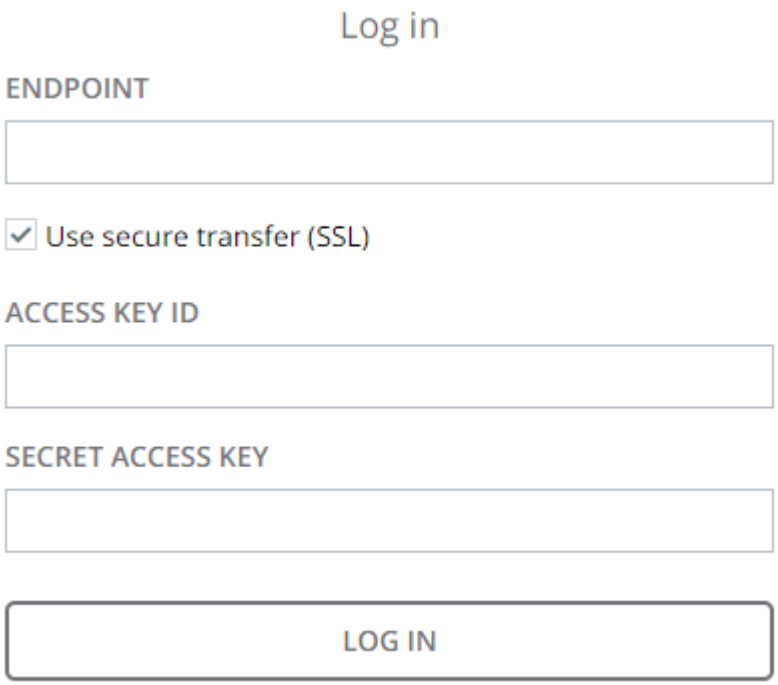
2.1 Managing Buckets via Storage User Panel

This section describes how to manage buckets and their contents using Storage user panel.

2.1.1 Logging in to the User Panel

To log in to the Storage user panel, do the following:

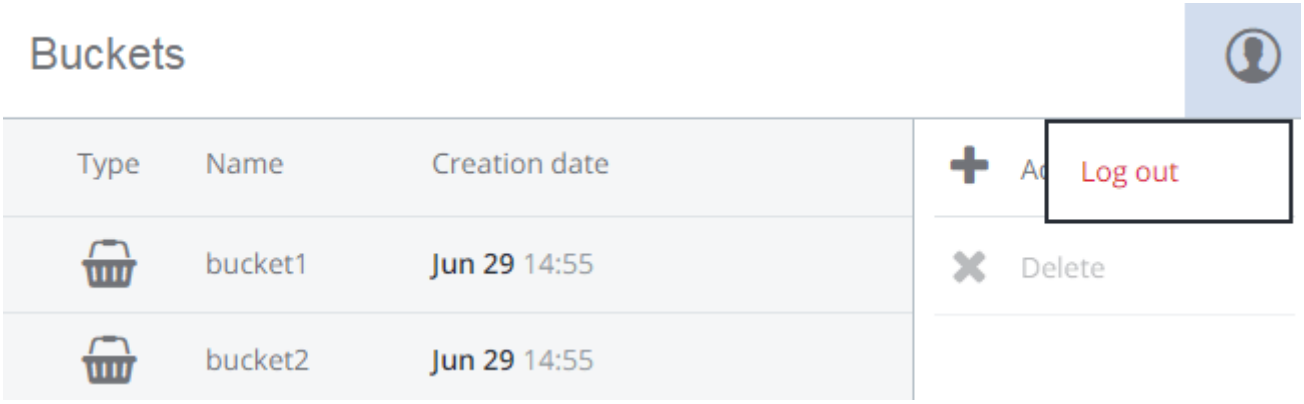
1. On any computer with access to the web interface, in a web browser visit `http://<user_panel_IP_address>:8888/s3/`.



2. On the Storage login screen, enter your credentials in the corresponding fields and click **LOG IN**.

Once you log in to the web interface, you will see the **Buckets** screen with the list of your buckets. From here, you can manage buckets as well as folders and files stored inside the buckets.

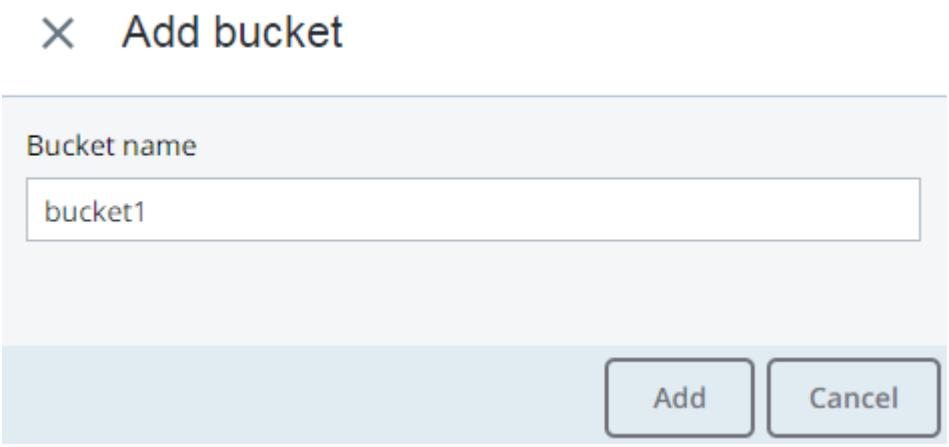
To log out, click the user icon in the upper right corner of any screen and click **Log out**.



2.1.2 Adding, Deleting, and Listing Buckets

On the **Buckets** screen:

- To add a new bucket, click **Add bucket**, specify a name, and click **Add**.



Use bucket names that comply with DNS naming conventions. For more information on bucket naming, see *Bucket and Key Naming Policies* on page 20.

- To delete a bucket, select it and click **Delete**.
- To list bucket contents, click a bucket name in the list.

2.1.2.1 Listing Bucket Contents in a Web Browser

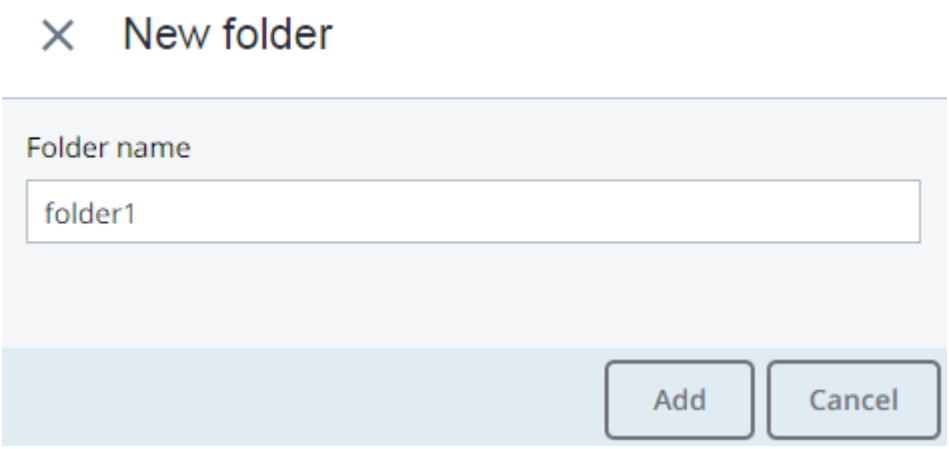
You can list bucket contents with a web browser. To do this, visit the URL that consists of the external DNS name for the S3 endpoint that you specified when creating the S3 cluster and the bucket name. For example, `mys3storage.example.com/mybucket`.

Note: You can also copy the link to bucket contents by right-clicking it in CyberDuck, and then selecting **Copy URL**.

2.1.3 Creating, Deleting, and Listing Folders

On the bucket contents screen:

- To create a folder, click **New folder**, specify folder name in the **New folder** window, and click **Add**.

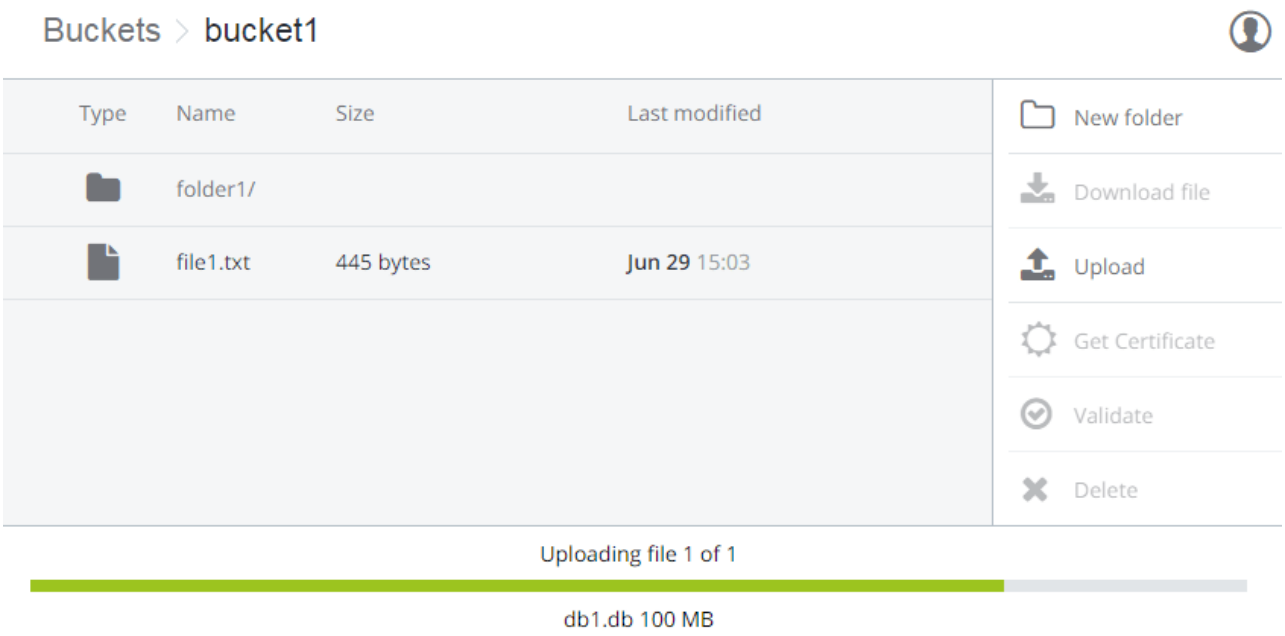


- To delete a folder, select it and click **Delete**.
- To list folder contents, click a folder name.

2.1.4 Uploading and Downloading Files

On the bucket or folder contents screen:

- To upload files to S3, click **Upload** and choose files to upload.



- To download files, select them and click **Download**.

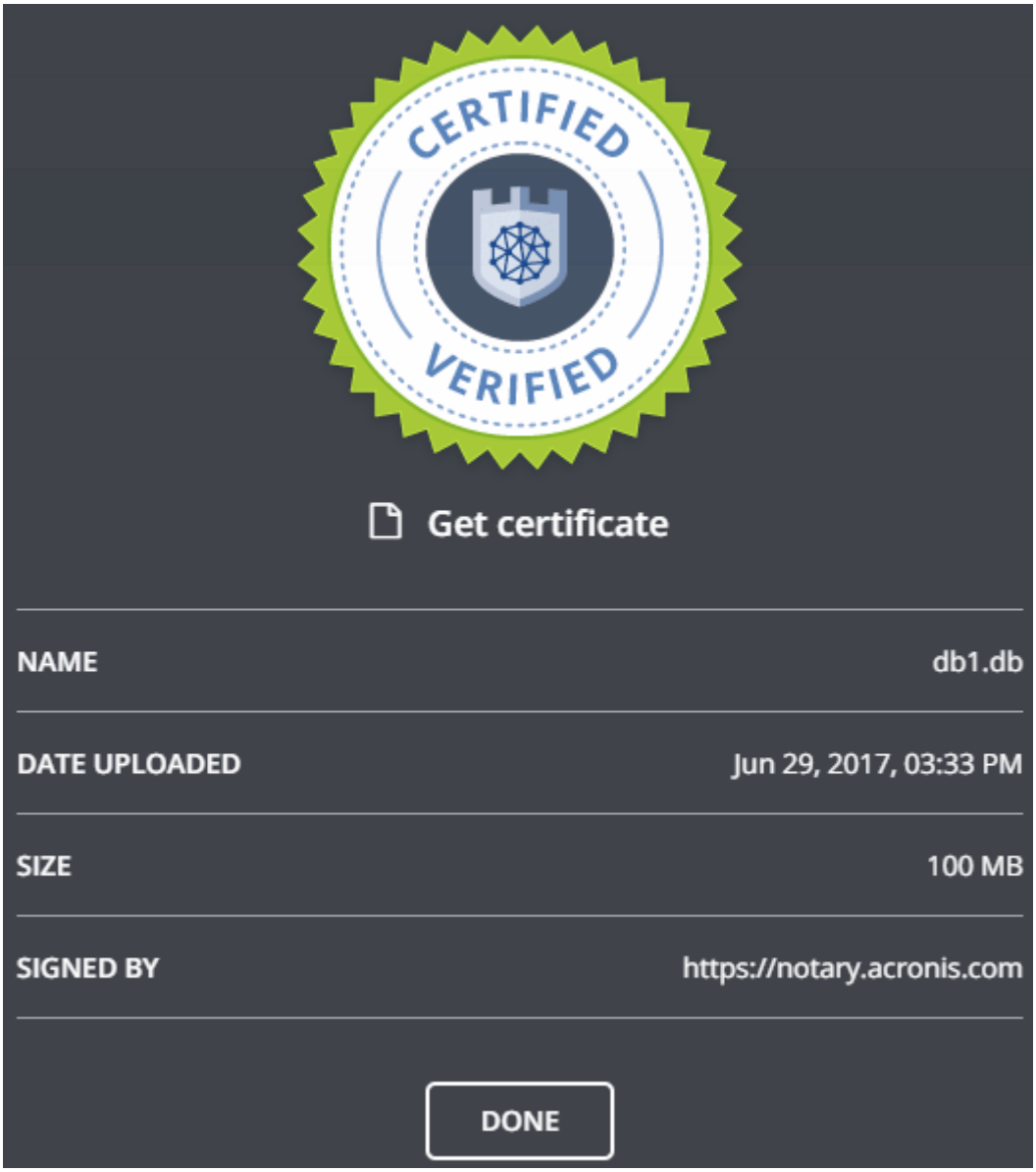
2.1.5 Obtaining and Validating File Certificates

Storage offers integration with the Acronis Notary service to leverage blockchain notarization and ensure the immutability of data saved in S3 buckets.

To certify files stored in your buckets, ask your system administrator to enable the Acronis Notary service for the buckets.

On the bucket's or folder's contents screen:

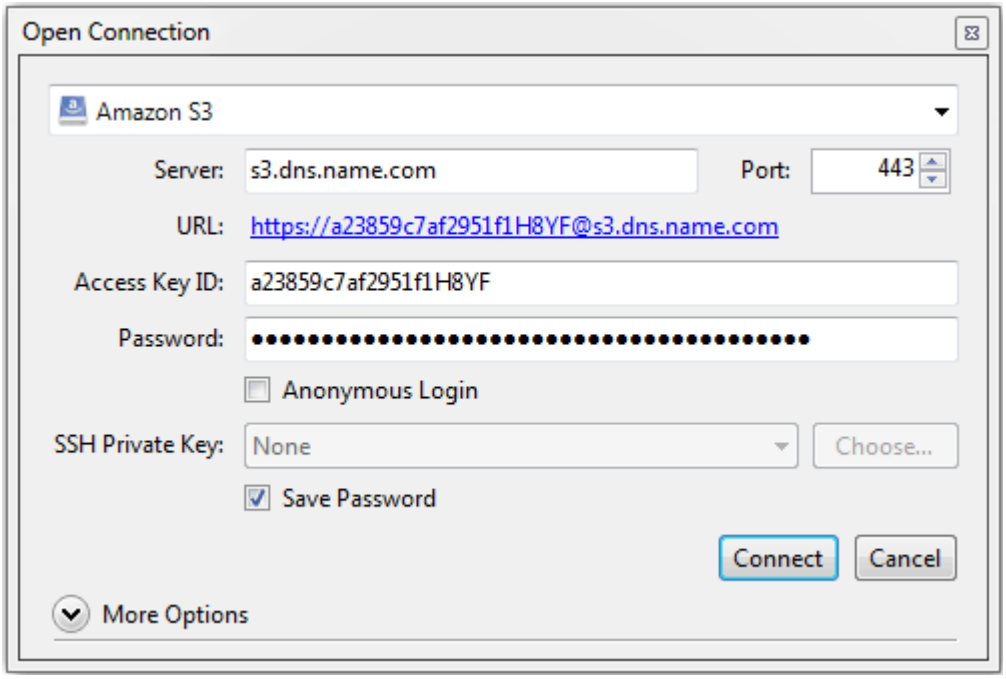
- To get a notarization certificate for a file, select it and click **Get Certificate**.
- To check the validity of a file's certificate, click **Validate**.



2.2 Accessing S3 Storage with CyberDuck

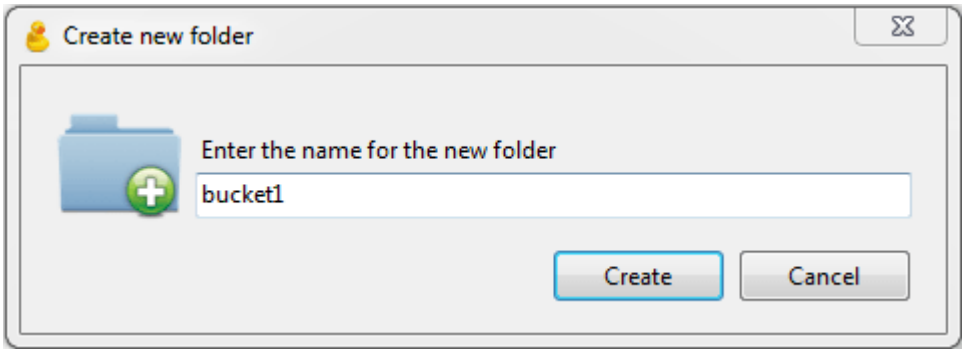
To access Storage with CyberDuck, do the following:

1. In CyberDuck, click **Open Connection**.
2. Specify your credentials:
   - The DNS name of the S3 endpoint.
   - The **Access Key ID** and, the **Password** field, the secret access key of an object storage user.



By default, the connection is established over HTTPS. To use CyberDuck over HTTP, you must install a special S3 profile from https://trac.cyberduck.io/wiki/help/en/howto/s3.

3. Once the connection is established, click **File** > **New Folder** to create a bucket.



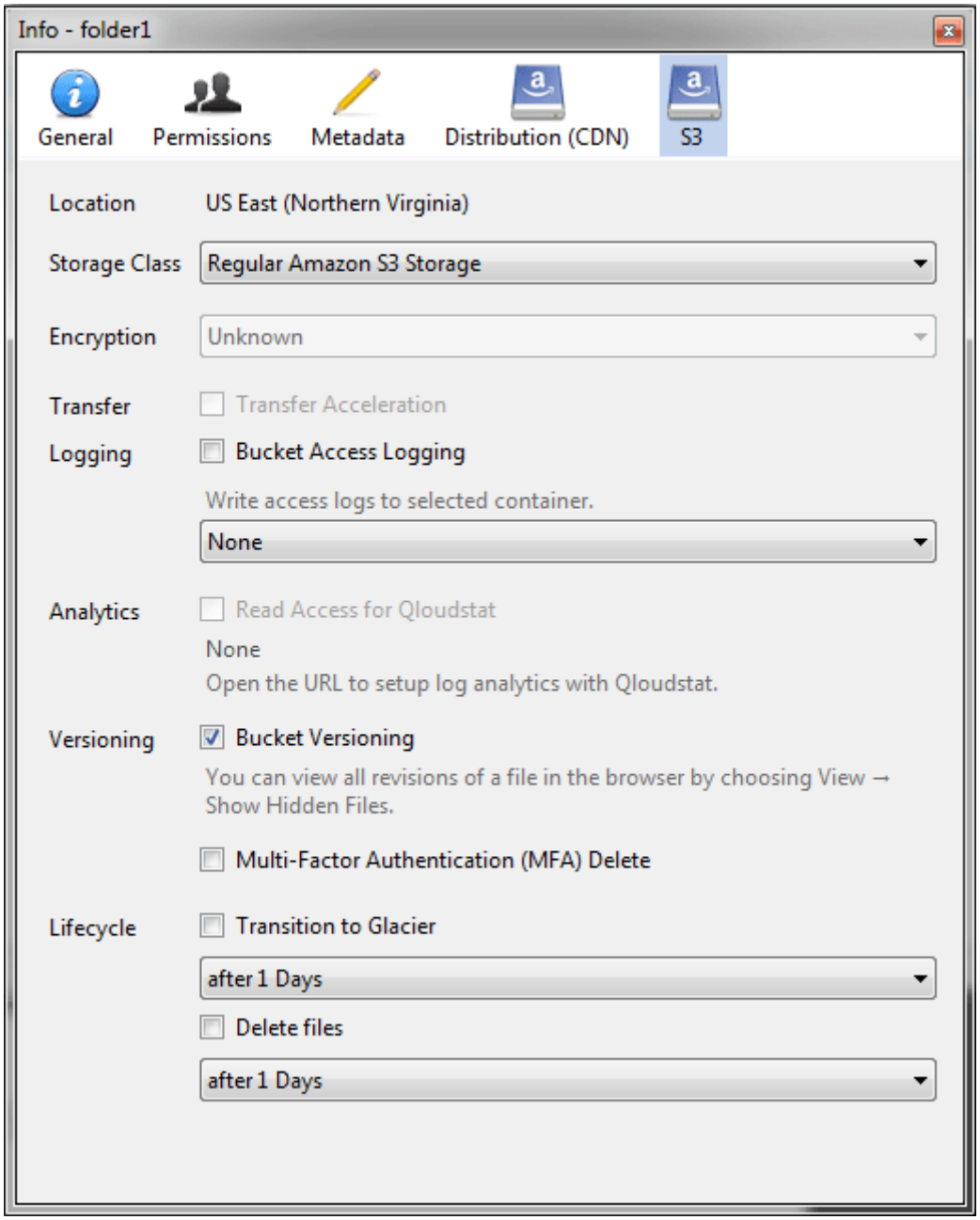
4. Specify a name for the new bucket, and then click **Create**. Use bucket names that comply with DNS naming conventions. For more information on bucket naming, see *Bucket and Key Naming Policies* on page 20.

The new bucket will appear in CyberDuck. You can manage it and its contents.

2.2.1 Managing Bucket Versions

Versioning is a way of keeping multiple variants of an object in the same bucket. You can use versioning to preserve, retrieve, and restore every version of every object stored in your S3 bucket. With versioning, you can easily recover from both unintended user actions and application failures. For more information about bucket versioning, refer to the Amazon documentation.

Bucket versioning is turned off by default. In CyberDuck, you can turn it on by selecting a checkbox in bucket properties. For example:

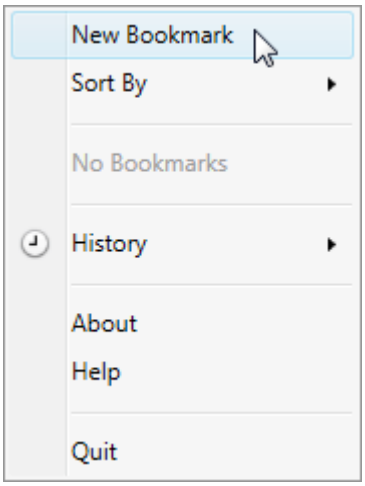


2.3 Mounting S3 Storage with Mountain Duck

Mountain Duck enables you to mount and access an S3 cluster in Storage as a regular disk drive. Do the following:

1. If your service provider has provided you with an SSL certificate, install it.

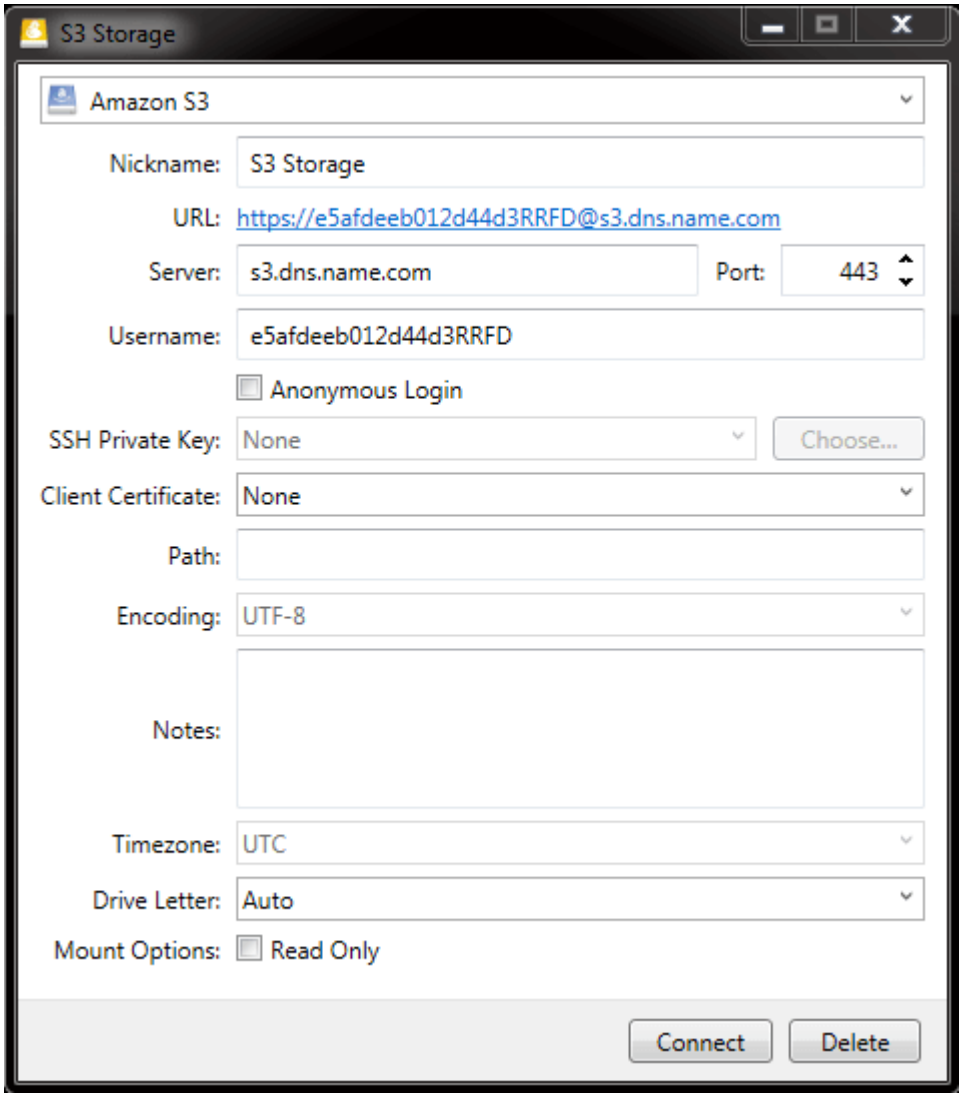
2. In Mountain Duck, click **New Bookmark**.



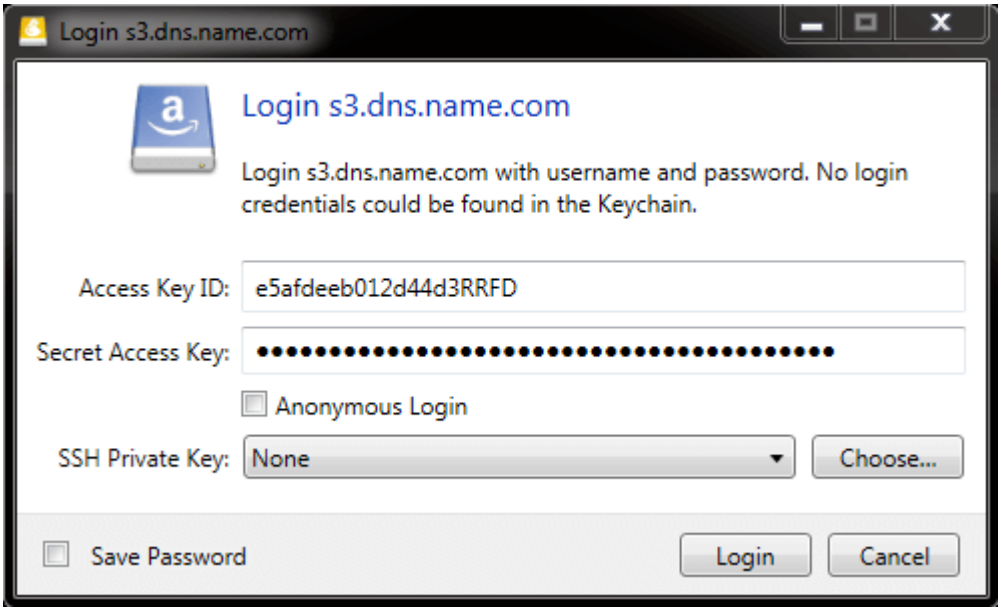
3. In the properties window, select **Amazon S3** profile from the first drop-down list and specify the following parameters:

   - **Nickname** of the disk drive,
   - endpoint DNS name in the **Server** field,
   - access key ID in the **Username** field;

   and click **Connect**.



4. In the login window, specify **Secret Access Key** and click **Login**.



Mountain Duck will mount the S3 storage as a disk drive. On the disk, you can manage buckets and store files in them.

2.3.1 Creating Buckets on Mounted S3 Storage

Windows and Mac OS X, operating systems supported by MountainDuck, treat buckets as folders in case the S3 storage is mounted as a disk drive. In both operating systems, the default folder name contains spaces. This violates bucket naming conventions (see *Bucket and Key Naming Policies* on page 20), therefore you cannot create a new bucket directly on the mounted S3 storage. To create a bucket on a mounted S3 storage, create a folder with a name complying with DNS naming conventions elsewhere and copy it to the root of the mounted S3 storage.

2.4 Configuring Backup Exec to Keep Backups in S3 Storage

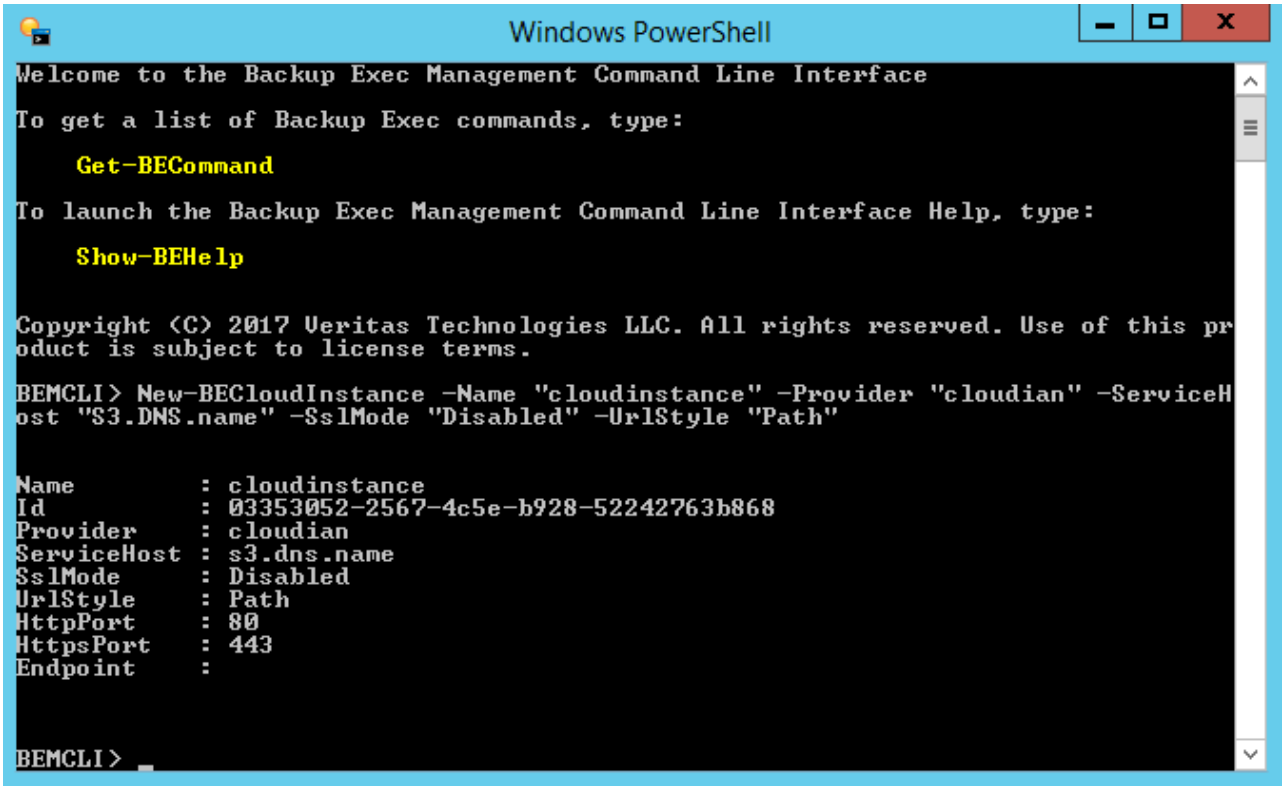
To store Backup Exec backups in S3 storage, do the following:

1. Create a bucket to store backups either using the Storage user panel or another application.
2. Install Backup Exec. During installation, make sure so select all the components of Backup Exec and check all the updates.

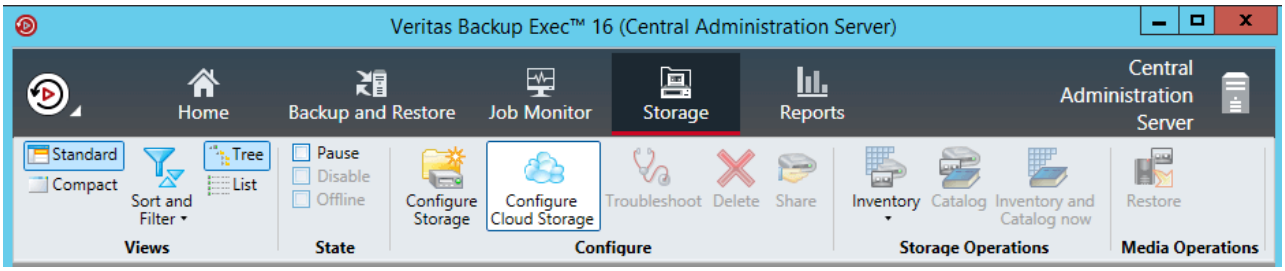
3. Run `CLILauncher` located in `C:\Program Files\Veritas\Backup Exec`.

4. In the Backup Exec command-line prompt, run the following command:

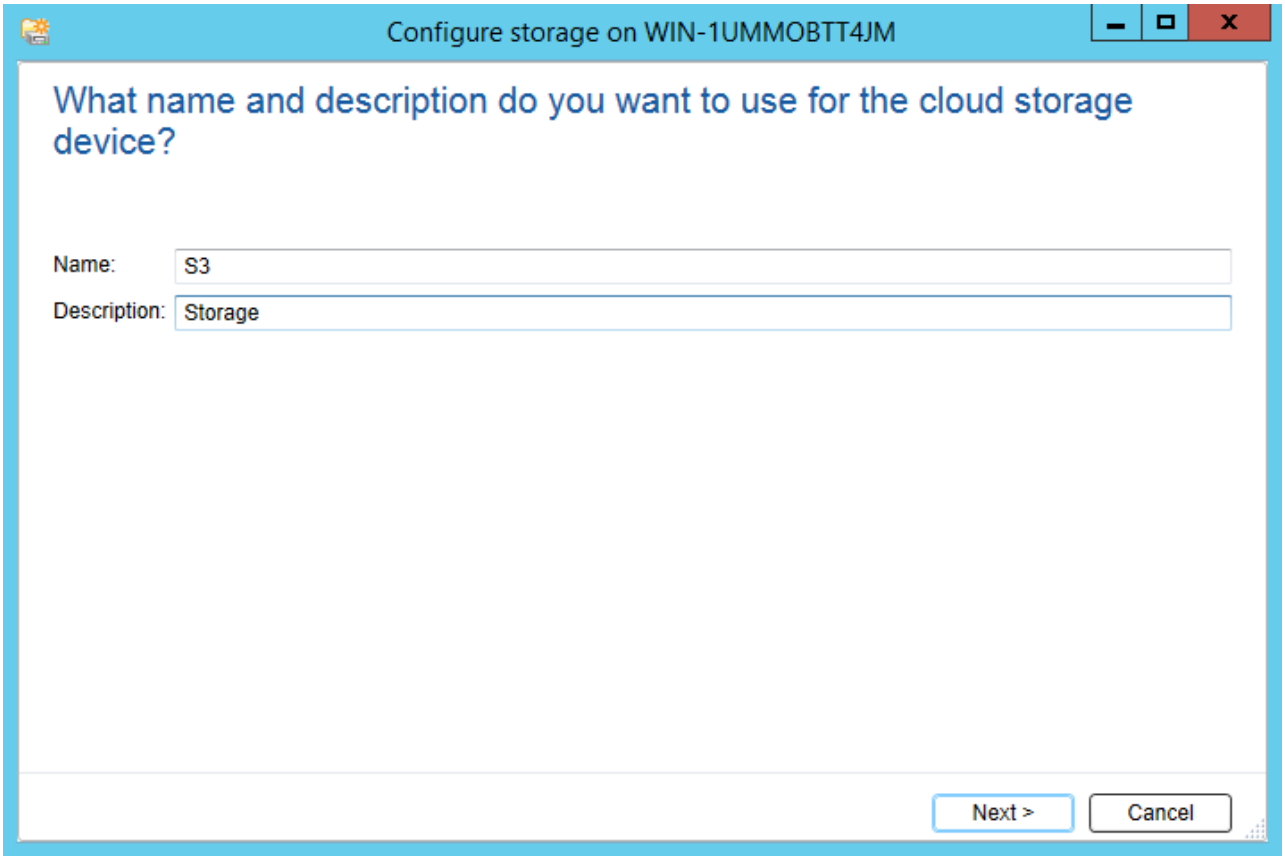
```
# New-BECloudInstance -Name "cloudinstance" -Provider "cloudian" \
-ServiceHost "<S3_DNS_name>" -SslMode "Disabled" -UrlStyle "Path"
```



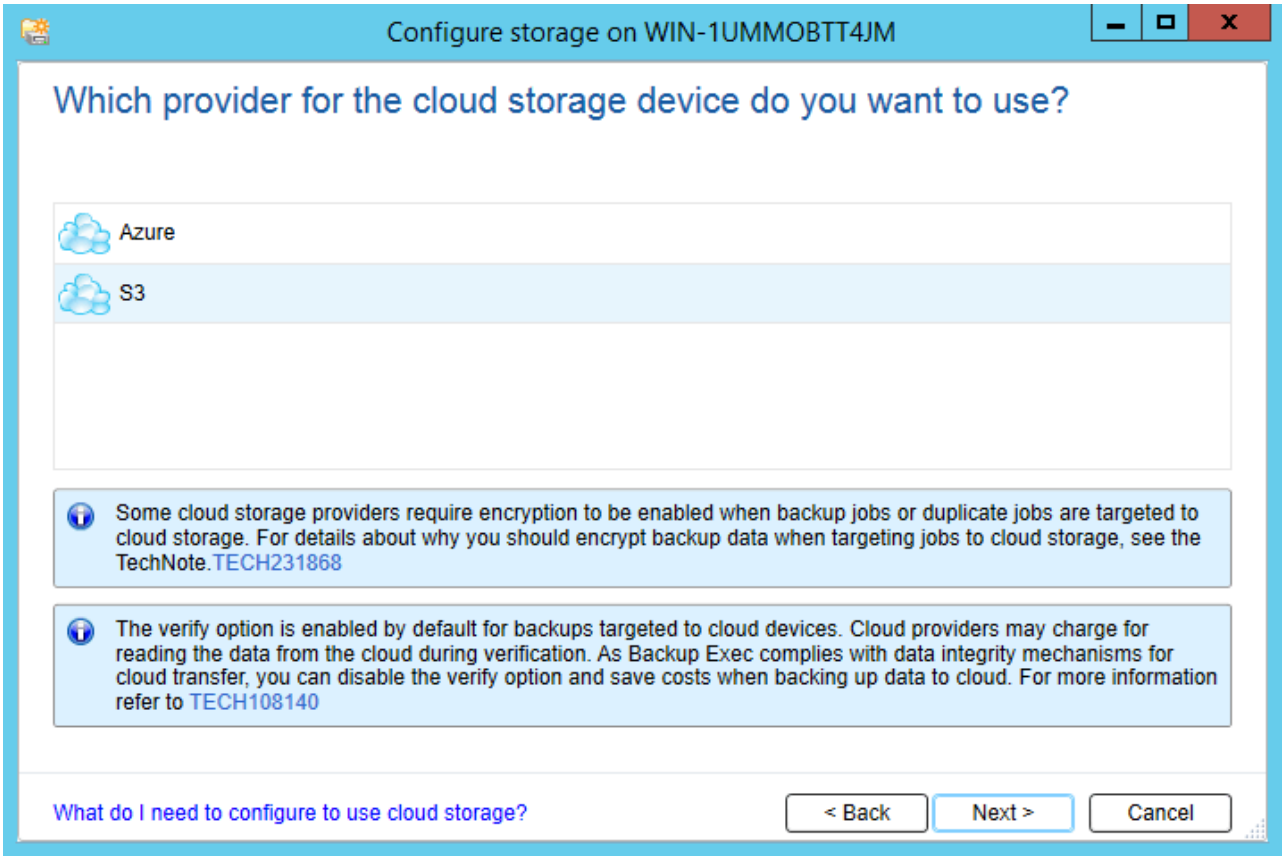
5. In Backup Exec, click **Configure Cloud Storage** on the **Storage** tab.



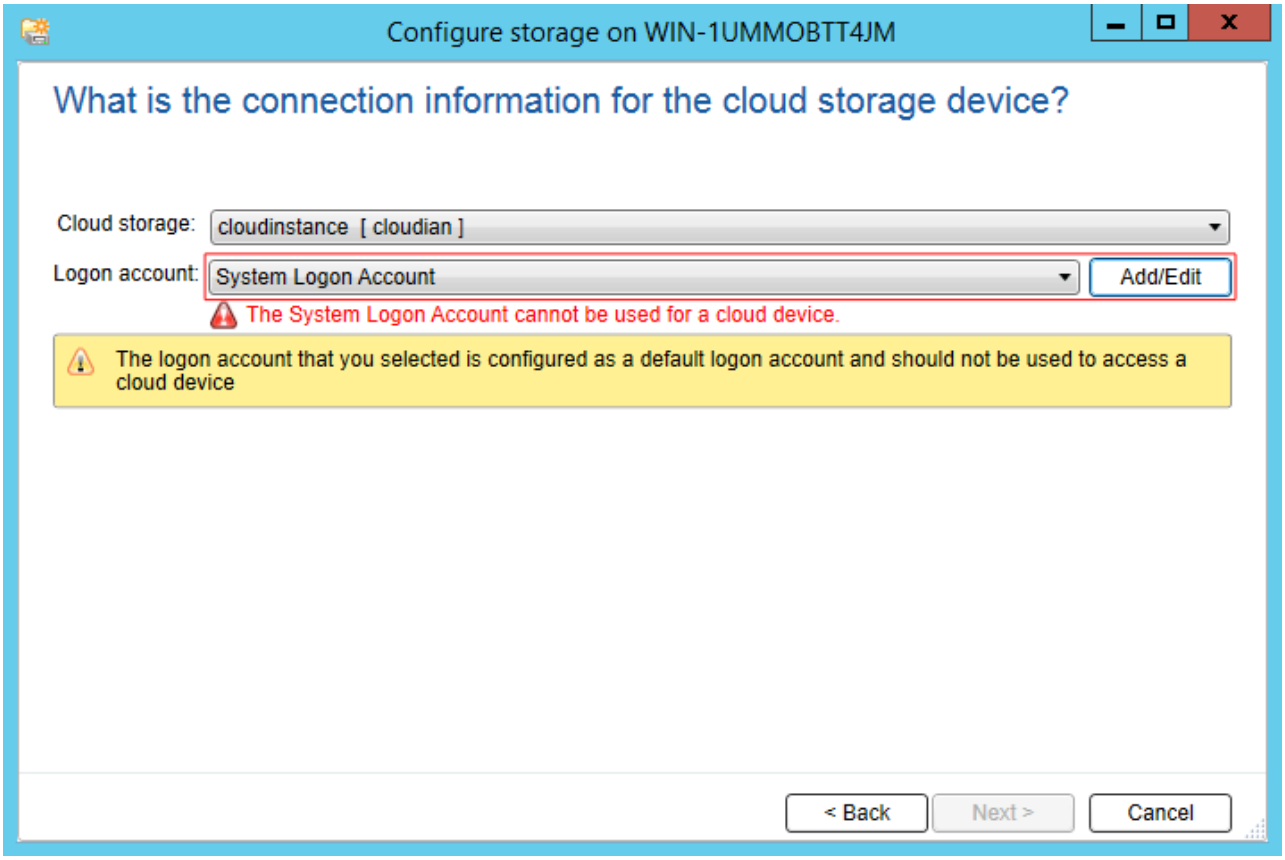
6. In the **Configure storage...** window, specify a name for Storage S3 and click **Next**.



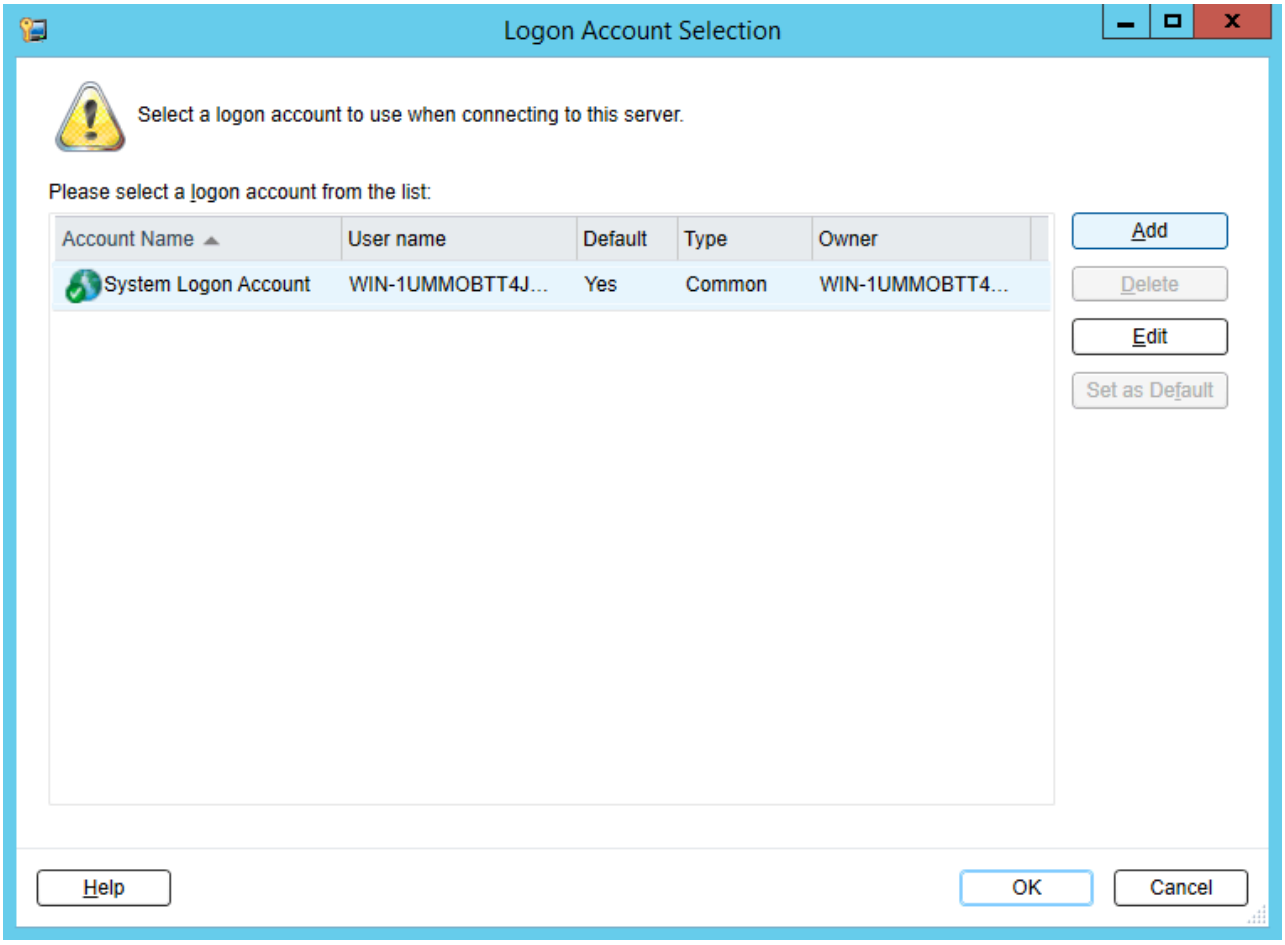
7. Select the **S3** device and click **Next**.



8. Select `cloudinstance [cloudian]` from the **Cloud storage** drop-down list.



9. Click **Add/Edit** next to the **Logon account** drop-down list.
10. In the **Logon Account Selection** window, click **Add**.

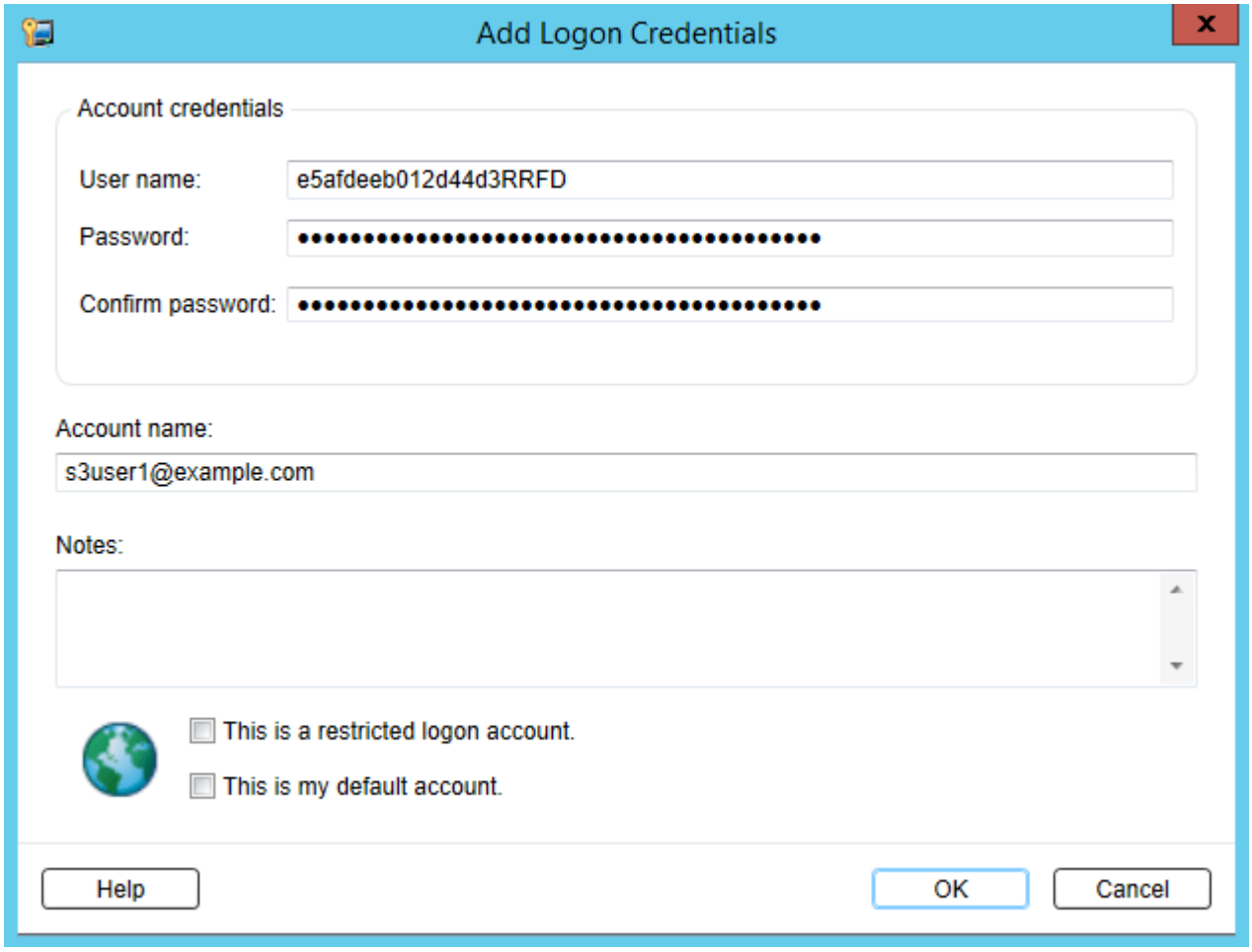


11. In the **Account credentials** section, specify your credentials:

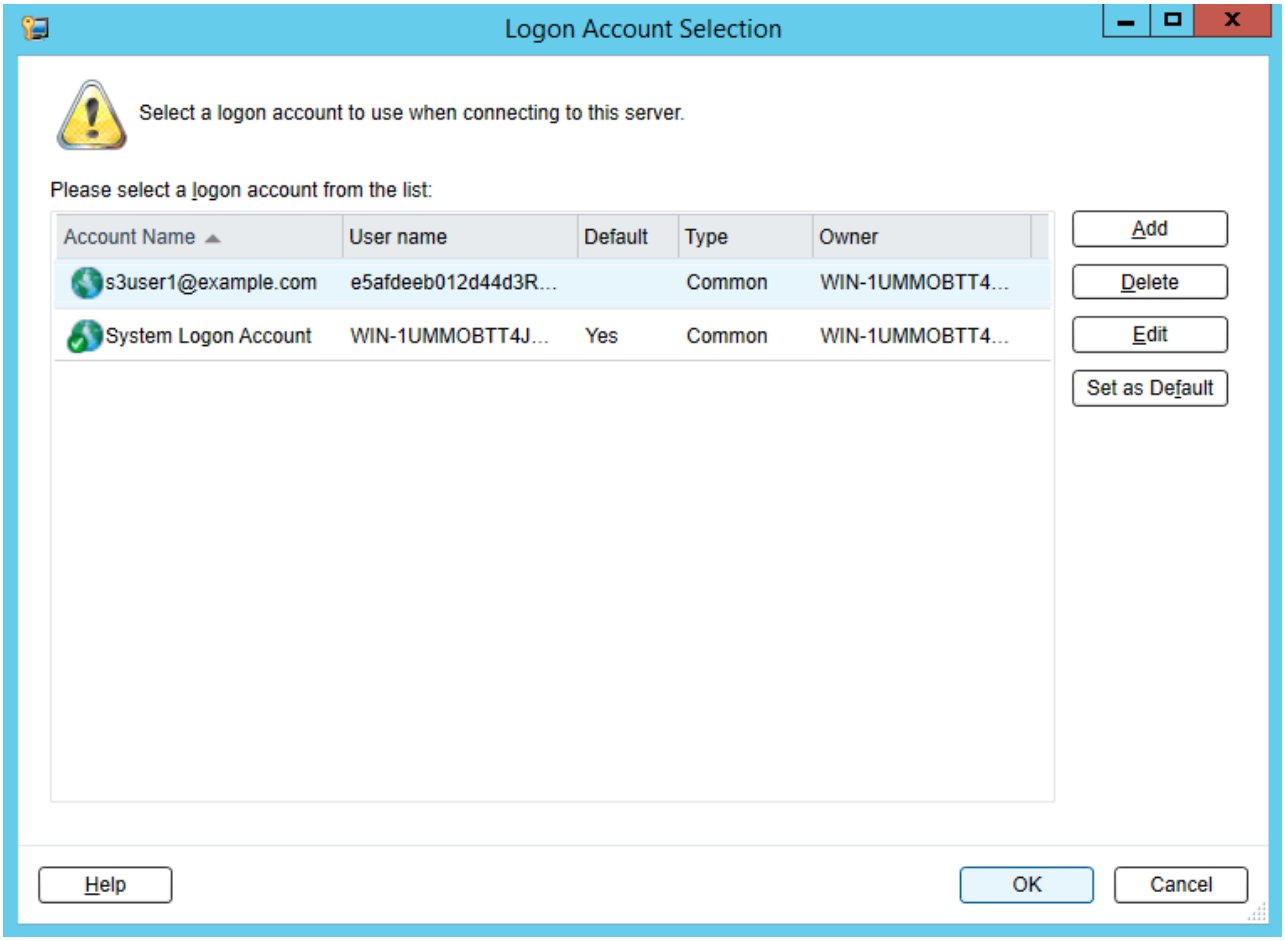
    11.1. S3 access key ID in the **User name** field.

    11.2. S3 secure access key in the **Password** field and confirm it.

    11.3. The username of your account in the **Account name** field.



12. Uncheck all the checkboxes and click **OK**.
13. Back in the **Logon Account Selection** window, make sure the newly added user account is selected and click **OK**.



14. Back in the **Configure storage...** window, click **Next**.
15. Select a bucket and click **Next** twice.
16. On the summary screen, click **Finish**, **OK**, and **Yes**.

Once the Backup Exec services are restarted, the S3 storage will appear in the list on the **Storage** tab. Now you can create backup jobs and specify the S3 storage as destination.

2.5 Bucket and Key Naming Policies

It is recommended to use bucket names that comply with DNS naming conventions:

- 3 to 63 characters long.
- Start and end with a lowercase letter or number.
- Contain lowercase letters, numbers, periods (.), hyphens (-), and underscores (_).

- Can be a series of valid name parts (described previously) separated by periods.

An object key can be a string of any UTF-8 encoded characters up to 1024 bytes long.

CHAPTER 3

Accessing Storage iSCSI Targets

This section describes ways to attach Storage iSCSI targets to a number of operating systems and third-party virtualization solutions.

3.1 Accessing Storage iSCSI Targets from CentOS 6

1. Make sure that the `iscsi-initiator-utils` package is installed.
2. Discover the required target by its IP address. For example:

```
# iscsiadm --mode discovery --type sendtargets --portal 192.168.10.100
```

3. Restart the `iscsid` service to rescan for newly added drives:

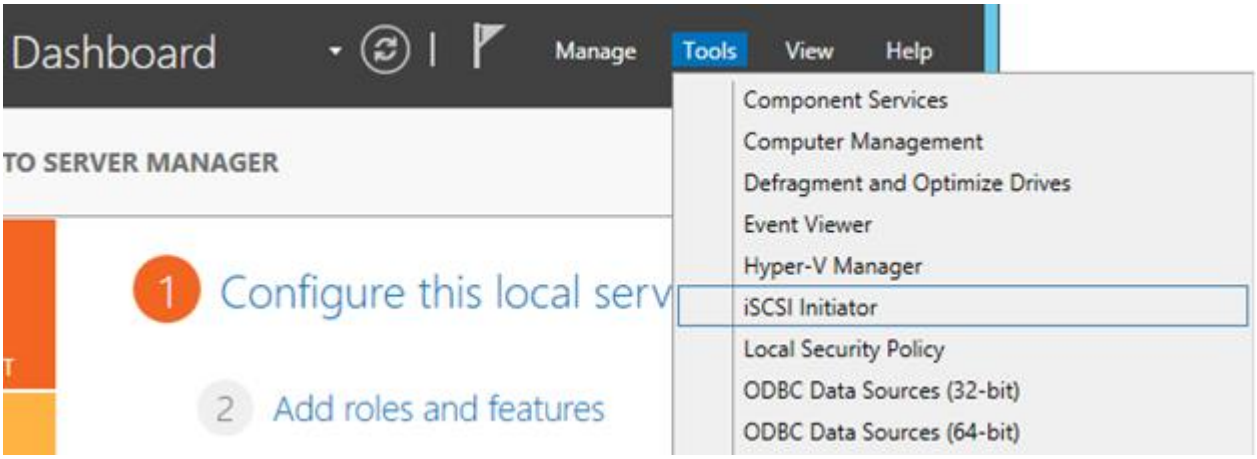
```
# service iscsi restart
```

To check that the new drive has appeared in the system, use fdisk, parted or similar tools.

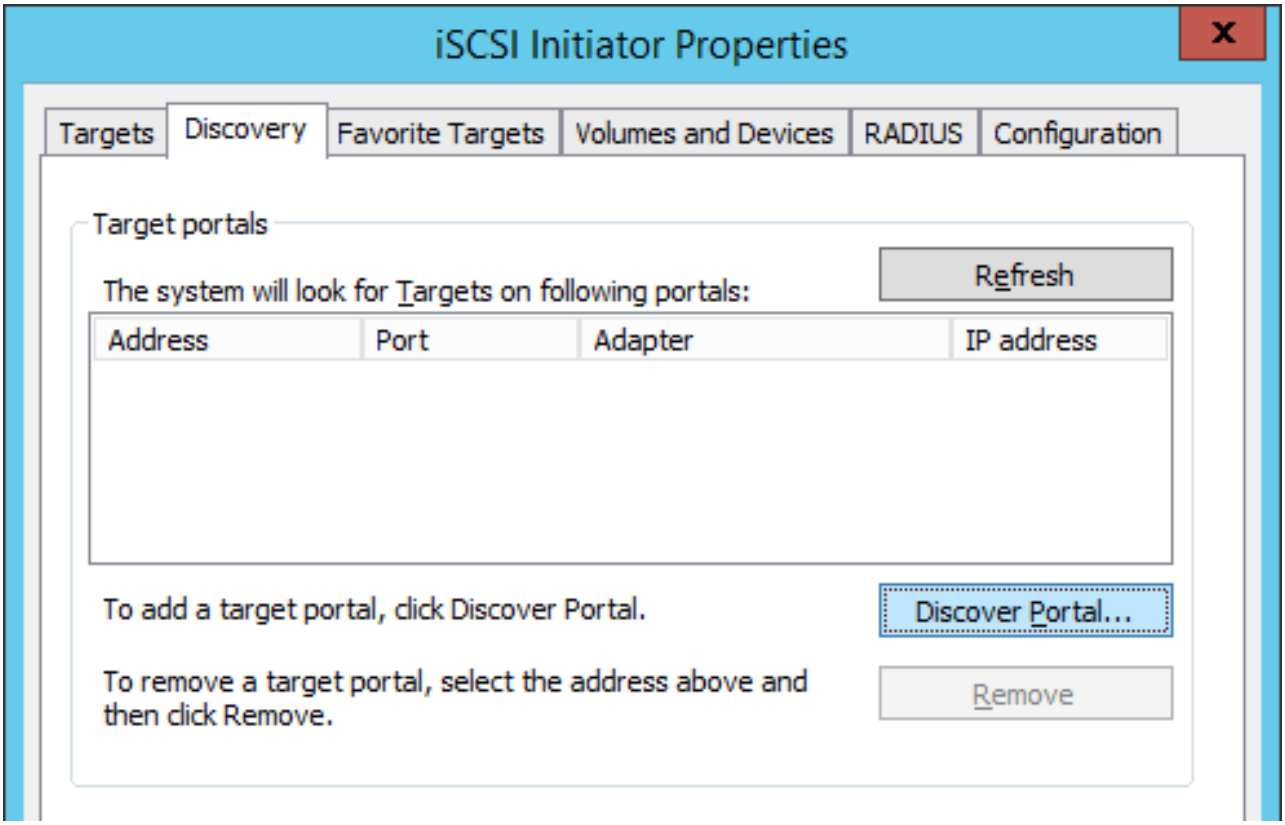
For more information, see the Red Hat Enterprise Linux Storage Administration Guide.

3.2 Accessing Storage iSCSI Targets from Microsoft Windows Server 2012 R2

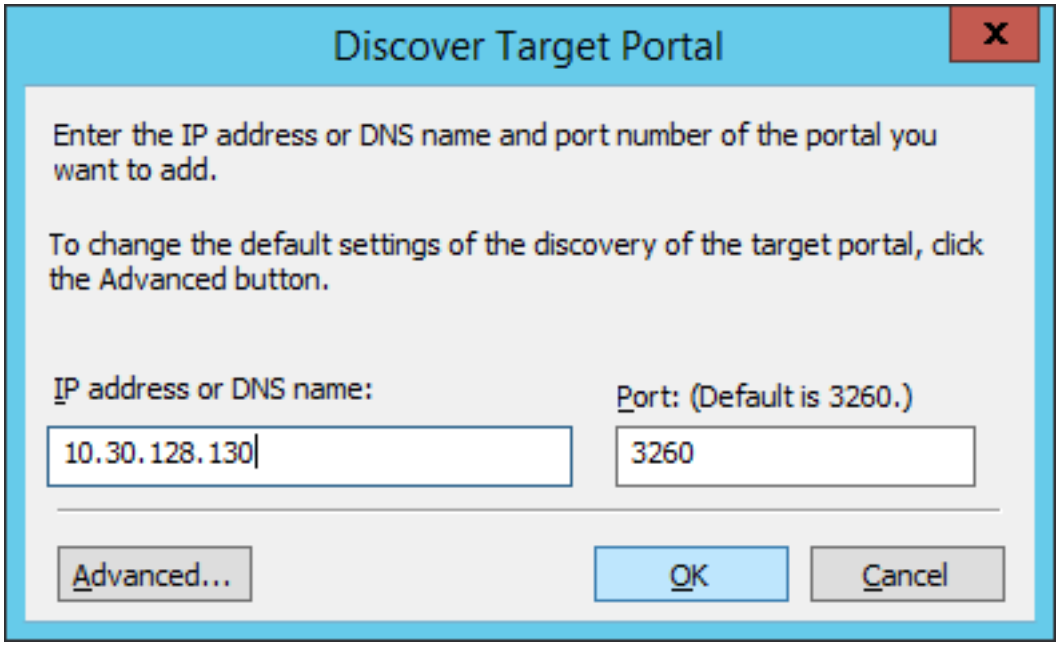
1. In the **Server Manager Dashboard**, click the **Tools** menu in the toolbar and select **iSCSI Initiator**.



2. In the **iSCSI Initiator Properties**, switch to the **Discovery** tab and click **Discover Portal...**.

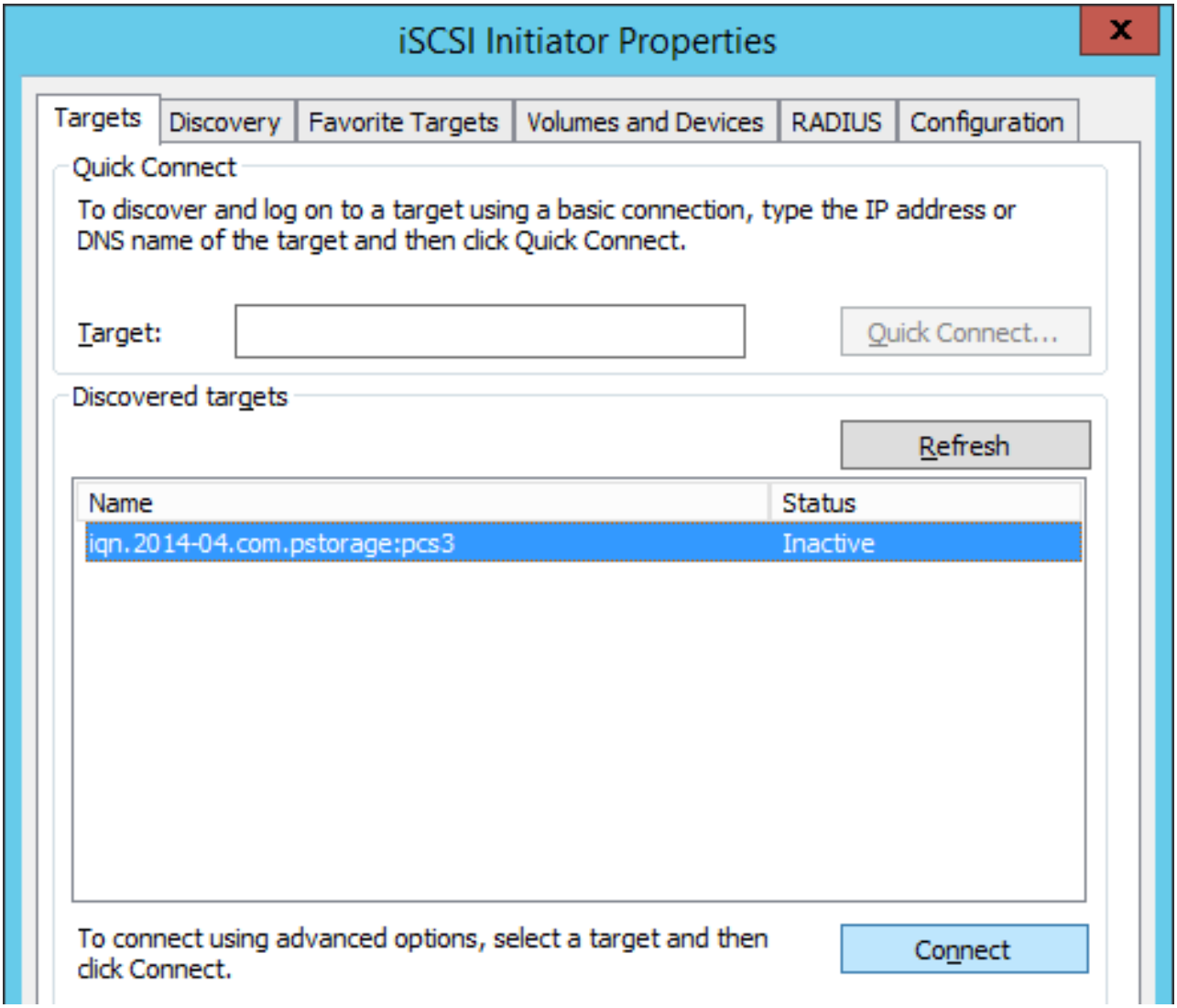


3. In the **Discover Target Portal** window, enter the portal IP address and click **OK**.

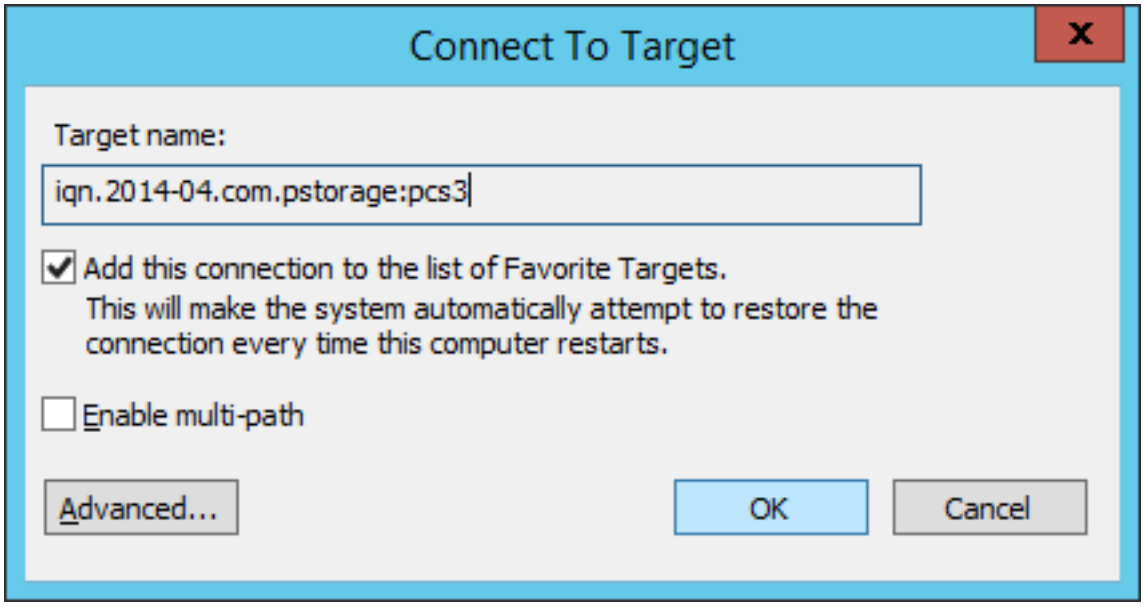


The newly added portal will appear in the **Target portals** section.

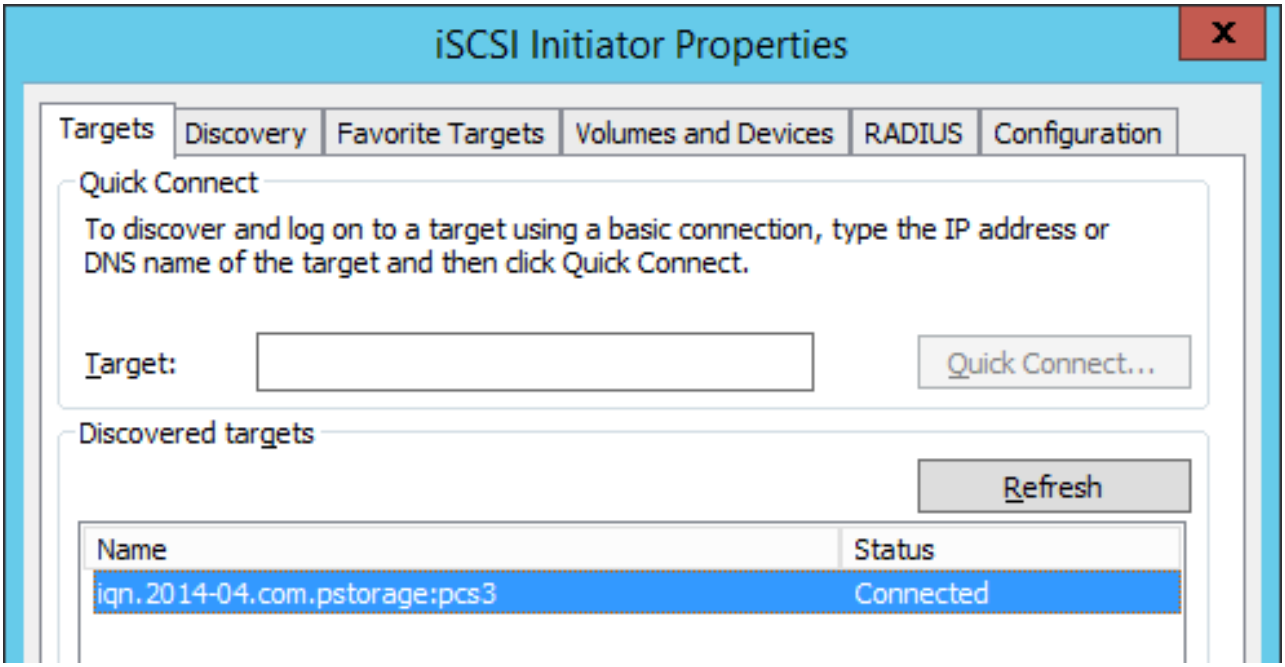
4. On the **iSCSI Initiator Properties** > **Targets** tab, select the new target in the **Discovered targets** section and click **Connect**.



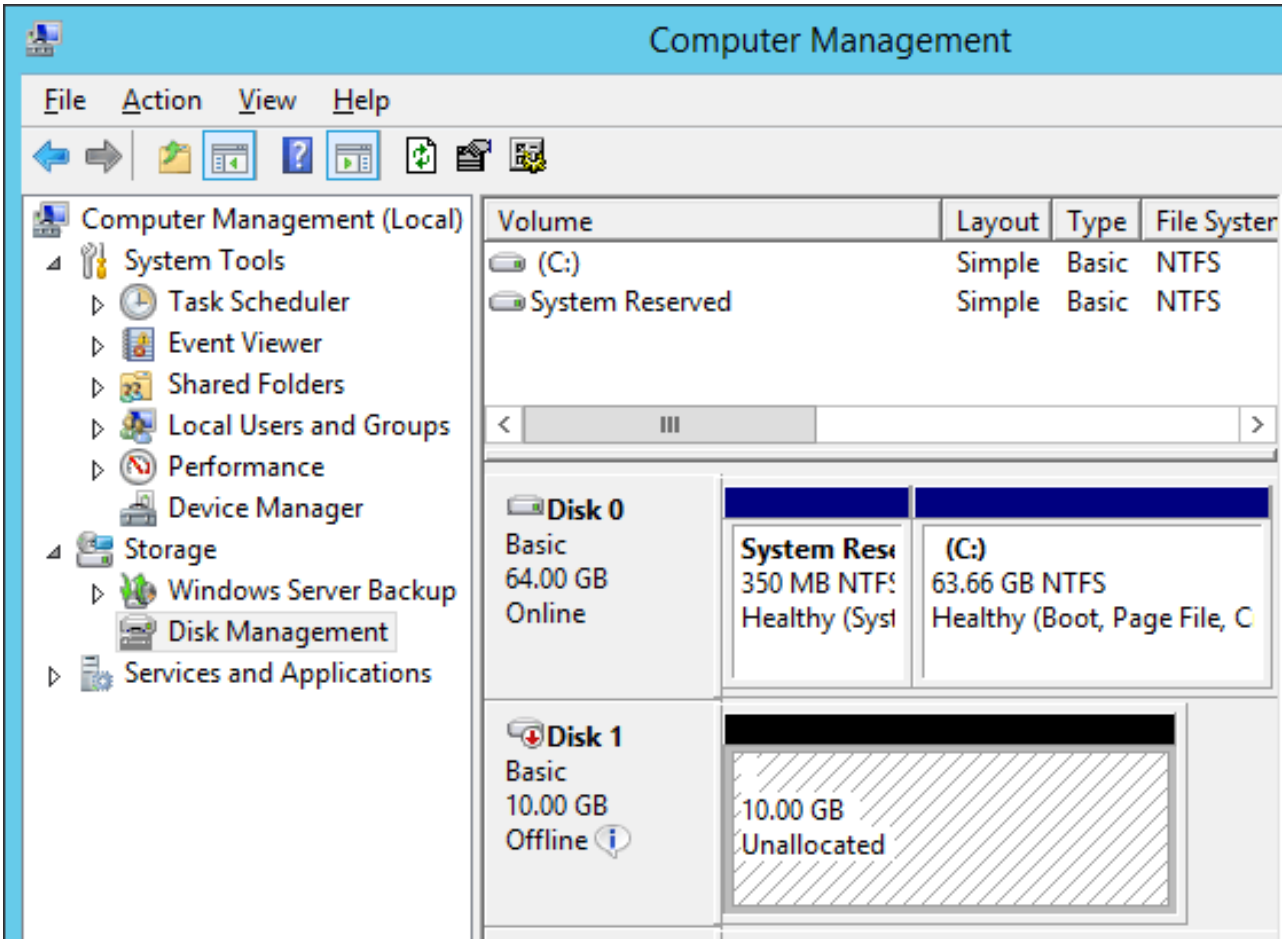
5. In the **Connect to Target** window, click **OK**.



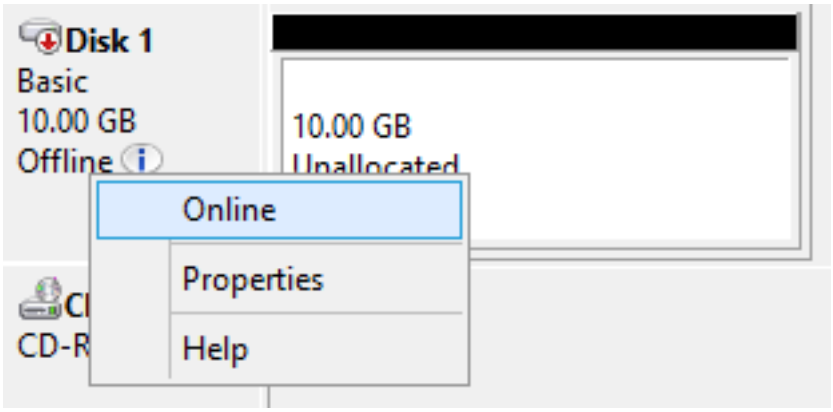
Target's **Inactive** status will change to **Connected**.



The newly attached disk will appear in **Server Manager Dashboard** > **Computer Management** > **Storage** > **Disk Management**.

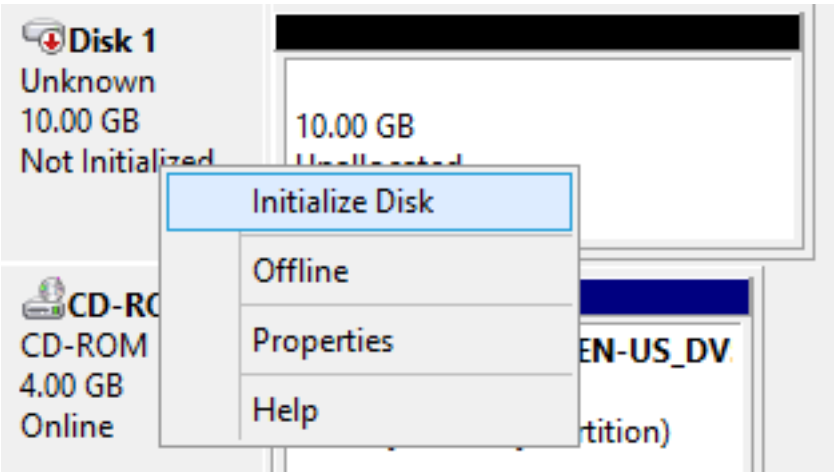


6. Right-click the disk information section and select **Online**.

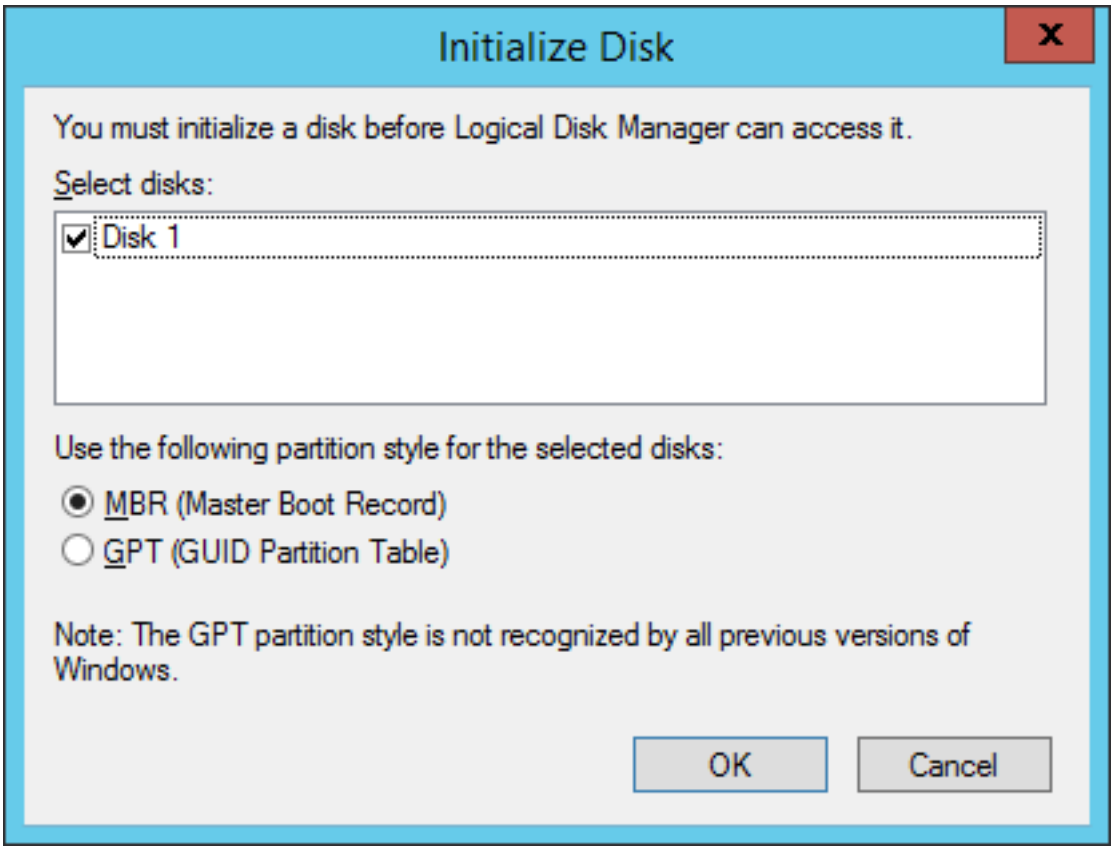


The disk status will change to **Online**.

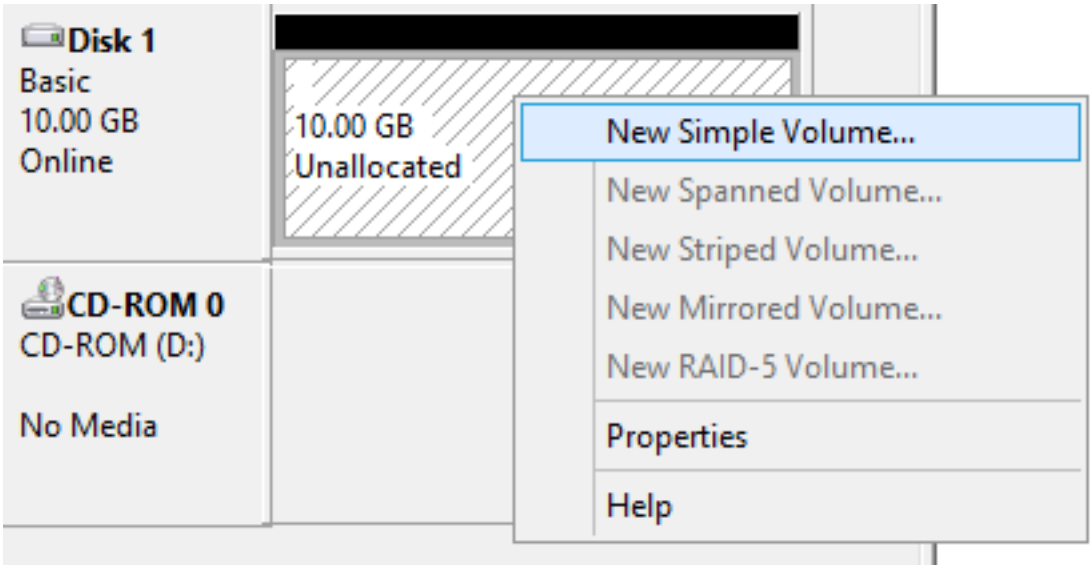
7. Right-click the disk information section and select **Initialize Disk**.



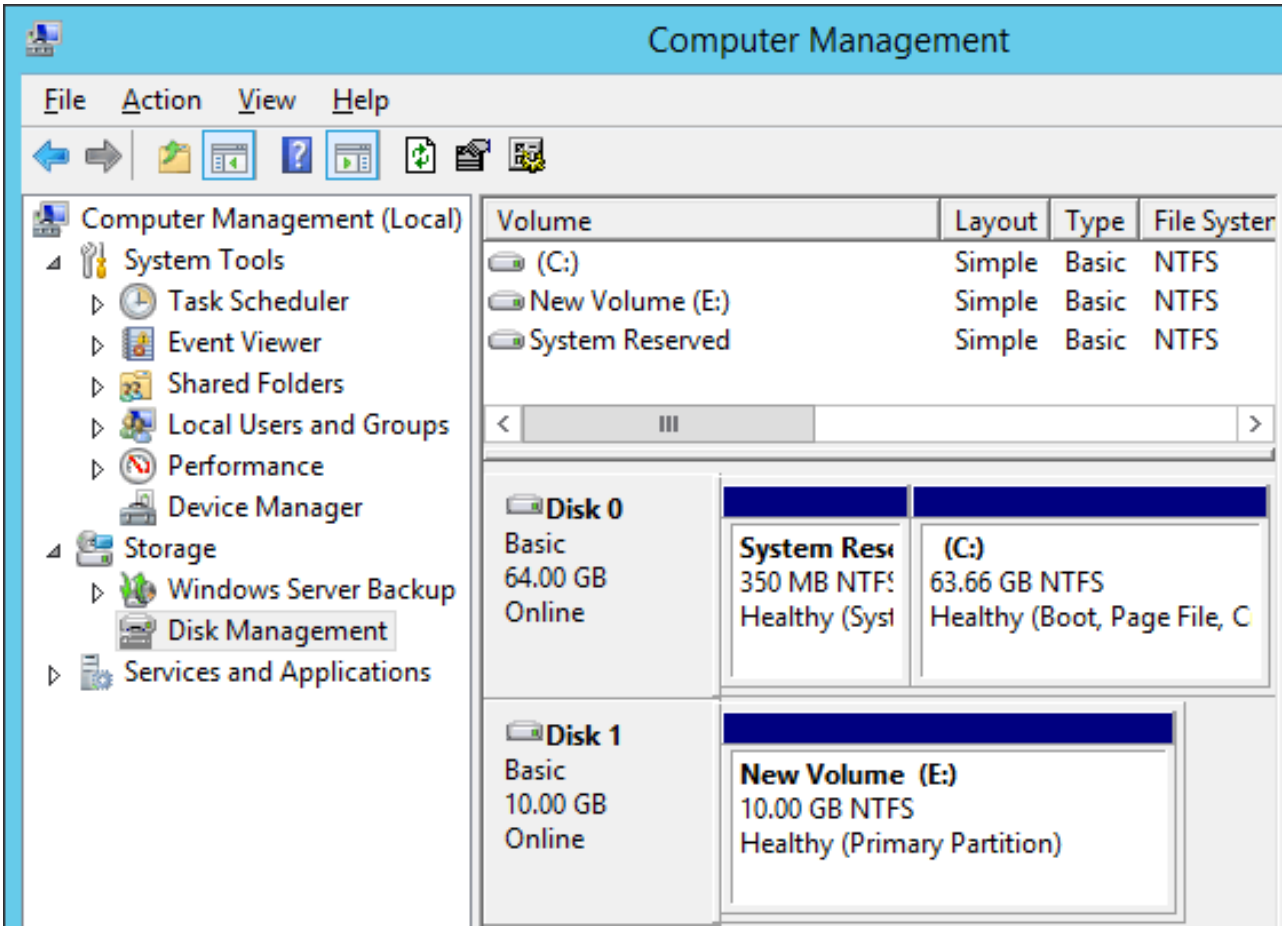
8. In the Initialize Disk window, click **OK**.



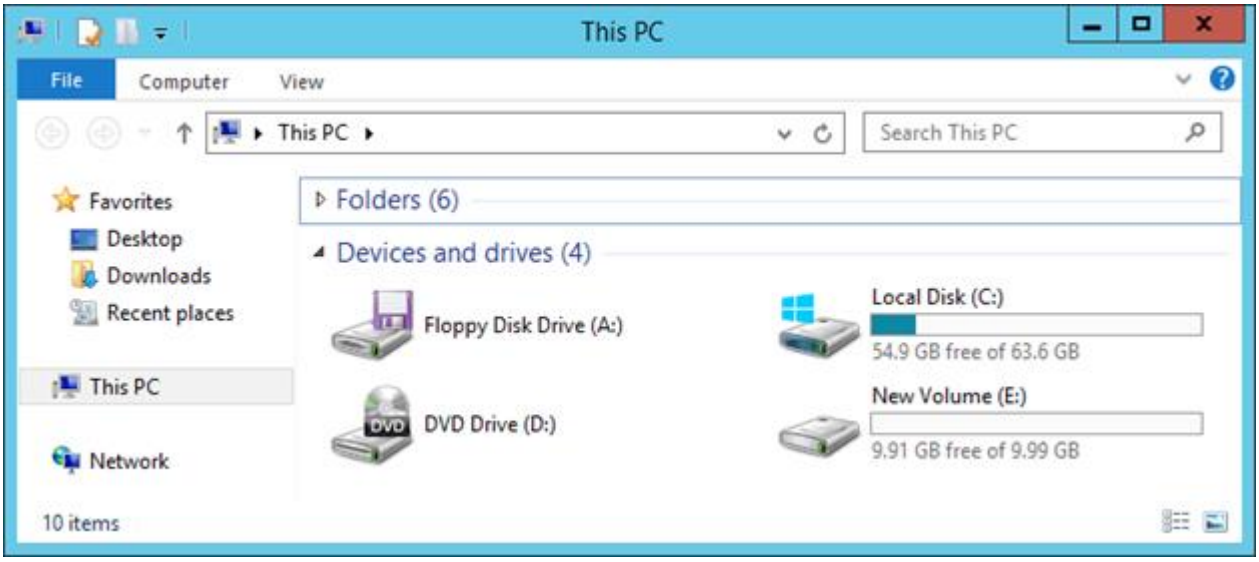
9. Right-click the disk space section, select **New Simple Volume...**, and follow the wizard's instruction to format the new disk to NTFS.



The disk state will change to **Healthy**.



The new disk will appear in Windows Explorer.



3.3 Accessing Storage iSCSI Targets from VMware ESXi

1. In the **vSphere Client**, switch to the **Configuration** tab, and click **Storage Adapters** in the **Hardware** section.
2. If no software iSCSI adapters have been added, do so by right-clicking in the **Storage Adapters** section and selecting **Add Software iSCSI Adapter...**.
3. Open the software iSCSI adapter's properties, switch to the **Static Discovery** tab and click **Add...**.
4. In the **Add Static Target Server** window, enter the target's IP address and name.
5. Close the software iSCSI adapter's properties window and rescan the adapter as prompted.
6. The newly added iSCSI target will appear in the **Details** section of the software iSCSI adapter you have configured.

For more information, see the VMware vSphere Storage Guide.

3.4 Accessing Storage iSCSI Targets from Citrix XenServer 6.2

1. In XenCenter, switch to the **Storage** tab and click **New SR...**.
2. In the **New Storage Repository** window:
   2.1. In the **Type** section, select the **Software iSCSI** option,
   2.2. In the **Name** section, provide a name or leave the default,
   2.3. In the **Location** section, enter target's IP address in the **Target Host** field, click **Discover IQNs** and select the desired target, then click **Discover LUNs** and select the desired LUN.
3. Click **Finish** to format the disk.

The new storage repository will appear in XenCenter.

For more information, see XenCenter documentation.

3.5 Accessing Storage iSCSI Targets from Microsoft Hyper-V

Note: Names of the targets to be mounted must not contain underscore characters.

---

1. Make sure that Microsoft iSCSI Initiator Service, `MSiSCSI`, is running.
2. Discover a new target portal. For example, for the portal 192.168.10.100, run:

```
PS C:\Users\Administrator>new-iscsitargetportal \
-targetportaladdress 192.168.10.100
Initiator Instance Name  :
Initiator Portal Address :
IsDataDigest             : False
IsHeaderDigest           : False
TargetPortalAddress      : 192.168.10.100
TargetPortalPortNumber   : 3260
.. _PSComputerName           ::

PSComputerName           :
```

3. Connect to the desired target. For example, for the target iqn.2014-03.com.vstorage:test1

```
PS C:\Users\Administrator> connect-iscsitarget
cmdlet Connect-IscsiTarget at command pipeline position 1
Supply values for the following parameters:
NodeAddress: iqn.2014-04.com.vstorage:test1
AuthenticationType      : NONE
InitiatorInstanceName   : ROOT\ISCSIPRT\0000_0
InitiatorNodeAddress    : iqn.1991-05.com.microsoft:win-l2dj7g36n7e...
InitiatorPortalAddress  : 0.0.0.0
InitiatorSideIdentifier : 400001370000
IsConnected             : True
IsDataDigest            : False
IsDiscovered            : True
IsHeaderDigest          : False
IsPersistent            : False
NumberOfConnections     : 1
SessionIdentifier       : ffffe00000b5e020-4000013700000005
TargetNodeAddress       : iqn.2014-04.com.vstorage:test1
TargetSideIdentifier    : 0001
.. _PSComputerName          ::

PSComputerName          :
```

4. To check that the disk has been connected, run

```
PS C:\Users\Administrator> get-disk
Number Friendly Name                    OperationalStatus Total Size
------ -------------                    ----------------- ----------
1      IET VIRTUAL-DISK SCSI Disk Device Offline           100 GB RAW
...
```

You can now initialise the newly mounted disk for use in Microsoft Hyper-V.

For more information, see iSCSI Cmdlets in Windows PowerShell.