Backup and Recovery for Microsoft SQL Server on AWS FSx for ONTAP

NetApp Solutions

NetApp
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TR-4951: Backup and Recovery for Microsoft SQL Server on AWS FSx for ONTAP

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This document covers the steps necessary to perform backup and recovery for Microsoft SQL Server on AWS FSx for ONTAP with SnapCenter. This includes the following information:

- NetApp SnapCenter configuration
- SnapCenter backup operations
- Backup operation for an FCI database
- Backup operation for multiple databases
- Restore and recovery

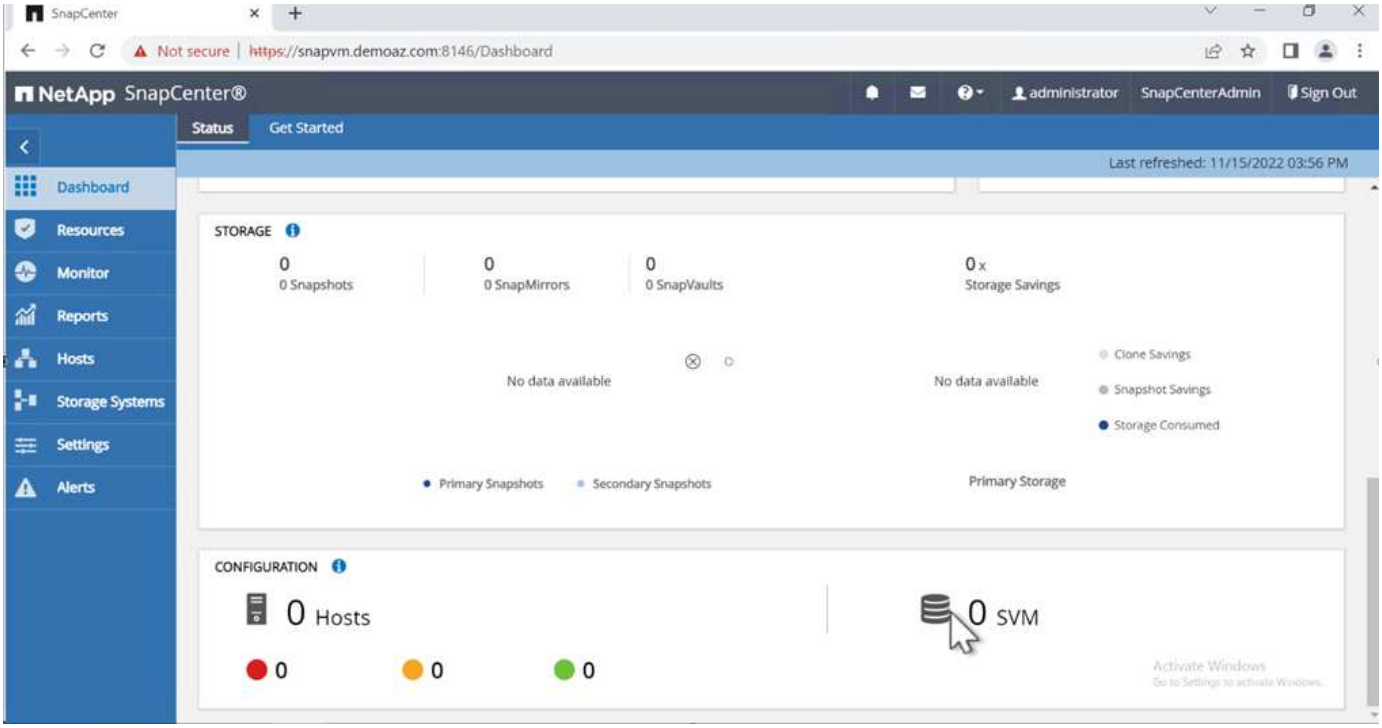
SnapCenter Configuration

The following steps must be performed for SnapCenter configuration and the protection of Microsoft SQL Server resources. Each of the following steps is detailed in the following sections.

1. Configure sysadmin credentials for the SQL Server backup and restore user.
2. Configure storage settings. Provide Amazon Web Services (AWS) management credential to access the Amazon FSx for NetApp ONTAP storage virtual machines (SVMs) from SnapCenter.
3. Add a SQL Server host to SnapCenter. Deploy and install the required SnapCenter Plug-ins.
4. Configure policies. Define the backup operation type, retention, and optional Snapshot backup replication.
5. Configure and protect the Microsoft SQL Server database.

SnapCenter newly installed user interface

Configure credentials for SQL Server backup and restore the user with sysadmin rights.

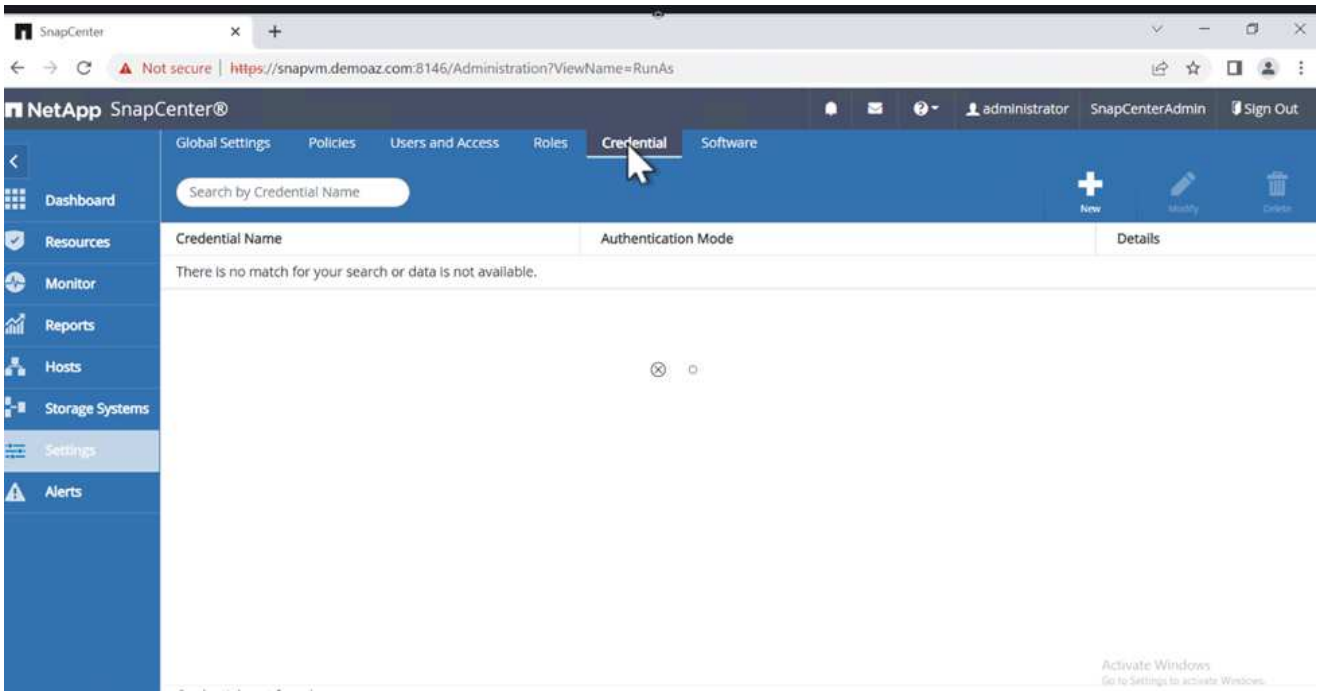


NetApp recommends using role-based access control (RBAC) to delegate data protection and management capabilities to individual users across the SnapCenter and window hosts. The user must have access to the SQL Server hosting the database. For multiple hosts, the username and password must be the same across the various hosts. Furthermore, to enable SnapCenter to deploy the required plug-in on SQL Server hosts, you must register the domain information for SnapCenter to validate your credentials and hosts.

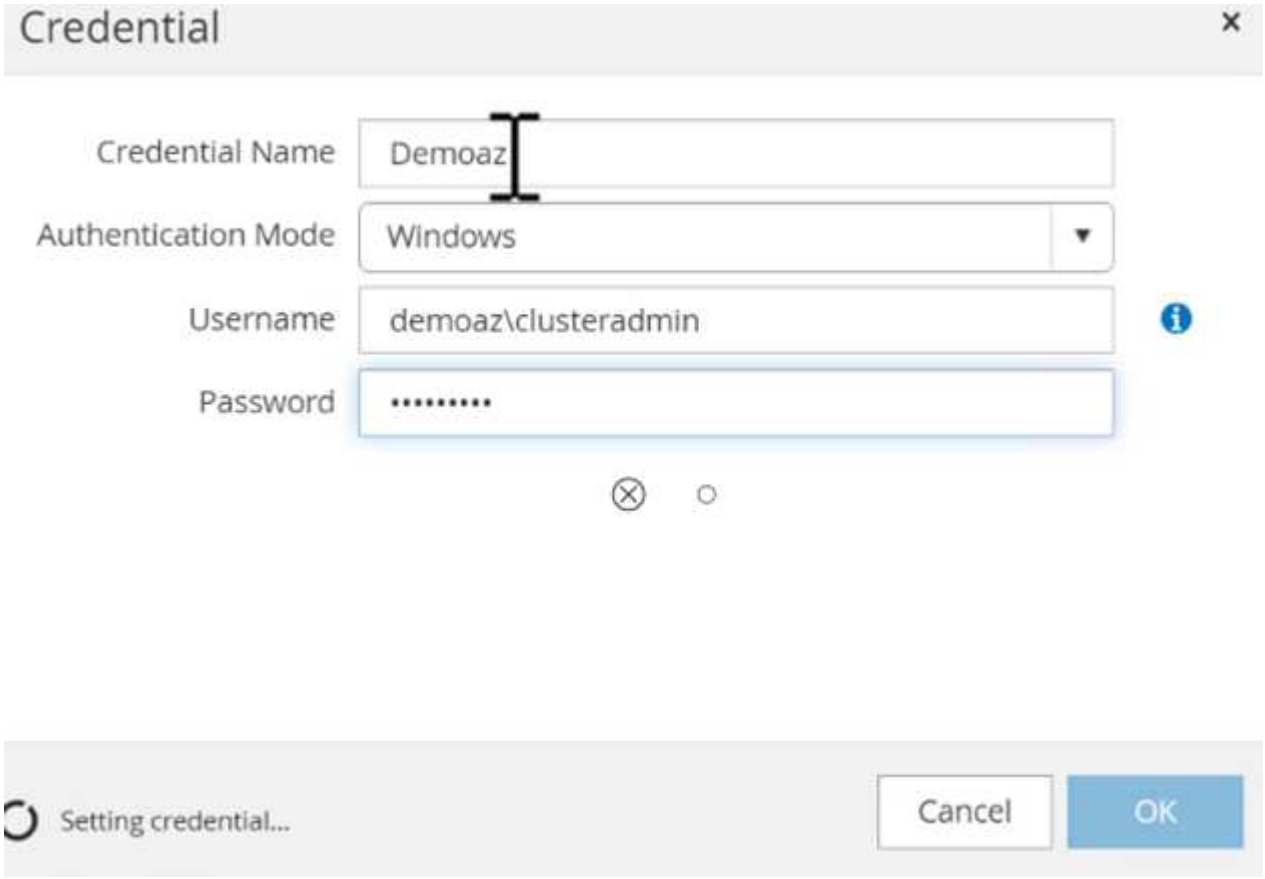
Expand the following sections to see the detailed instructions on how to complete each step.

Add the credentials

Go to **Settings**, select **Credentials**, and click (**+**).



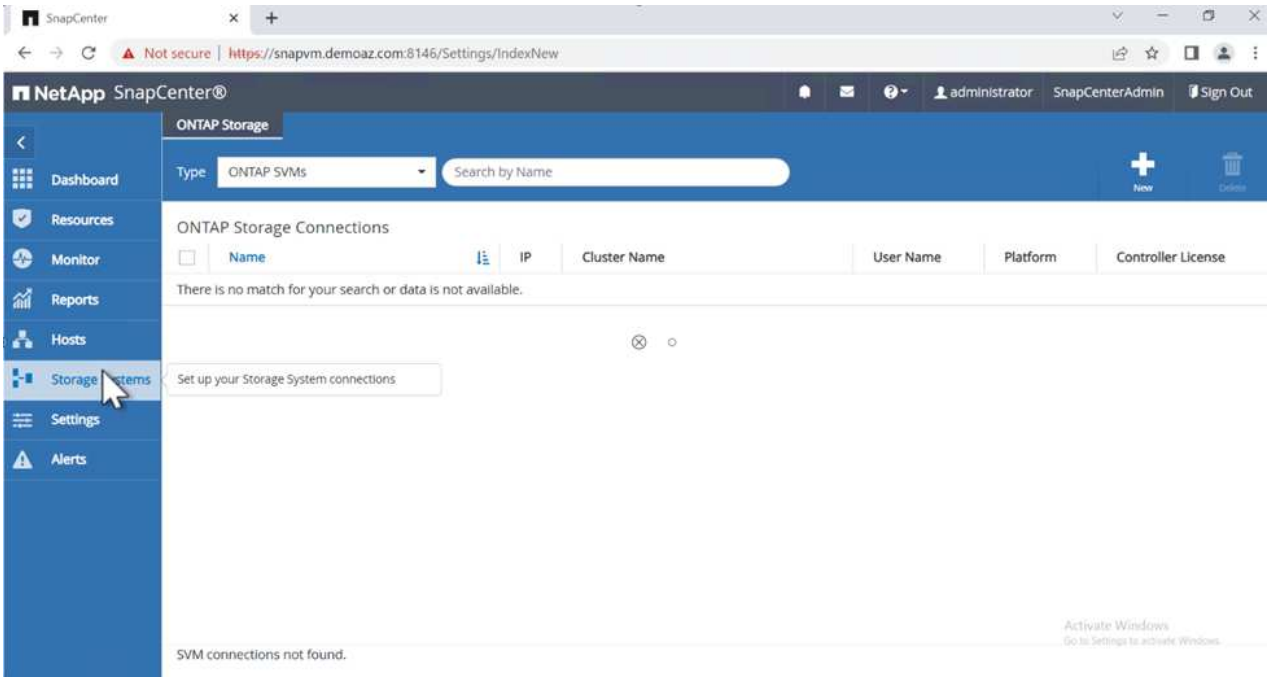
The new user must have administrator rights on the SQL Server host.



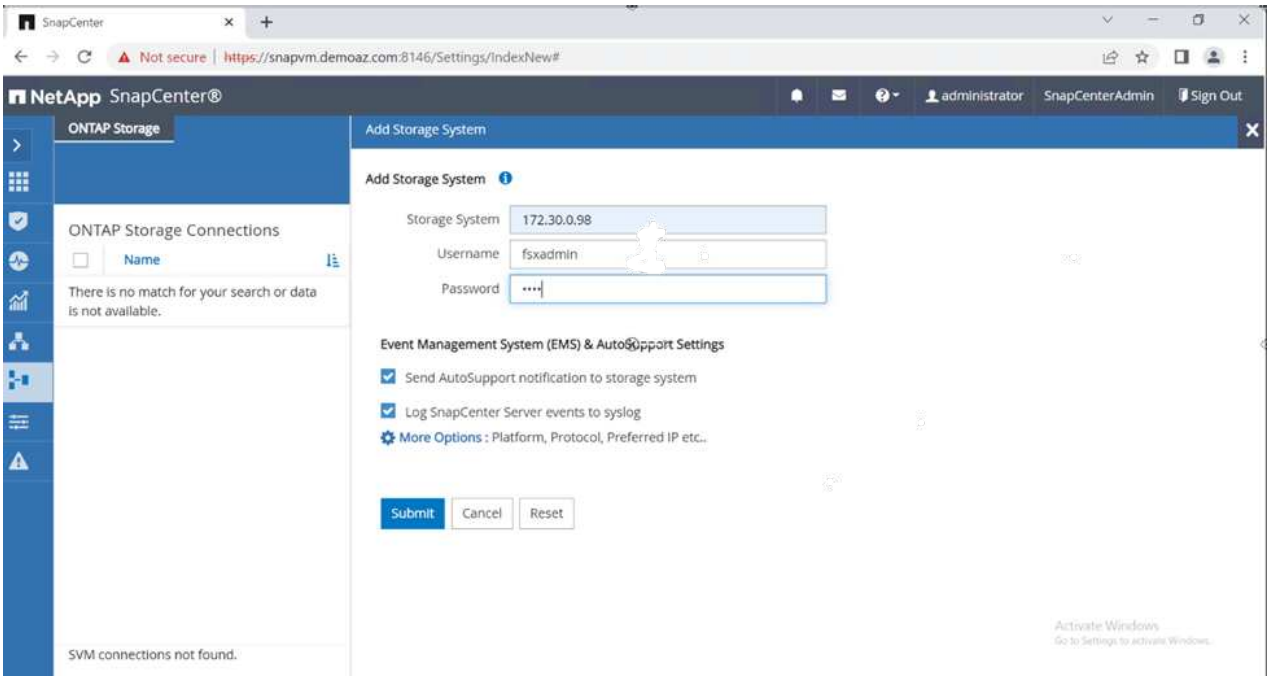
Configure storage

To configure storage in SnapCenter, complete the following steps:

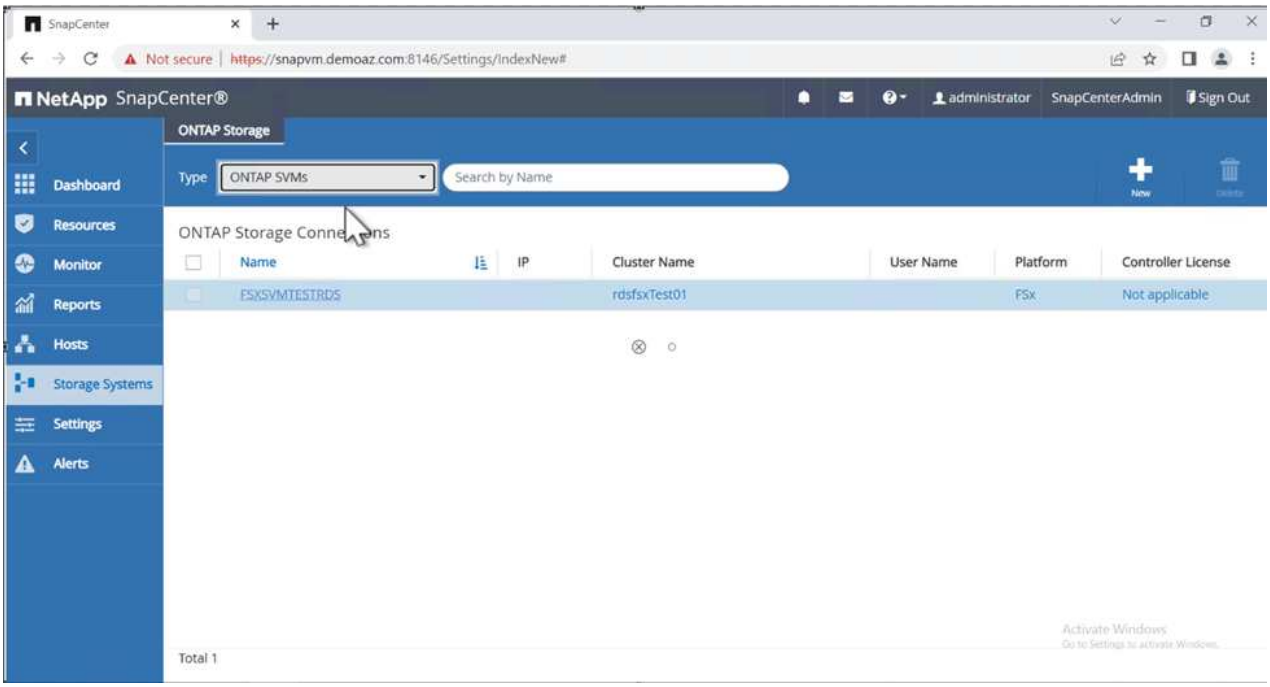
1. In the SnapCenter UI, select **Storage Systems**. There are two storage types, **ONTAP SVM** and **ONTAP Cluster**. By default, the storage type is **ONTAP SVM**.
2. Click (**+**) to add the storage system information.



3. Provide the **FSx for ONTAP management** endpoint.



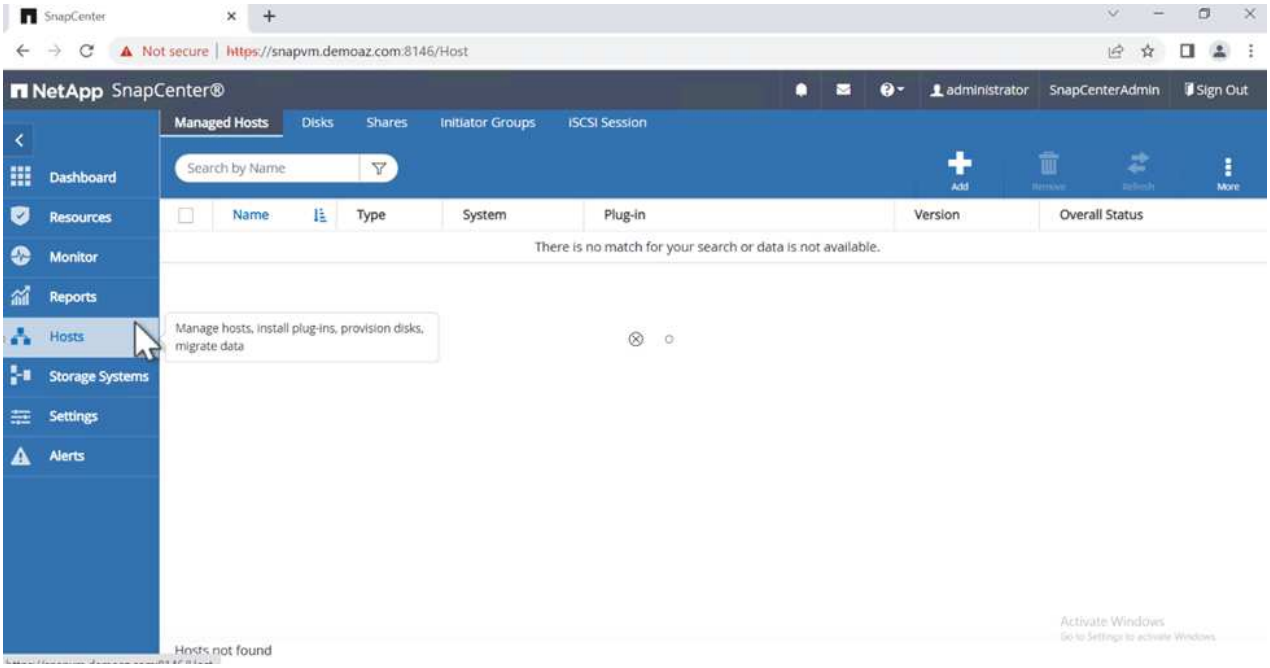
4. The SVM is now configured in SnapCenter.


SnapCenter
Not secure | https://snapvm.demoaz.com:8146/Settings/IndexNew#
NetApp SnapCenter®
administrator
SnapCenterAdmin
Sign Out
ONTAP Storage
Dashboard
Resources
Monitor
Reports
Hosts
Storage Systems
Settings
Alerts
Type
ONTAP SVMs
Search by Name
New
ONTAP Storage Connections
Name
IP
Cluster Name
User Name
Platform
Controller License
FSXSVMTESTRDS
rdsfsxTest01
FSx
Not applicable
Total 1
Activate Windows

Add a SQL Server host to SnapCenter

To add a SQL Server host, complete the following steps:

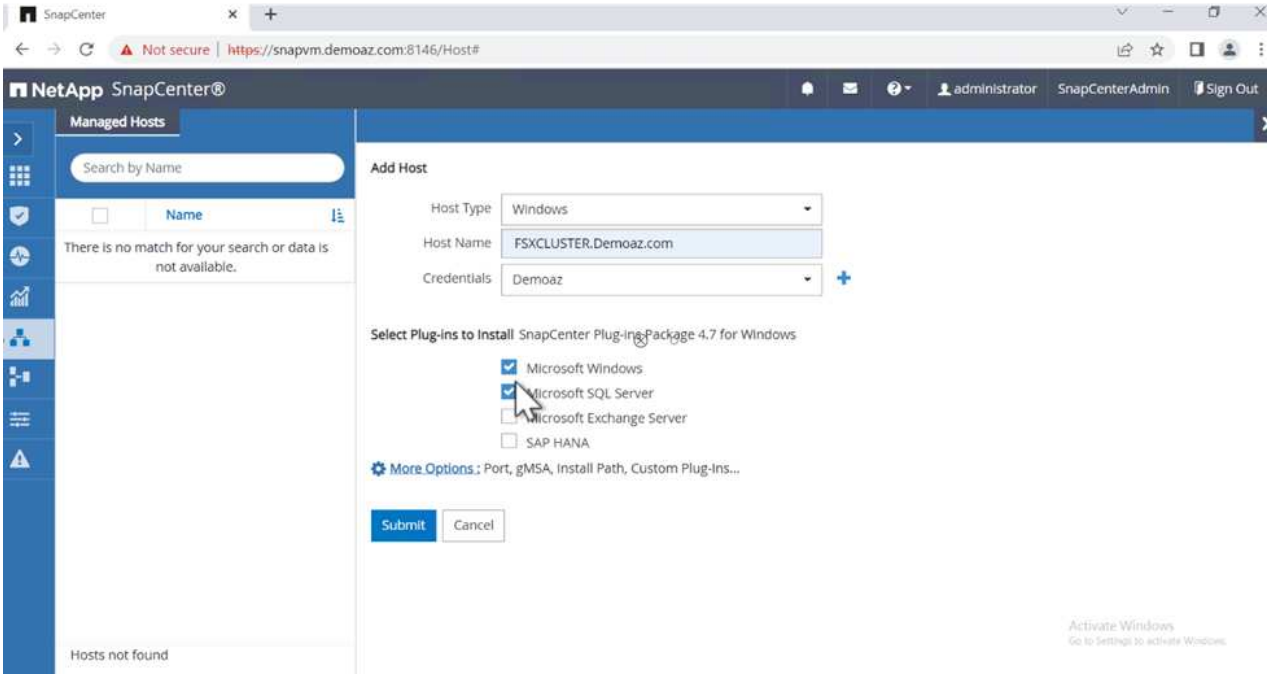
1. From the Host tab, click (**+**) to add the Microsoft SQL Server host.



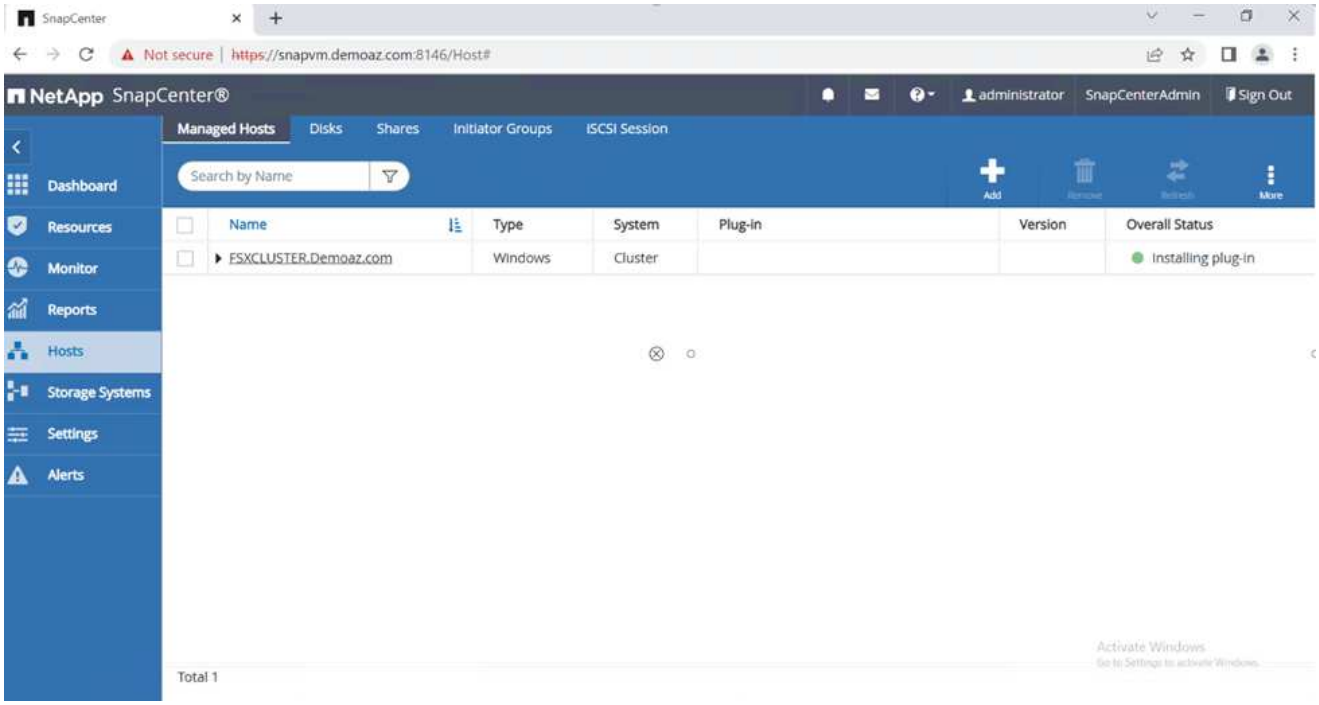
2. Provide the fully qualified domain name (FQDN) or IP address of the remote host.

   The credentials are populated by default.

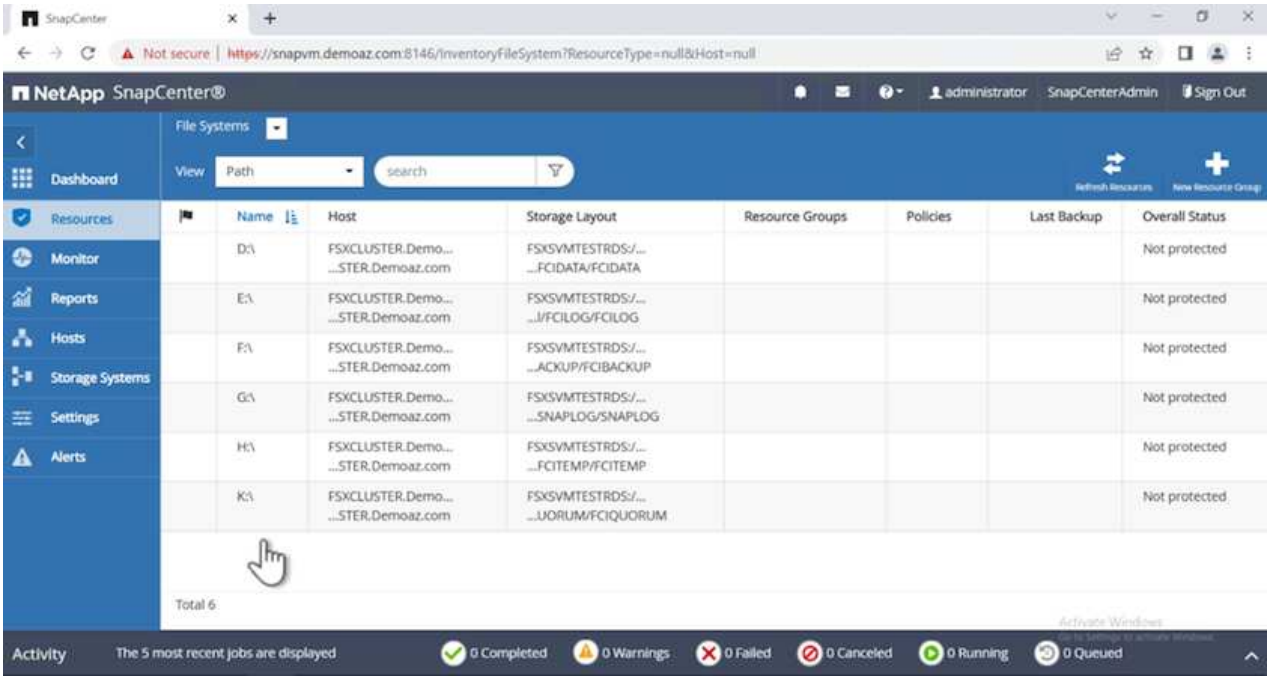
3. Select the option for Microsoft windows and Microsoft SQL Server and then submit.



The SQL Server packages are installed.



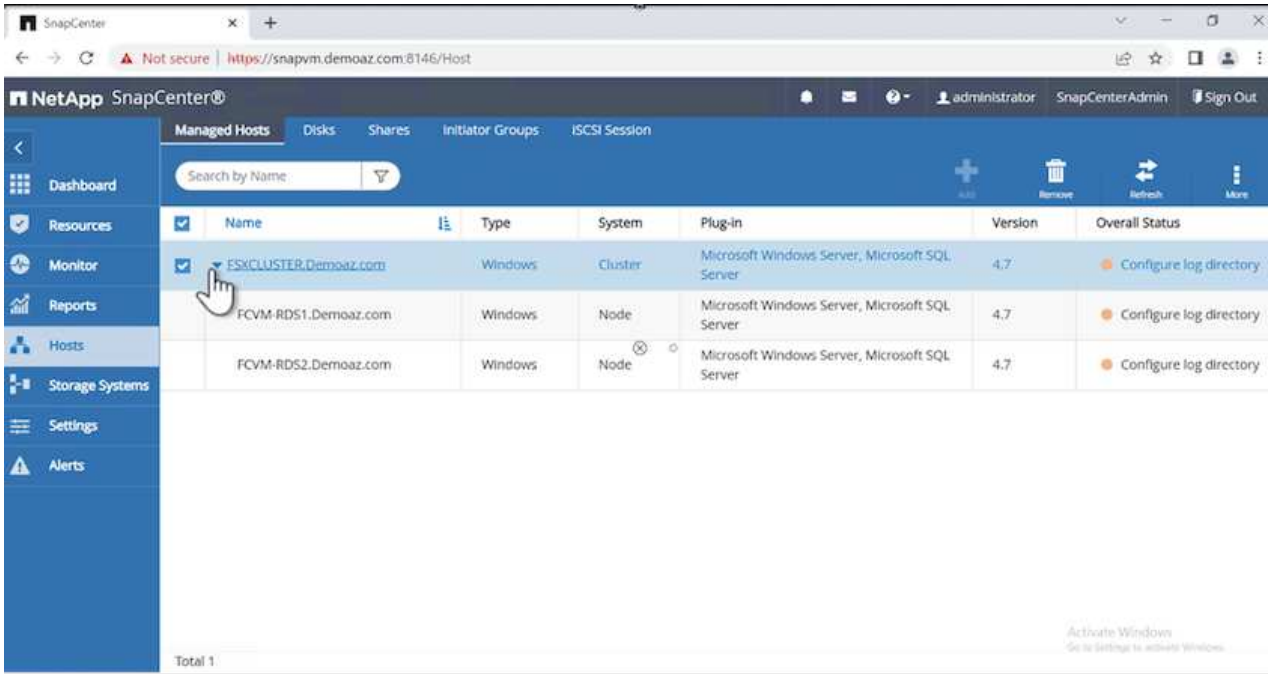
1. After the installation is complete, go to the **Resource** tab to verify whether all FSx for ONTAP iSCSI volumes are present.



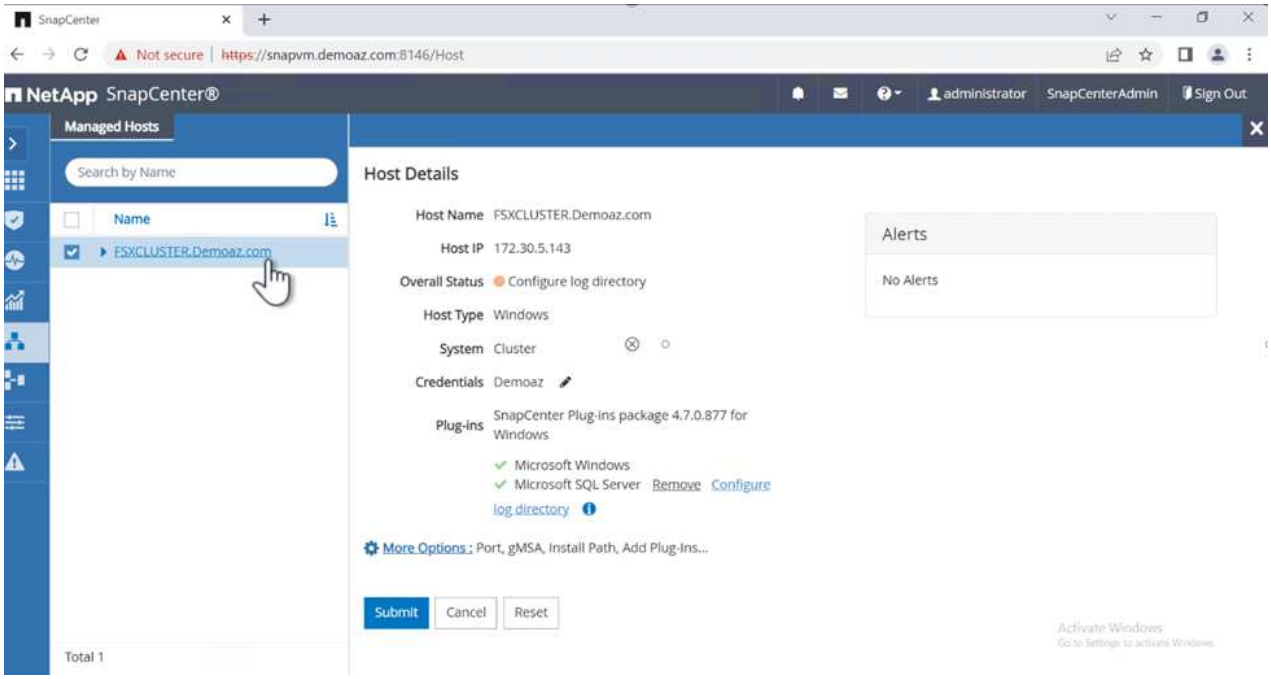
Configure log directory

To configure a host log directory, complete the following steps:

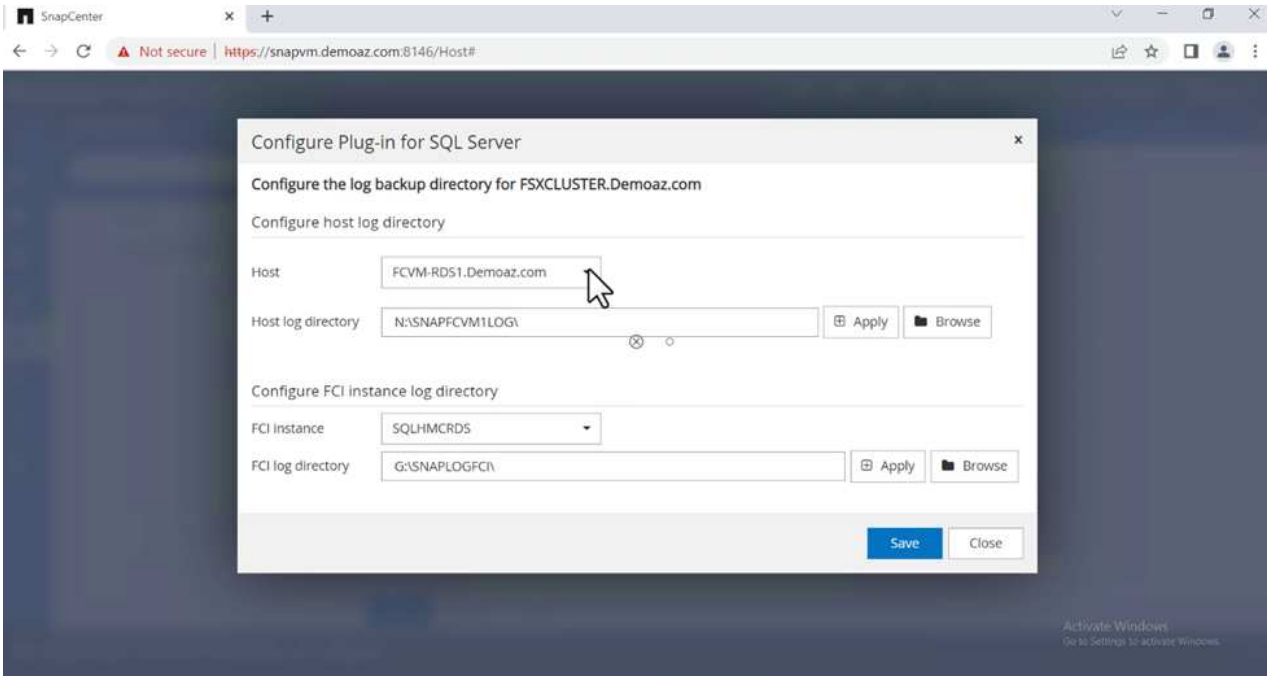
1. Click the check box. A new tab opens.



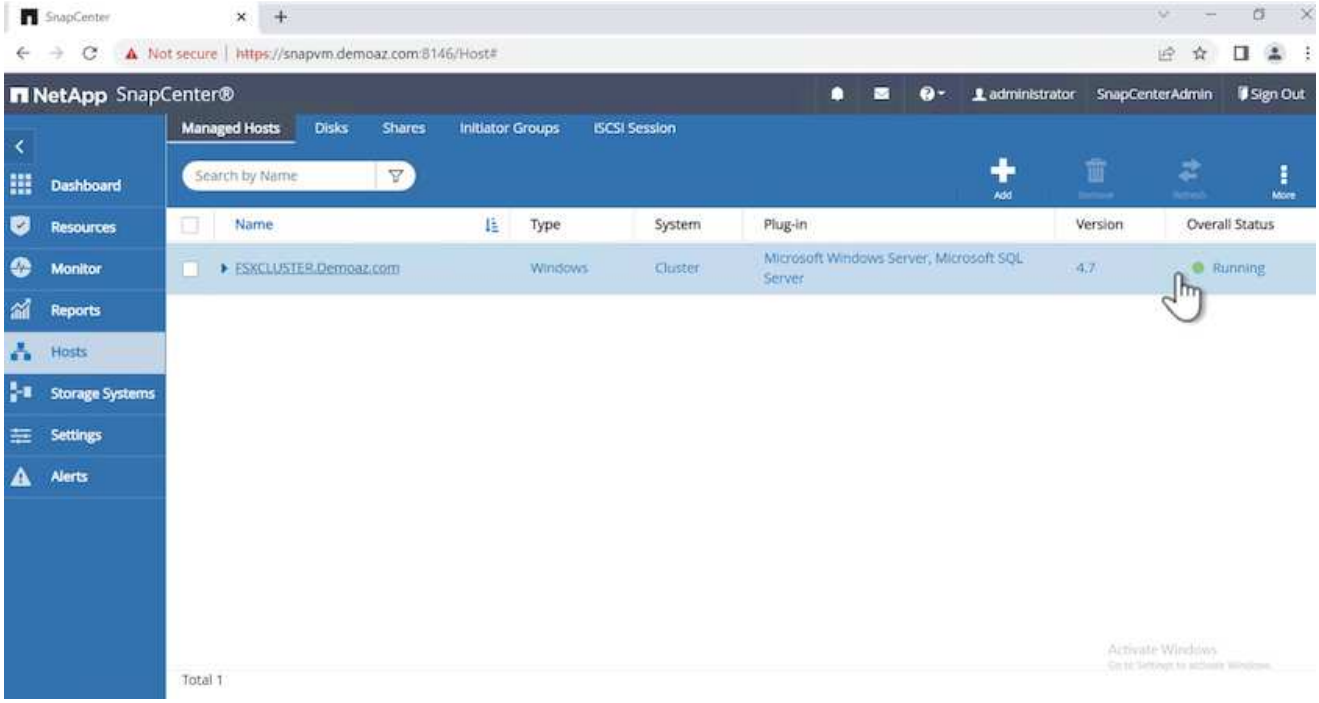
2. Click the **configure log directory** link.



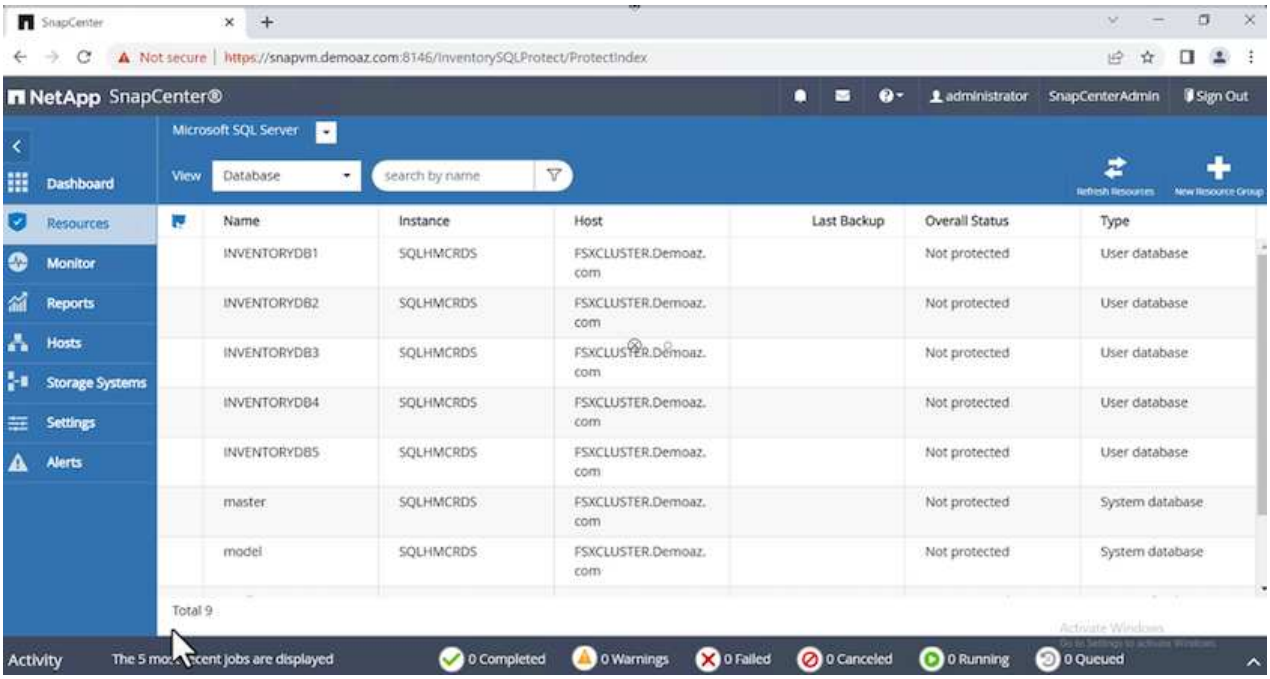
3. Select the drive for the host log directory and the FCI instance log directory. Click **Save**. Repeat the same process for the second node in the cluster. Close the window.



The host is now in a running state.



1. From the **Resources** tab, we have all the servers and databases.



Configure a backup policy

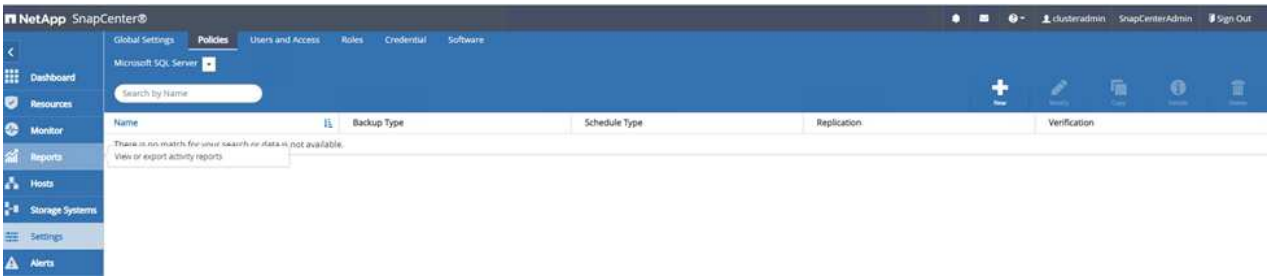
A backup policy is a set of rules that govern how to manage, schedule, and retain backup. It helps with the backup type and frequency based on your company's SLA.

Expand the following sections to see the detailed instructions on how to complete each step.

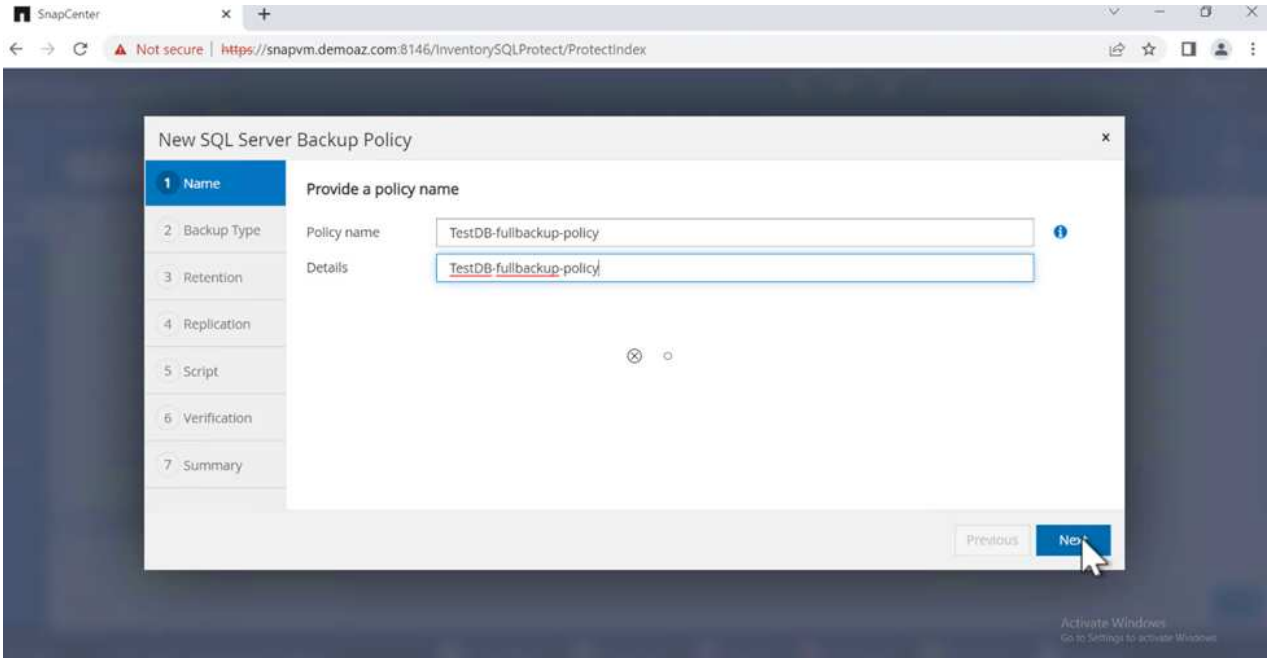
Configure back-up operation for an FCI database

To configure a backup policy for an FCI database, complete the following steps:

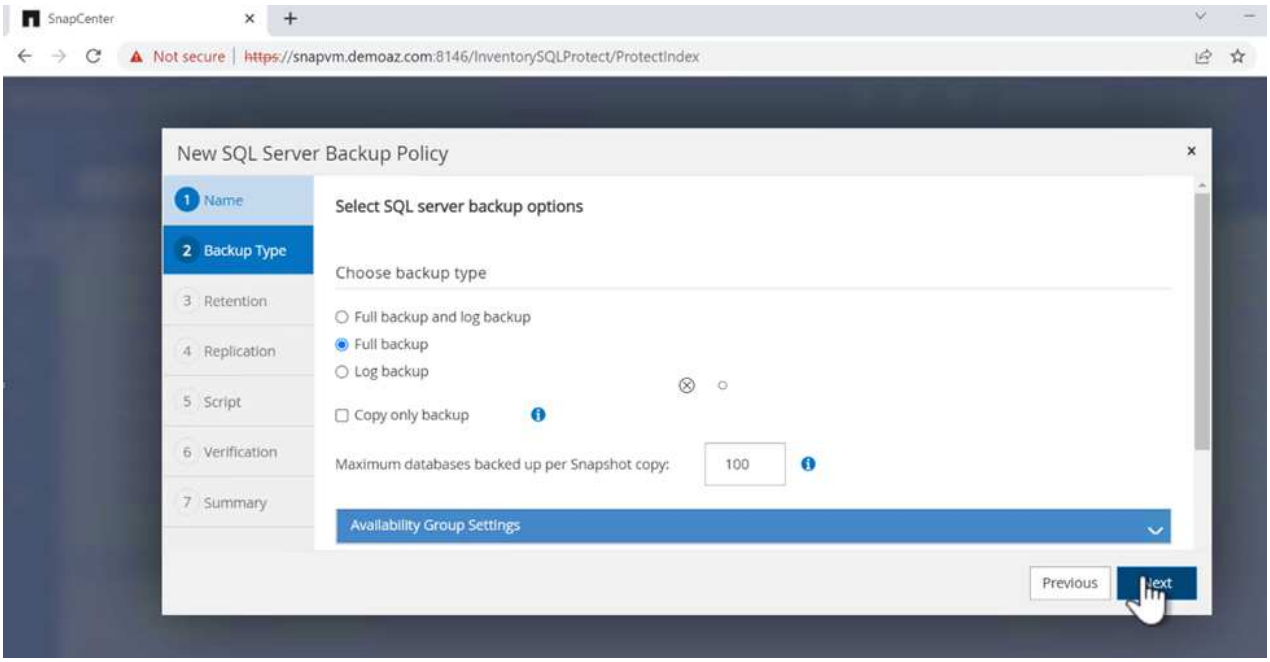
1. Go to **Settings** and select **Policies** on the top left. Then click **New**.



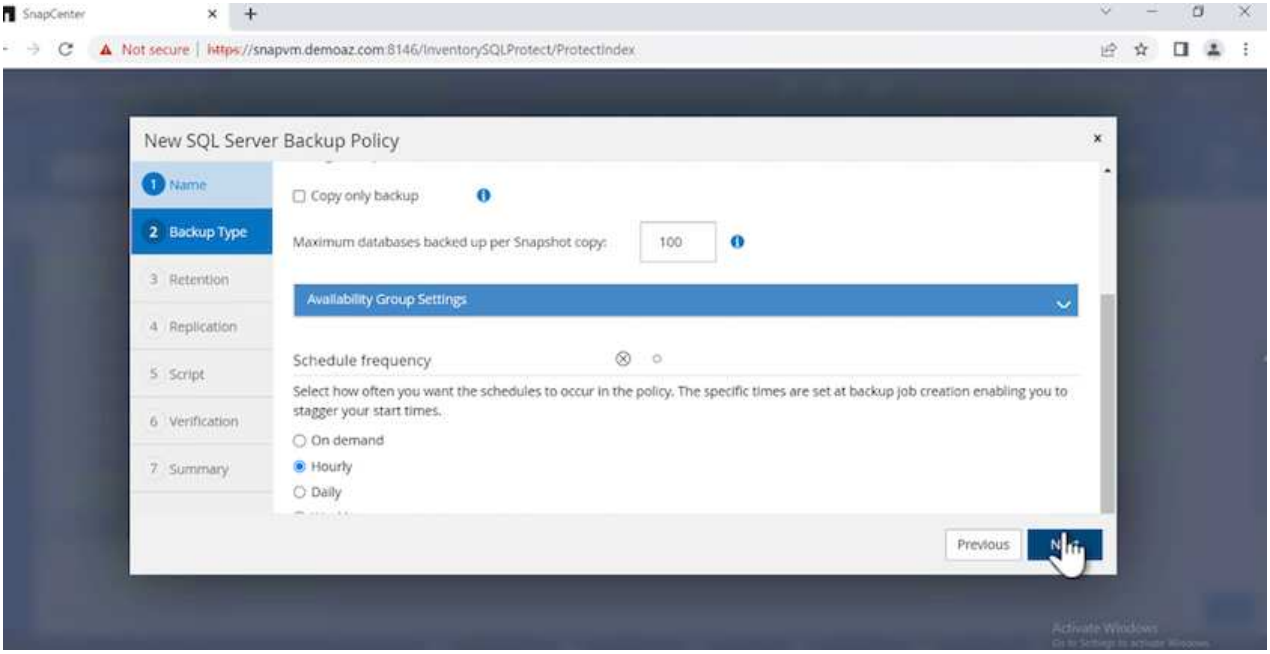
2. Enter the policy name and a description. Click **Next**.



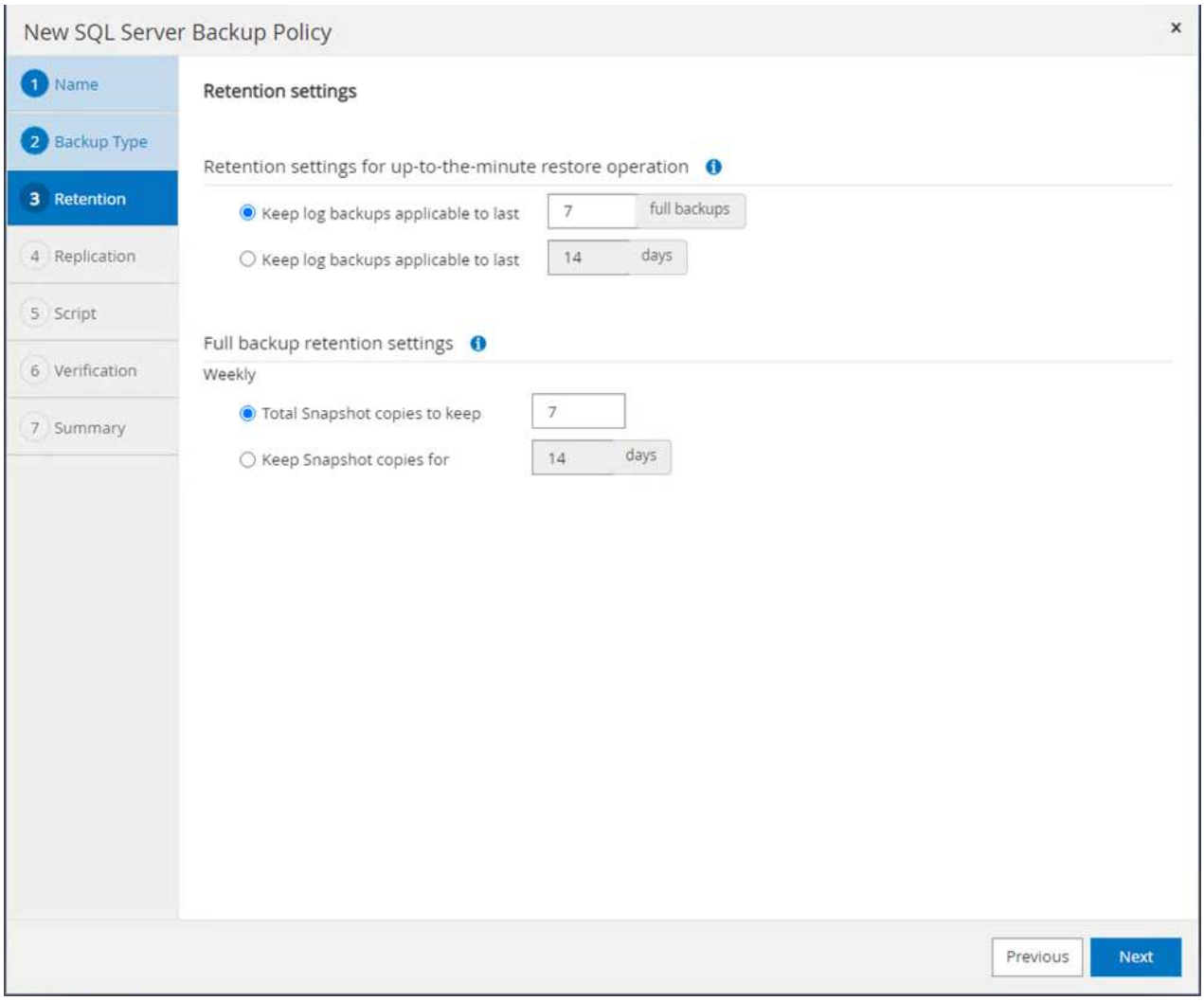
3. Select **Full backup** as the backup type.



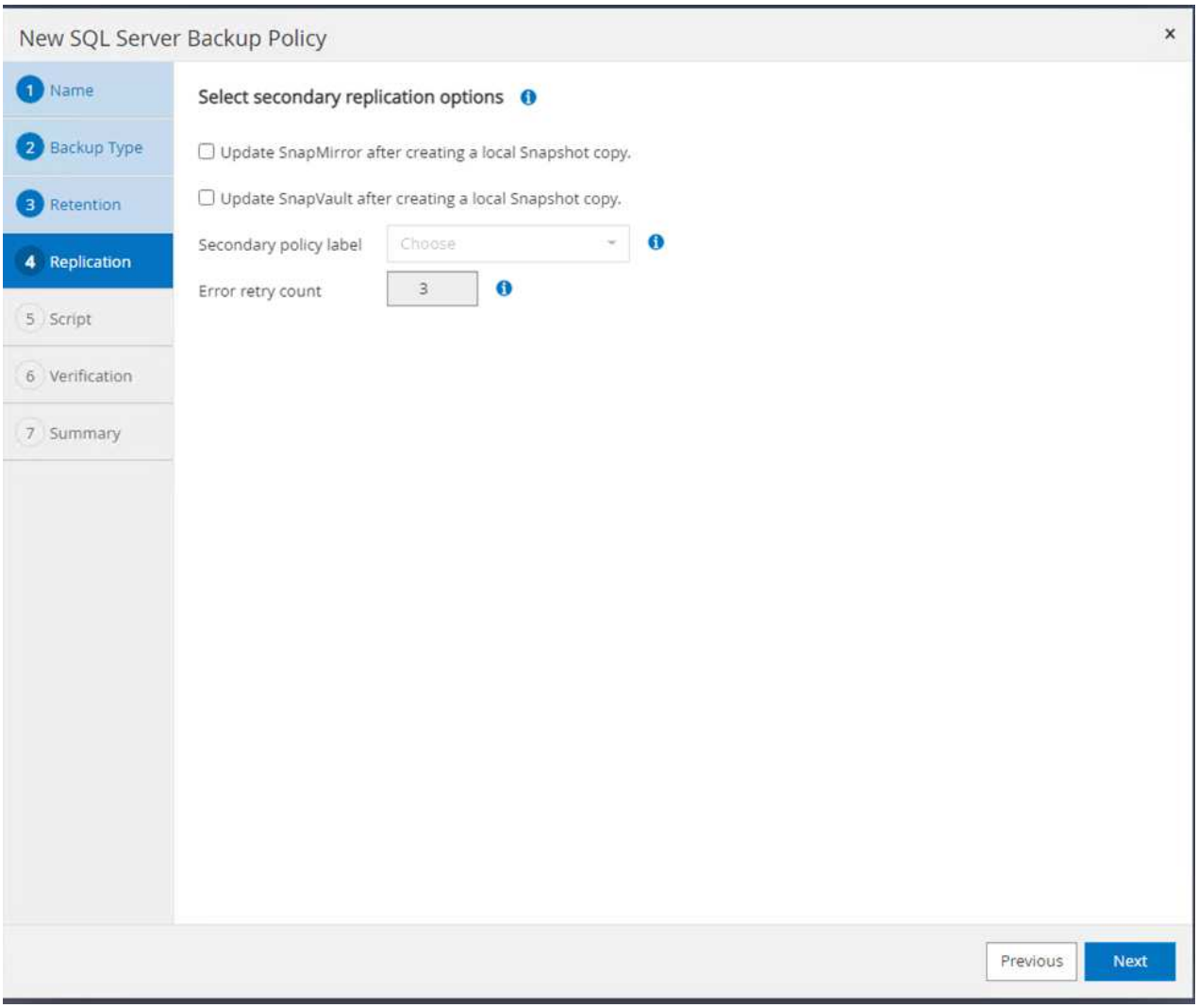
4. Select the schedule frequency (this is based on the company SLA). Click **Next**.



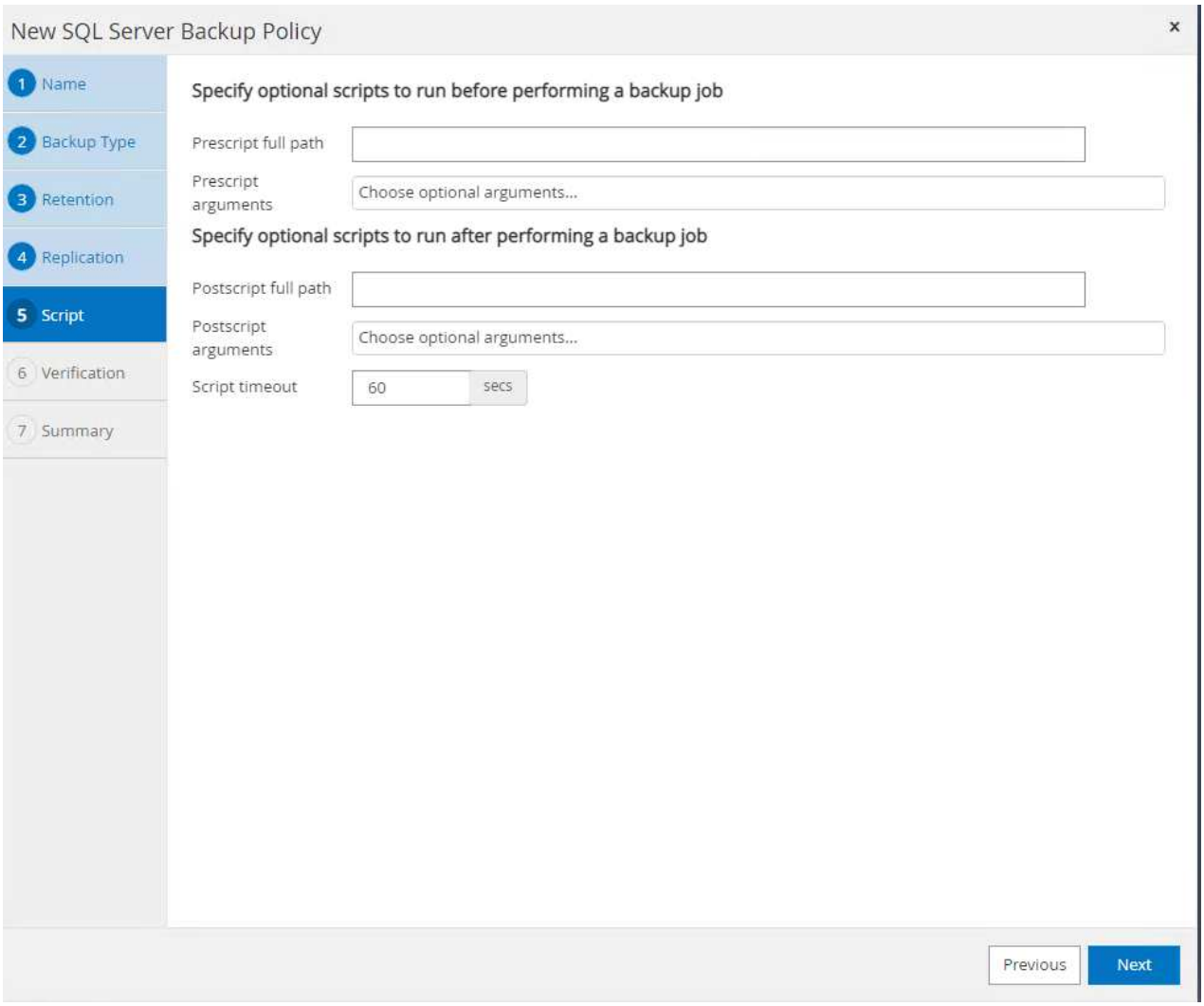
5. Configure the retention settings for the backup.



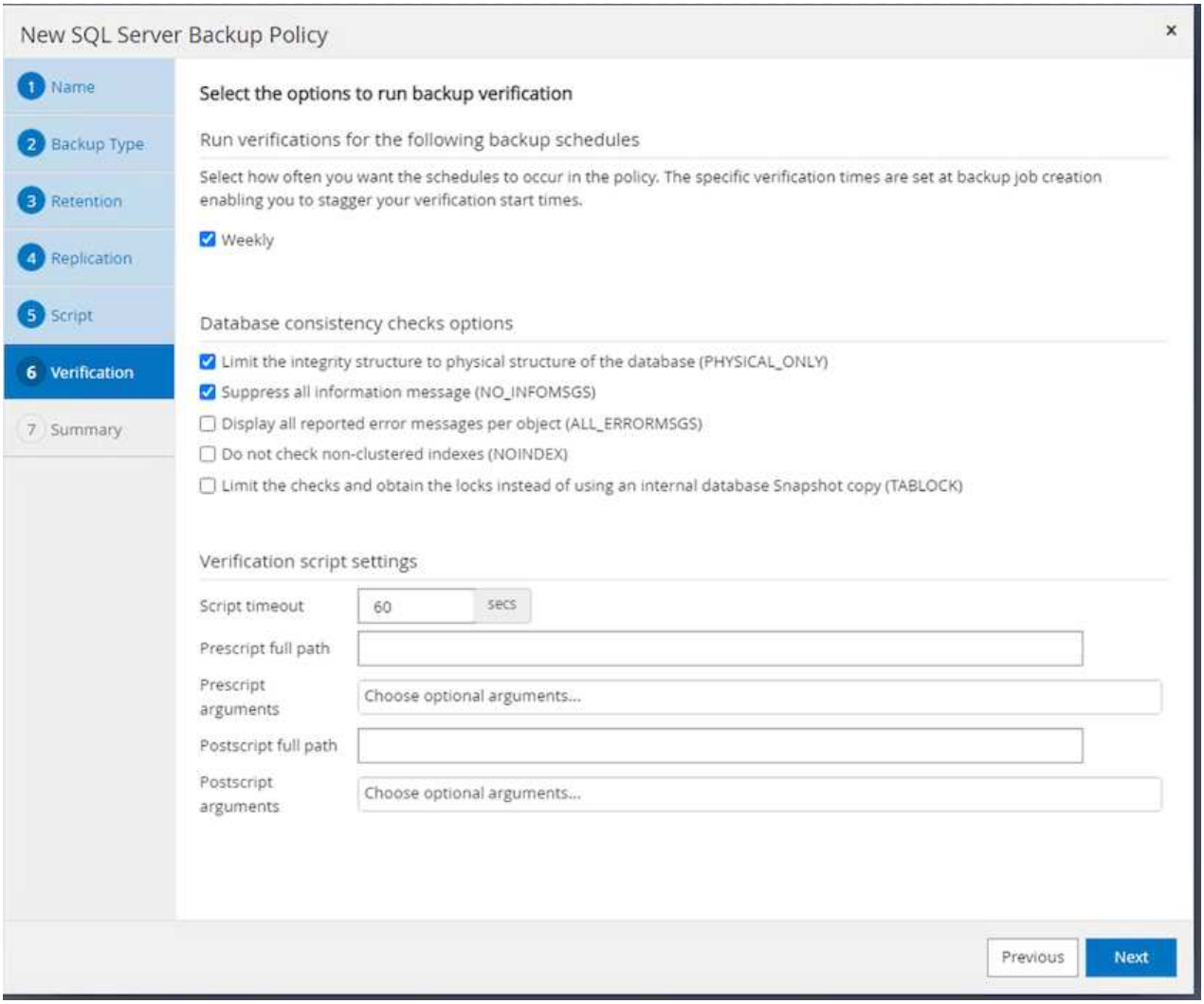
6. Configure the replication options.



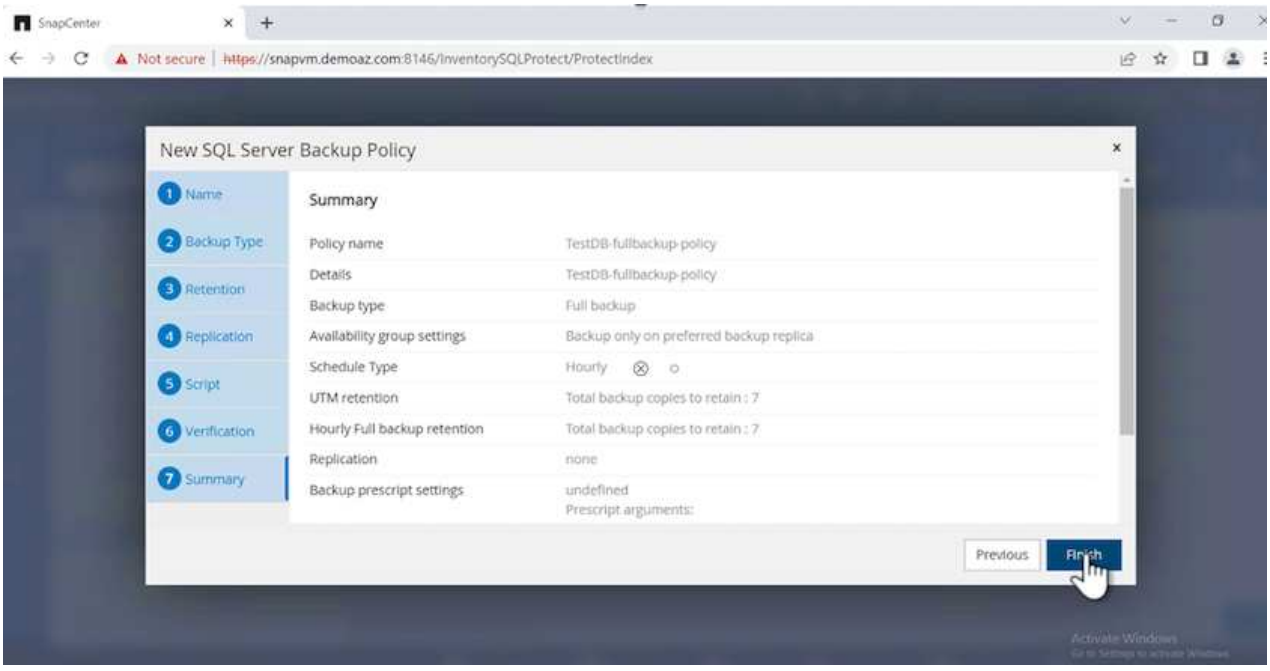
7. Specify a run script to run before and after a backup job is run (if any).



8. Run verification based on the backup schedule.

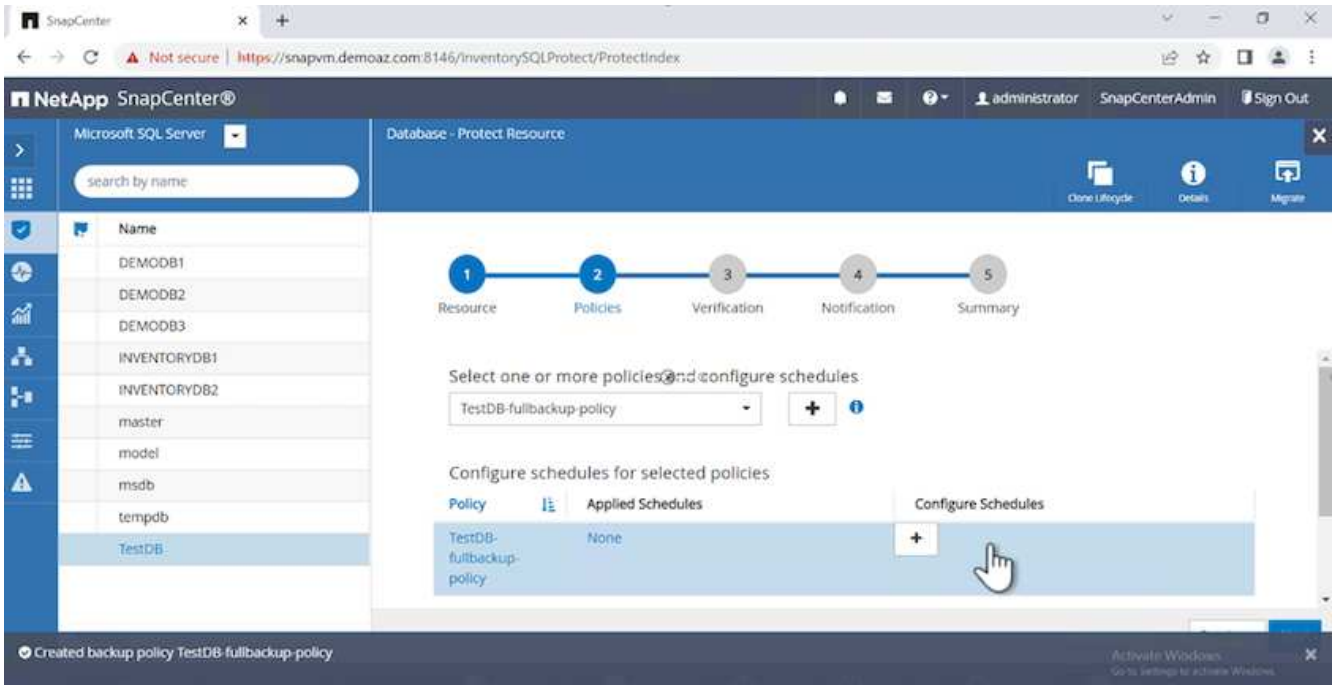


9. The **Summary** page provides details of the backup policy. Any errors can be corrected here.

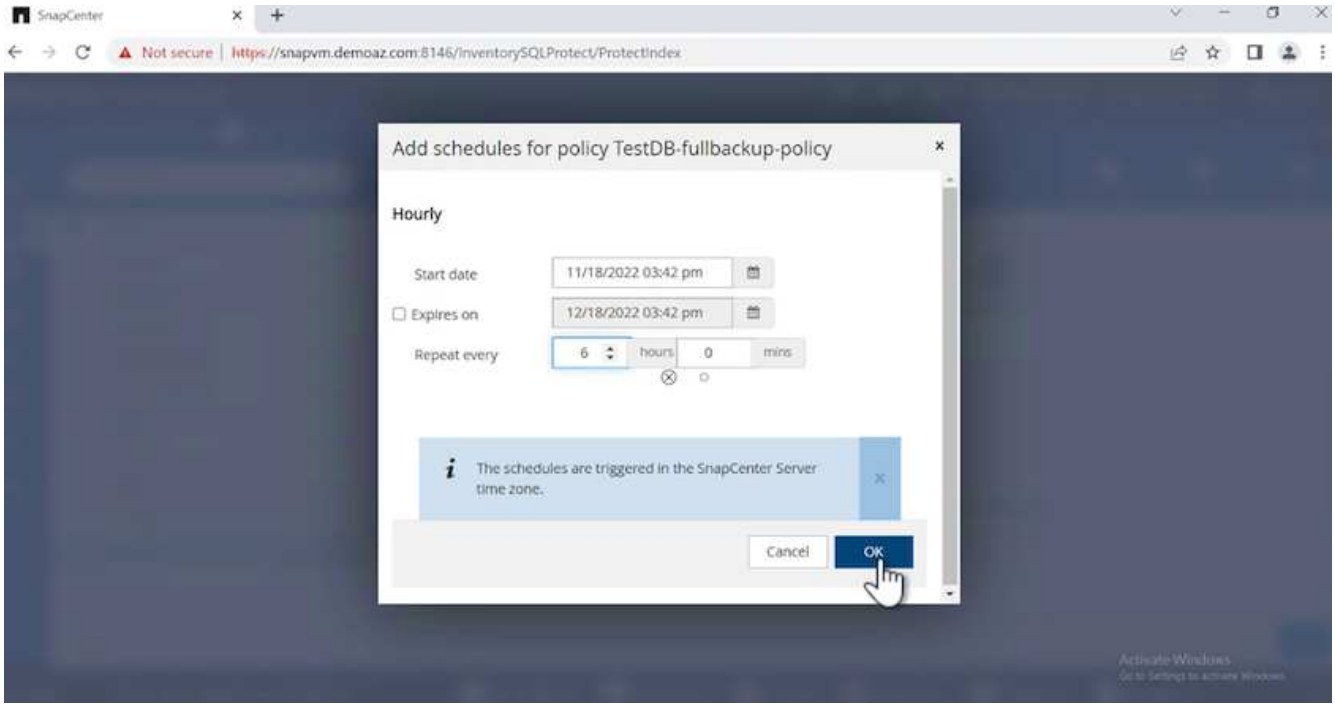


Configure and protect MSSQL Server database

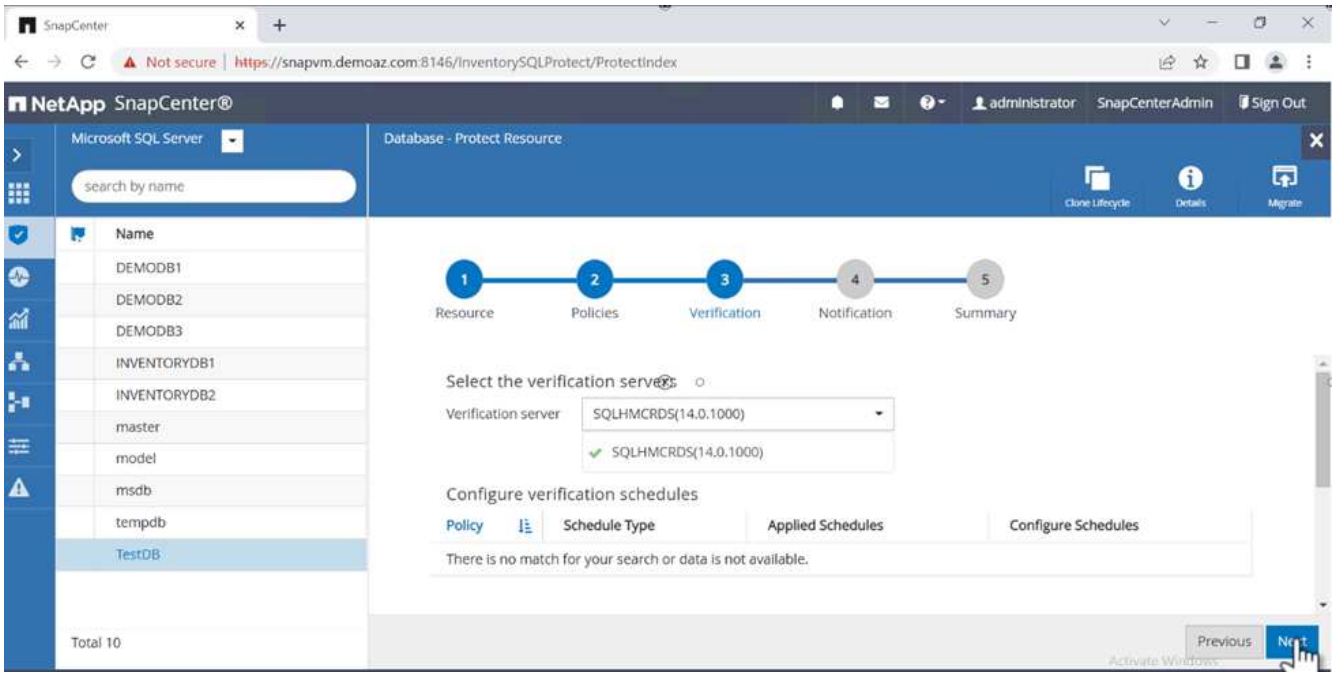
1. Set up the starting date and expiration date of the backup policy.



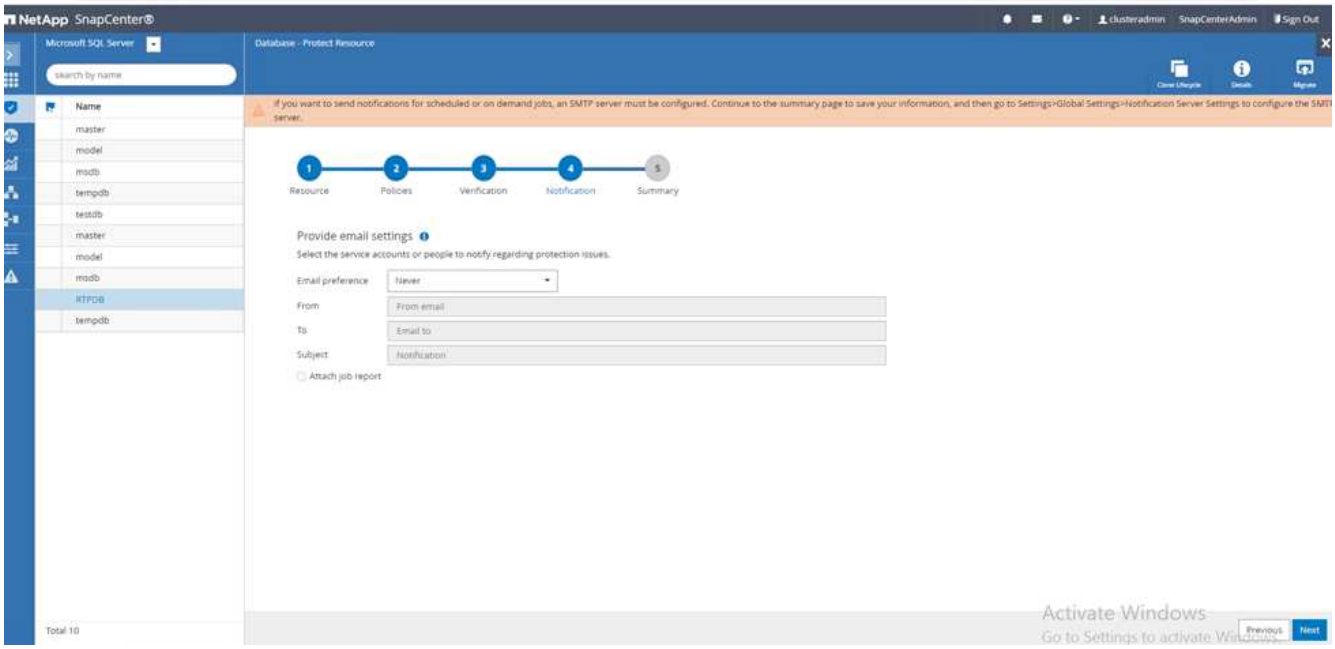
2. Define the schedule for the backup. To do that, click (**+**) to configure a schedule. Enter the **Start date** and **Expires on** date. Set the time based on the company's SLA.



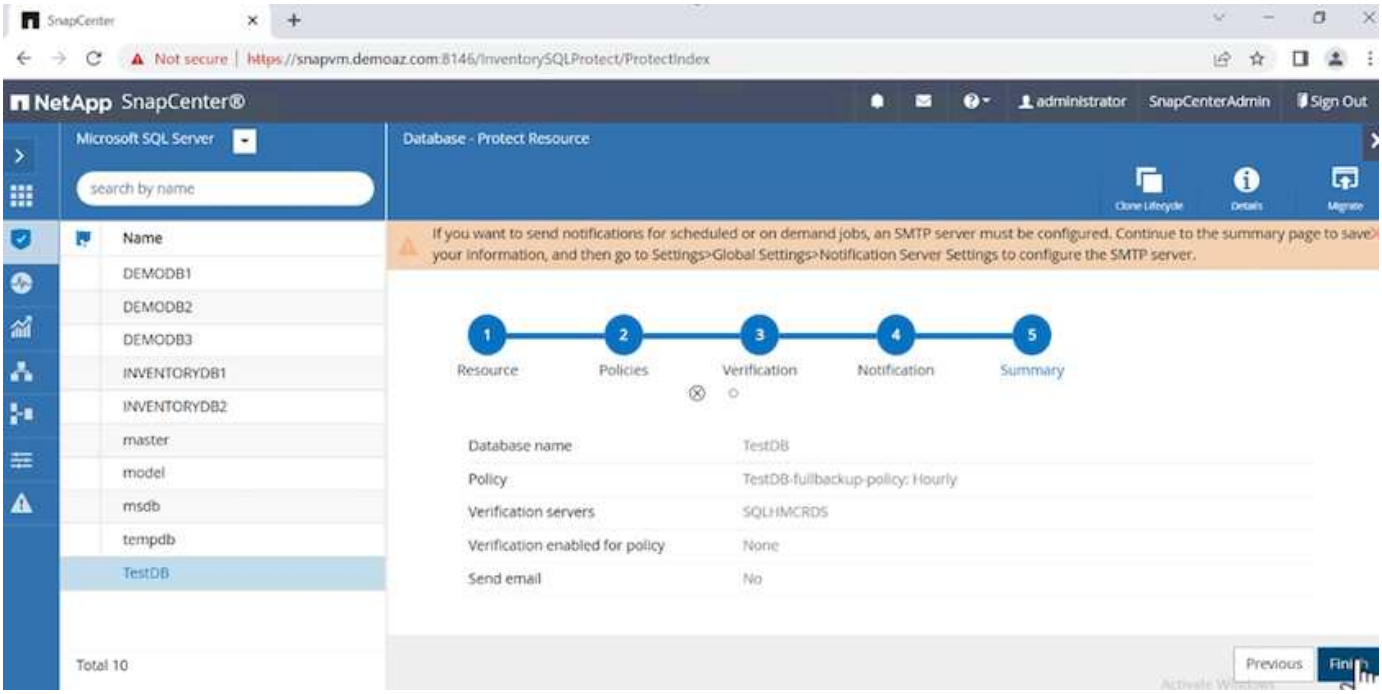
3. Configure the verification server. From the drop- down menu, select the server.



4. Confirm the configured schedule by clicking the plus sign and confirm.
5. Provide information for email notification. Click **Next**.



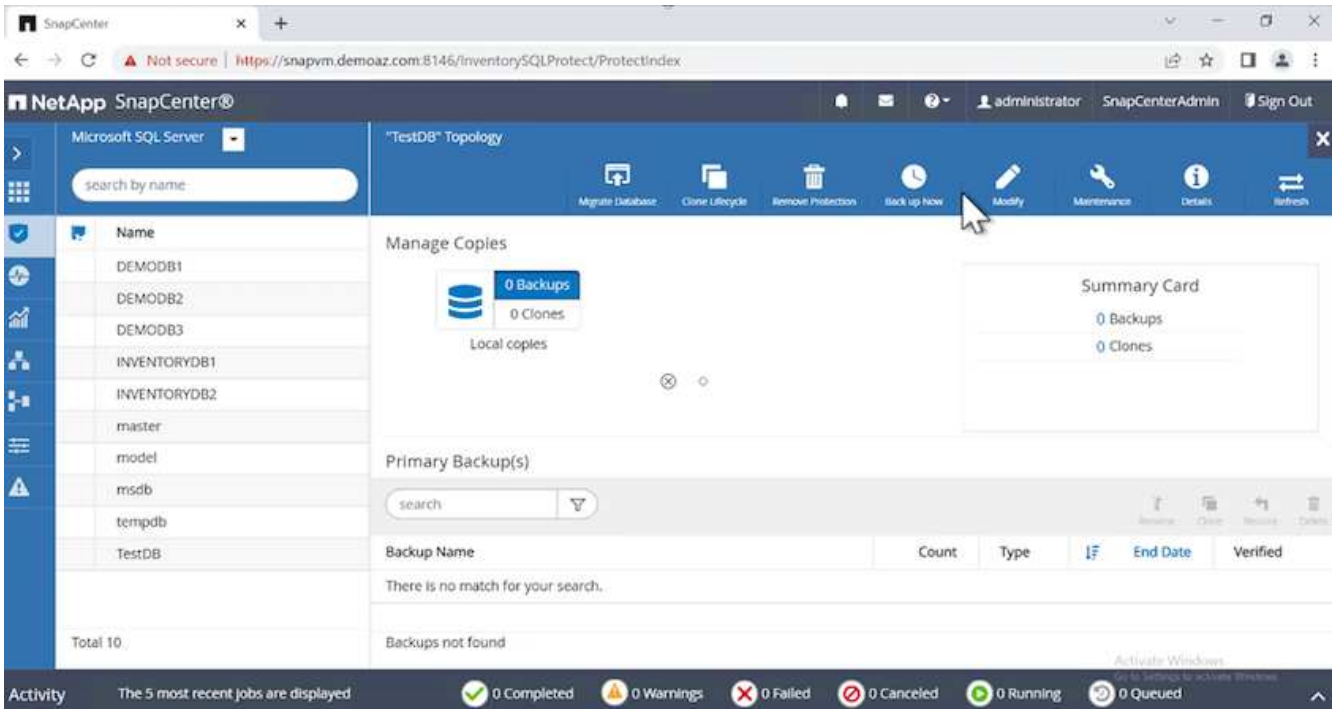
The summary of the backup policy for SQL Server database is now configured.



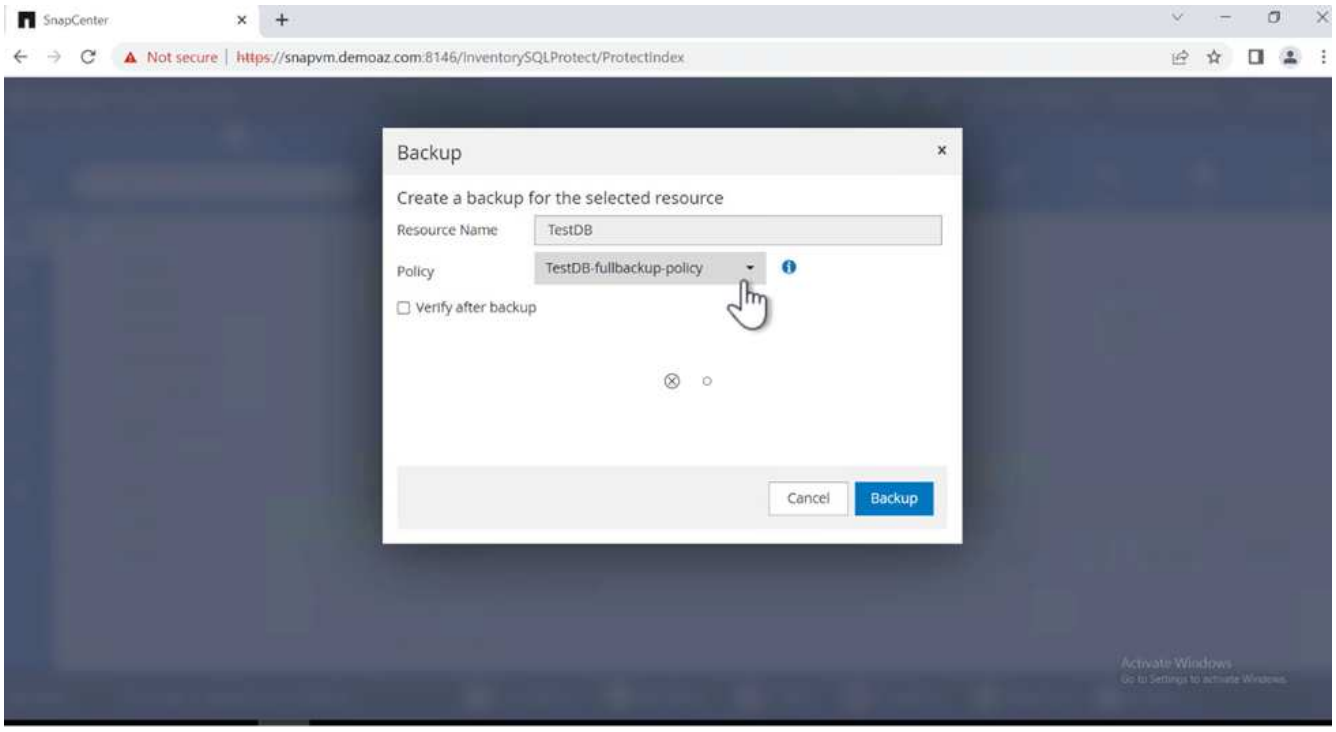
SnapCenter backup operations

To create on-demand SQL Server backups, complete the following steps:

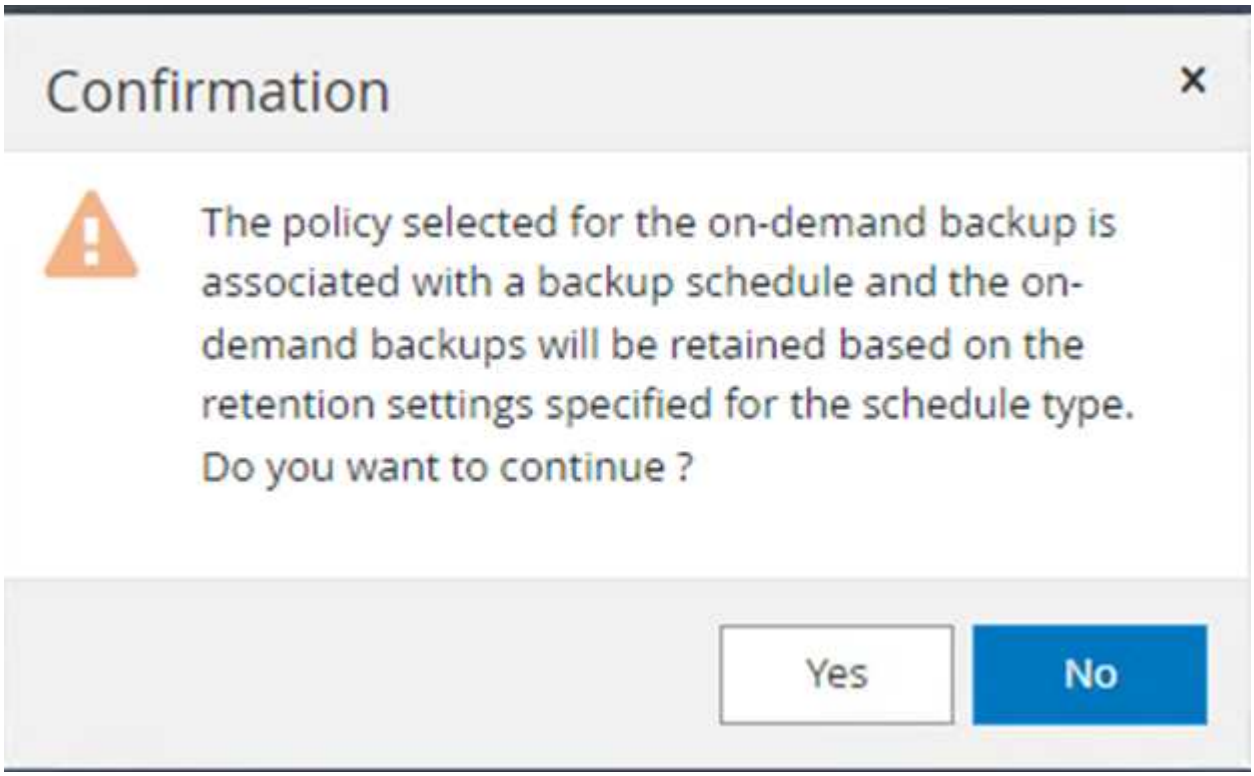
1. From the **Resource** view, select the resource and select **Backup now**.



2. In the **Backup** dialog box, click **Backup**.

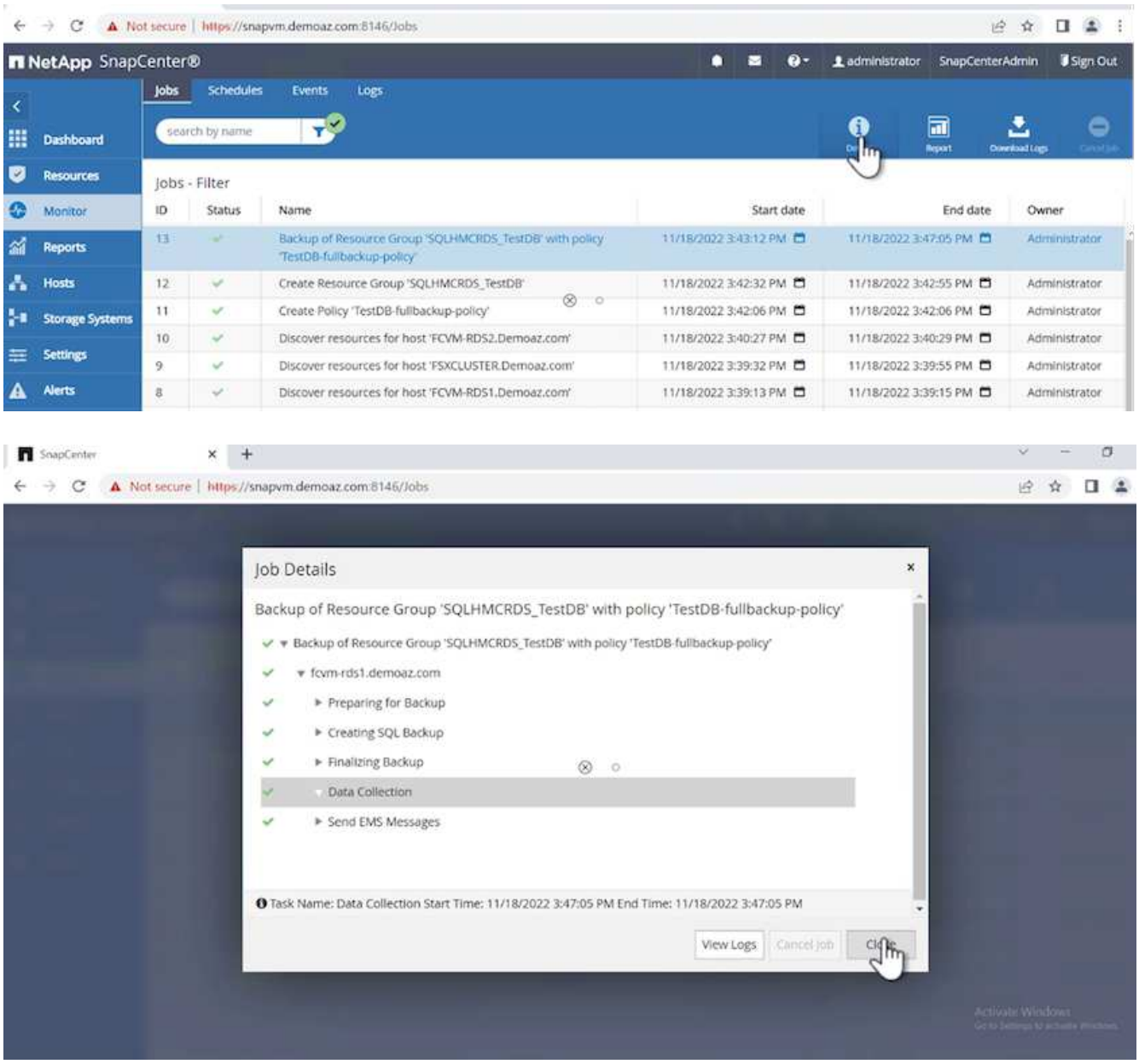


3. A confirmation screen is displayed. Click **Yes** to confirm.



Monitor backup job

1. From the **Monitor** tab, click the job and select **Details** on the right to view the jobs.

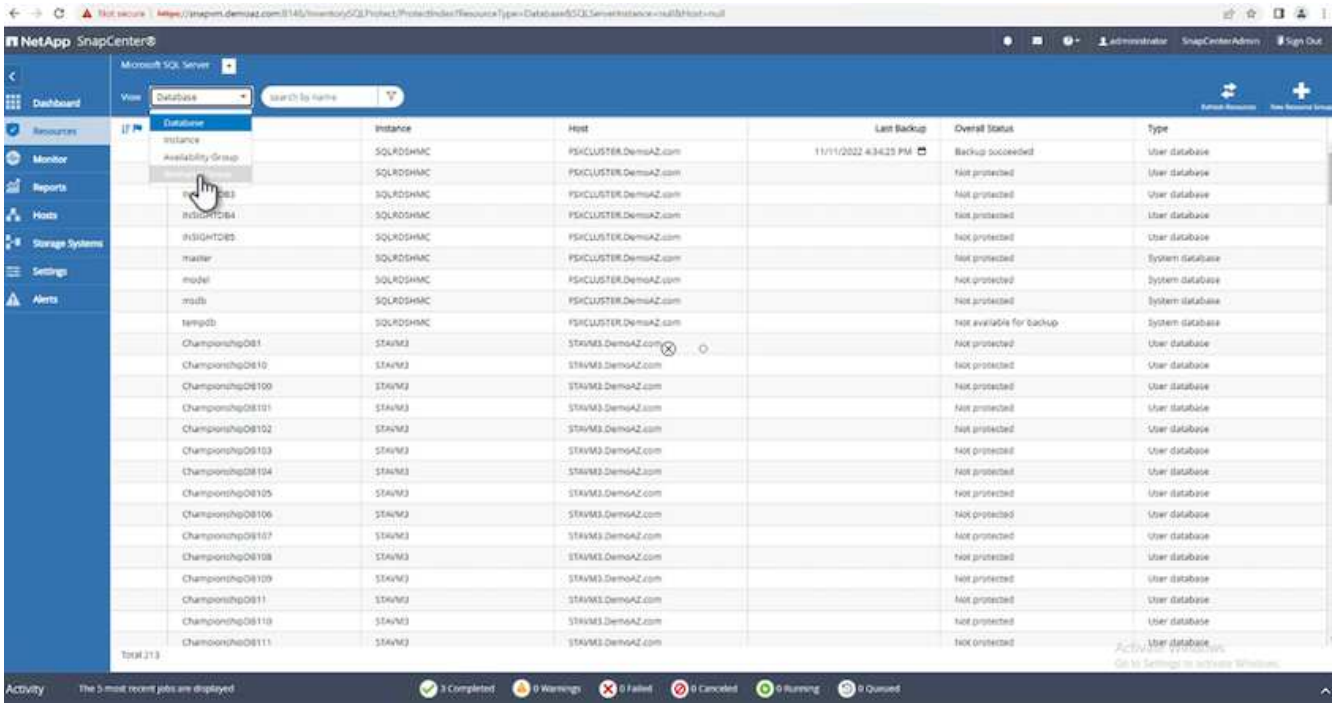


When the backup is completed, a new entry is shown in the Topology view.

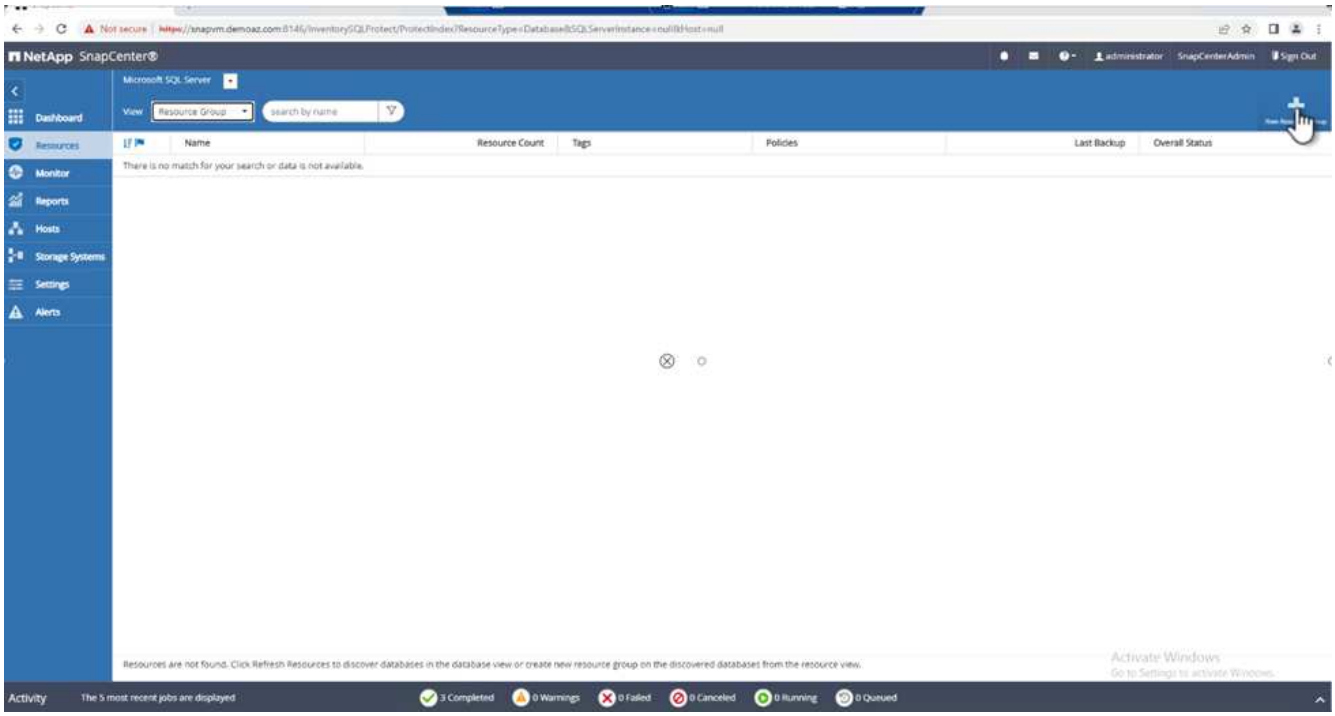
Backup operation for multiple databases

To configure a backup policy for multiple SQL Server databases, create resource group policies by completing the following steps:

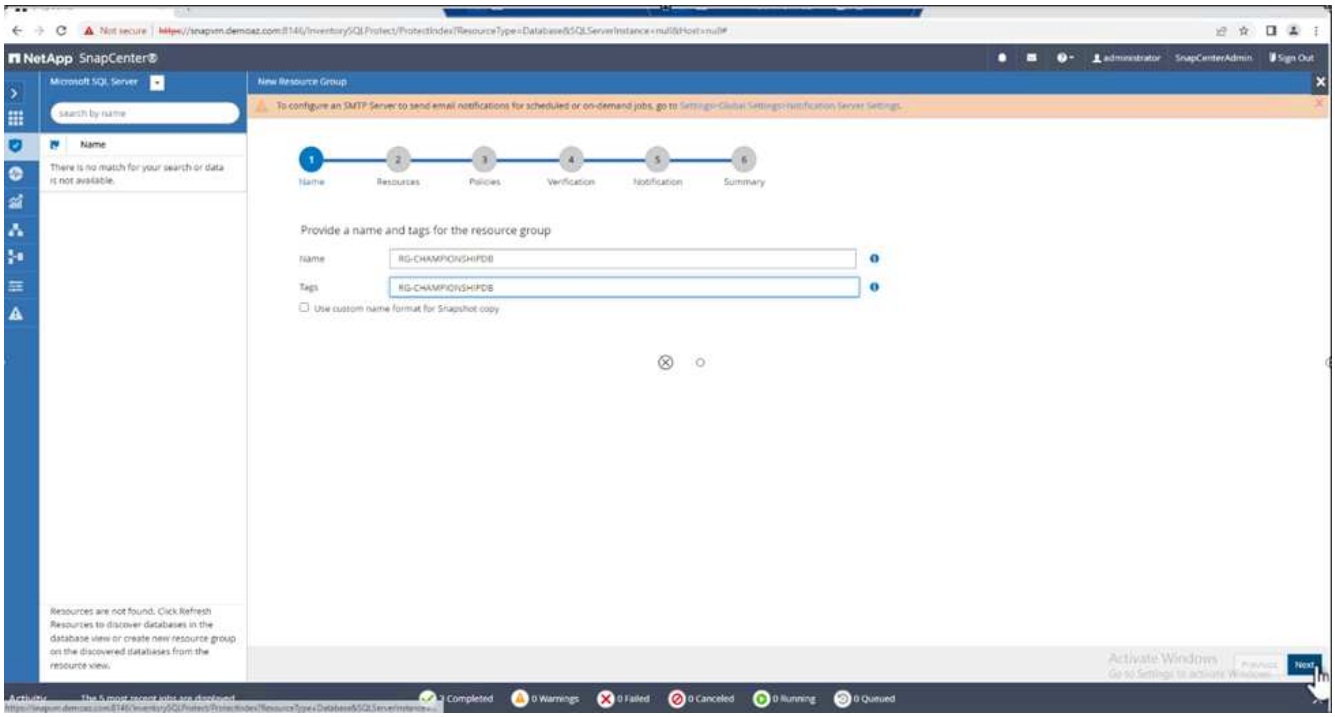
1. In the **Resources** tab from the **View** menu, change to a resource group using the drop-down menu.



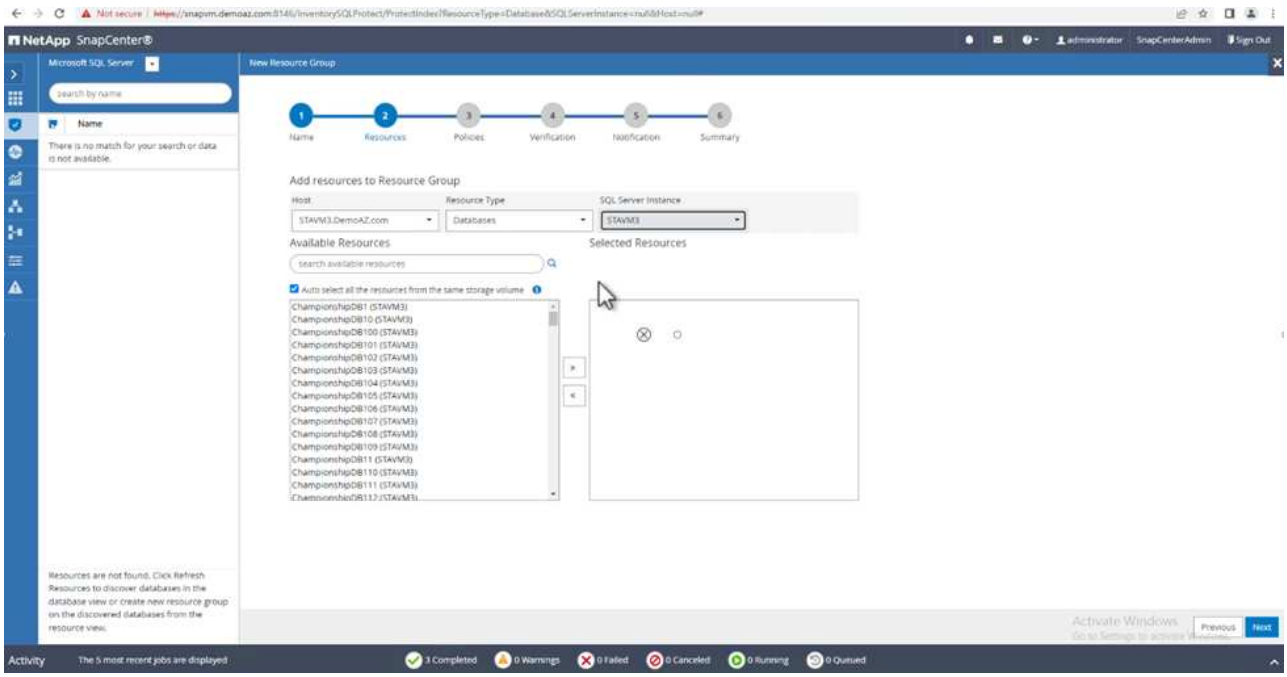
2. Click (**+**) for a new resource group.



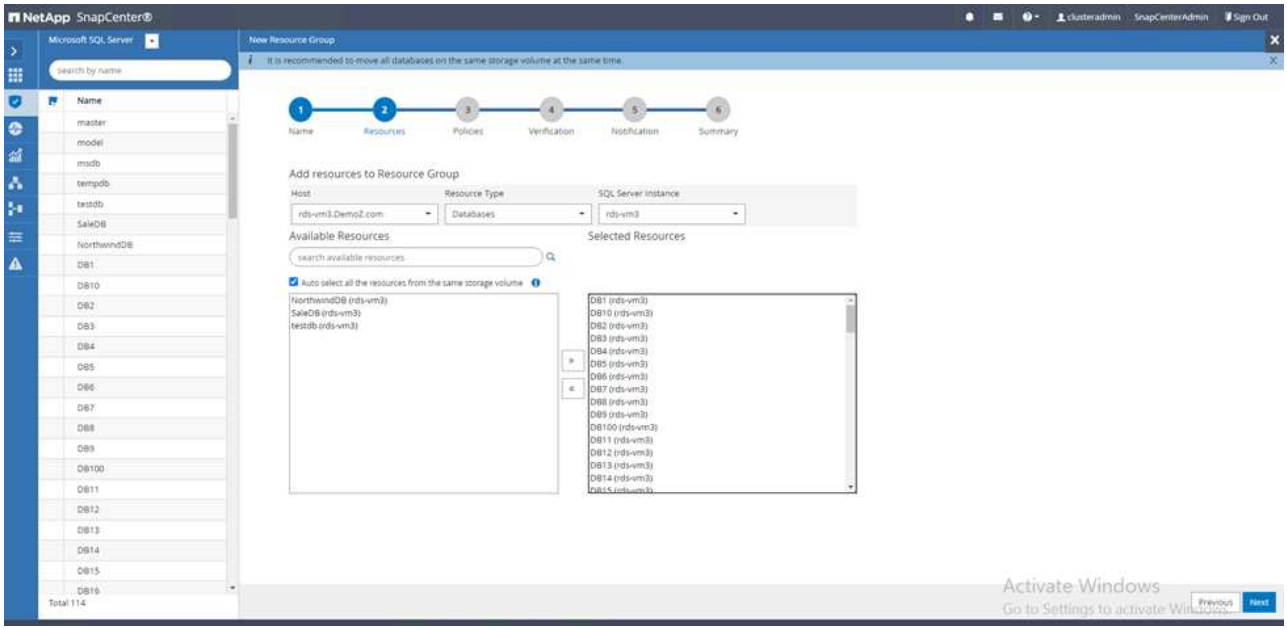
3. Provide a name and tag. Click **Next**.



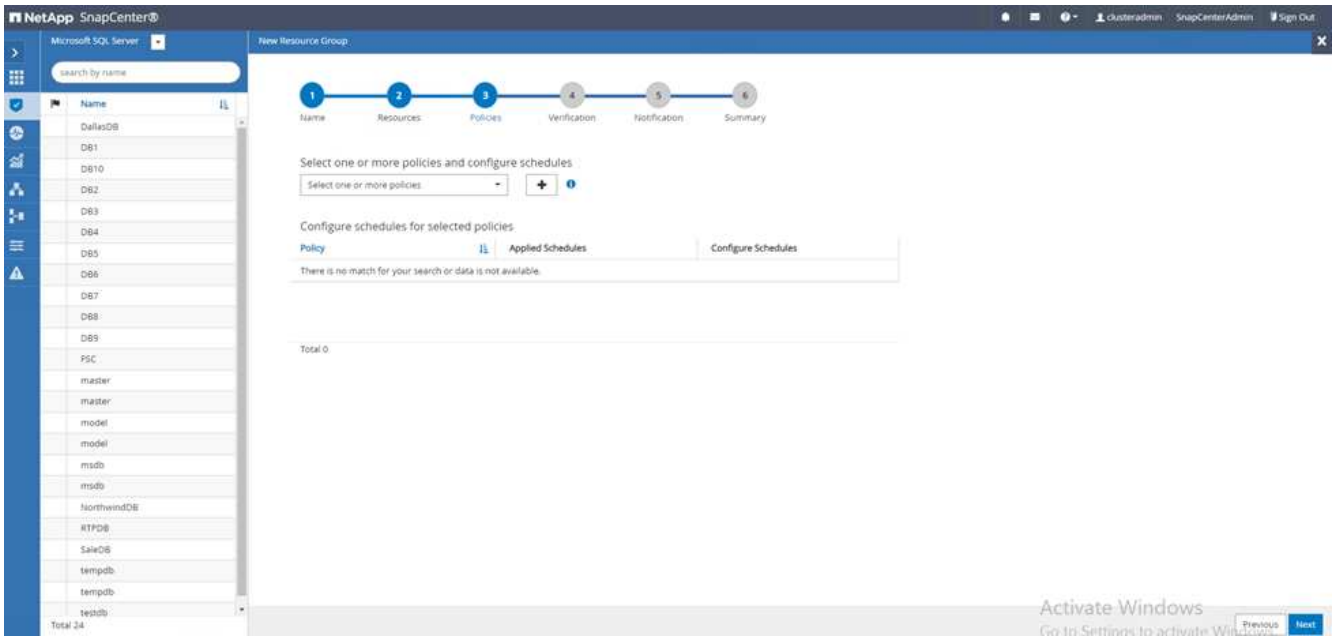
4. Add resources to the resource group:
   - **Host.** Select the server from the drop-down menu hosting the database.
   - **Resource type.** From the drop-down menu, select **Database**.
   - **SQL Server instance.** Select the server.



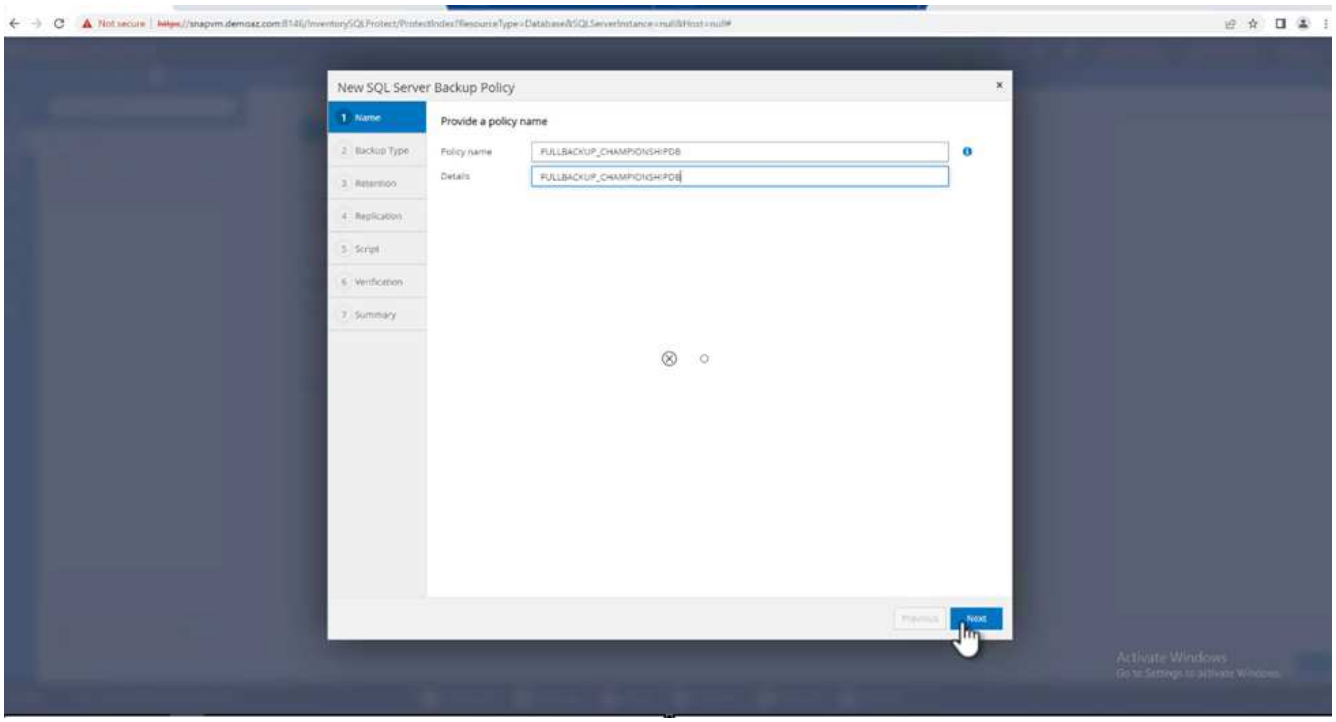
The **option** Auto Selects All the Resources from the Same Storage Volume* is selected by default. Clear the option and select only the databases you need to add to the resource group, Click the arrow to add and click **Next**.



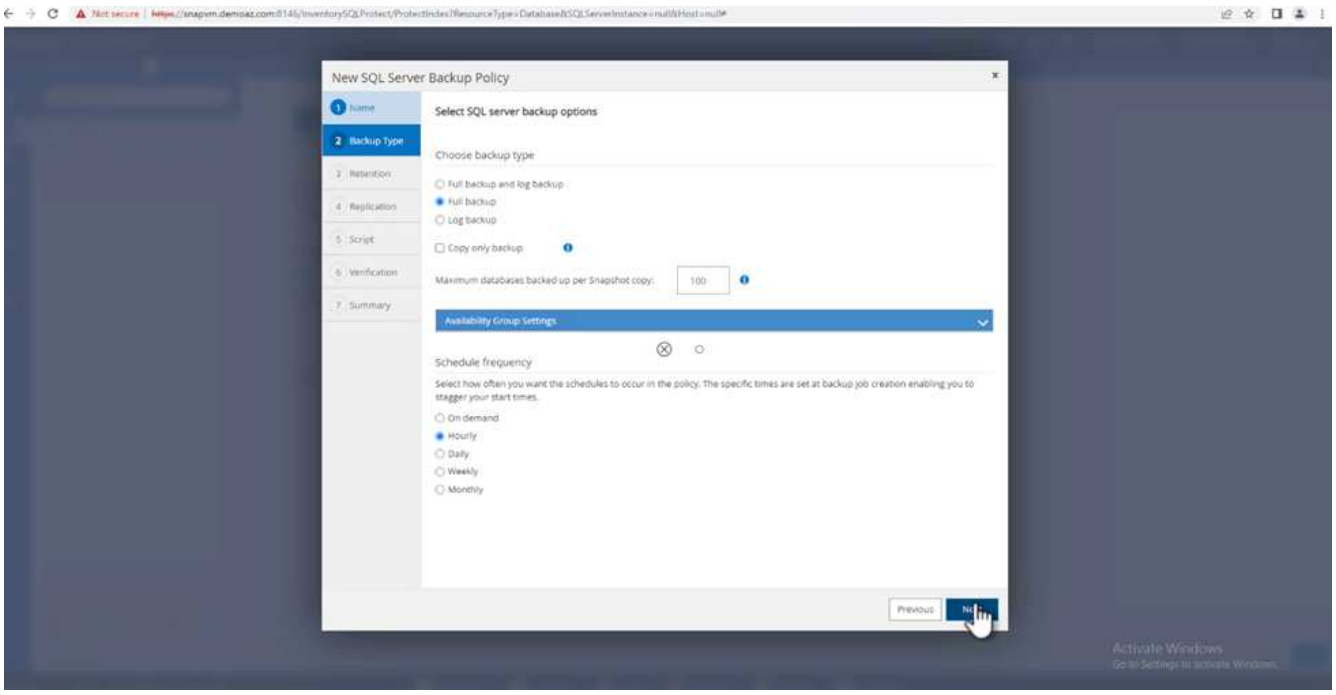
5. On the policies, click (**+**).



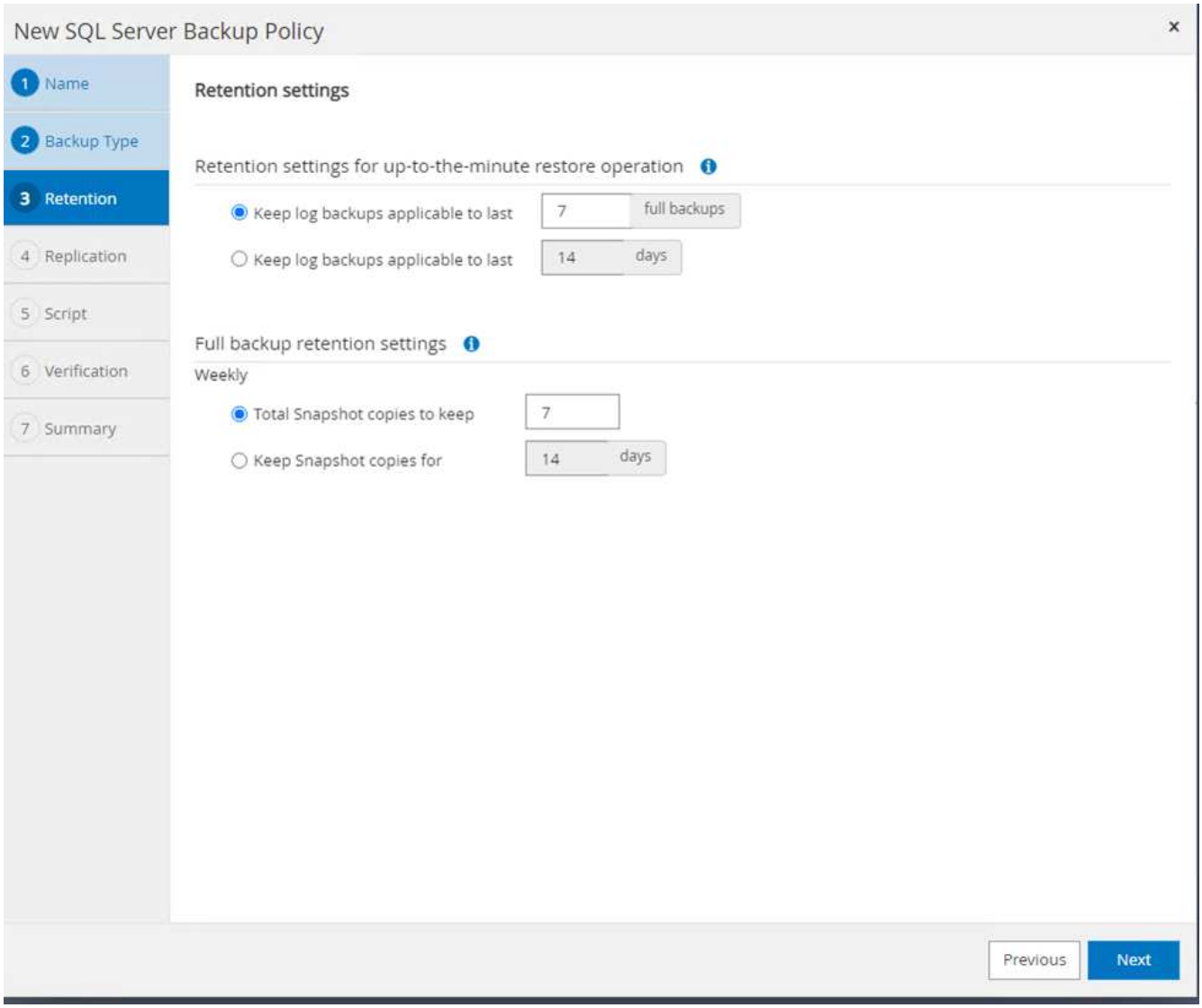
6. Enter the resource group policy name.



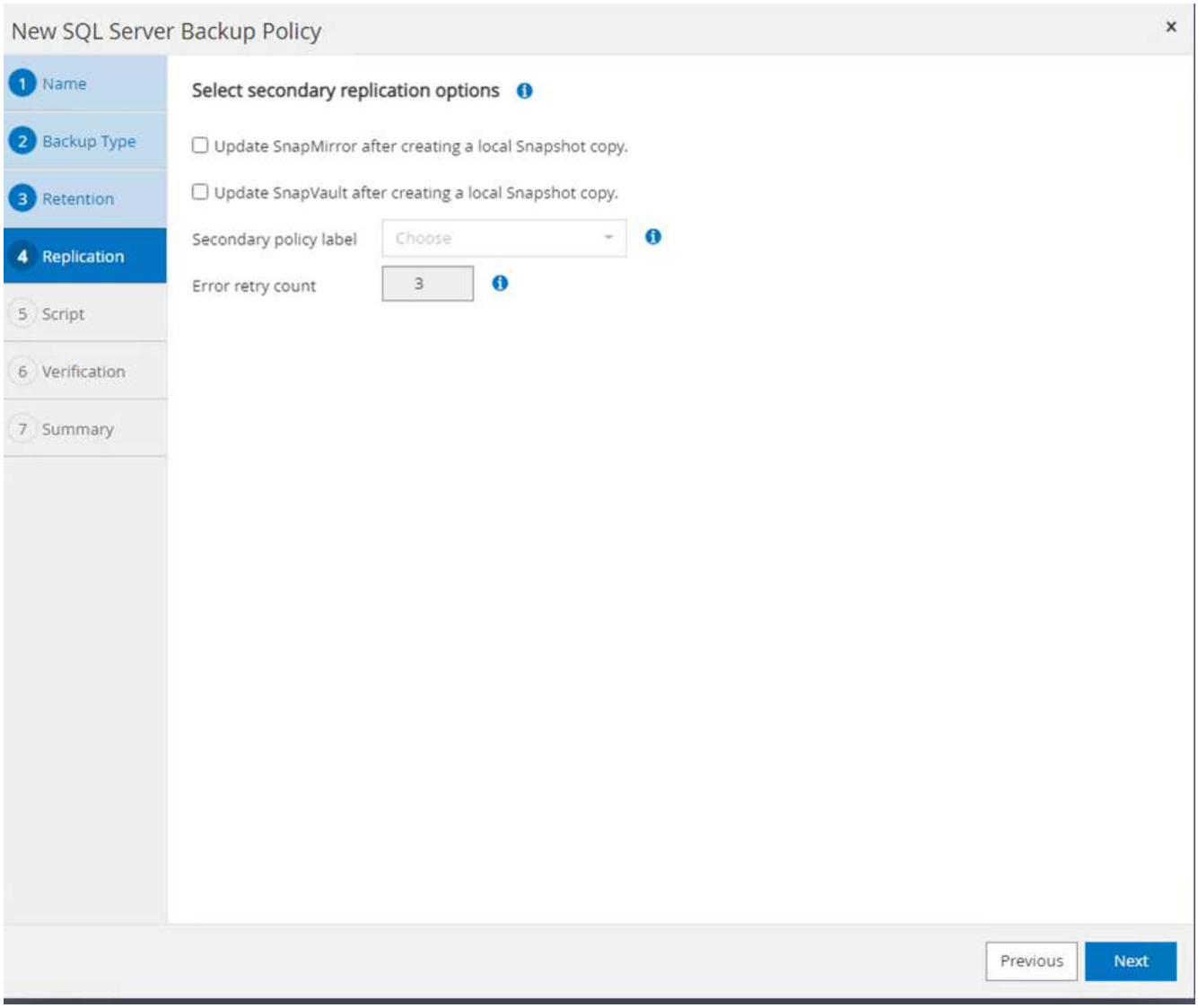
7. Select **Full backup** and the schedule frequency depending on your company's SLA.



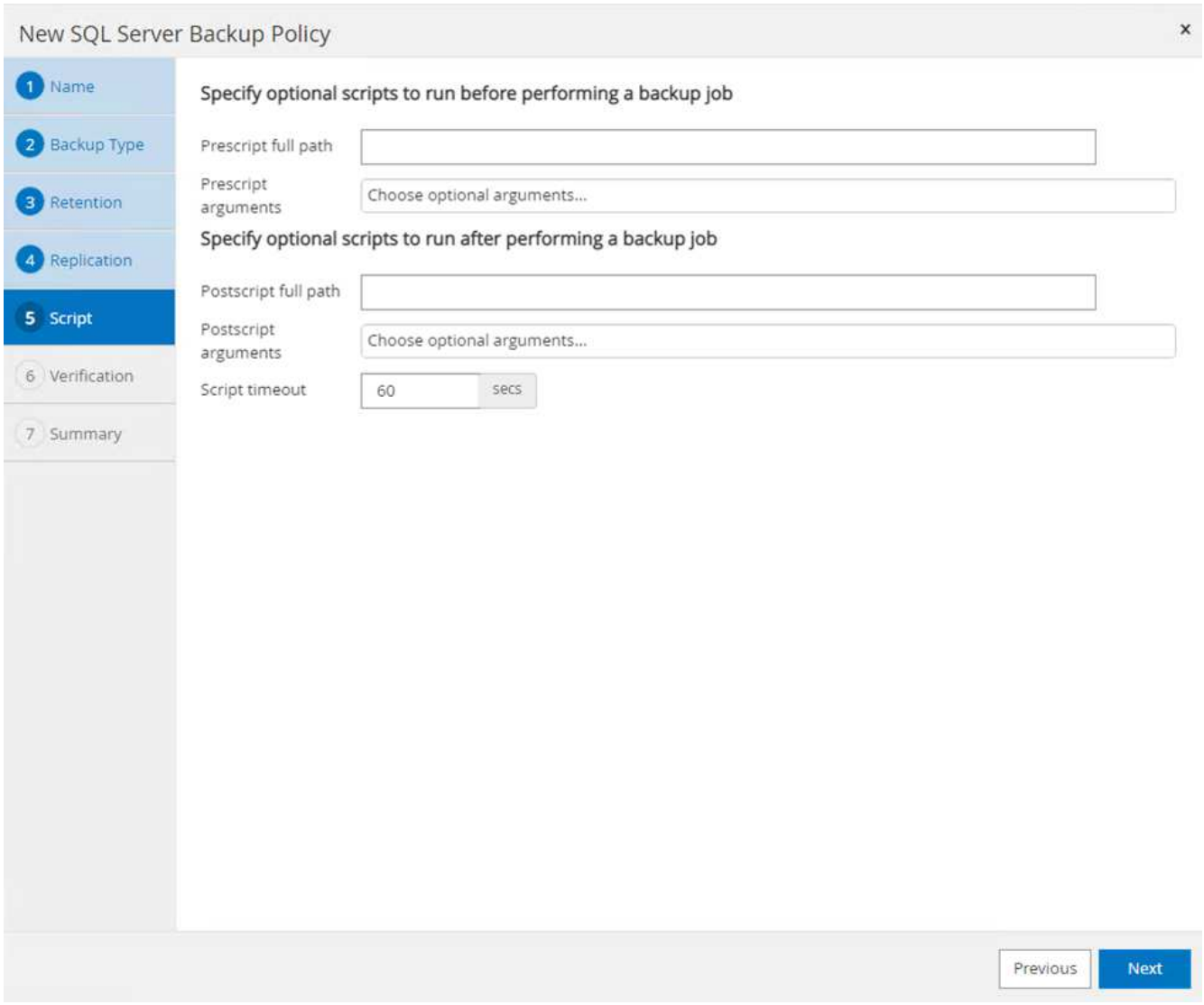
8. Configure the retention settings.



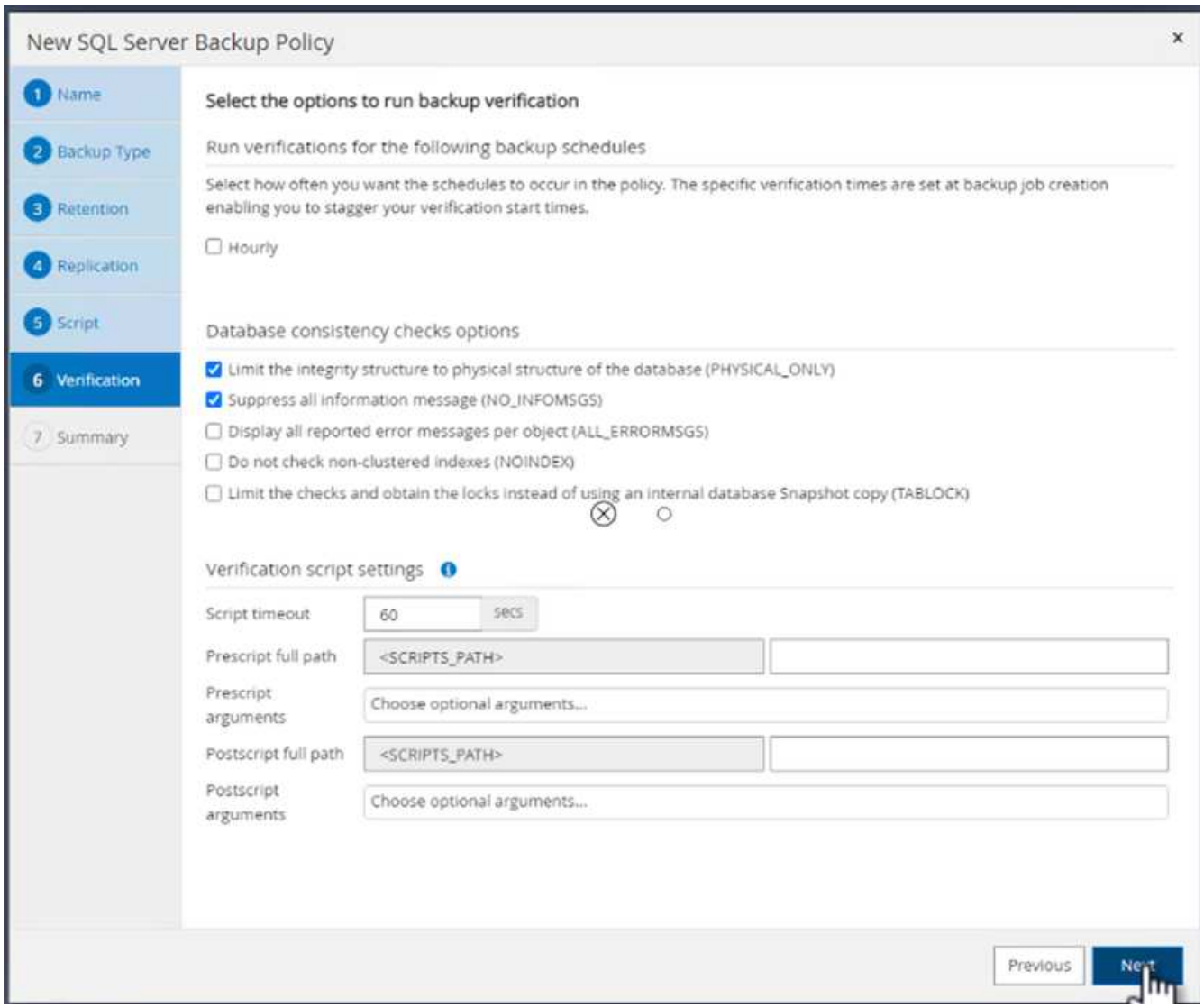
9. Configure the replication options.



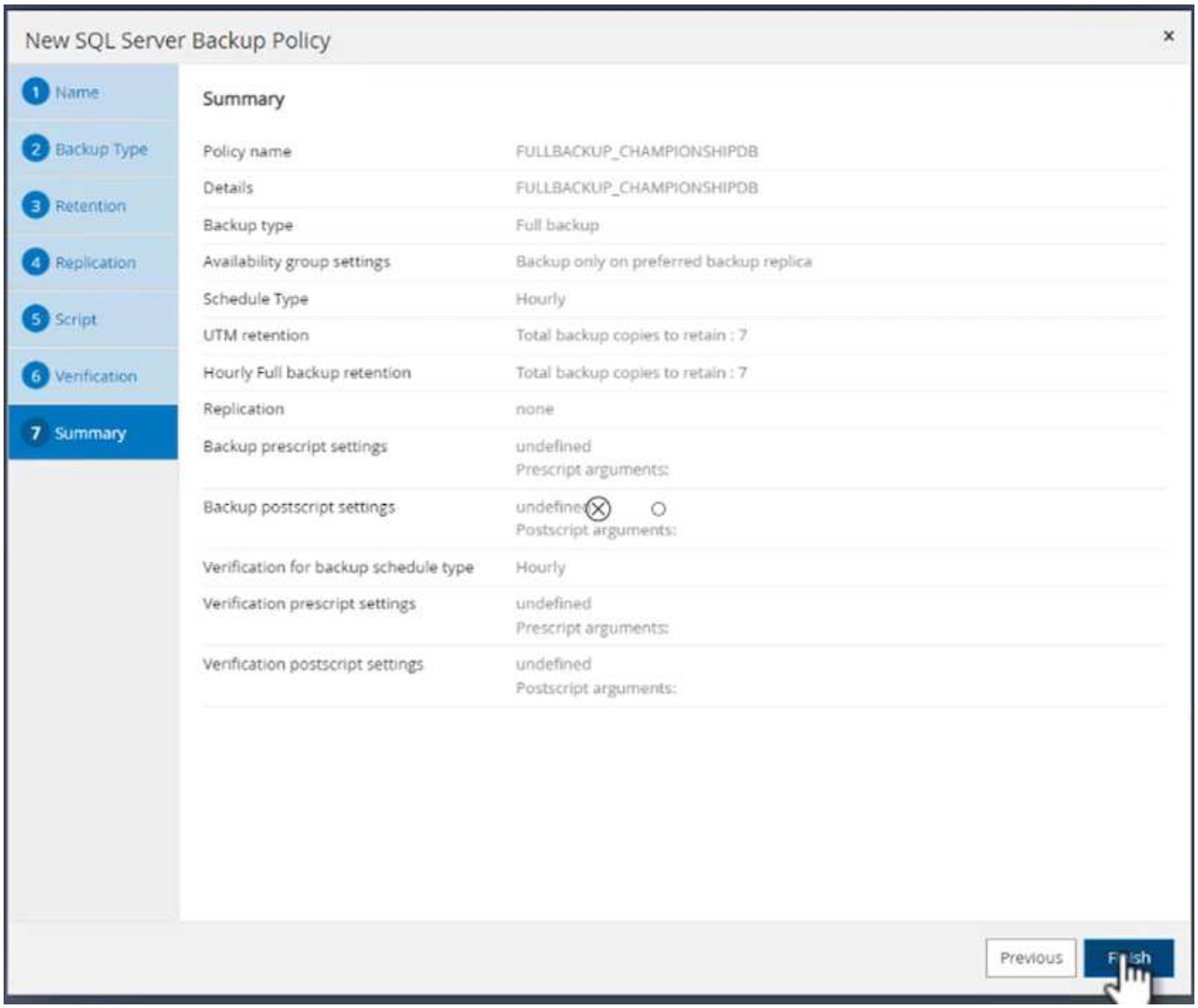
10. Configure the scripts to run before performing a backup. Click **Next**.



11. Confirm the verification for the following backup schedules.

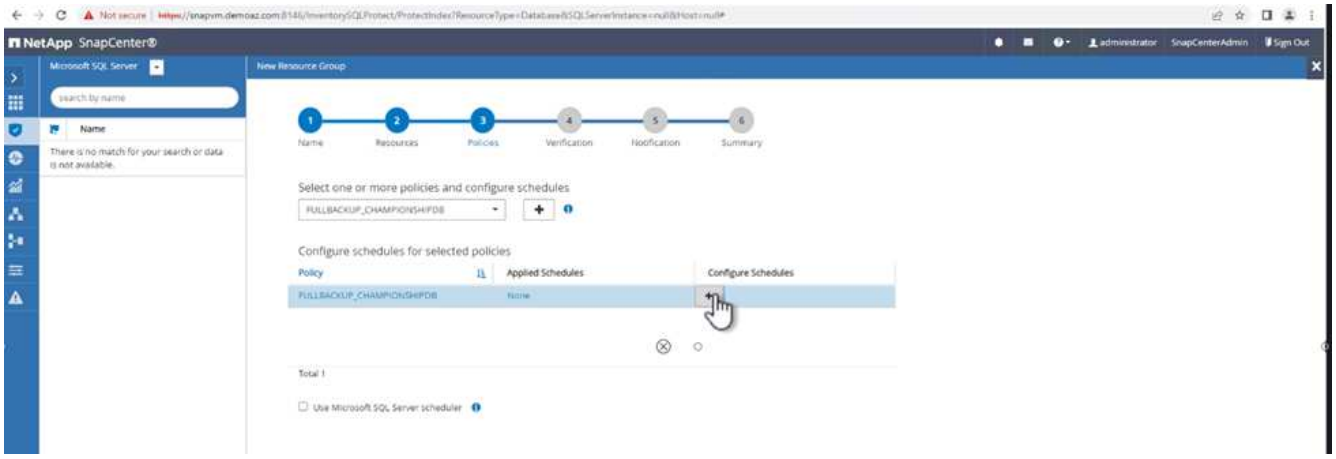


12. On the **Summary** page, verify the information, and click **Finish**.

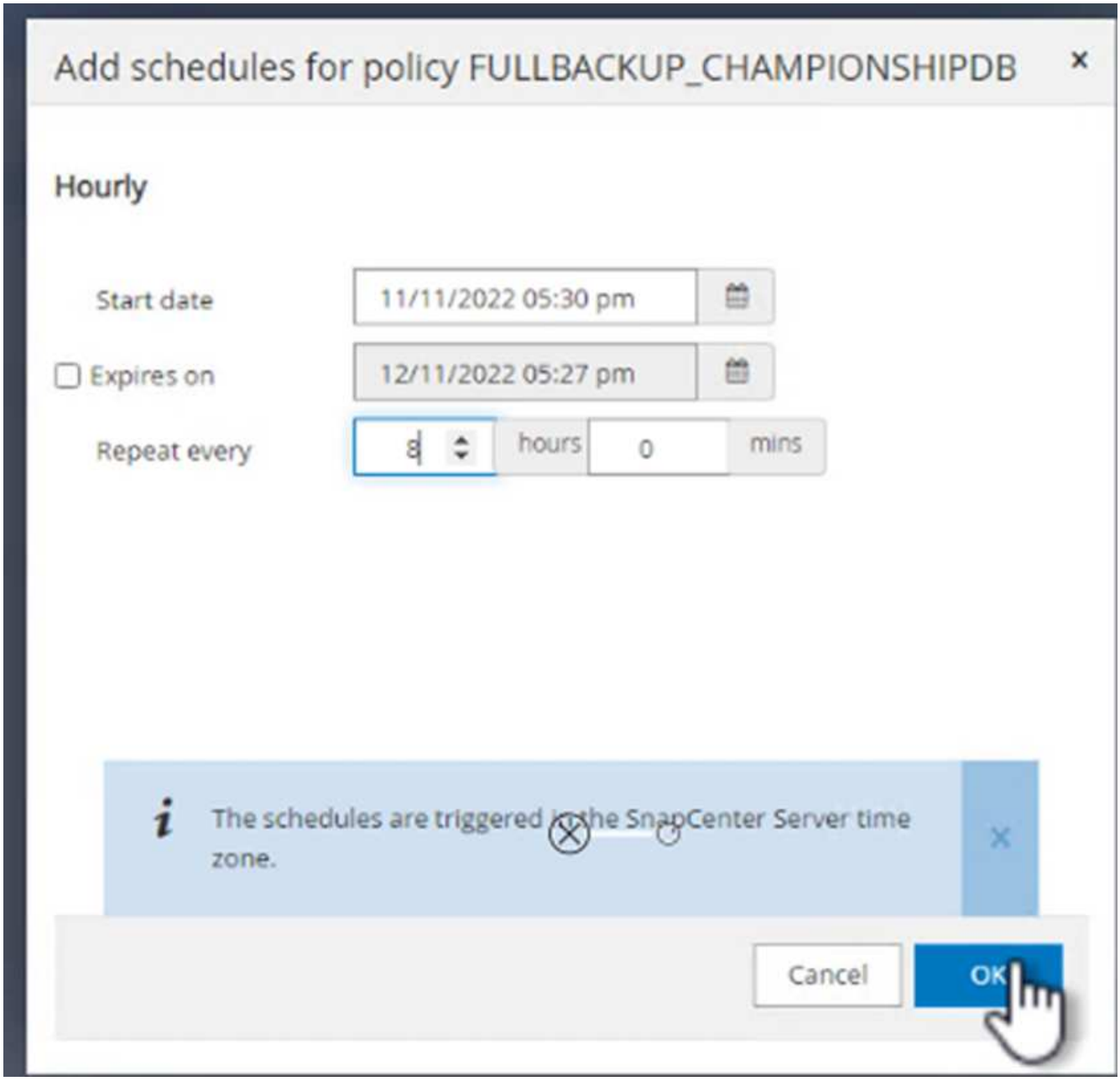


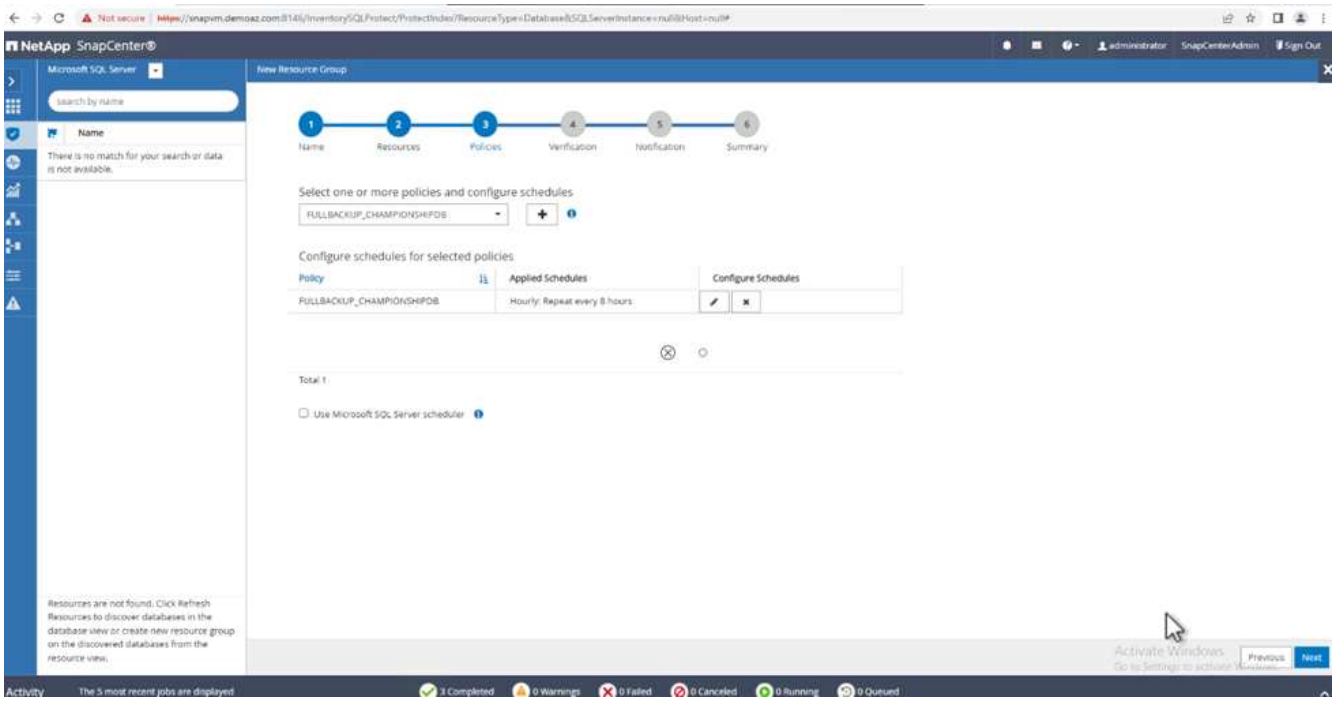
Configure and protect multiple SQL Server databases

1. Click the (**+**) sign to configure the start date and the expire- on date.

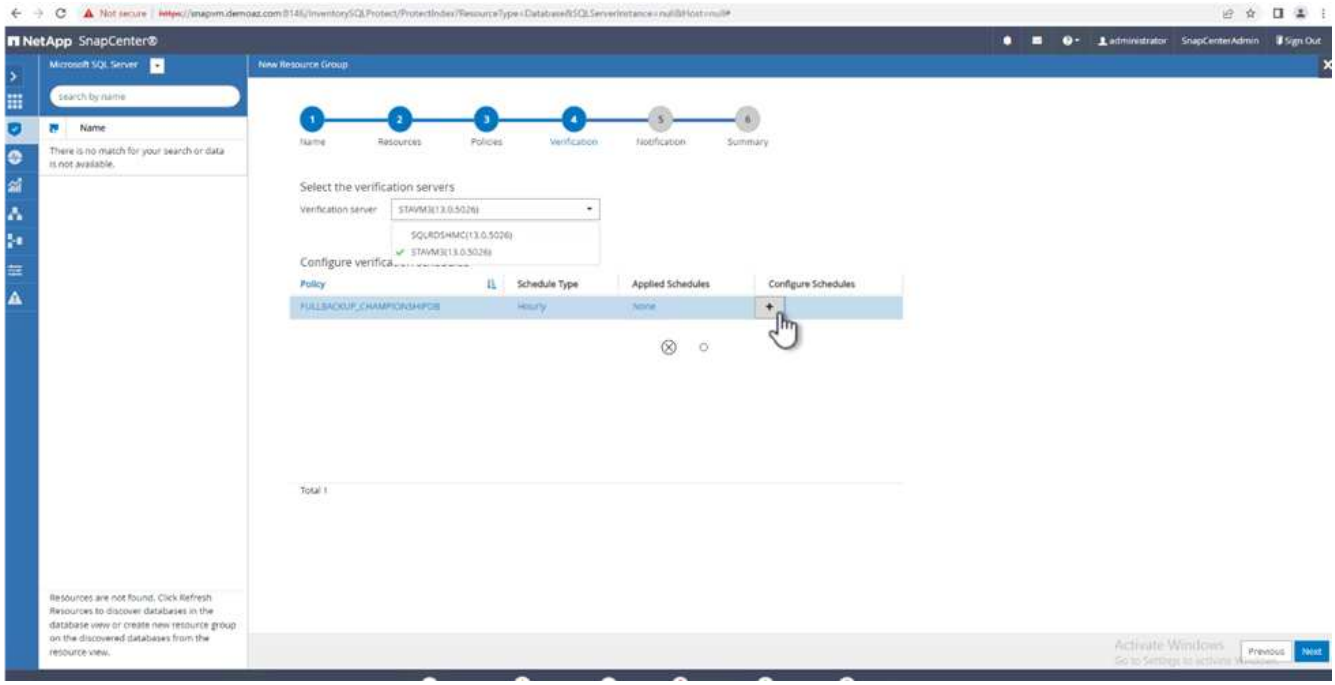


2. Set the time.

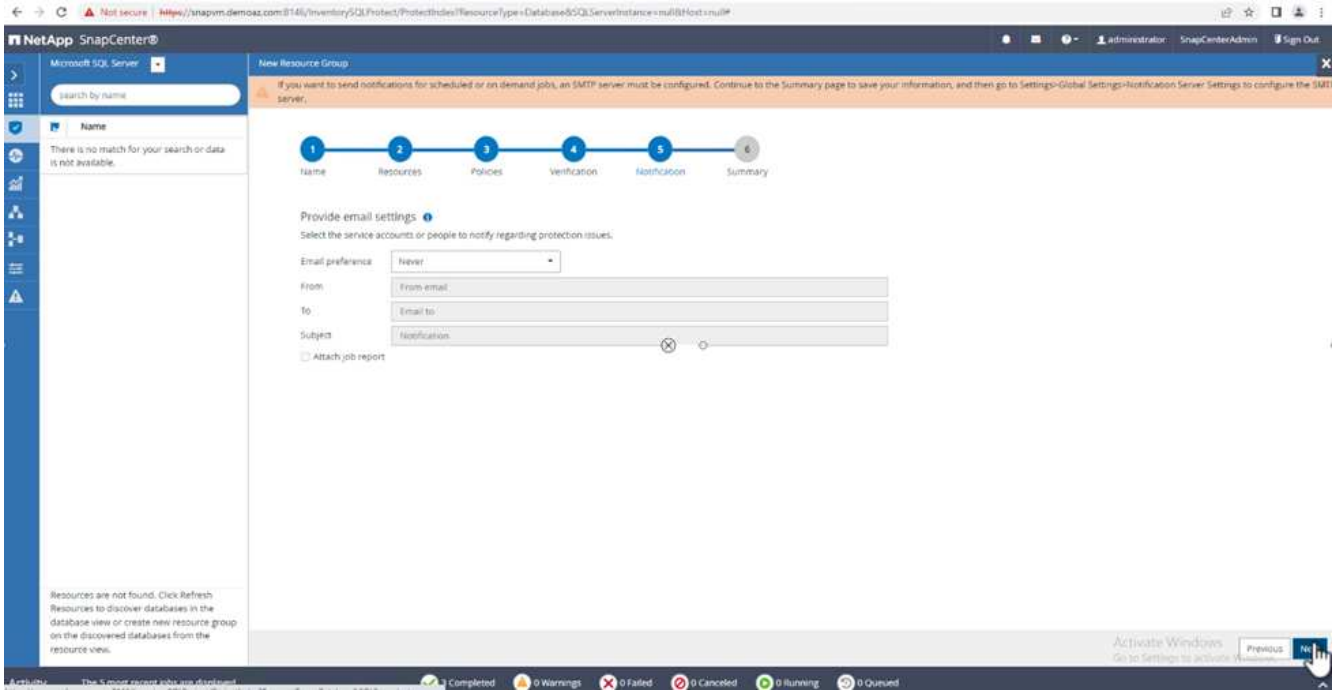

Add schedules for policy FULLBACKUP_CHAMPIONSHIPDB
Hourly
Start date
11/11/2022 05:30 pm
Expires on
12/11/2022 05:27 pm
Repeat every
8
hours
0
mins
The schedules are triggered in the SnapCenter Server time zone.
Cancel
OK



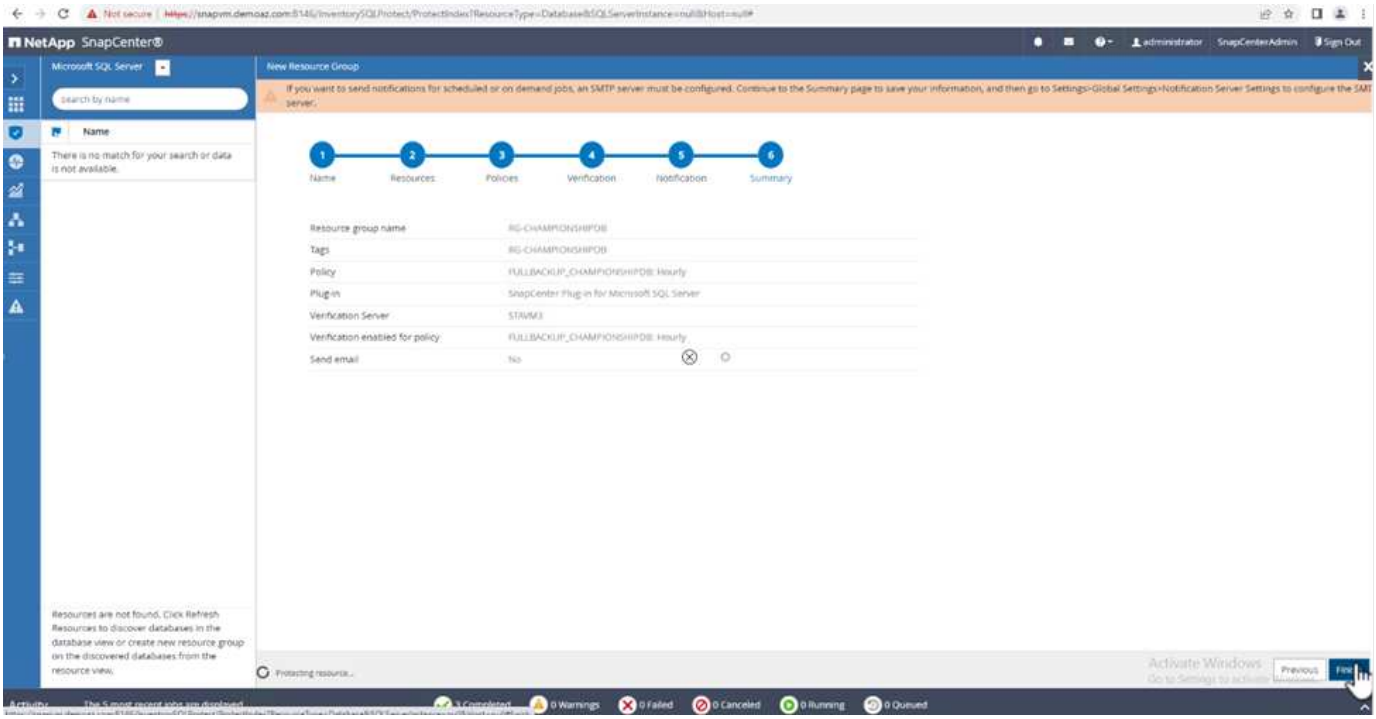
3. From the **Verification** tab, select the server, configure the schedule, and click **Next**.



4. Configure notifications to send an email.

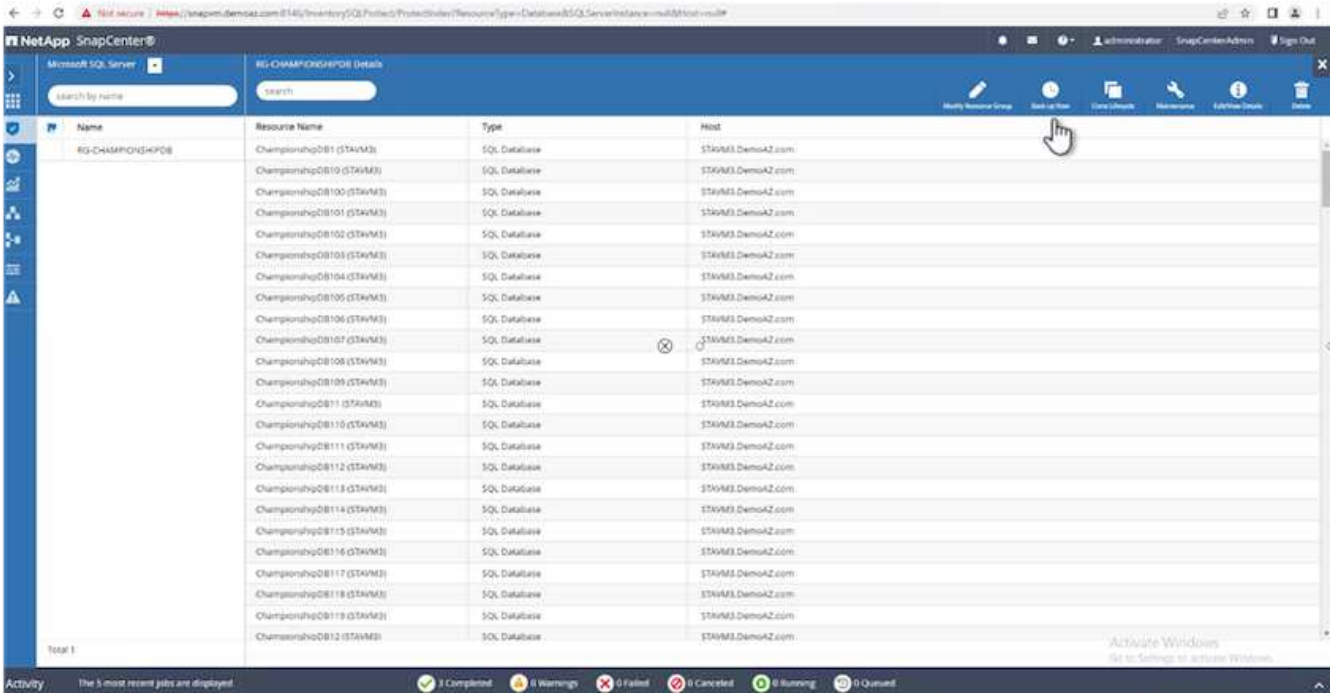


The policy is now configured for backing up multiple SQL Server databases.

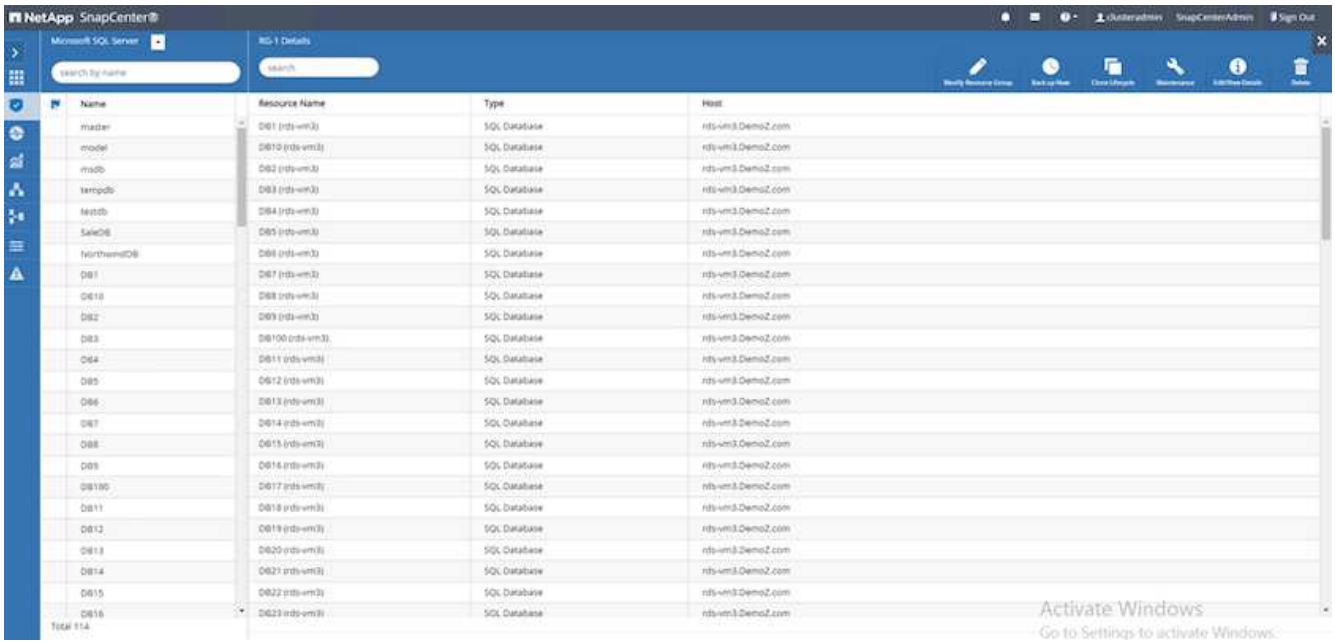


Trigger on-demand backup for multiple SQL Server databases

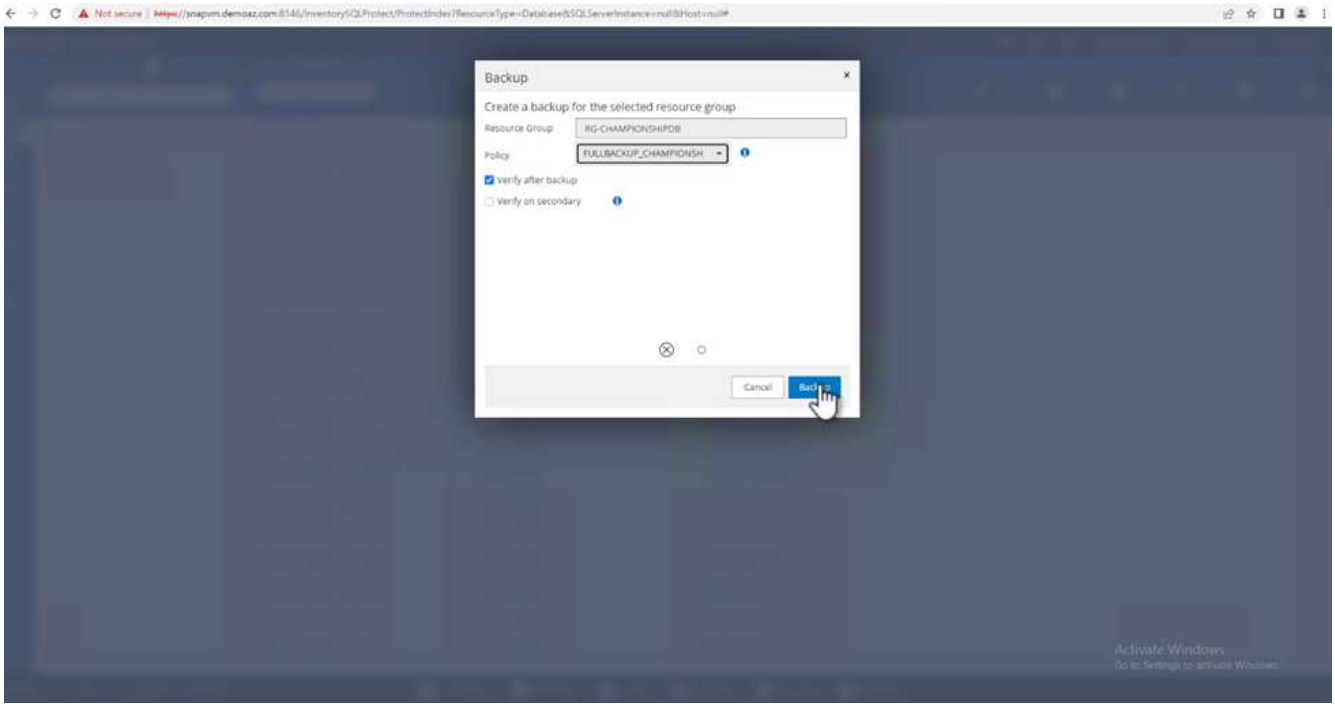
1. From the **Resource** tab, select view. From the drop-down menu, select **Resource Group**.



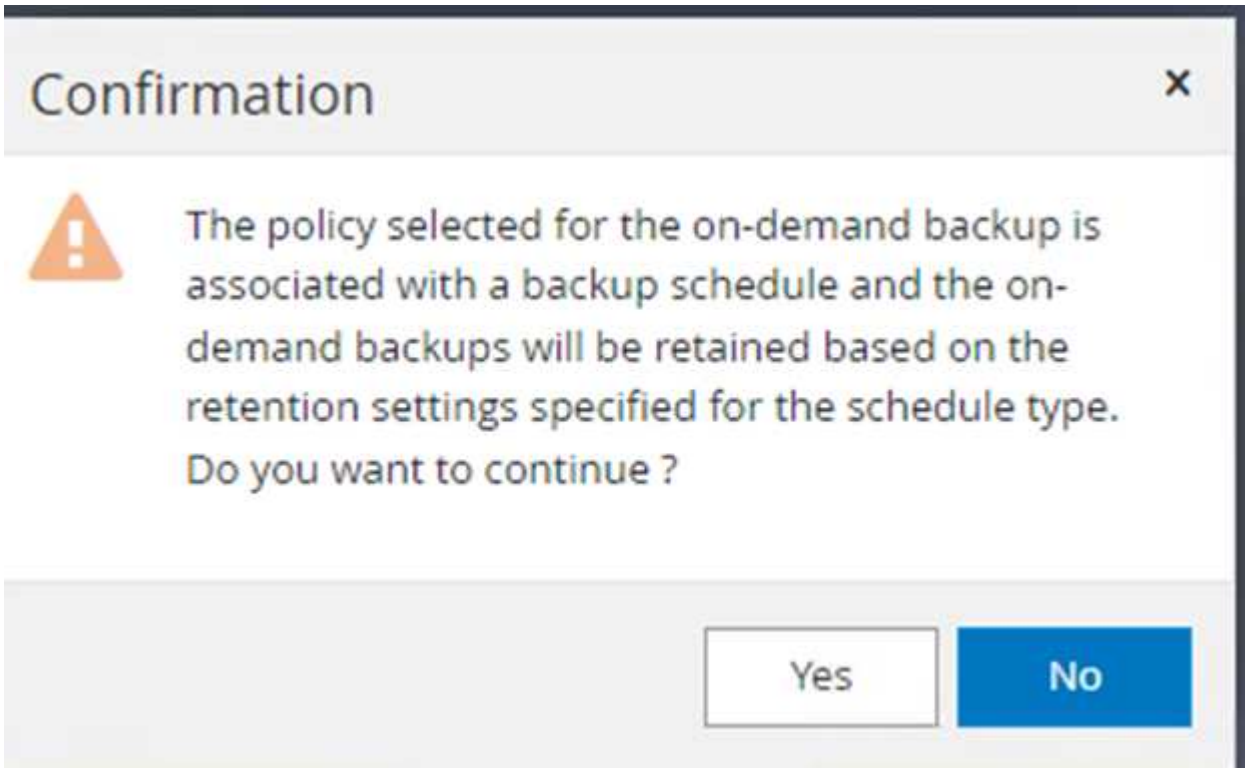
2. Select the resource group name.
3. Click **Backup now** in the upper right.



4. A new window opens. Click the **Verify after backup** checkbox and then click backup.



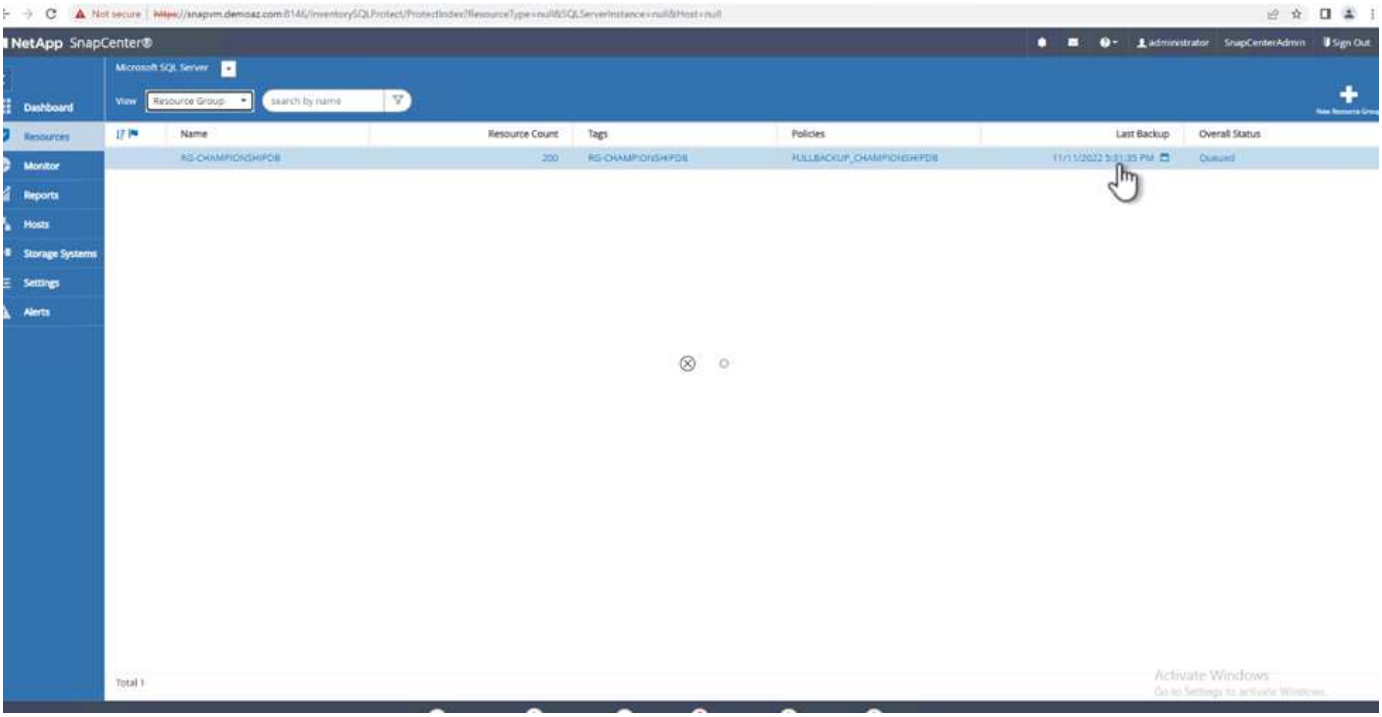
5. A confirmation message is dsiplayed. Click **Yes**.



Monitor multiple-database backup jobs

From the left navigation bar, click **Monitor**, select the backup job, and click **Details** to view job progress.

Click the **Resource** tab to see the time it takes for the backup to be completed.

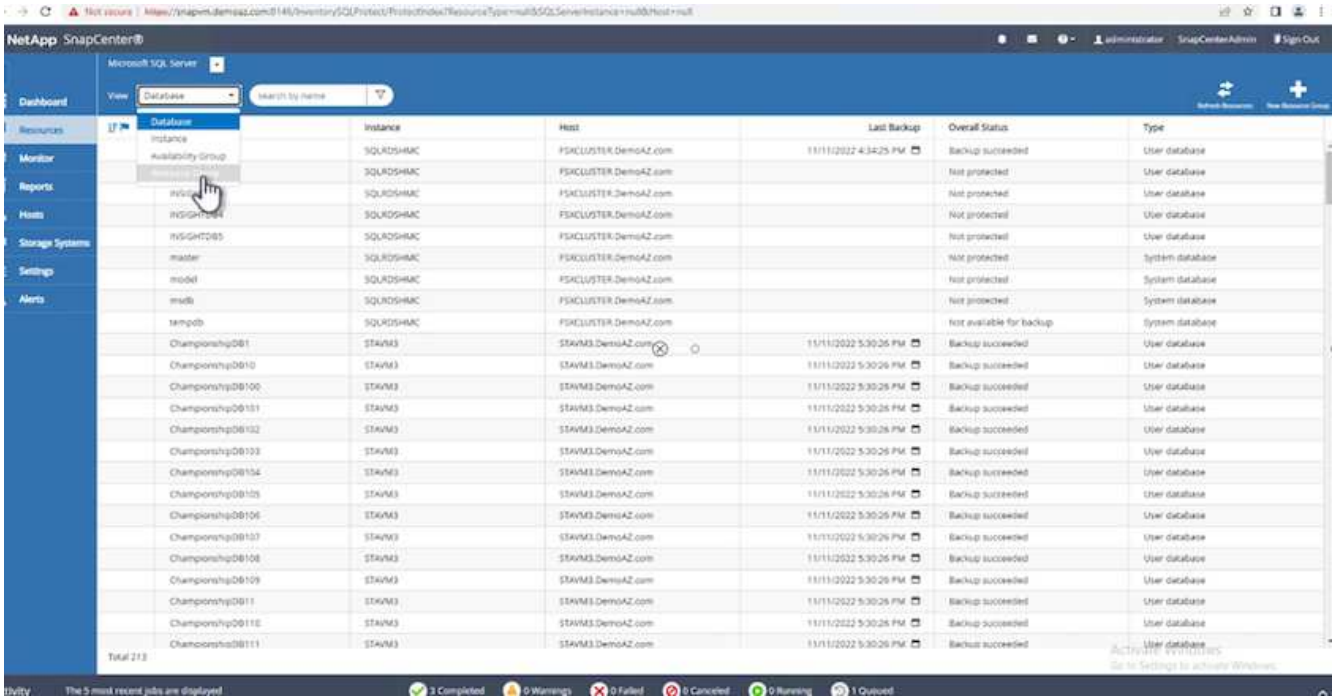


Transaction log backup for multiple database backup

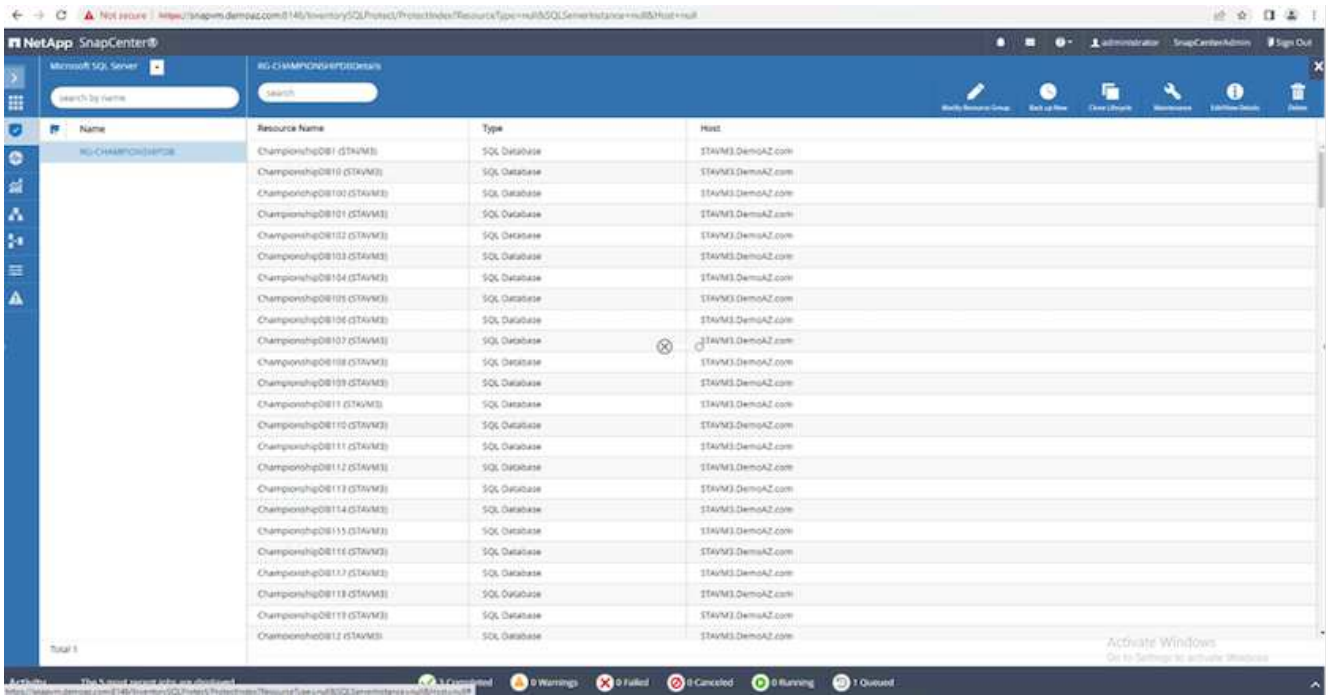
SnapCenter supports the full, bulked logged, and simple recovery models. The simple recovery mode does not support transactional log backup.

To perform a transaction log backup, complete the following steps:

1. From the **Resources** tab, change the view menu from **Database** to **Resource group**.

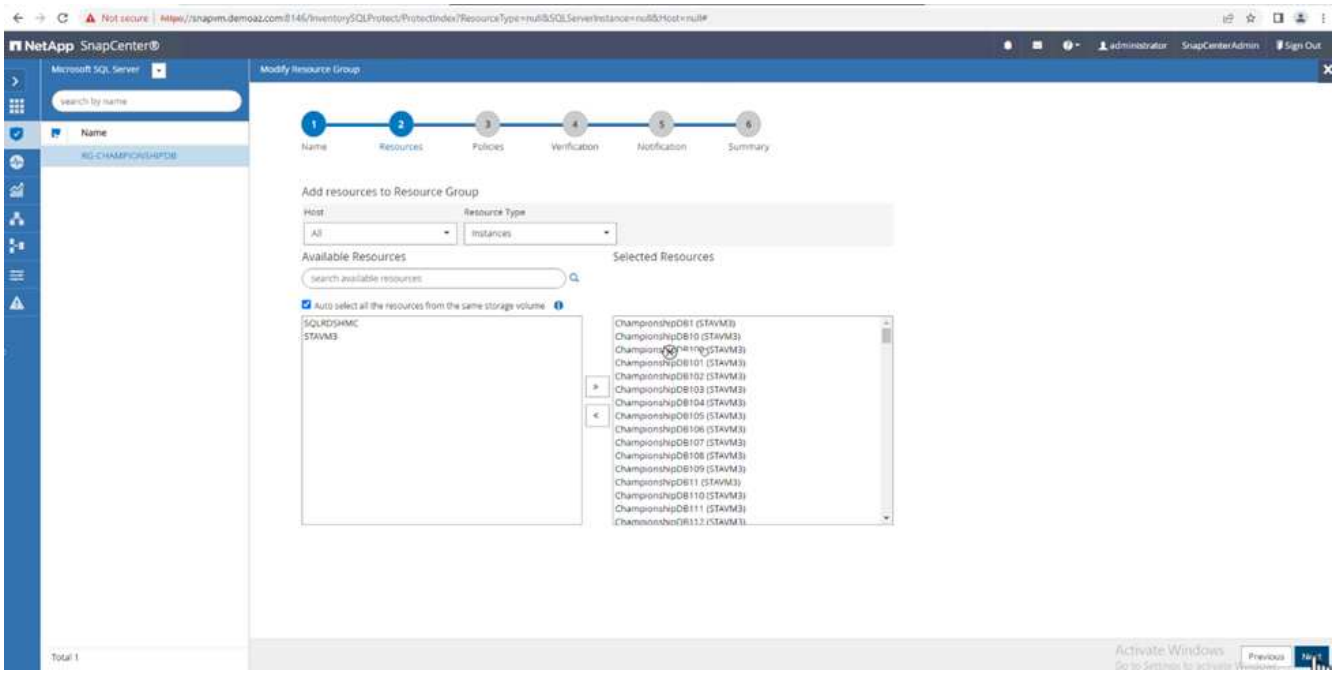


2. Select the resource group backup policy created.
3. Select **Modify Resource Group** in the upper right.

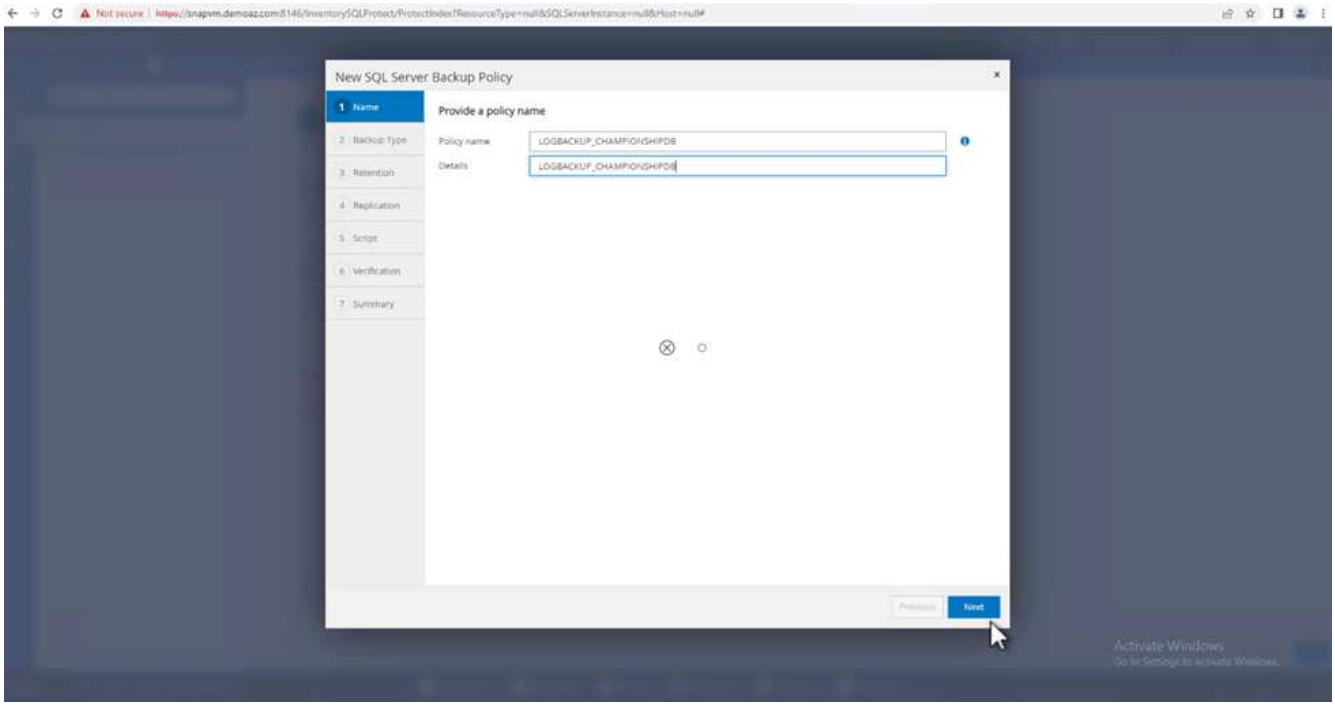


4. The **Name** section defaults to the backup policy name and tag. Click **Next**.

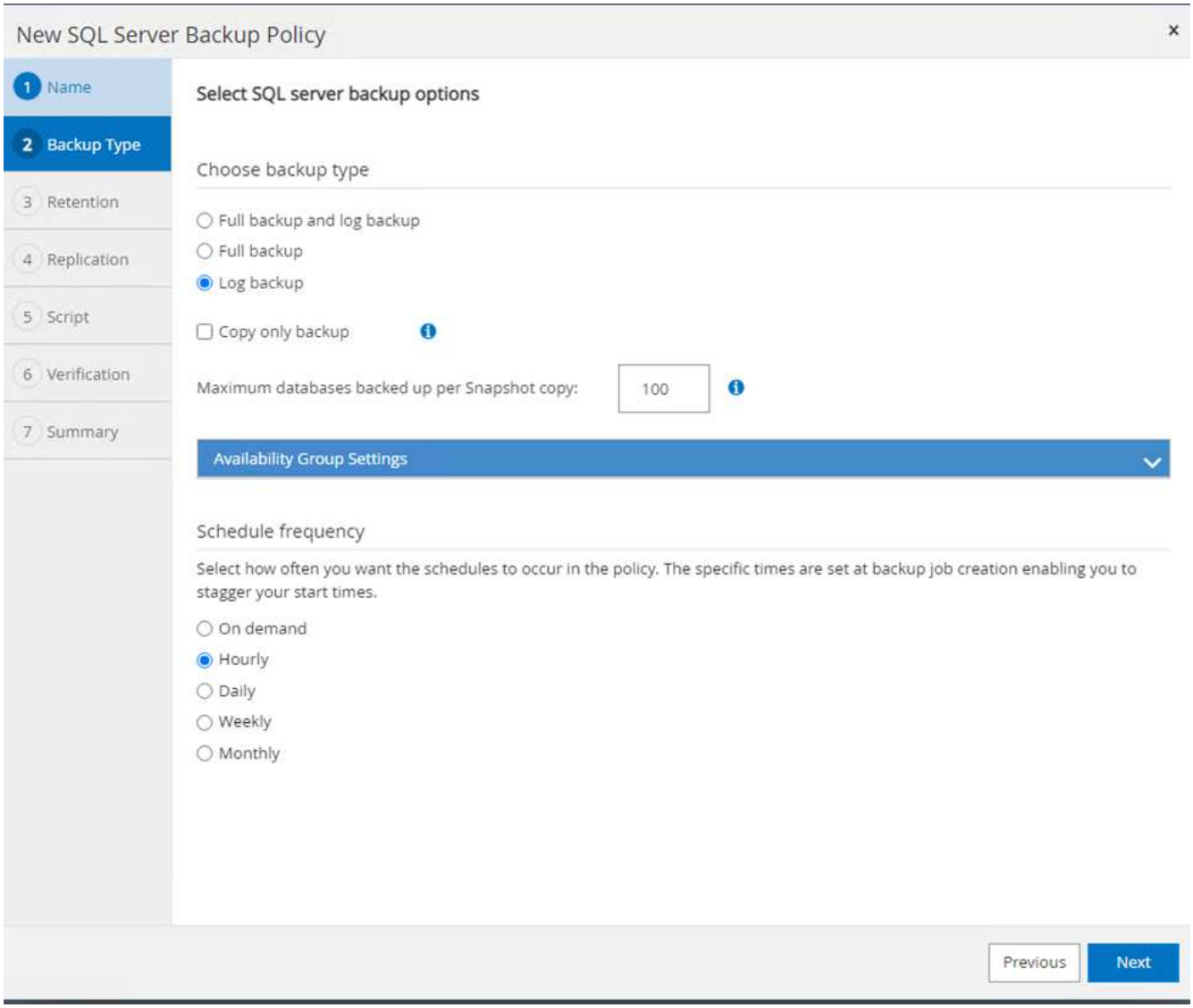
   The **Resources** tab highlights the bases to which the transaction backup policy is to be configured.



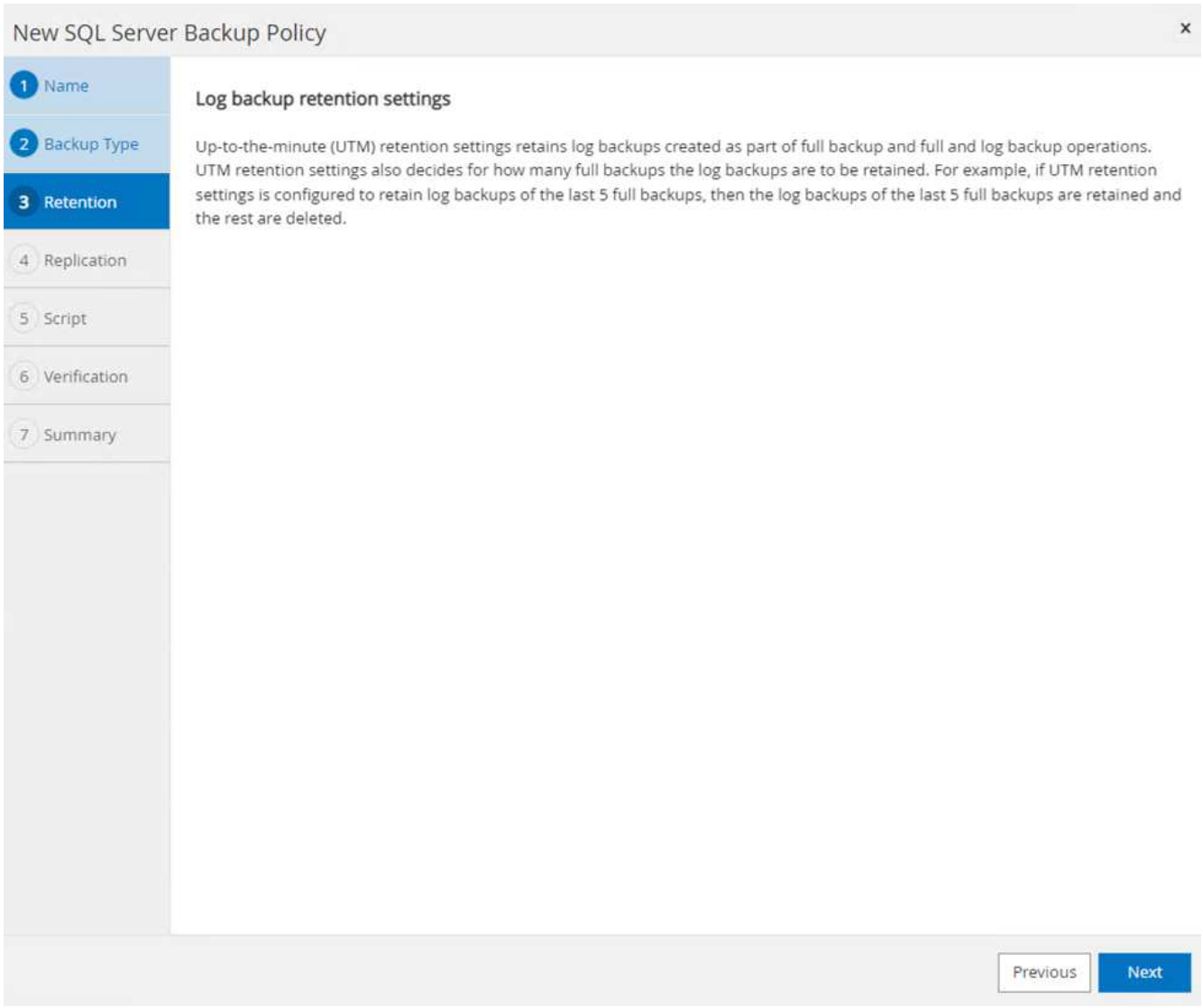
5. Enter the policy name.



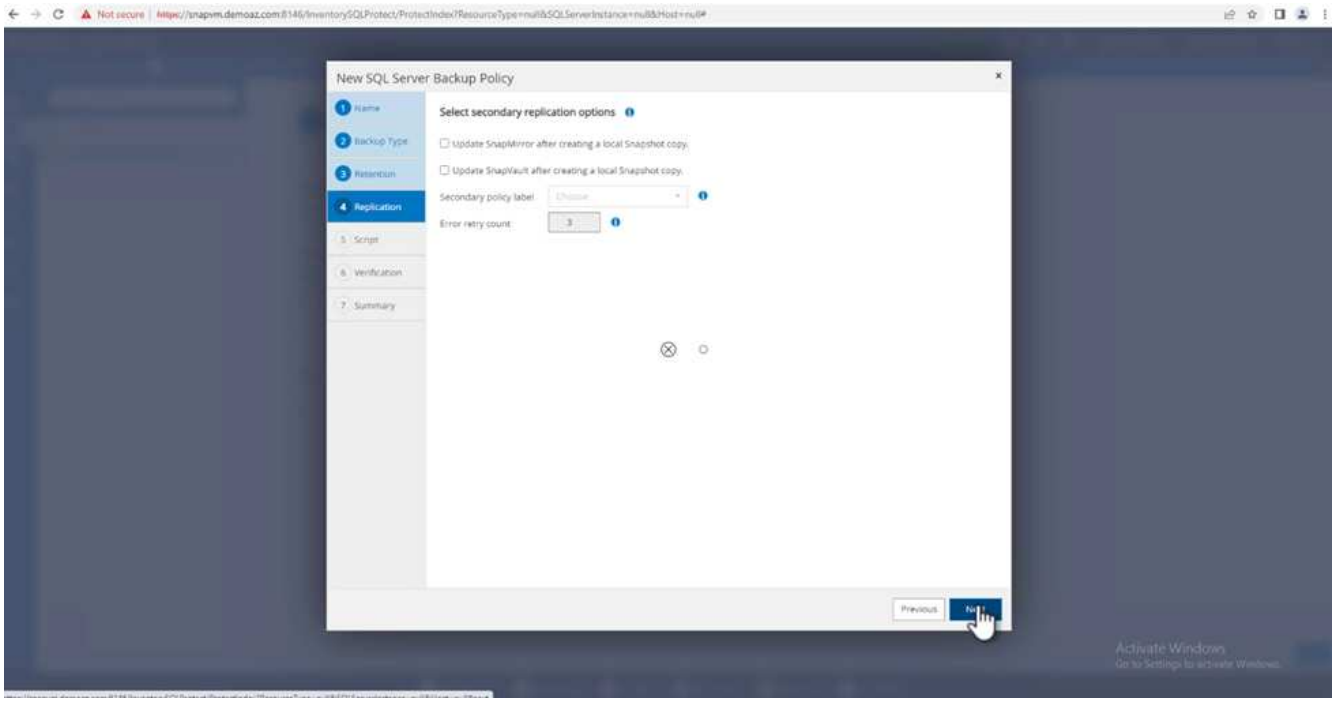
6. Select the SQL Server backup options.
7. Select log backup.
8. Set the schedule frequency based on your company's RTO. Click **Next**.



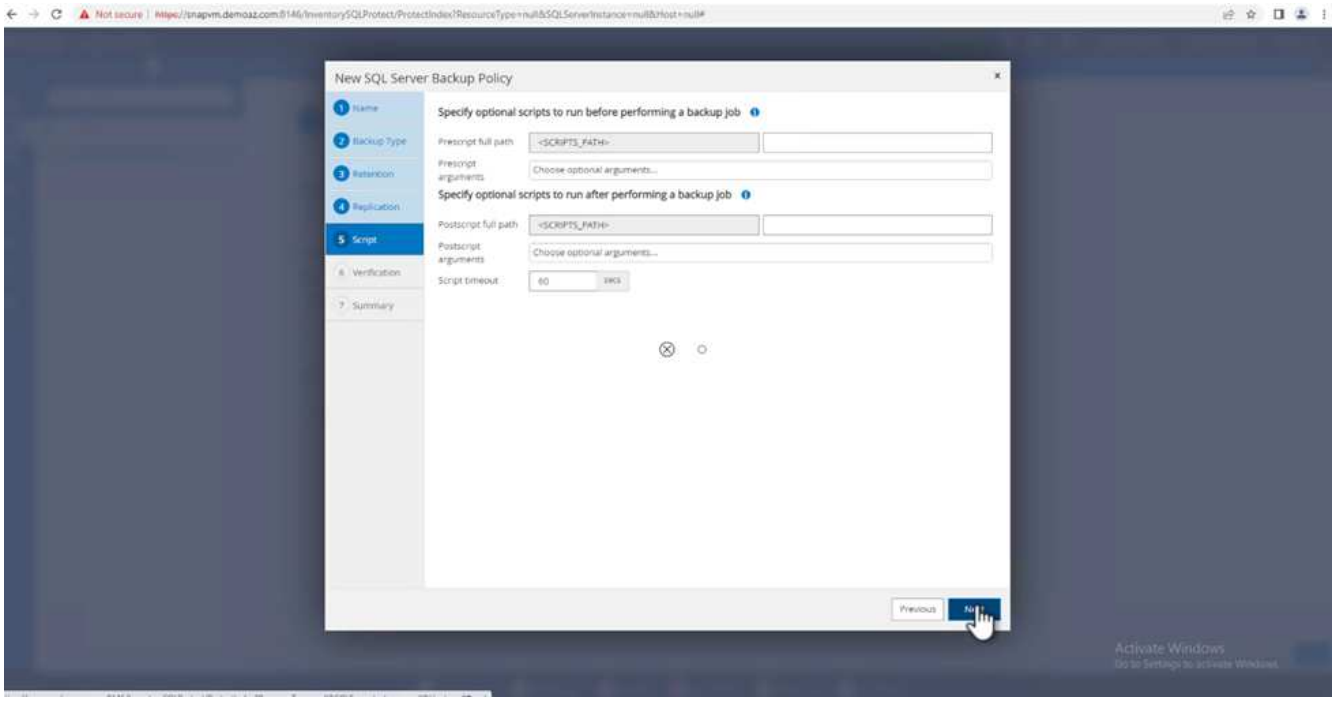
9. Configure the log backup retention settings. Click **Next**.



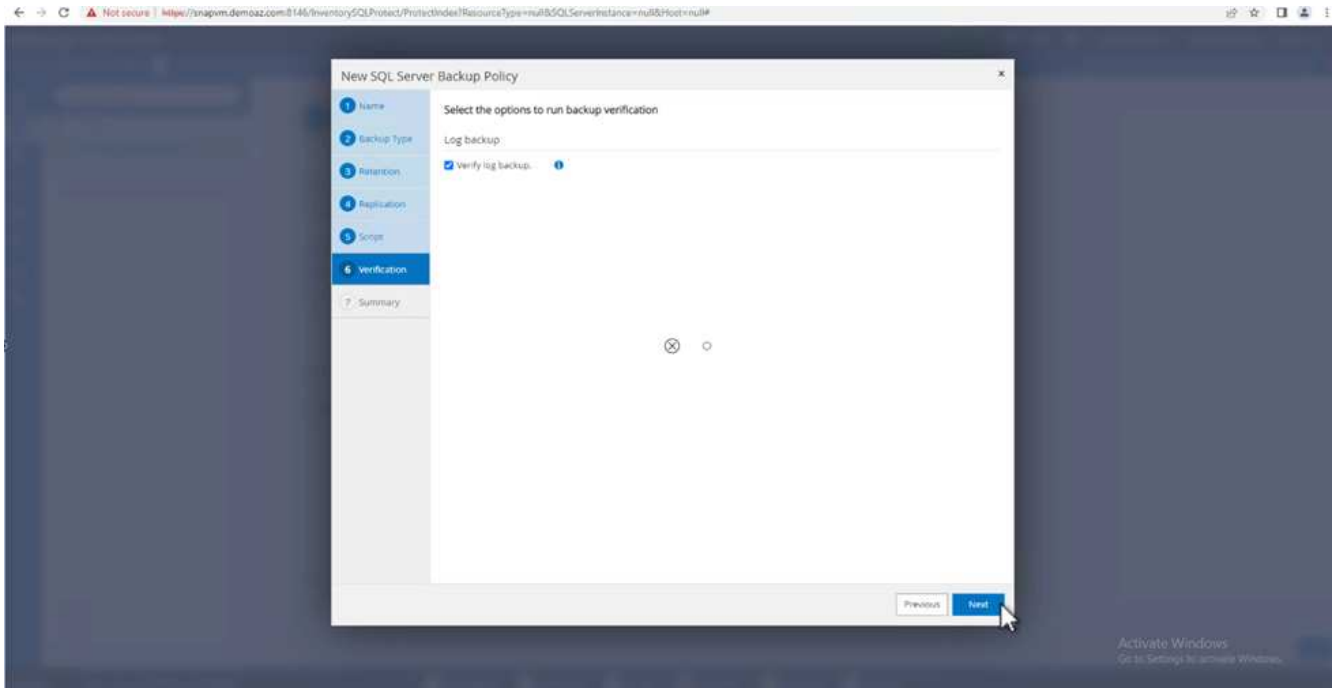
10. (Optional) Configure the replication options.



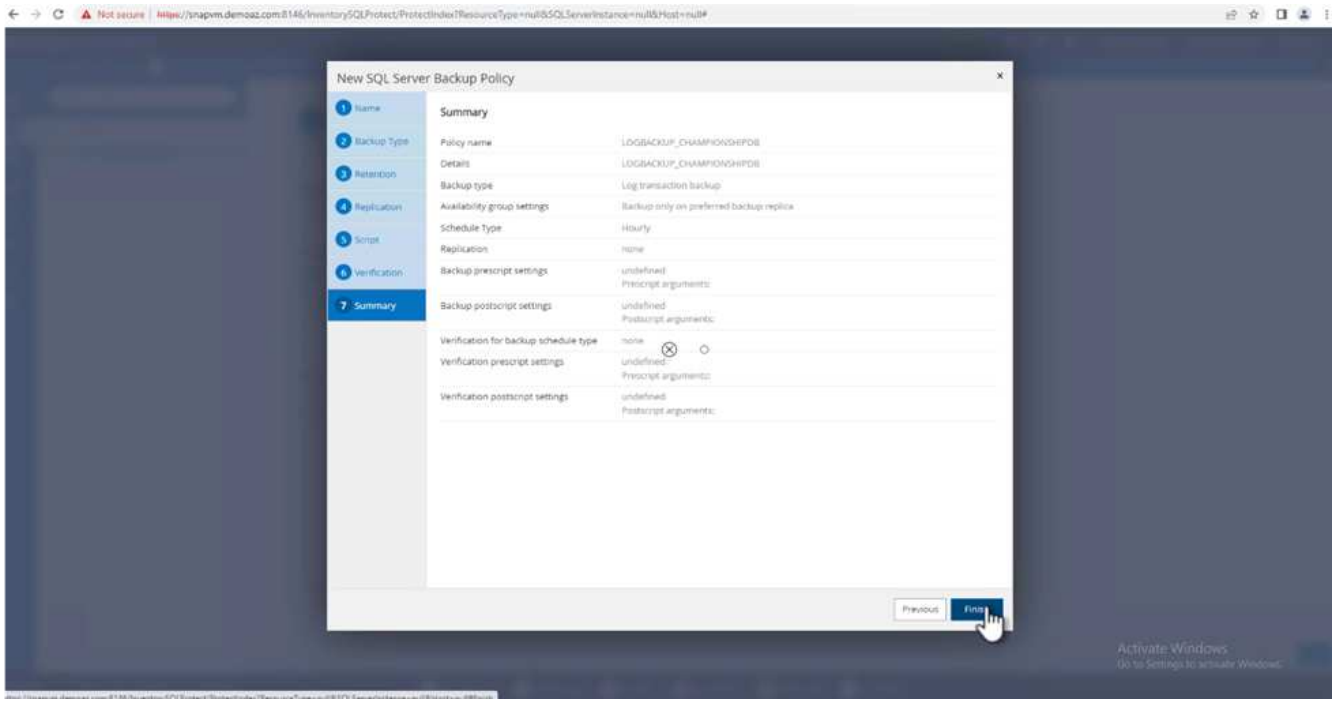
11. (Optional) Configure any scripts to run before performing a backup job.



12. (Optional) Configure backup verfication.

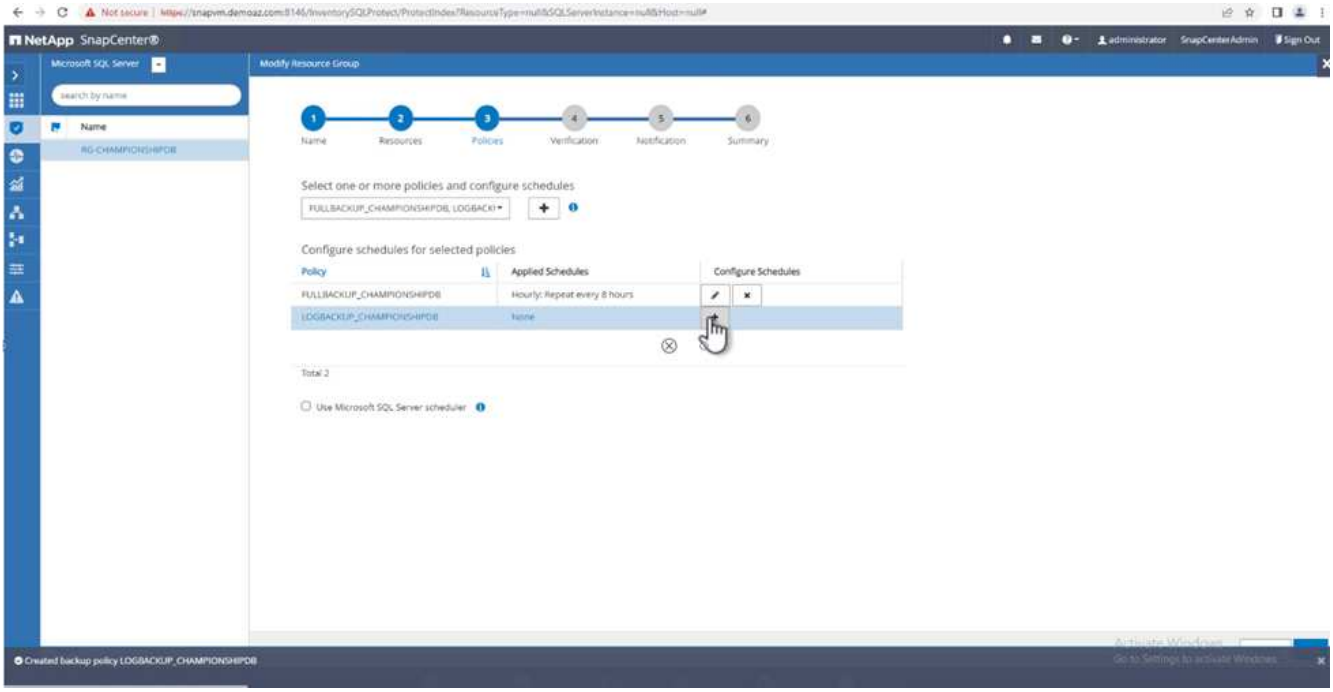


13. On the **Summary** page, click **Finish**.

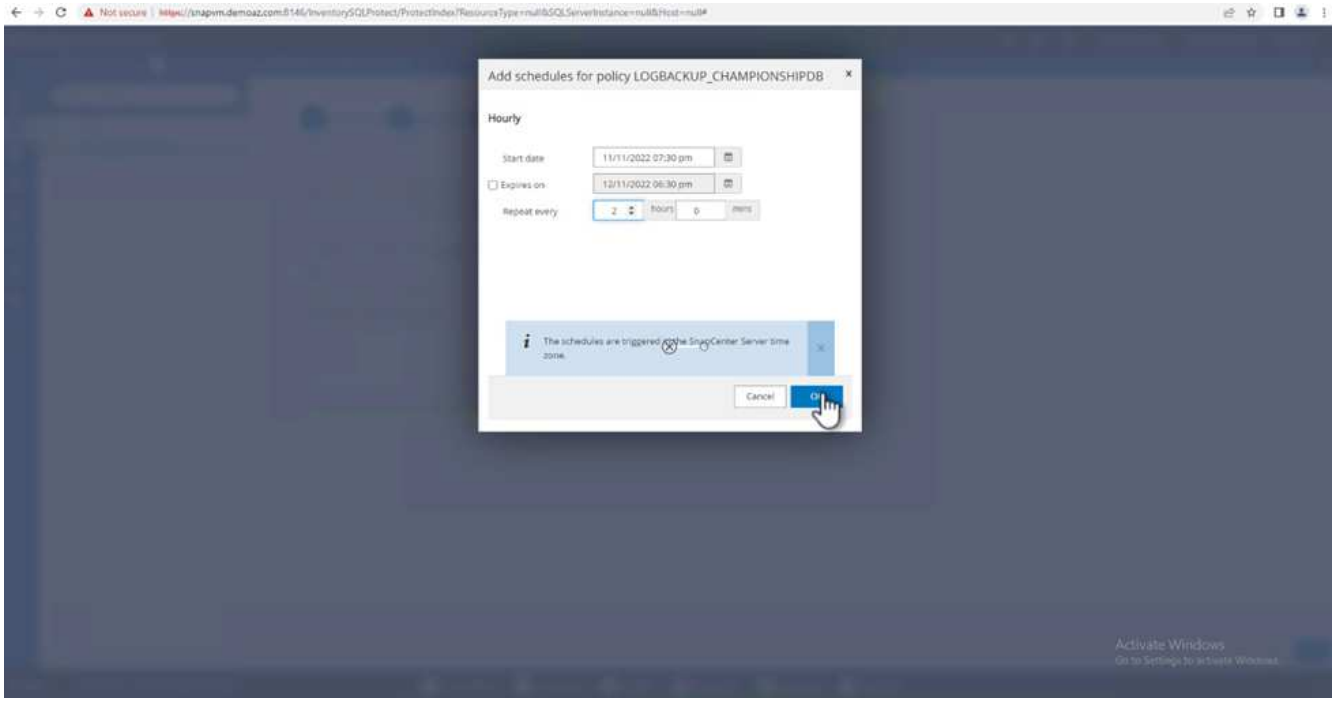


Configure and protect multiple MSSQL Server databases

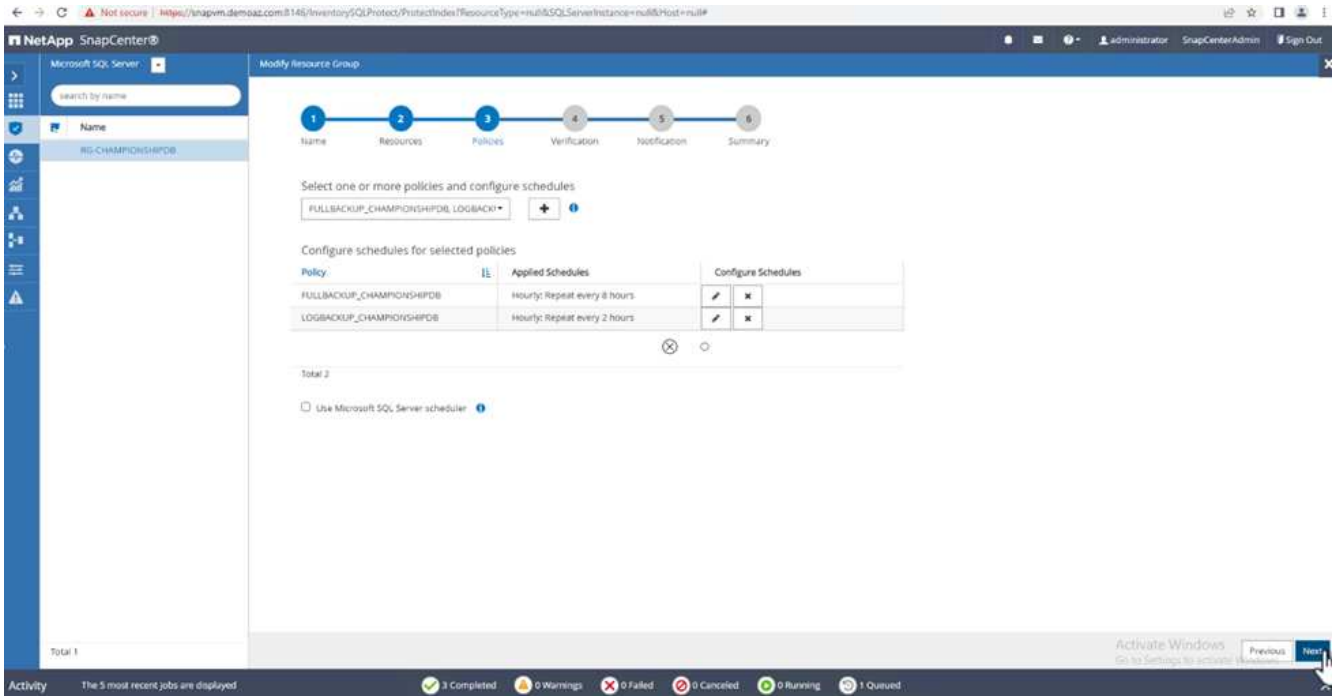
1. Click the newly created transaction log backup policy.



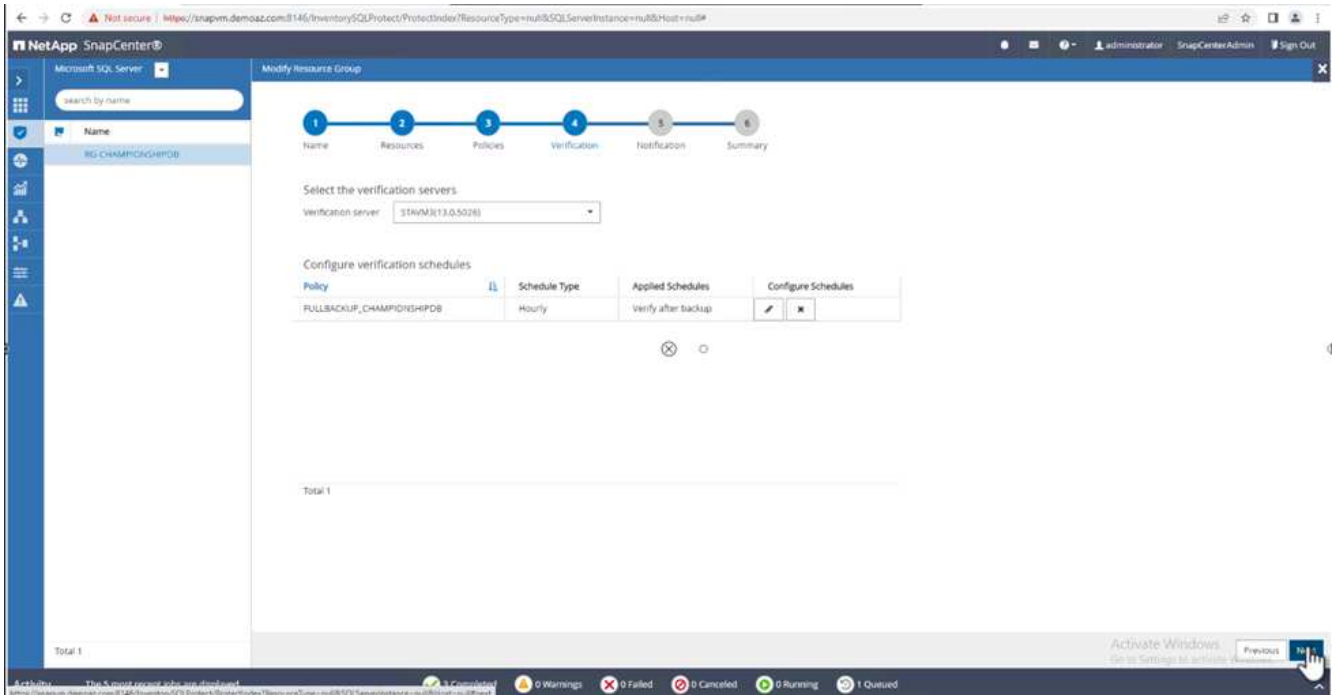
2. Set the **Start date** and **Expires on** date.
3. Enter the frequency of the log backup policy depending on the SLA, RTP, and RPO. Click OK.



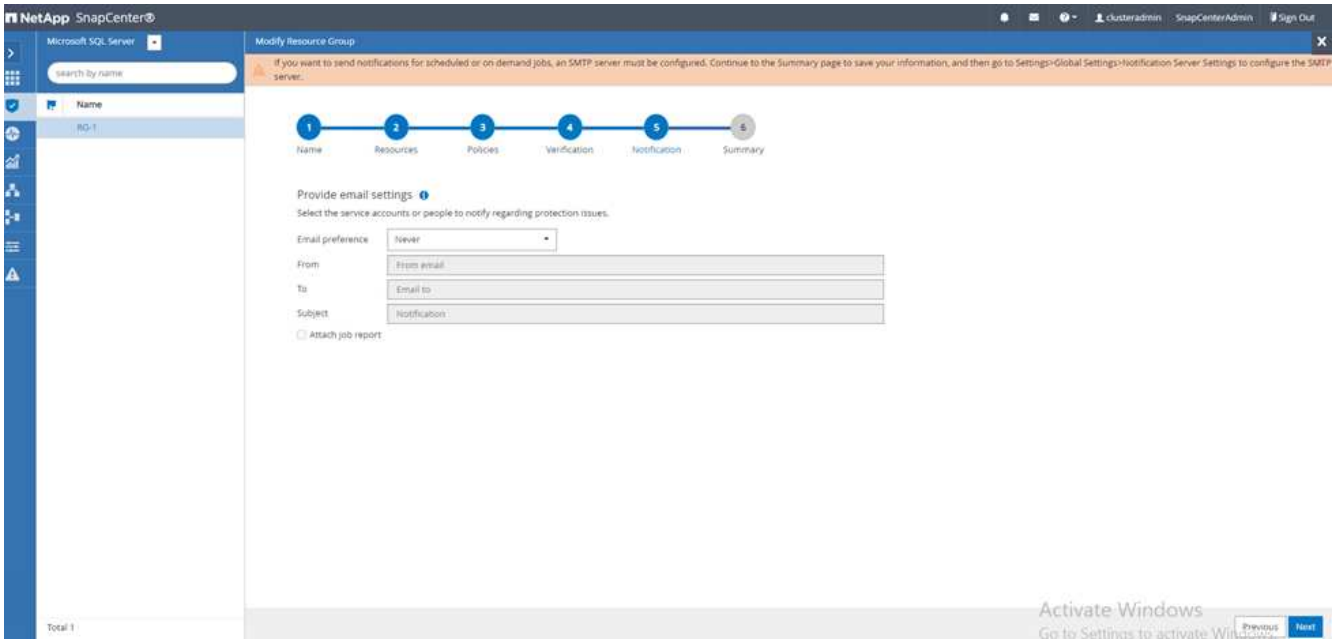
4. You can see both policies. Click **Next**.



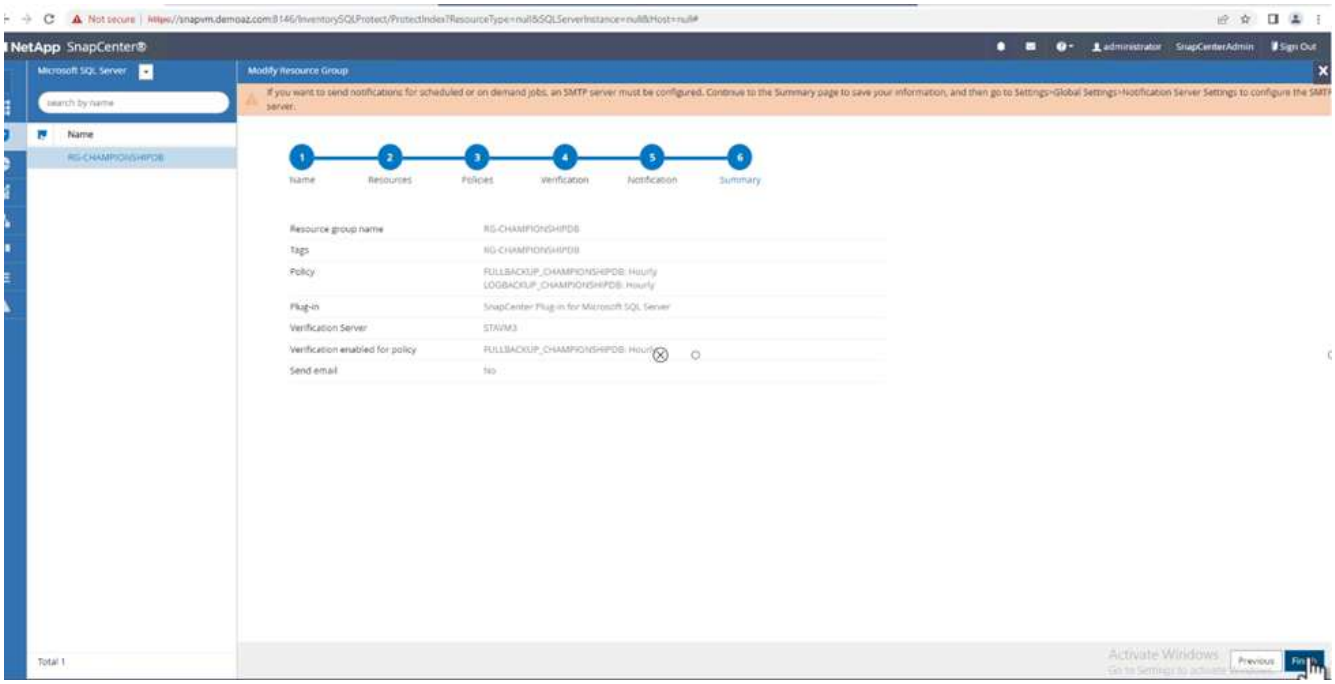
5. Configure the verification server.



6. Configure email notification.



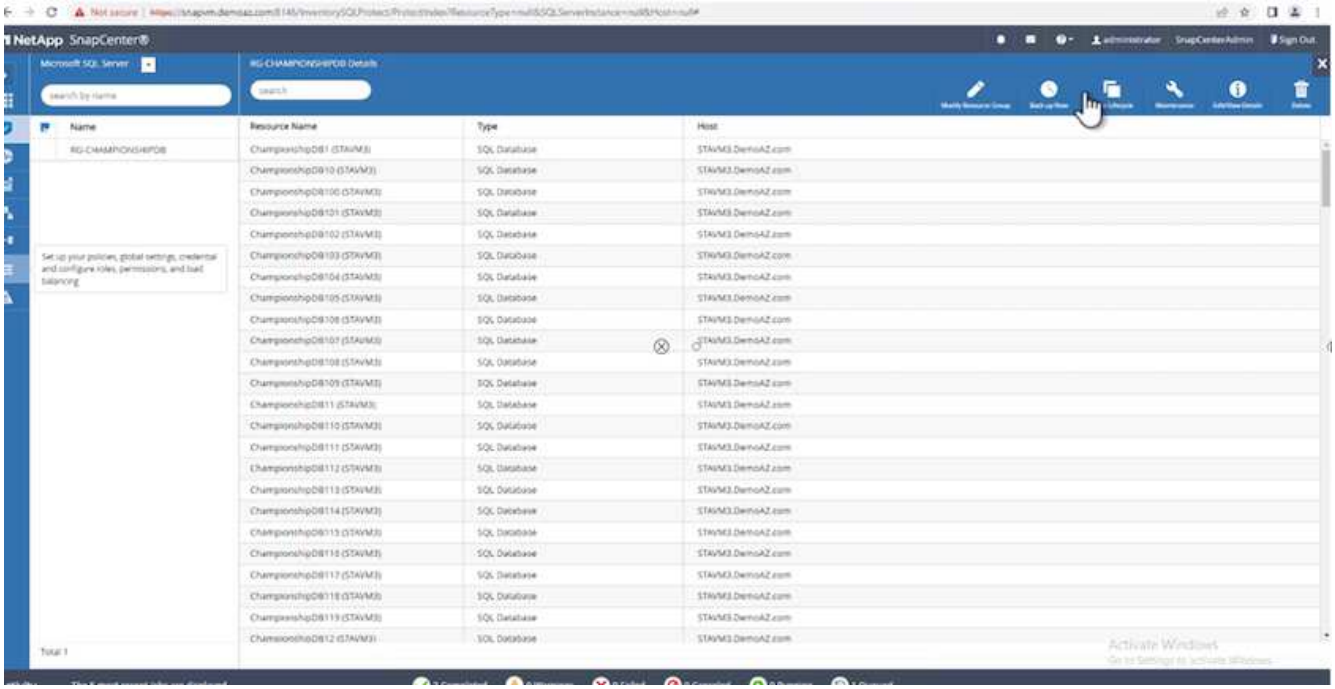
7. On the **Summary** page, click **Finish**.



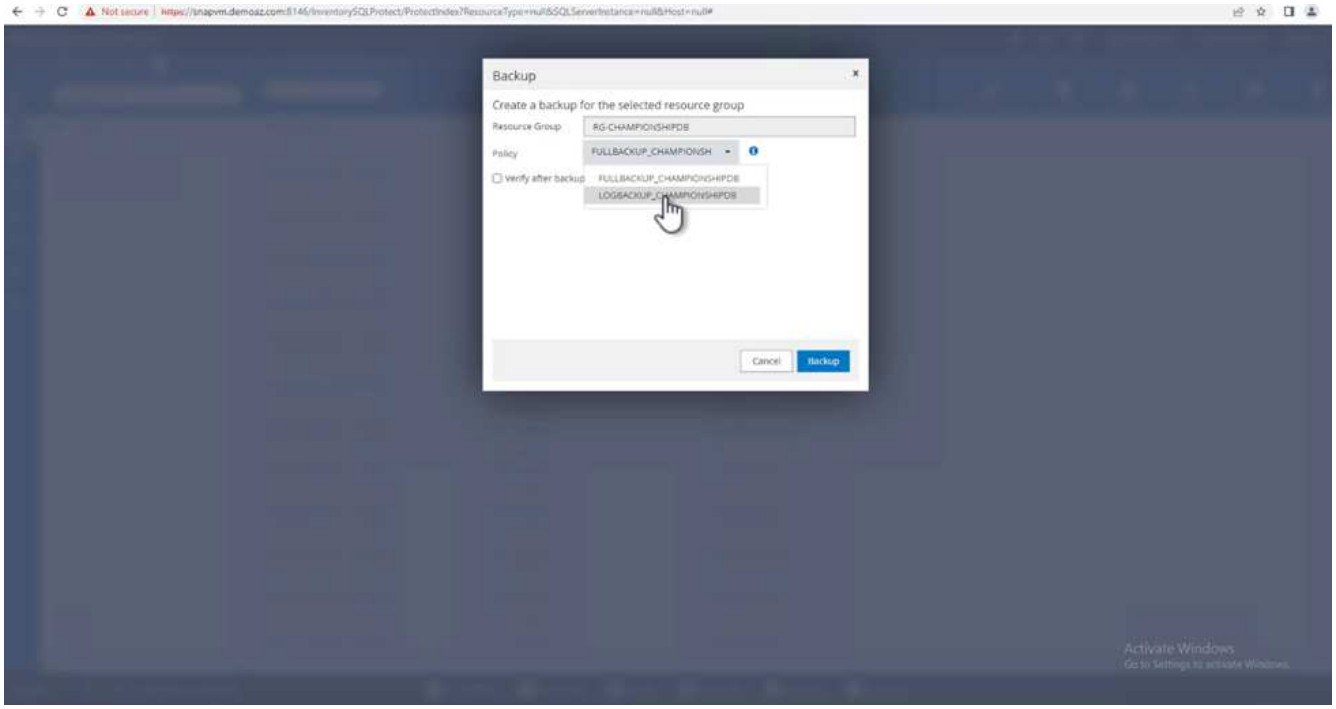
Triggering an on-demand transaction log backup for mutiple SQL Server databases

To trigger an on- demand backup of the transactional log for multiple SQL server databases, complete the following steps:

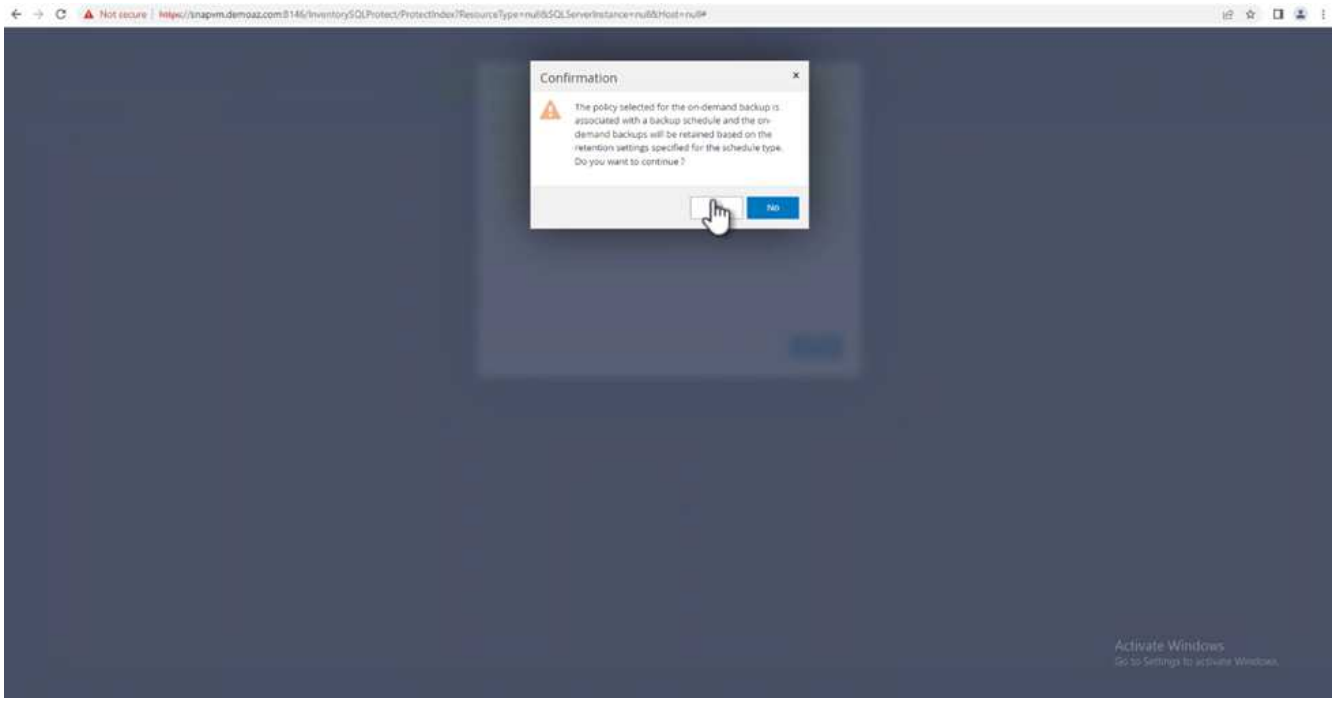
1. On the newly created policy page, select **Backup now** at the upper right of the page.



2. From the pop-up on the **Policy** tab, select the drop-down menu, select the backup policy, and configure the transaction log backup.



3. Click **Backup**. A new window is displayed.
4. Click **Yes** to confirm the backup policy.



Monitoring

Move to the **Monitoring** tab and monitor the progress of the backup job.

Restore and recovery

See the following prerequisites necessary for restoring a SQL Server database in SnapCenter.

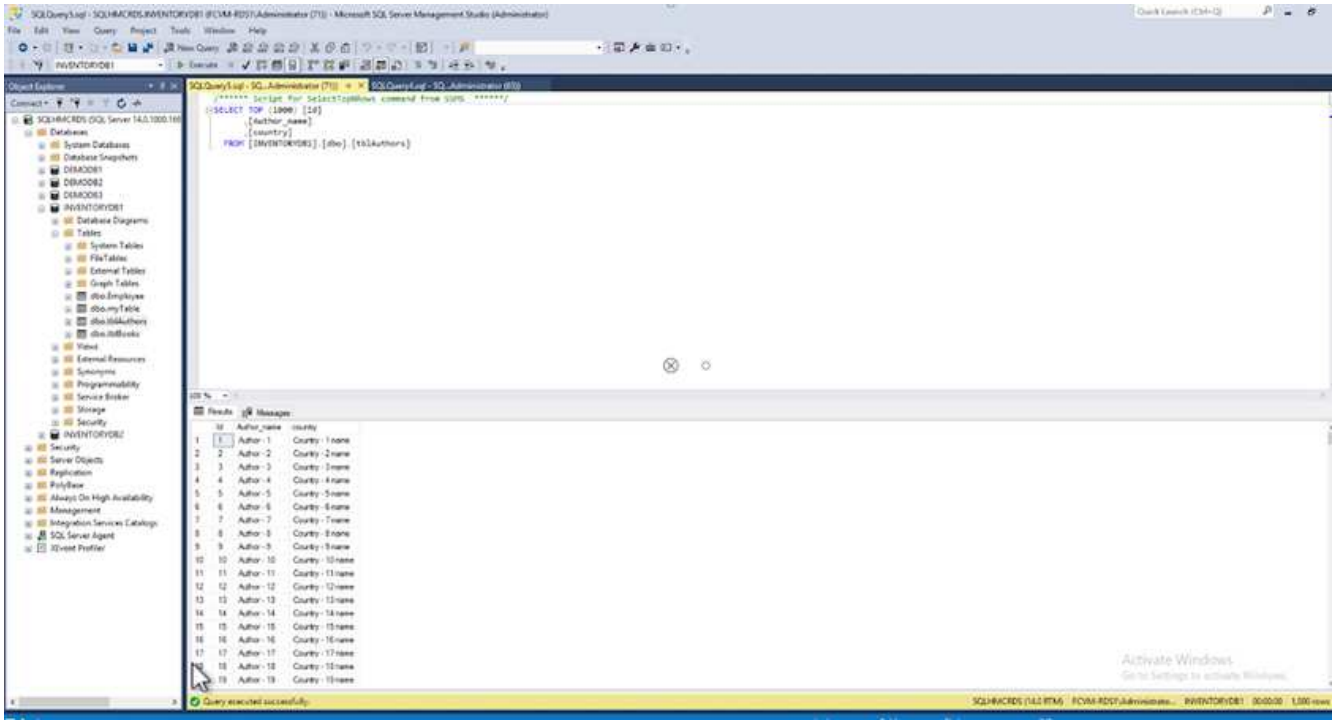
- The target instance must be online and running before a restore job completes.

- SnapCenter operations that are scheduled to run against the SQL Server database must be disabled, including any jobs scheduled on remote management or remote verification servers.
- If you are restoring custom log directory backups to an alternate host, the SnapCenter server and the plugin host must have the same SnapCenter version installed.
- You can restore the system database to an alternate host.
- SnapCenter can restore a database in a Windows cluster without taking the SQL Server cluster group offline.

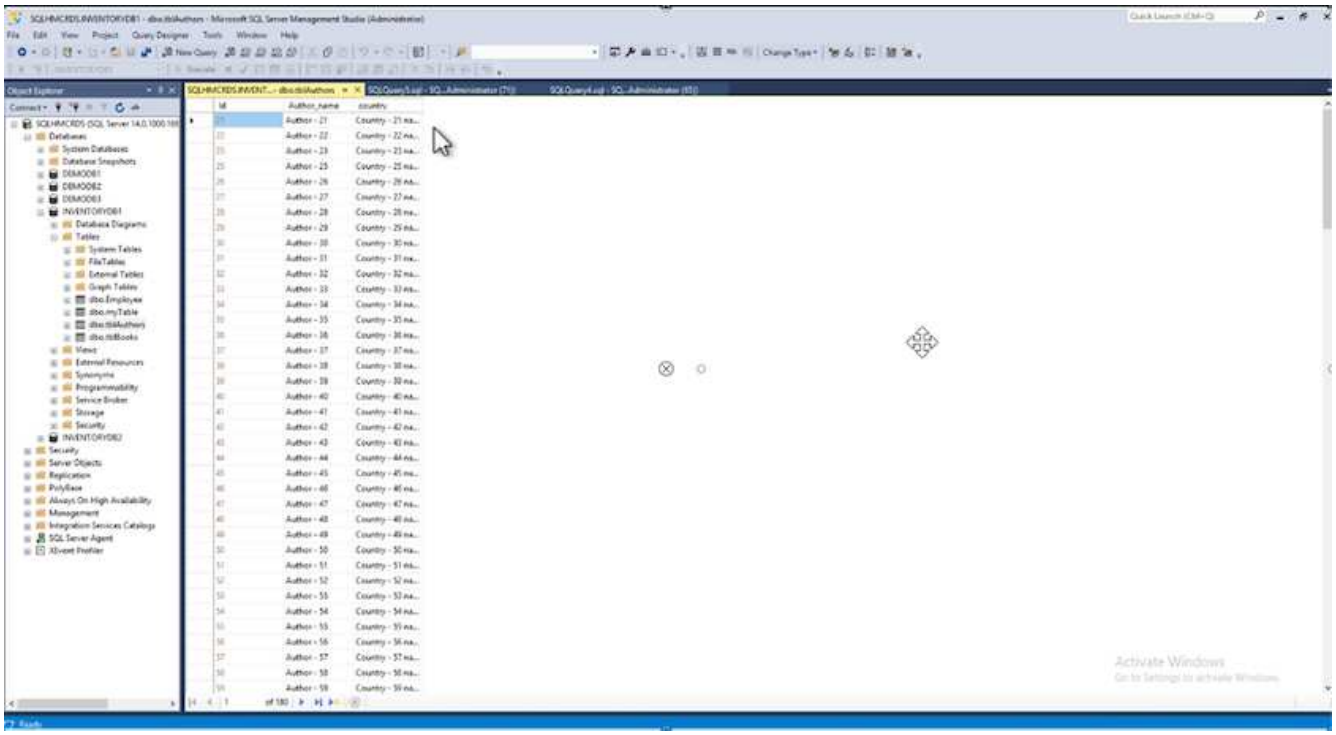
Restoring deleted tables on a SQL Server database to a point in time

To restore a SQL Server database to a point in time, complete the following steps:

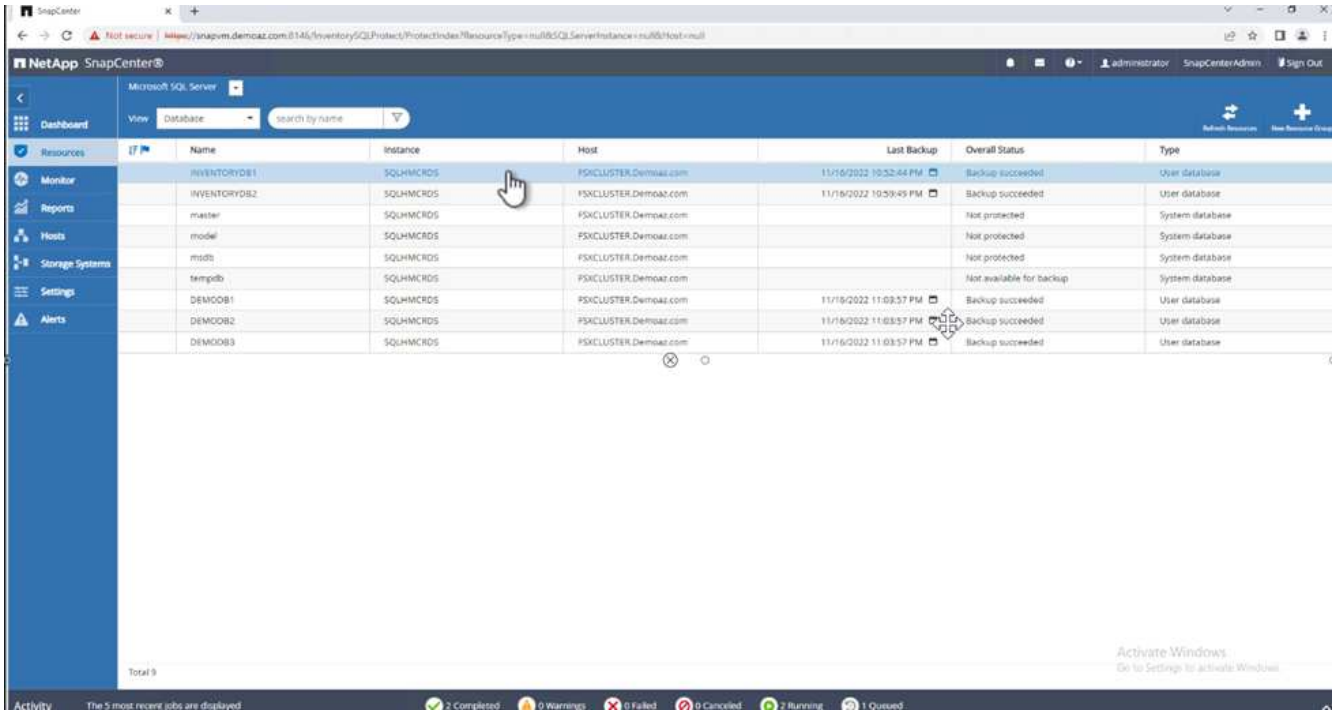
1. The following screenshot shows the initial state of the SQL Server database before the deleted tables.



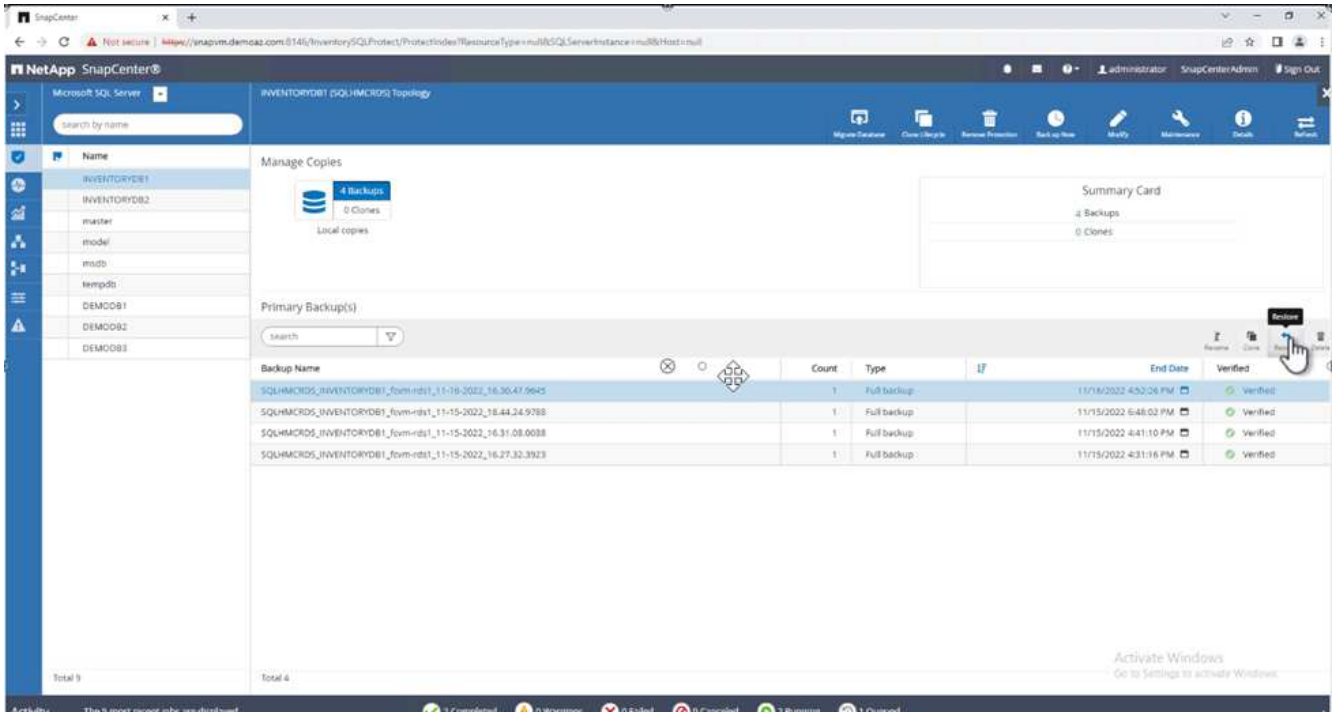
   The screenshot shows that 20 rows were deleted from the table.



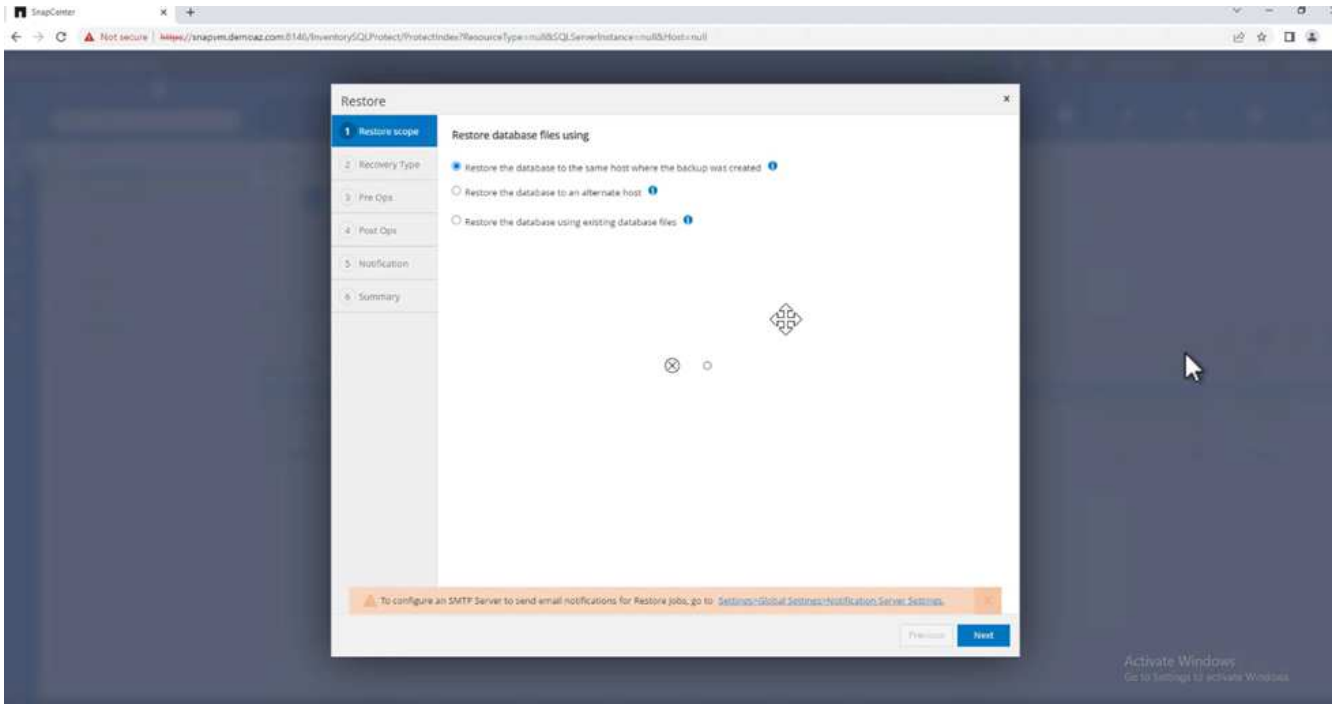
2. Log into SnapCenter Server. From the **Resources** tab, select the database.



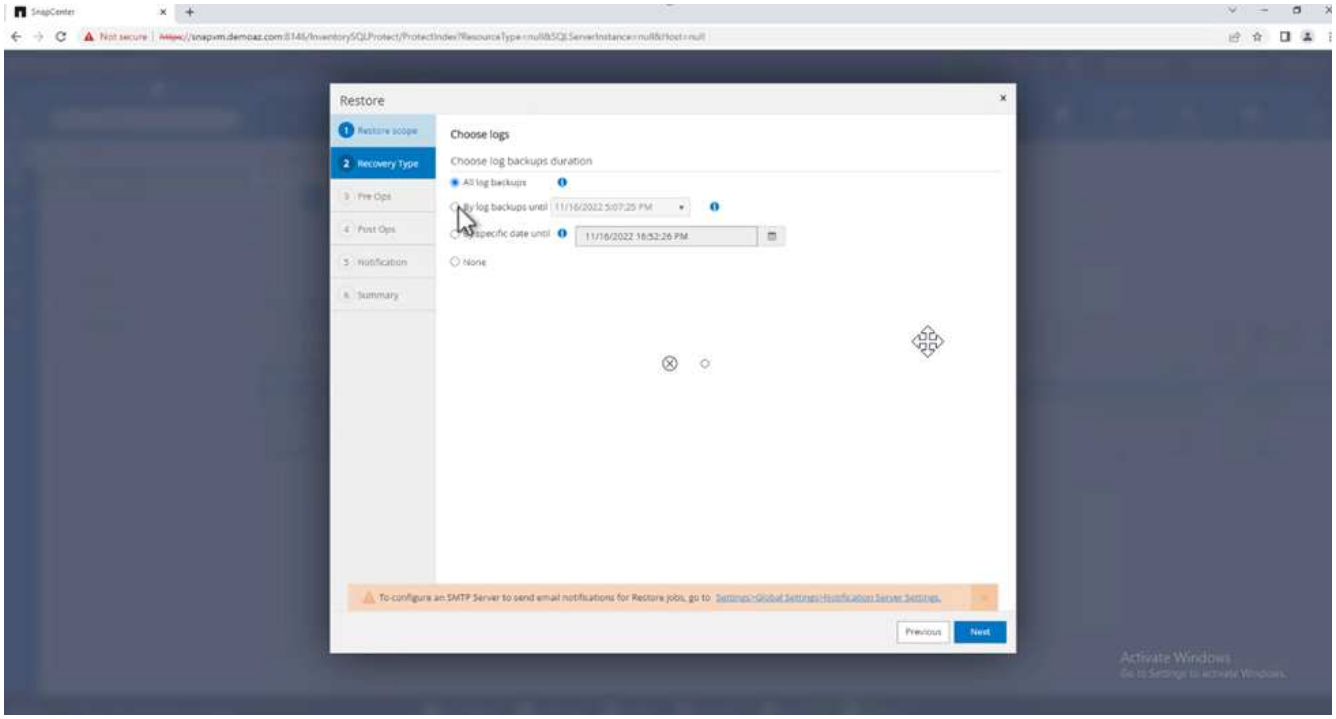
3. Select the most recent backup.
4. On the right, select **Restore**.

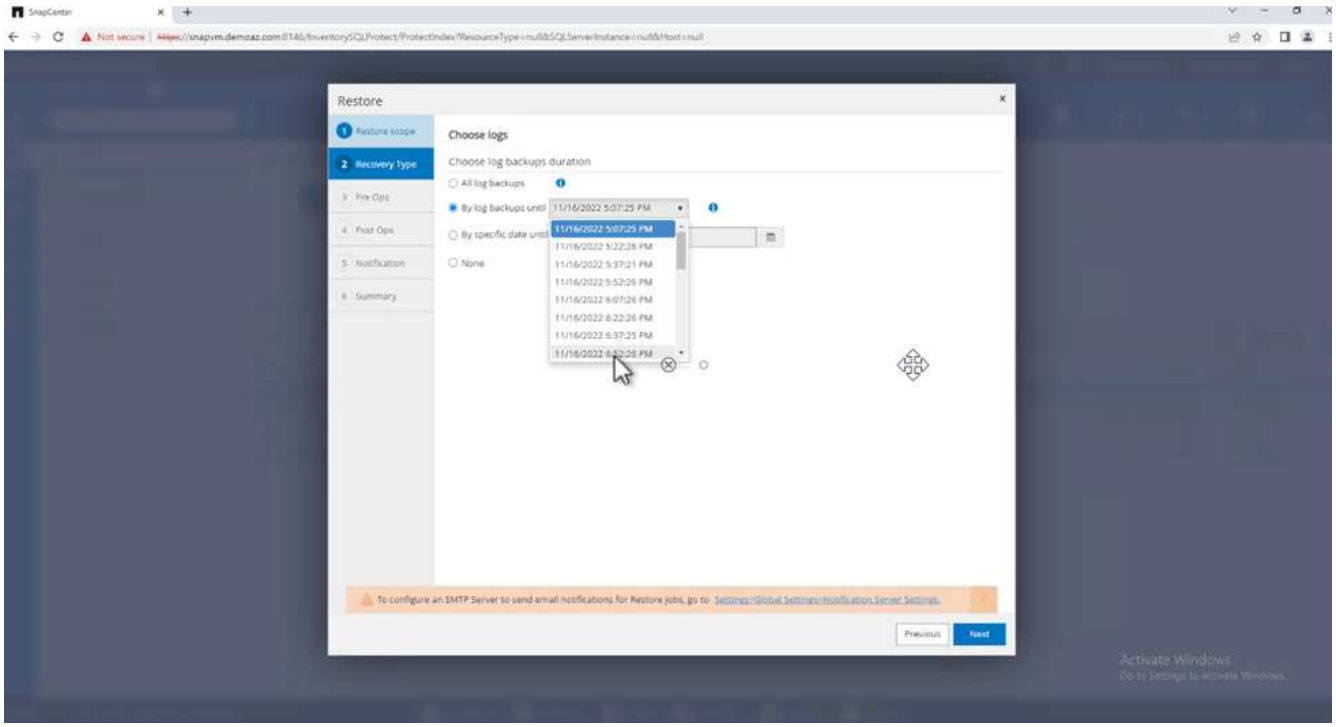


5. A new window is displayed. Select the **Restore** option.
6. Restore the database to the same host where the backup was created. Click **Next**.



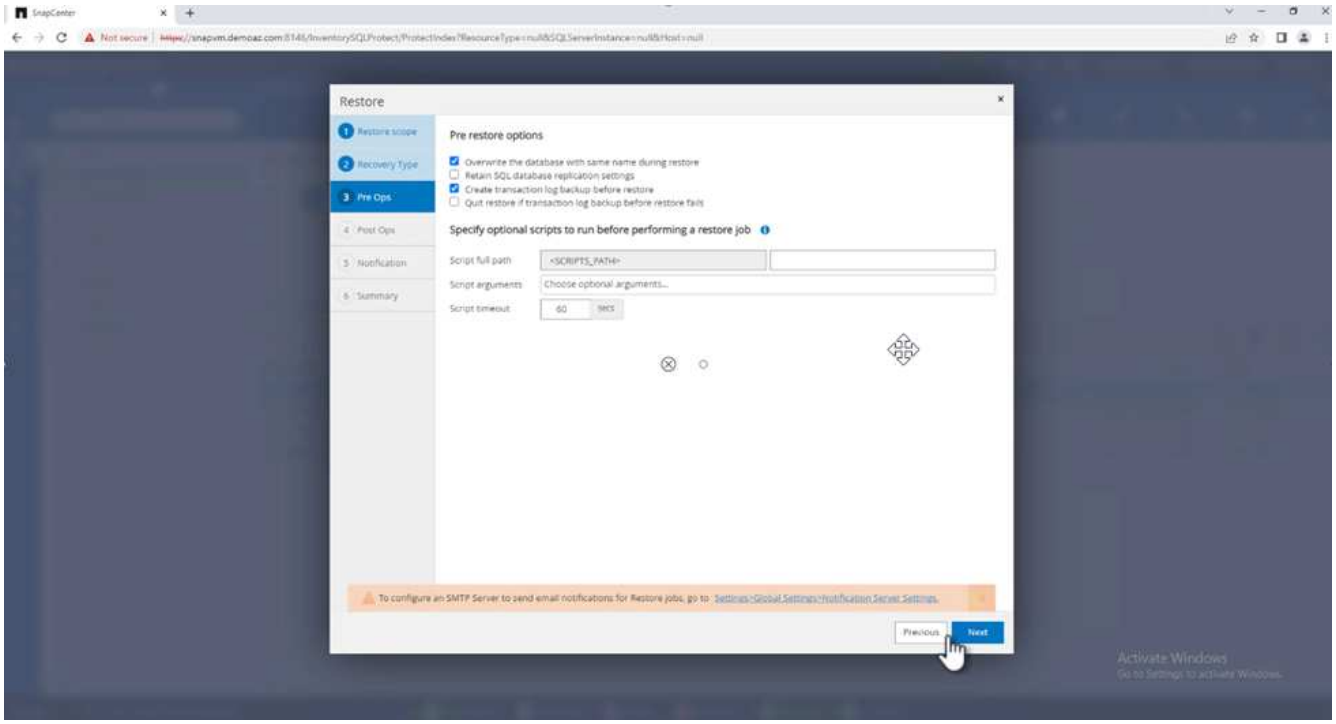
7. For the **Recovery type**, select **All log backups**. Click **Next**.





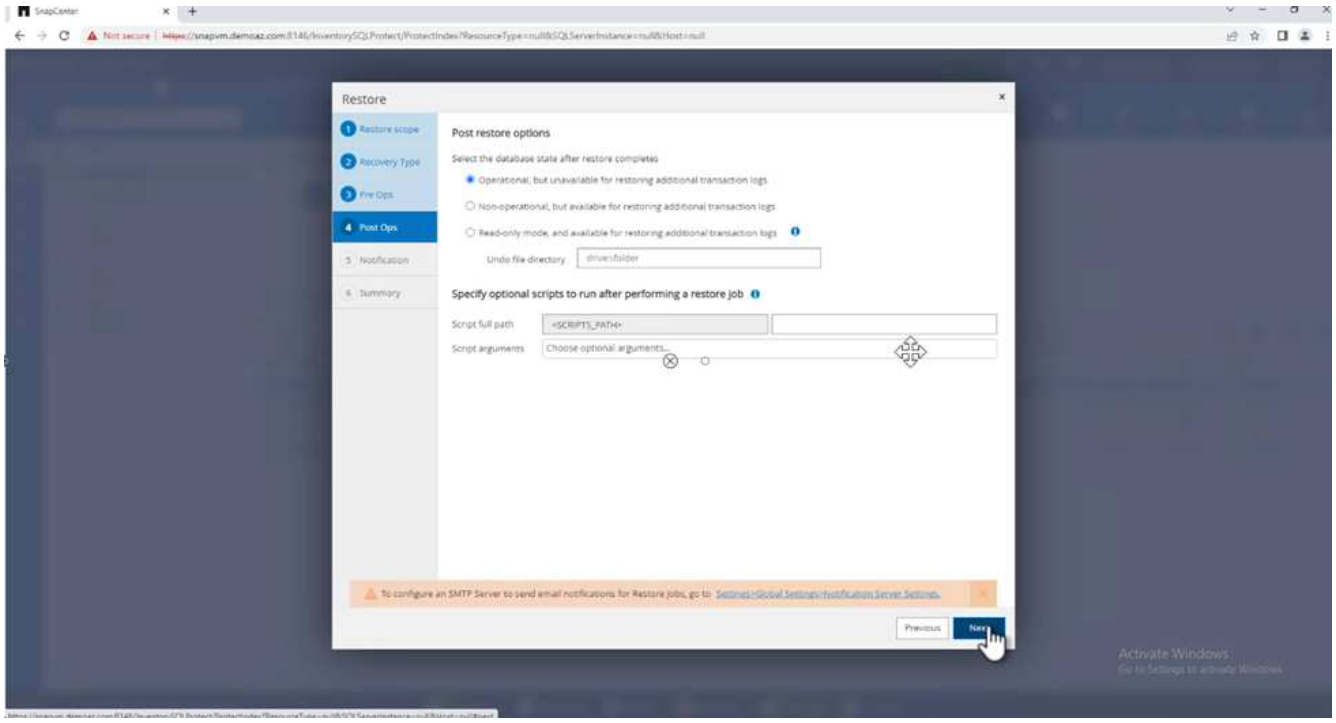
Pre- restore options:

1. Select the option **Overwrite the database with same name during restore**. Click **Next**.

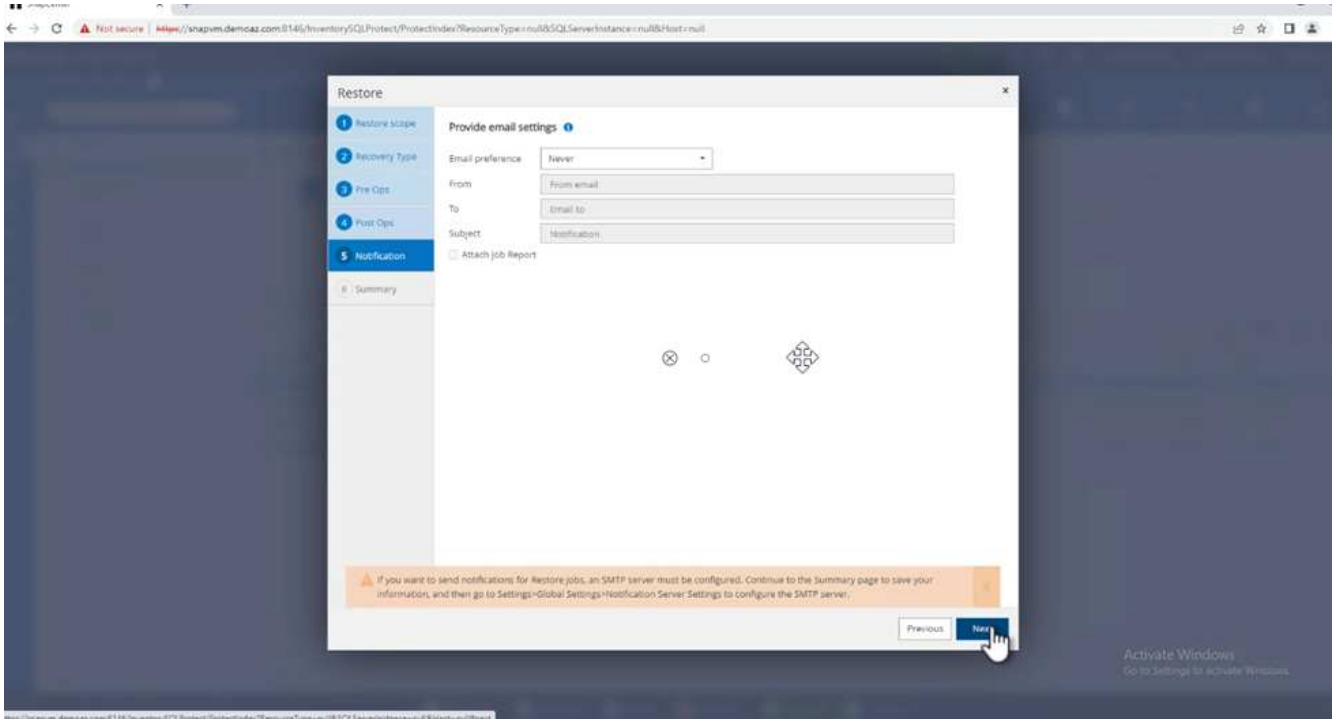


Post- restore options:

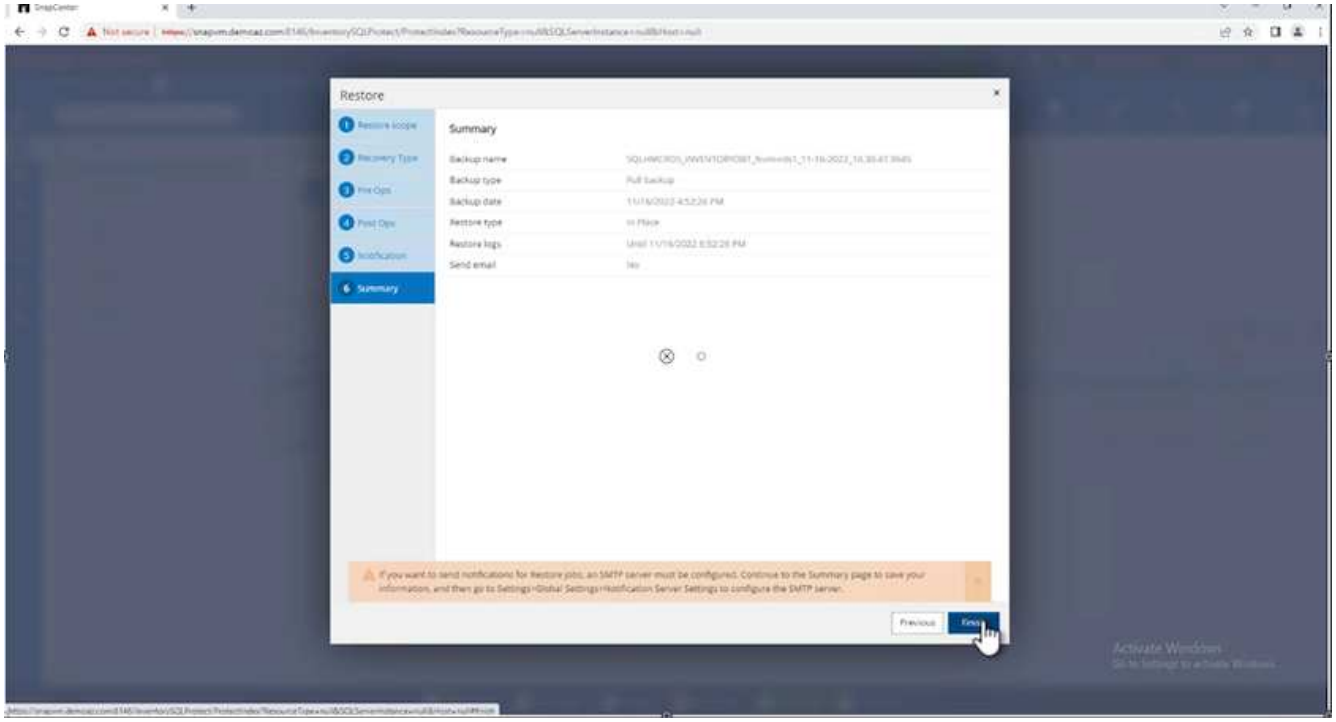
1. Select the option **Operational, but unavailable for restoring additional transaction logs**. Click **Next**.



2. Provide the email settings. Click **Next**.

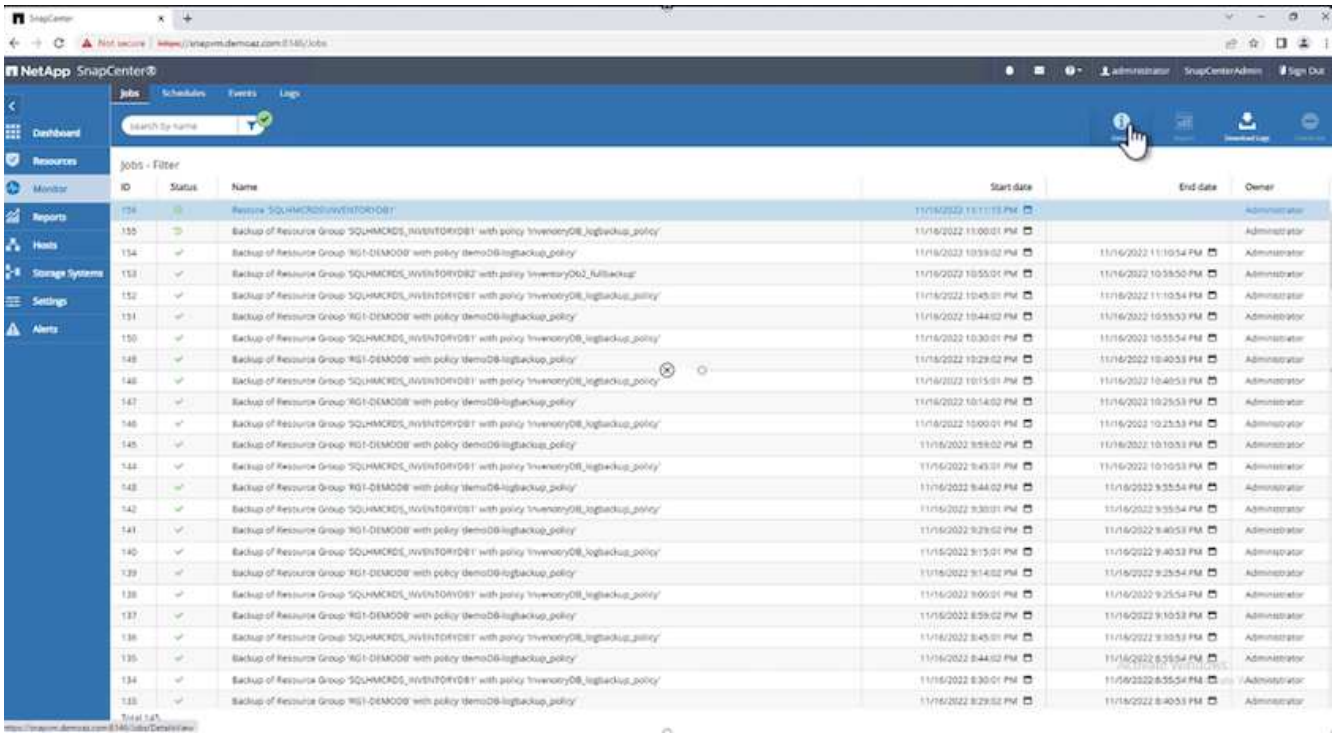


3. On the **Summary** page, click **Finish**.

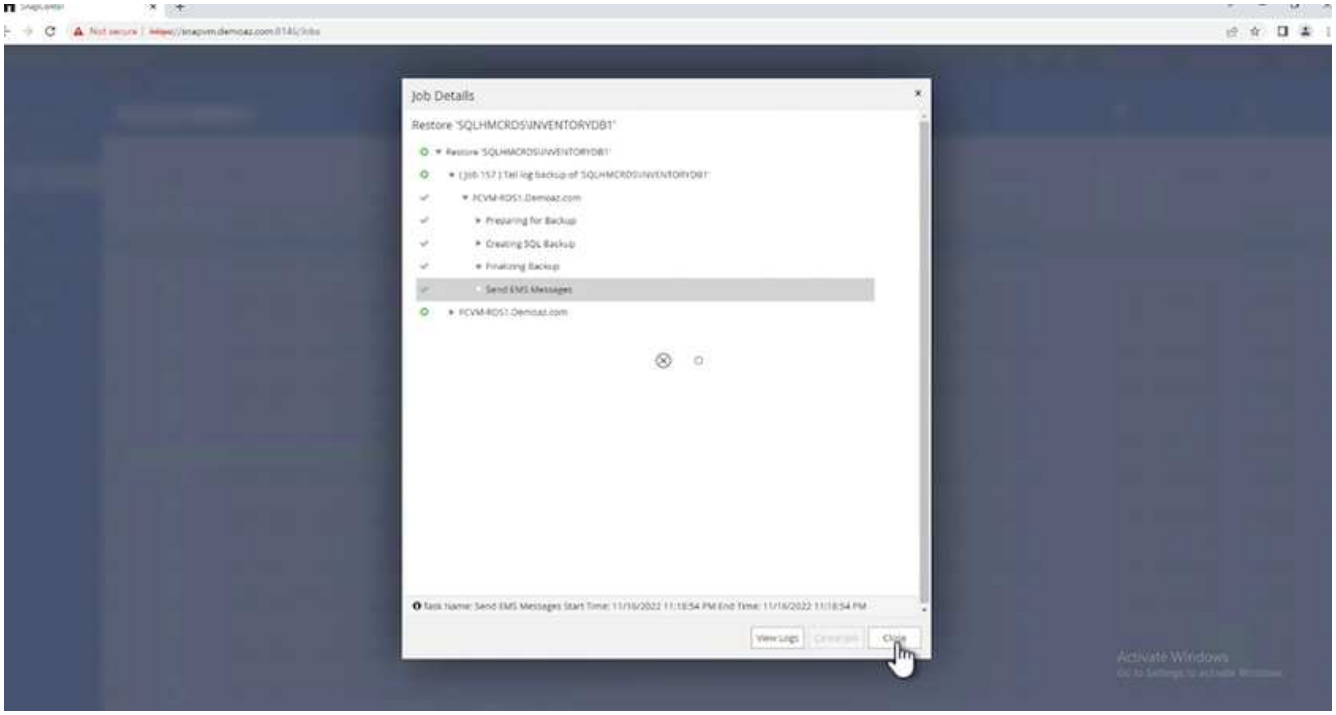


Monitoring the restore progress

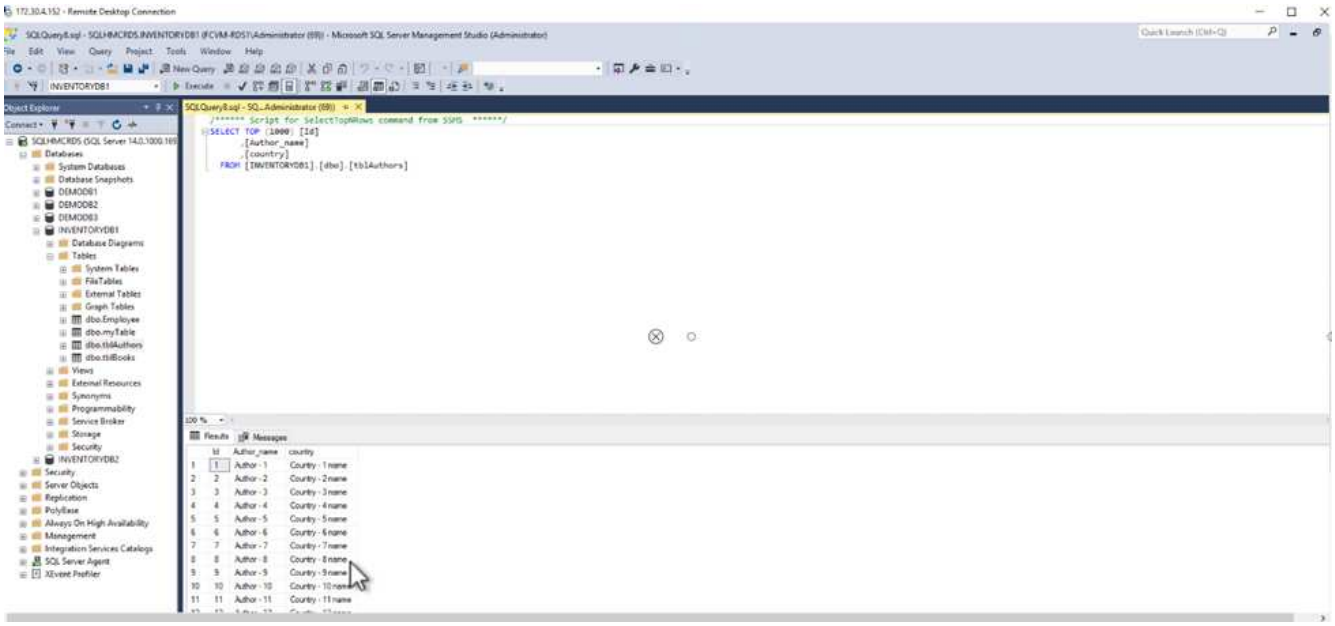
1. From the **Monitoring** tab, click the restore job details to view the progress of the restore job.



2. Restore the job details.



3. Return to SQL Server host > database > table are present.



Where to find additional information

To learn more about the information that is described in this document, review the following documents and/or websites:

- TR-4714: Best Practices Guide for Microsoft SQL Server using NetApp SnapCenter

  https://www.netapp.com/pdf.html?item=/media/12400-tr4714pdf.pdf

- Requirements for restoring a database

  https://docs.netapp.com/us-en/snapcenter-45/protect-scsql/concept_requirements_for_restoring_a_database.html

- Understanding cloned database lifecycles

  https://library.netapp.com/ecmdocs/ECMP1217281/html/GUID-4631AFF4-64FE-4190-931E-690FCADA5963.html

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