Data protection

Enterprise applications

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Database backup strategies should be based on identified business requirements, not theoretical capabilities. By combining ONTAP's Snapshot technology and leveraging Microsoft SQL Server API's, you can quickly take application consistent backup irrespective of size of user databases. For more advanced or scale-out data management requirements, NetApp offers SnapCenter.

SnapCenter

SnapCenter is the NetApp data protection software for enterprise applications. SQL Server databases can be quickly and easily protected with the SnapCenter Plug-in for SQL Server and with OS operations managed by the SnapCenter Plug-in for Microsoft Windows.

SQL Server instance can be a standalone setup, failover cluster instance or it can be always on availability group. The result is that from single-pane-of-glass, databases can be protected, cloned and restored from primary or secondary copy. SnapCenter can manage SQL Server databases both on-premises, in the cloud, and hybrid configurations.Database copies can also be created in few minutes on the orignal or alternate host for development or for reporting purpose.

SQL Server also requires coordination between the OS and the storage to ensure the correct data is present in snapshots at the time of creation. In most cases, the only safe method to do this is with SnapCenter or T-SQL. Snapshots created without this additional coordination may not be reliably recoverable.

For more details about the SQL Server Plug-in for SnapCenter, see TR-4714: Best practice guide for SQL Server using NetApp SnapCenter.

Protecting database using T-SQL snapshots

In SQL Server 2022, Microsoft introduced T-SQL snapshots that offers a path to scripting and automation of backups operations. Rather than performing full-sized copies, you can prepare the database for snapshots. Once the database is ready for backup, you can leveraging ONTAP REST API's to create snapshots..

The following is a sample backup workflow:

1. Freeze a database with ALTER command. This prepares the database for a consistent snapshot on the underlying storage. After the freeze you can thaw the database and record the snapshot with BACKUP command.
2. Perform snapshots of multiple databases on the storage volumes simultaneously with the new BACKUP GROUP and BACKUP SERVER commands.
3. Perform FULL backups or COPY_ONLY FULL backups. These backups are recorded in msdb as well.
4. Perform point-in-time recovery using log backups taken with the normal streaming approach after the snapshot FULL backup. Streaming differential backups are also supported if desired.

To learn more, see Microsoft documentation to know about the T-SQL snapshots.

NetApp recommends using SnapCenter to create Snapshot copies. The T-SQL method described above also works, but SnapCenter offers complete automation over the backup, restore, and cloning process. It also performs discovery to ensure the correct snapshots are being created. No pre-configuration is required.

SQL Server availability group with SnapCenter

SnapCenter supports backup of SQL Server availability group database configured with Windows failover cluster.

SnapCenter plugin for Microsoft SQL Server must be installed on all nodes of Windows server failover cluster. Refer the documentation on prerequisites and the steps to setup the SnapCenter plugins.

SnapCenter discovers all the databases, instances and availability groups in Windows hosts and resources are enumerated on the SnapCenter resource page.

Protecting databases in always on availability group

Databases in availability group can be protected in multiple ways.

- Database level backup: Select the availability database for the database resource page, add the policy consisting of full/log backup, schedule the backup. SnapCenter takes the backup irrespective of the database role whether it is a primary replica or a secondary replica. The protection can also be configured by adding databases to resource group.
- Instance level backup: Select the instance and all the databases running on the instance are protected based on the selected policy. All the databases, including the availability database running as primary or secondary replica are backed up using SnapCenter. The protection can also be configured by adding instance to resource group.
- Availability group level backup: While configuring the policy, SnapCenter have a advance option for availability group level backup. The availability group setting in policy allows users to select the replica preference for backup. You could select primary, secondary replica or all of them. The default option is based on backup replica set in SQL Server availability group configuration.

The availability group setting in SnapCenter policy will apply only if availability group level backup is used to protect availability group databases and do not apply for database or instance level backup.

NetApp recommends to use availability level backup to backup across all the replica running on NetApp ONTAP storage.

Configuring log backup in SnapCenter

If availability group is setup on standalone SQL Server setup then a dedicated disk must be mounted on each node of a Windows server failover cluster. Dedicated disk should be used to configure log directory to save transaction log backups.

If availability group is setup on SQL Server failover cluster then clustered disk should be created on SQL Server failover cluster instance to host log directory.

Restoring database in availability group setup with SnapCenter

- SnapCenter provide reseed option to automatically recover the database from the latest snapshot available at the secondary replica. Reseed operation will automatically restore and join the database backup to availability group.
- Alternate way to restore replica database in availability group is by breaking the availability group and performing the complete full and log restore. Use SnapCenter to restore database in norecovery mode and then use SQL Server management studio or T-SQL to join the database back to availability group.

- To recover just subset of data, clone capability from SnapCenter can be used to create clone copy of database. Database copy is created within few minutes using SnapCenter, then export the data to primary replica using SQL Server native tools.

For best practice to setup database storage layout to meet the RTO and RPO requirement, please see TR-4714 Best practices for Microsoft SQL Server using NetApp SnapCenter.

SnapCenter do not support distributed availability group and contained availability group.

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