



Version 1.2

July 2024

Protect SQL Always On Availability Group Databases with Cohesity

Cohesity Solution for Backup and Restore of SQL Server AG Databases

ABSTRACT

As databases continue to grow in number and size, data centers in today's organizations need different methods and strategies to protect their databases and manage their growing data. Now, because we have integrated the Cohesity platform with VDI, you can use it with our SQL adapter to add another backup method to your toolbox. Cohesity's VDI-based backup gives you the flexibility of a SQL native backup.

Table of Contents

Complexity Forces Us to Sink or Swim	4
Cohesity's Adapter Support for SQL AG Databases	5
Choosing an Adapter Backup Method.....	6
Features and Benefits of Cohesity Protection	7
Use Cohesity to Protect SQL AG Databases	9
Deploy the Cohesity Windows Agent	10
Register SQL Server in Cohesity	13
SQL Host Physical Registration	15
SQL Server Application Registration	17
Create a Protection Group	18
<i>Specify MS SQL Settings</i>	22
Recover SQL Database	27
Upgrade Your Disaster Recovery Preparedness	28
Take Local Snapshots	29
Replicate Backups Off-Site.....	29
Archive Backups to the Cloud	29
Best Practices for Cohesity SQL Server Protection	30
Appendix A: Planning Retention for VDI Backups	32
Appendix B: Product Documentation	33
Your Feedback	34
About the Authors.....	34
Document Version History.....	34

Figures

Figure 1: Cohesity Protection Features and Benefits	7
Figure 2: Set Up SQL Server Data Protection with Cohesity	9

Figure 3: Primary Only Preference 24

Figure 4: SQL Backups in Cohesity are Available to Replicate and Archive 28

Tables

Table 1: Cohesity’s Adapter Support for SQL AG Databases 5

Table 2: Secondary Only Preference 25

Table 3: Preferred Secondary 25

Table 4: Any Option..... 25

Complexity Forces Us to Sink or Swim

In complex data center environments, there is no easy way to manage all the backups and recoveries that comprise the foundation of their protection. Administrators often describe the task as similar to keeping many plates spinning at the same time; without an enterprise-level data management solution, one is left to either sink or swim.

Three essential factors push the demand for efficient data management:

- **The growing number of databases.** The number and kind of backups increase as the demand for protection continues to grow.
- **The increasing size of databases.** Larger databases result in longer backup windows that make it harder to meet your SLAs.
- **The ever-increasing duration and cost of retention.** Managing the storage for backups becomes more difficult as company standards and government regulations increase retention requirements.

Cohesity's Adapter Support for SQL AG Databases

Table 1: Cohesity's Adapter Support for SQL AG Databases

DB Types	Definition	Protection Method		
		Volume-based	File-based	VDI-based
AAG	<p>A database that belongs to an availability group (AG). For each availability database, the availability group maintains a single read-write copy (the primary replica) and one to eight read-only copies (secondary replicas).</p> <p>For details, see Always On availability groups: a high-availability and disaster-recovery solution in the Microsoft documentation.</p>	✓	✓	✓

Choosing an Adapter Backup Method

Cohesity provides three different agent-based methods to back up and restore your database.

Generally speaking, protect user databases with the following methods, listed in order of recommendation:

1. **File-Based Method.** *Has the most features.*
2. **VDI-Based Method.** *SQL native backup for highly transactional databases.*

NOTE: See [Planning VDI-Based Method Retention Requirements](#).

3. **Volume-Based Method.** *Captures application files alongside the database files.*

In the case of File Stream databases, use the following methods, listed in order of recommendation:

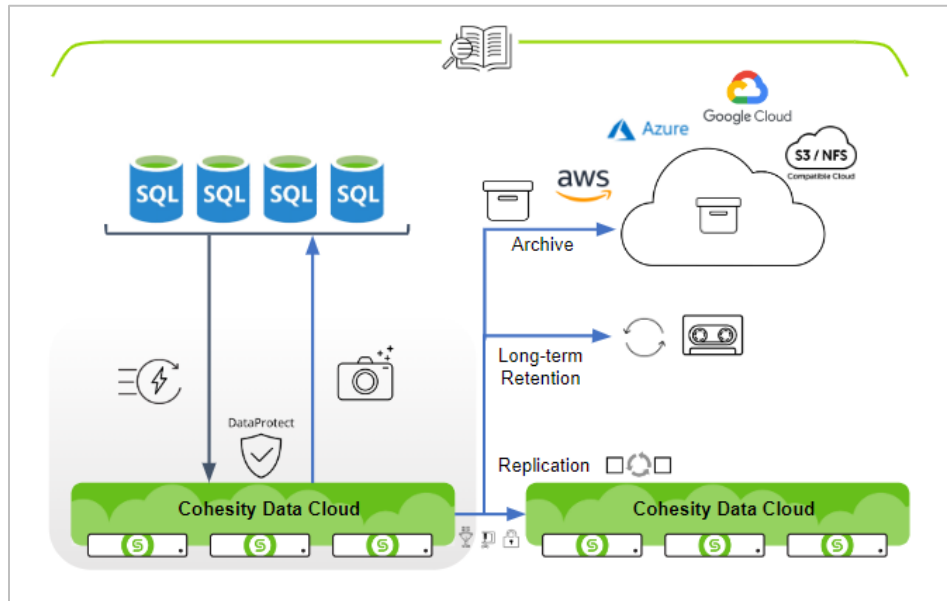
1. VDI-Based Method
2. Volume-Based Method

For a comparison of backup methods and their corresponding features, see [Protect SQL Server with Cohesity — A Guide for Choosing a Backup Method](#).

Features and Benefits of Cohesity Protection

Cohesity's solution for SQL Server includes many features that make your backups much more valuable, including:

Figure 1: Cohesity Protection Features and Benefits



- **Flexibility.** Cohesity gives you the ability to browse and search across all your snapshots, and to restore to different locations on different servers.
- **Performance to Meet Your SLAs.** Cohesity gives you the backup performance you need to protect your SQL Server databases efficiently and securely.
- **Scalability.** Cohesity protection for SQL Server is scalable from a single database to several SQL failover cluster Instances and even an entire data center with hundreds of SQL instances.
- **Compression.** Data compression significantly reduces storage usage and data transmission. Efficient storage means you have room for more backups and other important data. By default, Cohesity performs compression on all the data it stores.

If you also enable *inline* compression, the process occurs as Cohesity is saving the data to storage, instead of after saving it.

- **Encryption at rest, in flight, and in the cloud.** It is vital to protect your data from unauthorized access.
 - **Data-at-Rest.** The Cohesity [SpanFS®](#) file system provides full at-rest encryption based on the strong AES-256 CBC (Cipher Block Chaining) standard.
 - **Data-in-Flight.** Cohesity can encrypt all data that is transmitted.
 - **Data-in-Cloud.** Cohesity's CloudArchive provides encryption for data stored in the cloud.

For details, see [Cohesity Security Features](#) in the online Help.

- **Archive to cloud.** Cohesity's policy-based ability to archive to public clouds like AWS, Azure, and Google Cloud, as well as to any S3-compatible storage, makes it easy to leverage lower-cost long-term retention and protect your data from regional disasters. Cohesity makes it easy to retrieve your organization's information to different geographical locations, whenever you need to.
- **Disaster Recovery.** Protect your SQL Server universe from disaster by replicating your Cohesity backups to another location that can be ready to failover (and failback, after repairs) as soon as disaster strikes.

In addition, you can use Cohesity to protect SQL servers that are deployed with different configurations. SQL Server might be on a Windows Failover Cluster, or configured for Always On Availability Groups (AG), or SQL Server might be running on a Virtual Machine (VM). In such cases, you can use Cohesity *for other SQL Server backups* and even *create new backup strategies*. For example, you can protect the SQL Server database *and* the VM it is running on, or you can protect SQL databases across different data centers.

Use Cohesity to Protect SQL AG Databases

Cohesity offers a policy-based, highly scalable data protection infrastructure for your SQL Server data. With a few steps, you can set up Cohesity to meet all your data protection requirements.

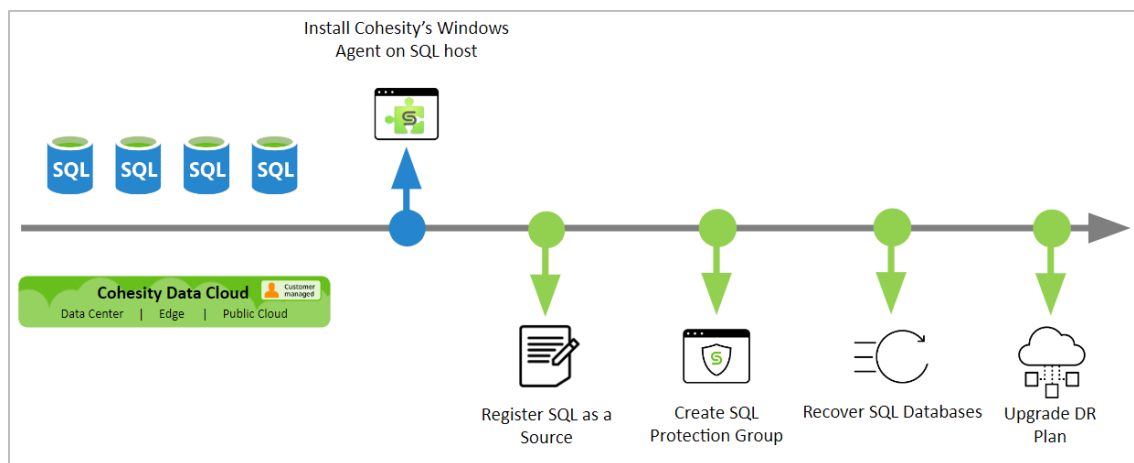
It is important to understand the process that makes a backup strategy successful. For example, it is important to have a second copy of backup data in case the original copy fails. But that is only part of the story. When you need to recover your SQL databases, it is crucial that you be able to find those backups and restore them quickly. To take full advantage of the many features of Cohesity's solution, be sure you understand each step of the implementation.

To protect your SQL databases using Cohesity:

1. [Install and deploy Cohesity's Windows Agent on your SQL server.](#)
2. [Register your SQL Server as a Cohesity source.](#)
3. [Create a Cohesity Protection Group to specify the SQL data you need to protect.](#)
4. [Recover protected SQL Server databases.](#)
5. [Upgrade your disaster recovery \(DR\) plan to improve your enterprise's readiness and resilience.](#)

NOTE: For more background, see [Appendix A: Terminology](#) and [Appendix B: Product Documentation](#).

Figure 2: Set Up SQL Server Data Protection with Cohesity



Complete these steps to protect your SQL databases. Get started by deploying Cohesity's Windows Agent next!

Deploy the Cohesity Windows Agent

To start, you need to install the Cohesity Windows Agent on your SQL Server host. The Windows agent is designed to work specifically with the Windows operating system and is compatible with Windows versions 2008R2 and above. If there are multiple SQL Server hosts, you will need to install the agent on each host you wish to protect.

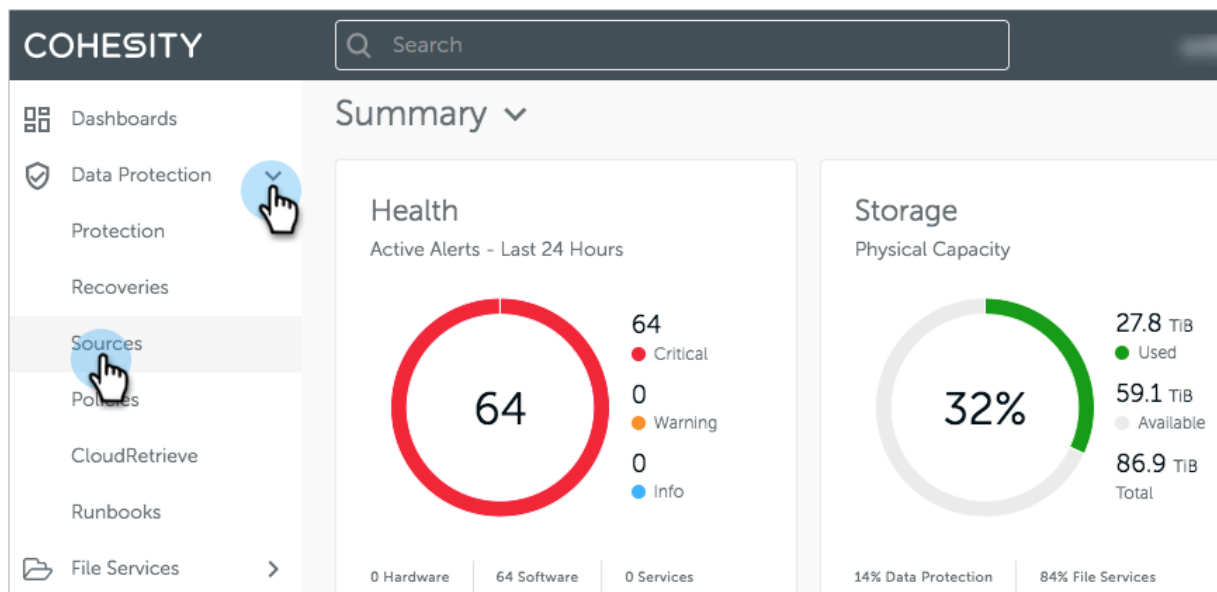
The agent is lightweight and has a small memory footprint. It carries out the tasks you define in your Cohesity Protection Groups and ties together technologies and capabilities already in Windows, like Windows VSS, and new technologies, like Cohesity Changed Block Tracker (CBT), so that you can tackle data management efficiently.

You manage the Cohesity Agent through the Sources page in Cohesity. When an upgrade becomes available for any agent you've installed, an **Upgrade Agent** button appears next to your SQL Server source. You can upgrade the agent from there.

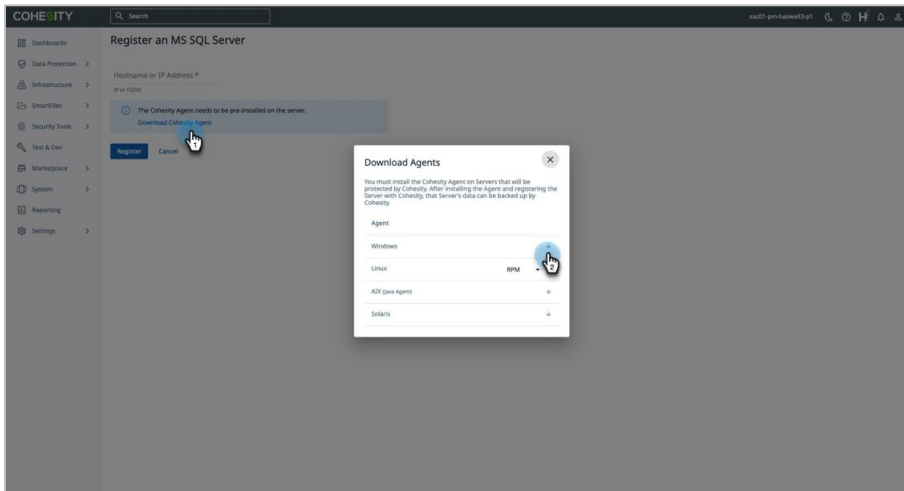
IMPORTANT: You need to install the agent on each SQL Server host you wish to protect.

To install the agent:

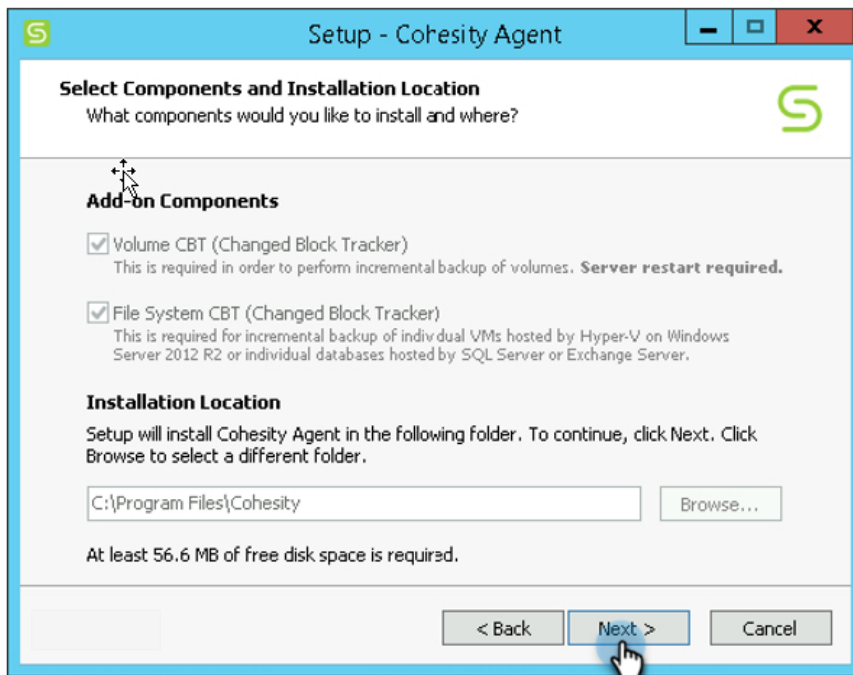
1. Log in to Cohesity and navigate to **Data Protection > Sources**.



2. Click **Download Cohesity Agent**.
3. Click the **Download** (↓) button for **Windows**.

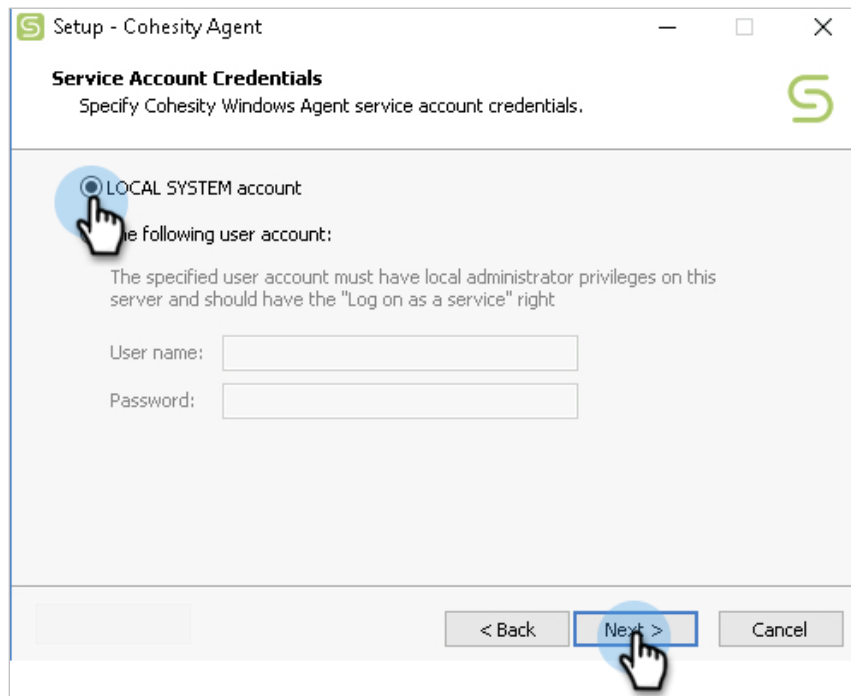


4. Download or copy the agent to all SQL Server hosts you want to protect. On each SQL Server host, install the agent and run the installer.
5. When you launch the Cohesity Windows Agent installer, under **Add-on Components**, ensure that **Volume CBT** (the default) and **File System CBT** are selected and click **Next**.



TIP: The Cohesity volume snapshot captures all the data on the SQL Server host. That means it captures all the changes on the volume *and* changes to other, non-SQL files. To keep your SQL backups running efficiently, keep the volume that SQL Server is using clear of lower-priority and unrelated files.

6. Select the type of service account to use for control over your systems. The **LOCAL SYSTEM account** gives you direct control, but you can also enter an Active Directory domain admin user account.



TIP: If you are unsure which account to use, don't let that slow you down — choose the **LOCAL SYSTEM account**. This account already has most of the required permissions. You can change the agent service account later if you change your mind.

Your SQL Server host is now ready to be registered as a Cohesity source in the next chapter.

Register SQL Server in Cohesity

To protect your SQL Server databases with Cohesity and take advantage of its many features, you need to register it as a Cohesity source. Once it's registered in Cohesity, you will be able to add it to a Protection Group and configure the settings for your environment.

To register SQL Server as a Source in Cohesity:

1. Before you can register SQL Server as a source, you need to join AD to your Cohesity cluster. Log in to Cohesity, navigate to **Settings > Access Management > Active Directory**, and click **Add Active Directory**.

The screenshot shows the Cohesity web interface. The top navigation bar includes the Cohesity logo, a search bar, and user profile information. The left sidebar contains various system management categories. The main content area is titled 'Access Management' and features a sub-menu with options like 'Users & Groups', 'Roles', 'Active Directory', 'Kerberos', 'LDAP', 'Organizations', 'SSO', 'Keystone', and 'NIS'. The 'Active Directory' option is selected. Below this, there is a table listing configured Active Directory domains. A blue button labeled 'Add Active Directory' is located in the top right corner of the main content area. Hand icons with numbers 1 through 4 indicate the navigation path: 1 points to 'Settings' in the sidebar, 2 points to 'Access Management', 3 points to 'Active Directory', and 4 points to the 'Add Active Directory' button.

Domain	Organization	Organizational Unit	Workgroup	Machine Accounts	Mapped Provider
qa01.eng.cohesity.com	-	-	QA01	haswell6-p1	-
pmad02.pm.cohesity.com	testorg	-	PMAD02	sac01-haswell6	-
jarvis.dc	jarvis	-	JARVIS	cohesity-hyx	-
nastarget.com	-	-	NASTARGET	haswelnew6	-

- In the **Join Active Directory** form, enter the AD administrator **Username** and **Password** and click **Join**.

× Back to Active Directory

Join Active Directory

Username *
administrator

Password *
.....

Preferred Domain Controllers (Optional)

Machine Accounts

+ Add

Machine Account	DNS Hostname	Encryption Types
haswell6-vip	-	2 Selected

Use the above Machine Accounts even if they already exist in AD Domain.

Mapped Provider

None LDAP NIS

Organizational Unit (Optional)
Format - OUName or OUName/SubOUName

AD Workgroup / NetBIOS Name (Optional)

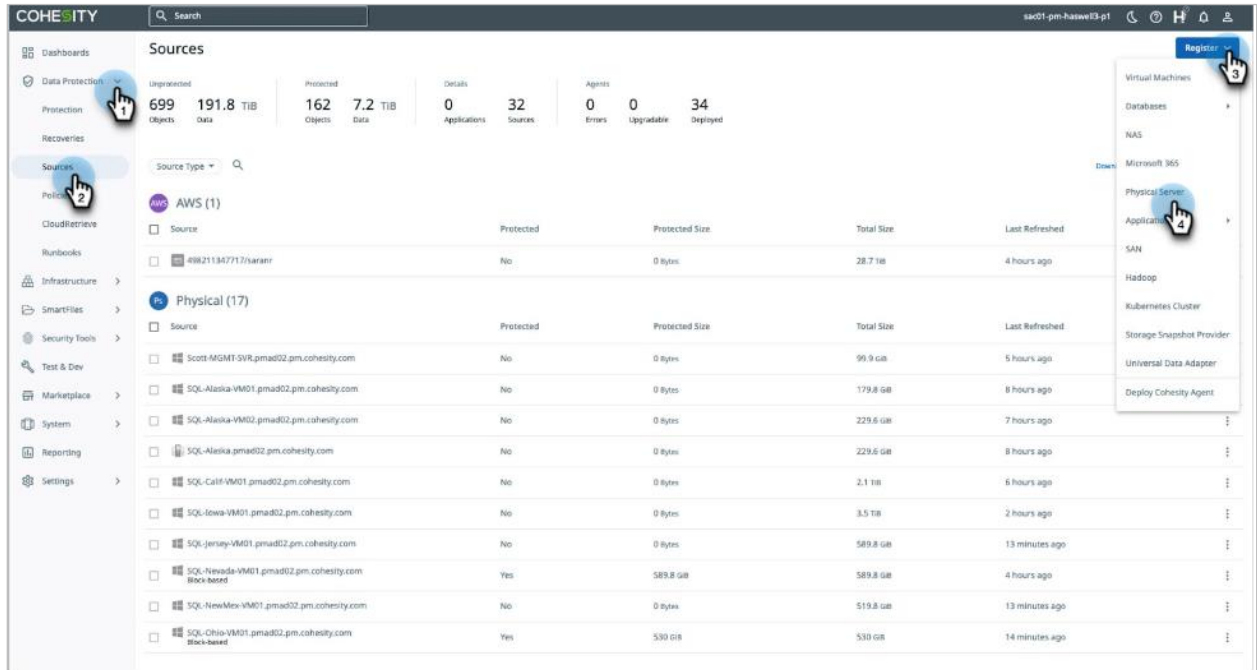
Discover Trusted Domains

Join Cancel

- For details on the other options here, see [Join the Cluster to an AD Domain](#) in the online Help.

SQL Host Physical Registration

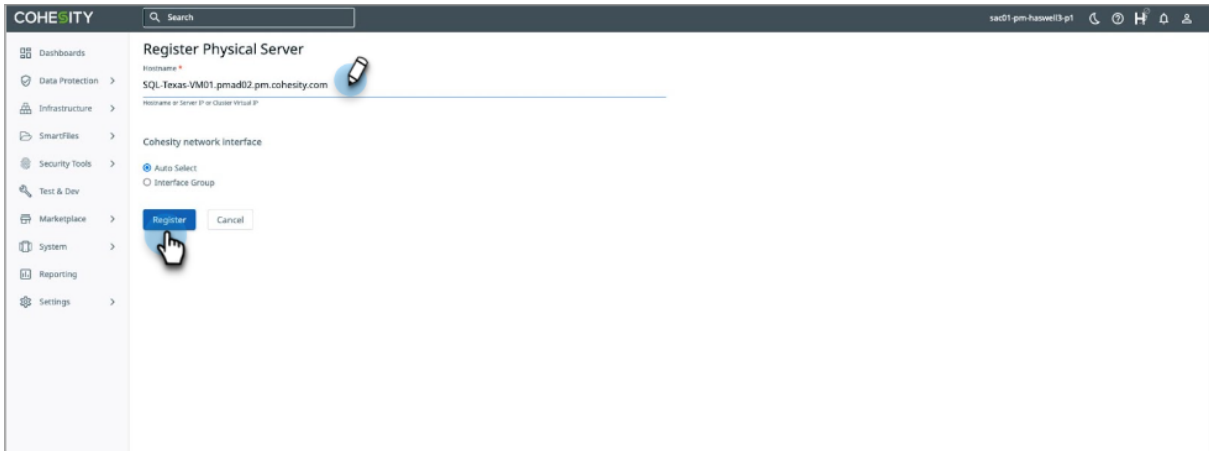
1. Navigate to **Data Protection > Sources**. Then click **Register** and select **Physical Server**.



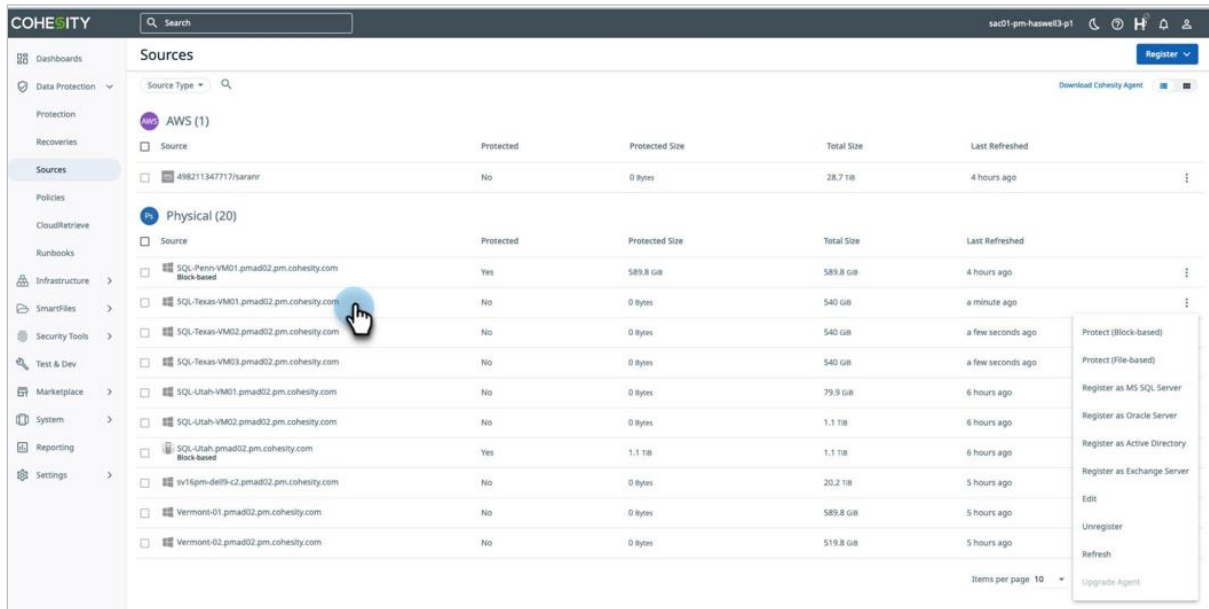
NOTE: Registering the host as a **Physical Server** allows Cohesity to have full application awareness.

IMPORTANT: You need to register each SQL Server host in the Availability Group you wish to protect.

- In the **Register Physical Server** form, enter the SQL Server FQDN or IP address and click **Register**.



- The **Sources** page now includes your SQL Server hosts (in our example, **SQL-Texas-VM01**, **SQL-Texas-VM02**, **SQL-Texas-VM03**), available to register the SQL Server application.



SQL Server Application Registration

1. From the **Sources** page which includes your SQL Server hosts (in our example, **SQL-Texas-VM01**, **SQL-Texas-VM02**, **SQL-Texas-VM03**), click the ellipsis and choose **Register as MS SQL Server**.

Register each of the hosts in the Availability Group.

The screenshot shows the Cohesity web interface. The left sidebar contains navigation menus for Dashboards, Data Protection, Protection, Recoveries, Sources, Policies, CloudRetrieve, Runbooks, Infrastructure, SmartFiles, Security Tools, Test & Dev, Marketplace, System, Reporting, and Settings. The main content area is titled 'Sources' and displays a table of sources. The table is divided into two sections: 'AWS (1)' and 'Physical (20)'. The 'Physical' section lists various SQL Server hosts. A hand cursor points to the ellipsis menu for 'SQL-Texas-VM02'. A second hand cursor points to the 'Register as MS SQL Server' option in the dropdown menu that appears. The table columns include Source, Protected, Protected Size, Total Size, and Last Refreshed. The 'SQL-Texas-VM02' entry is currently not protected (0 bytes).

Source	Protected	Protected Size	Total Size	Last Refreshed
AWS (1)				
498211347717/sarant	No	0 bytes	28.7 TiB	4 hours ago
Physical (20)				
SQL-Penns-VM01.pmad02.pm.cohesity.com	Yes	589.8 GiB	589.8 GiB	4 hours ago
SQL-Texas-VM01.pmad02.pm.cohesity.com	No	0 bytes	540 GiB	a minute ago
SQL-Texas-VM02.pmad02.pm.cohesity.com	No	0 bytes	540 GiB	a few seconds ago
SQL-Texas-VM03.pmad02.pm.cohesity.com	No	0 bytes	540 GiB	a few seconds ago
SQL-Utah-VM01.pmad02.pm.cohesity.com	No	0 bytes	79.9 GiB	6 hours ago
SQL-Utah-VM02.pmad02.pm.cohesity.com	No	0 bytes	1.1 TiB	6 hours ago
SQL-Utah.pmad02.pm.cohesity.com Block-based	Yes	1.1 TiB	1.1 TiB	6 hours ago
ov16pm-dell9-c2.pmad02.pm.cohesity.com	No	0 bytes	20.2 TiB	5 hours ago
Vermont-01.pmad02.pm.cohesity.com	No	0 bytes	589.8 GiB	5 hours ago
Vermont-02.pmad02.pm.cohesity.com	No	0 bytes	519.8 GiB	5 hours ago

To protect your newly registered SQL source, you'll create a Cohesity Protection Group for it in the next chapter.

Create a Protection Group

Automation is the only way to stay ahead of the demand for backups and data management. In Cohesity, Protection Groups combine operational requirements (which objects to protect, indexing, alerts, exclusions, inclusions, etc.) with the business requirements that are defined in a Protection Policy (scheduling, retention, etc.). Multiple Protection Groups can use the same Protection Policy, but each Group can have only one Policy. For more, see [About Policies and Protection Groups](#) in the online Help.

Automate your SQL database backups by building a Protection Group and assigning the SQL host you [registered](#) earlier and applying the Protection Policy that meets your business requirements.

NOTE: Because SQL Server configurations can be implemented across multiple hosts, or can be part of a Windows cluster, it's important that you identify all the SQL Server hosts so that they can be included in your Protection Group.

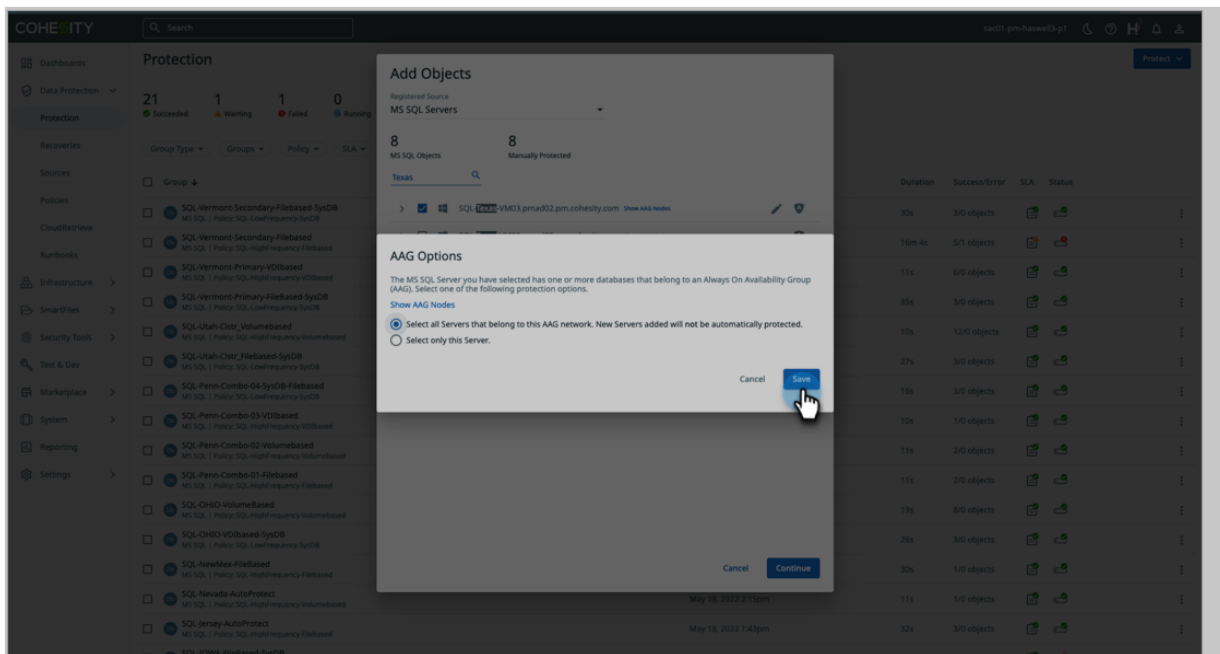
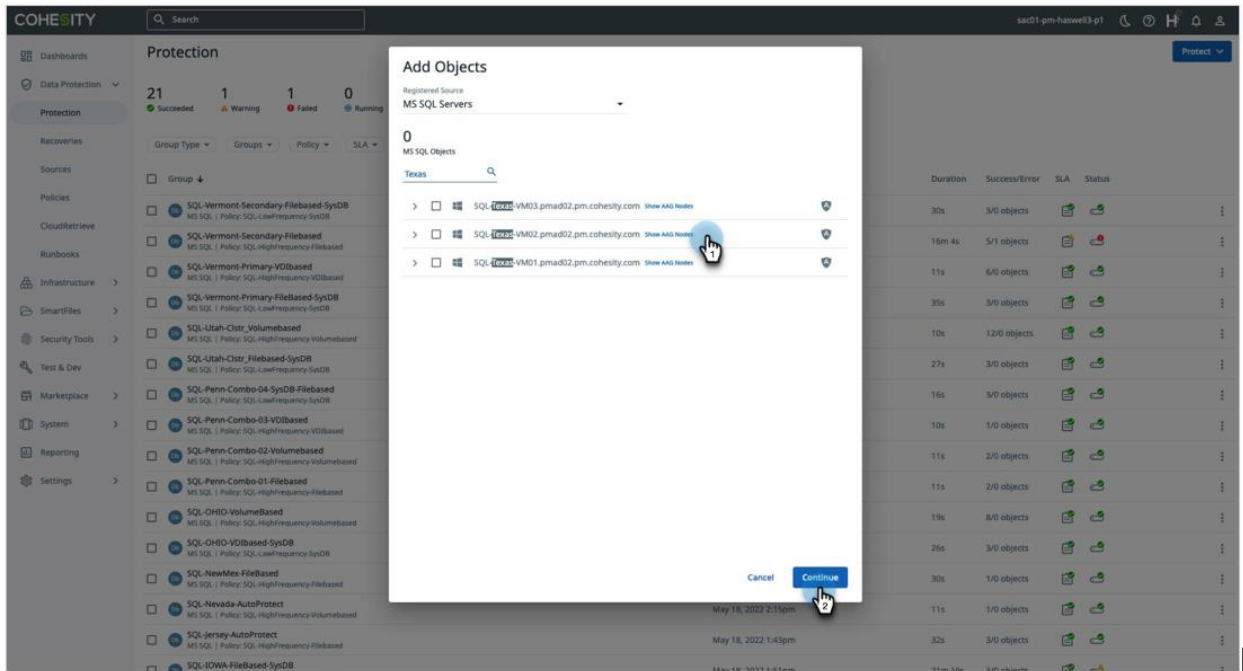
To create a Protection Group:

1. Log in to Cohesity and navigate to **Data Protection > Protection**. Then click **Protect** and select **Databases > MS SQL Server**.

The screenshot shows the Cohesity Protection interface. The top navigation bar includes 'COHESITY', a search bar, and user information 'sac01-pm-hzswell03-p1'. The left sidebar contains navigation options: Dashboards, Data Protection, Protection (highlighted), Sources, Policies, CloudRetrieve, Runbooks, Infrastructure, SmartFiles, Security Tools, Test & Dev, Marketplace, System, Reporting, and Settings. The main content area is titled 'Protection' and displays a summary of 21 Succeeded, 1 Warning, 1 Failed, 0 Running, 0 Cancelled, 22 Met SLA, and 1 Missed SLA. Below this is a table of protection groups with columns for Group, Start Time, Duration, and Success/Error. A 'Protect' button is visible in the top right corner. A dropdown menu is open, showing a list of sources: Amazon RDS, Amazon Aurora, Cassandra, Microsoft 365, MongoDB, MS SQL Server (highlighted), Oracle Database, Virtual Machines, Databases, NAS, Physical Server, Applications, SAN, Cohesity View, Hadoop, Remote Adapter, Kubernetes Cluster, and Universal Data Adapter.

TIP: You can add or remove more SQL sources to the Protection Group later if you like. In this way, you can build onto the Protection Group to manage all your SQL servers.

- In the **New Protection** form, under **Source**, select the SQL host(s) you registered earlier, make your selections, and click **Save Selection**.



3. In the same form, enter a Protection Group **Name** and select the appropriate **Policy**. Under **Settings**, select the **Storage Domain** and set the **Start Time**.

The screenshot shows the 'New Protection' configuration form in Cohesity. The form is divided into several sections:

- Source:** Registered Source: MS SQL Servers.
- Objects:** 30 MS SQL Objects, 3 Auto Protected.
- Protection Group:** Radio buttons for 'New Group' (selected) and 'Existing Group'. Name: SQL-Texas-AAG Group-Filebased.
- Policy:** SQL-Production-Filebased. A dropdown menu is open showing options: Backup (Every day / Retain 2 weeks), Periodic Full Backup (Every day), Retry Options (Retry 3 times on error / 3 minutes apart), and Log Backup (Databases) (Every 1 hour / Retain 2 weeks).
- Settings:** Storage Domain: Storage Domain. Start Time: 2:27pm | America/New_York.

Hand icons indicate the fields being interacted with: the Start Time field, the Policy dropdown, the Storage Domain field, and the Start Time field.

TIPS:

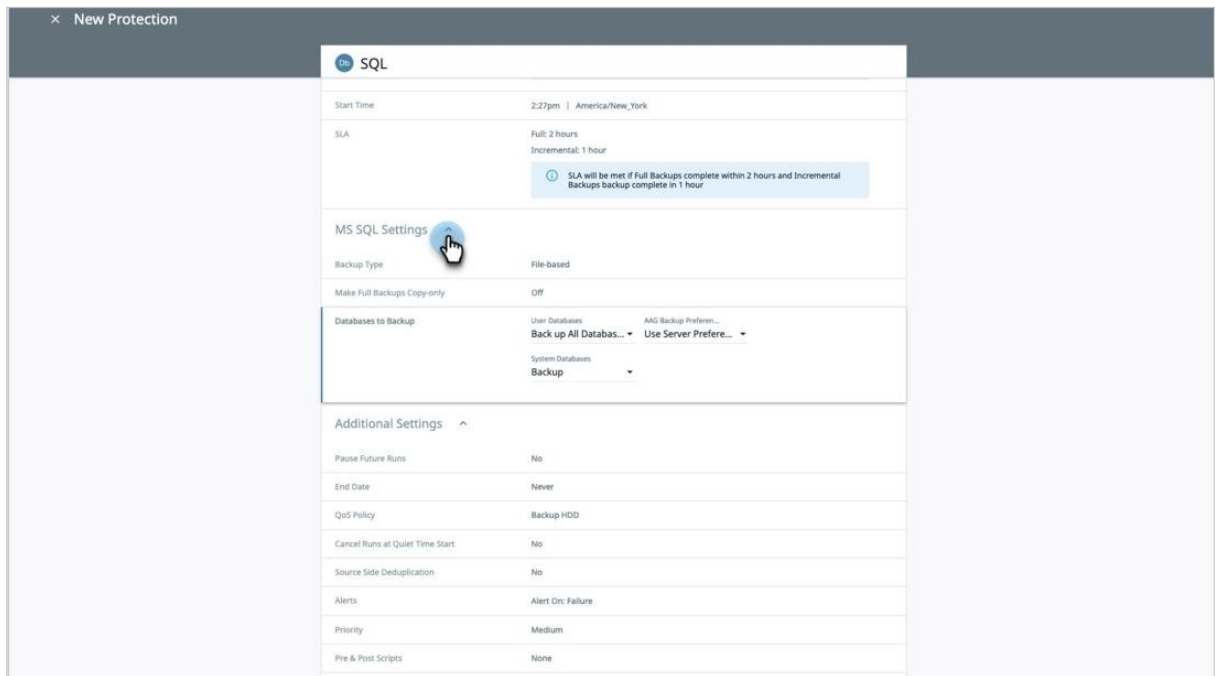
- Give your Protection Group a descriptive name that identifies the kind of data being protected and how it is managed. This will help you identify and manage your SQL backups as your environment grows. Use descriptors like: production (PROD), critical, infrastructure (INFRA), financial, sales, primary, secondary, and employees (EMP).
For example:

Production_Sales	DataCenter_Dallas_Production
Critical_Infrastructure	Production_ReplicatedTo_DRsite
Archive_LongRetention	Development_User_Data

- Once you set the Policy for a Protection Group, all the sources assigned to that Protection Group will be conveniently managed the same way.
- To create a custom Protection Policy to meet specific scheduling, retry options, log backup, replication, and archiving needs, learn how to [Create or Edit a Standard Policy](#) in the online Help.

For maximum space savings and security, choose a Storage Domain with compression, deduplication, and encryption enabled. For details, see [Create or Edit Storage Domains](#) in the online Help.

4. In the same form, configure any **MS SQL Settings**.



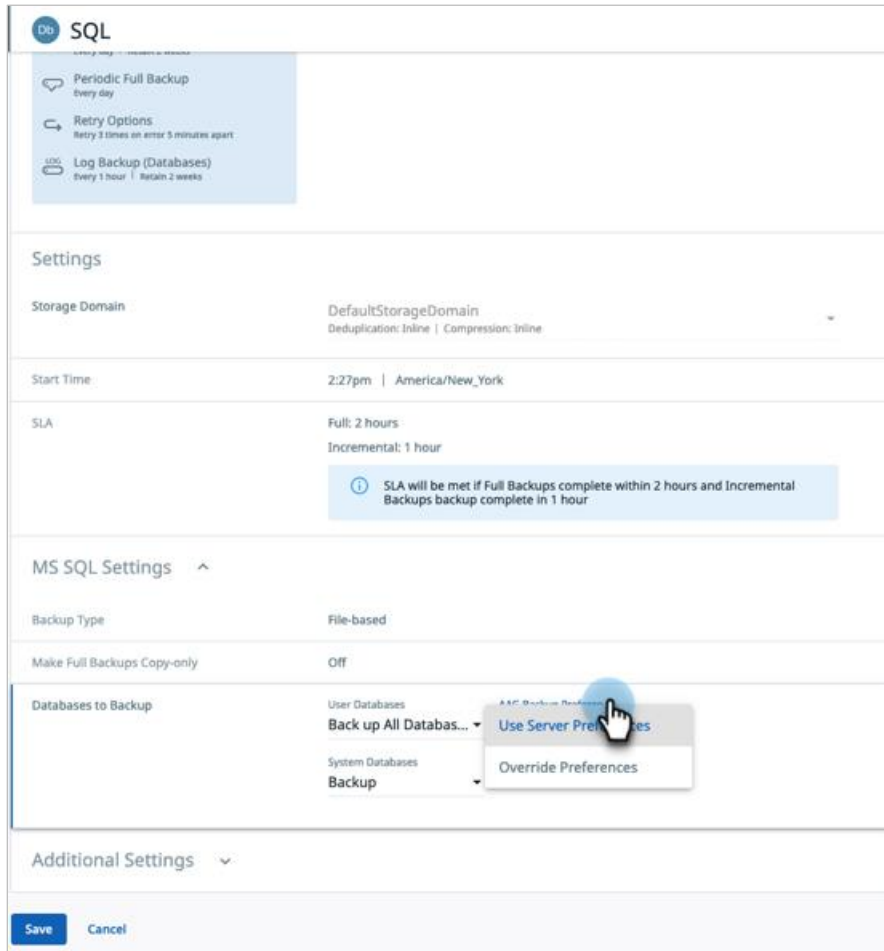
Specify MS SQL Settings

Click on “MS SQL Setting” to expand it. The MS SQL Settings provides the following options:

- User Databases. Select the **User Databases** to back up all user databases.
- Systems Databases. Select whether to back up **System Databases**.

AAG Backup Preferences

AAG Backup Preferences determine which replica is used to take a backup.



Cohesity gives you control over which settings to use to indicate which replica to take a backup from. MS SQL Server Preferences can be used, or Cohesity AAG Backup Preferences can be used by overriding Server Preferences and using AAG Backup Preferences in the Cohesity UI.

The key to understanding MS SQL Server AAG Backup Preferences includes the following:

- The settings are indicators only. They are logical flags which have no functionality behind them. The logical flags are read by AG “aware” backup mechanisms such as MS SQL Server Maintenance Plans.
- The terms “Prefer”, “Available”, “Replica” are also important. Prefer means higher priority; Available means a database is in a state that can be backed up; and Replica(s) refers to the databases in an AG relationship, both Primary and Secondary.

What does this mean for your backup strategy? This means that any backup mechanism that does not read the MS AG Backup Preference settings like a scripted SQL native backup, will succeed against any available replica regardless of the settings. Cohesity does read the AAG Backup Preferences and takes the backup of the desired replica.

Additionally, Cohesity gives you the option of overriding the default MS SQL AG Backup Preferences and use Cohesity SQL AAG Backup preferences.

There are two AG Backup Preference options with the Cohesity MS SQL Settings:

Cohesity recommends using MS SQL Server AG Backup Preferences since these should be familiar to most MS SQL DBAs.

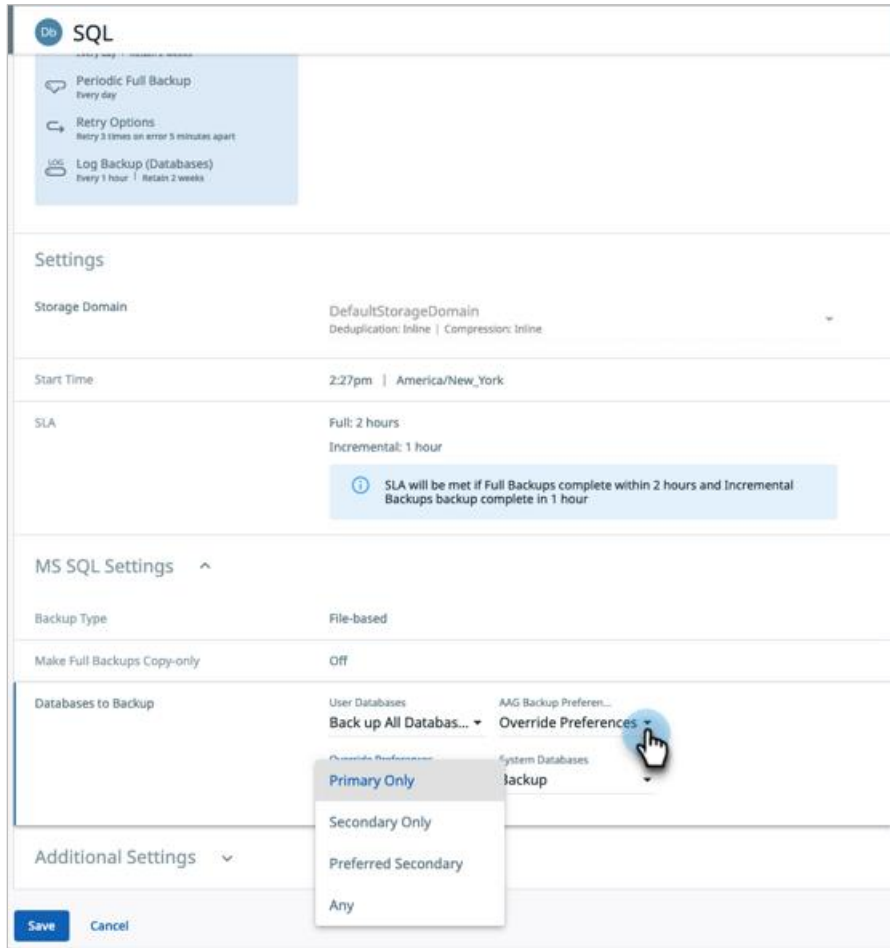
- Use Server Backup Preferences.

There are four MS SQL Server AG Backup Preferences:

- **Primary Only.** Takes the backup from the Primary replica and not consider the Secondary replica.
- **Secondary Only.** Takes the backup from the Secondary replica and not consider the Primary replica.
- **Prefer Secondary.** Takes the backup from the Secondary replica, but if not available will take it from the Primary.
- **Any.** Takes the backup from a Secondary replica based on MS SQL Server Backup Priority List, starting with the highest value. If that replica is not available, Cohesity will move to the next replica with the next highest value.

- Override Preferences

There are four Cohesity AG Override Backup Preferences.



The tables below will show you which replica will be backed up based on the AG Backup Preferences.

Primary Only:

This preference stipulates that Cohesity Data Protect will perform the backup using the primary replica.

Figure 3: Primary Only Preference

PRIMARY REPLICA	SECONDARY REPLICA	BACKUP TAKEN ON
Available	Available	Backup taken on Primary
Available	Not Available	Backup taken on Primary

Secondary Only:

This preference stipulates that Cohesity Data Protect will run backups against the secondary replica, without exception. Even if the Primary is the only replica online, the backup will be skipped.

Table 2: Secondary Only Preference

PRIMARY REPLICA	SECONDARY REPLICA	BACKUP TAKEN ON
Available	Available	Backup taken on Secondary
Available	Not Available	Backup Skipped

Preferred Secondary:

This option stipulates that Cohesity Data Protect will always run against the secondary replica, unless all the secondary replicas are unavailable. In this case, it will succeed on the Primary.

Table 3: Preferred Secondary

PRIMARY REPLICA	SECONDARY REPLICA	BACKUP TAKEN ON
Available	Available	Backup taken on Secondary
Available	Not Available	Backup taken on Primary
Not Available	Available	Backup taken on Secondary

Any:

This option stipulates that Cohesity Data Protect can use any replica in the AG group for the backup. Replicas are prioritized based on the MS SQL Server Backup Priorities List.

Table 4: Any Option

PRIMARY	SECONDARY	BACKUP TAKEN ON
Available	Available	This will take the backup from a Secondary replica based on MS SQL Server Backup Priority List, starting with the highest priority value. If that replica is not available, Cohesity will move to the next replica with the next highest value.

- In the same form, configure any **Additional Settings** that you need to and then click **Protect**.

Your new SQL Protection Group is now active and running, and appears on the **Protection** page. For more on optimizing your protection, see [Cohesity MS SQL Best Practices](#) in the online Help.

Now that you have created a Protection Group for your SQL Server databases, you can add other SQL sources, or change the Protection Policy and settings. In this way, all your SQL sources in this Protection Group will be managed the same way. For example, to replicate all the backups to an off-site target, simply add replication to the Policy that is assigned to this Protection Group.

TIP: In larger environments, build two or three different Protection Groups with different configurations to manage several SQL Server hosts. This helps keep your data management simpler even as your environment grows.

Recover SQL Database

Any SQL AG database protected by Cohesity can be restored like any other database using Cohesity restore workflows. Cohesity does not automatically introduce the restored database into the SQL AG Group. To introduce the database into the AG Group, follow Microsoft steps for a new AG database.

Upgrade Your Disaster Recovery Preparedness

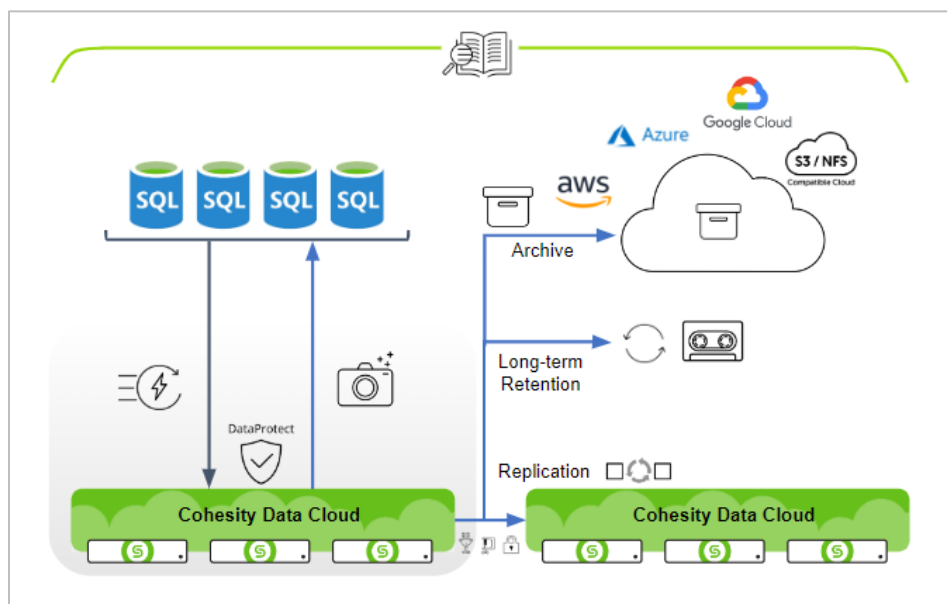
Disaster Recovery (DR) and business continuity are closely related plans designed to proactively protect a business's infrastructure and data. Taking SQL backups is only one part of protecting your business; you must also protect the data from corruption and catastrophic disaster. You can achieve this by keeping a series of backups, replicating those backups off-site, and archiving them under a long-term retention plan.

Cohesity gives you the foundation to build a DR plan to protect your business:

- **Capture and Store.** Protect your SQL databases from loss and corruption with regularly scheduled backups.
- **Geo-Redundancy.** Replicate your SQL backups to an off-site location to protect from catastrophic loss and disaster.
- **Cost-Effective Archival.** Archive your SQL backups to the cloud and store them on lower-cost storage tiers for long-term retention.

Use a Protection Group to schedule regular SQL backups and assign a Protection Policy to include archiving and replicating those backups for long-term retention and disaster recovery.

Figure 4: SQL Backups in Cohesity are Available to Replicate and Archive



Take Local Snapshots

Protect your SQL backups over time by maintaining a series of *local* Cohesity snapshots. Use Cohesity Protection Groups to schedule and automate SQL backup management.

Replicate Backups Off-Site

Protect your entire set of SQL backups from catastrophic loss by replicating your SQL backups to an off-site location. Choose a Protection Policy for your Protection Group that automatically copies the SQL backups to a second, off-site Cohesity cluster. By default, deduplication and compression are enabled for replication, and Cohesity sends *only the changed data* over the network, producing a significant reduction in network traffic and cost.

Archive Backups to the Cloud

Archive your SQL backups to the cloud as a way to address long-term data retention requirements and simultaneously lower the cost of storage. Cohesity provides a policy-based method to archive to public clouds (AWS, Azure, and GCP), as well as to any S3-compatible storage.

With Cohesity CloudArchive, Cloud Recover, and CloudRetrieve, your SQL backups are available for recovery to their original Cohesity cluster or onto a different Cohesity cluster, for geo-redundancy, and disaster recovery.

Best Practices for Cohesity SQL Server Protection

Configuring the right Cohesity settings dramatically improves the performance of your backups, and the efficiency of your storage and archives. Manage your backups by choosing the optimal settings for deduplication, compression, and encryption.

- **Use inline deduplication.** Deduplication (enabled by default) prevents duplicate blocks of repeated data from being stored, dramatically reducing your storage consumption.

With *inline deduplication*, the process occurs as Cohesity is saving the blocks, instead of waiting until *after* Cohesity has written the data to its Storage Domain. Cohesity recommends you use deduplication and wherever possible, enable inline deduplication.

- **Use inline compression.** Compressing your data significantly reduces the space needed to store your backups and frees up space for more backups and other important data.

With inline compression, the process occurs as Cohesity is saving the blocks, instead of waiting until *after* Cohesity has written the data to its Storage Domain. Both compression and inline compression are enabled by default, and Cohesity recommends you take advantage of them. For details, see [Create or Edit Storage Domains](#) in the online Help.

- **Use encryption.** When a platform governs access to data across the systems in your environment, it is crucial to protect the data it manages. Cohesity recommends you enable encryption — at rest, in flight, and in the cloud — for all your SQL Server backups. For more, see [Cohesity Security Features](#) in the online Help.
- **Keep multiple snapshots to guard against corruption.** Cohesity recommends you maintain five to seven local snapshots of your backups.

When you capture and store your backups like this, you protect your data from corruption over time. By taking and maintaining several snapshots, you are in position to recover data from its state *prior* to being corrupted. Snapshots are efficient because they capture just the changed blocks of data, and then use deduplication and compression.

Cohesity recommends protecting all your SQL Servers with regularly scheduled backups, and then in turn moving some of those backups off-site and archiving them under a [long-term retention plan for disaster recovery](#).

- **Validate the backups.** Cohesity recommends a periodic restore of a SQL Server database in a test environment from its backup. This is an important step in the overall backup strategy because it tests, verifies, and validates the integrity of the backup. Restore a sample from the snapshot set to a non-production server and evaluate it. In addition to confirming that the right data is backed up properly, this practice also ensures that you have already validated your method of restoring objects *before* a critical event necessitates it.
- **Verify logging and auditing operations.** It is very important to log and audit changes on a SQL Server. Cohesity logs its recovery process. In Cohesity, navigate to **Data Protection > Recoveries** and click into your SQL database recovery task to view detailed logs.
- **Shelter in the cloud.** Cohesity recommends archiving to the cloud for low-cost, long-term storage and protection from regional disasters.

Cohesity provides a policy-based method to archive to public clouds (AWS, Azure, Google Cloud Platform) or any S3-compatible storage. This makes it easy to change policies, meet regulatory requirements, and retrieve your data to different geographical locations.

- **Use replication to defend against site disaster loss.** Protect your entire set of SQL Server backups from catastrophic loss by replicating them to a different geographical site. Cohesity can automatically replicate the SQL database backups stored in the Cohesity cluster to a second, off-site Cohesity cluster.

Cohesity replication always performs source-side deduplication and compression first and sends only the changed data over the network for cost-effective disaster recovery. As such, Cohesity replication is an essential part of every [disaster recovery \(DR\) plan](#).

- **Be prepared *before* disaster hits with a DR plan.** One of the best things you can do to protect your SQL Server is to include it when you [create your DR plans](#).

Appendix A: Planning Retention for VDI Backups

There are three types of database backups that can be taken with SQL VDI: *full*, *differential*, and *log*. Having a combination of these backup types on hand will protect your SQL database.

- **Full Backup.** The full backup is a complete backup of a database. The full backup contains all the data in a database and can be used to do a complete restore of the database to the point in time that the full backup completed.
- **Differential Backup.** Used only in conjunction with a full backup, a differential backup specifies that the backup file should consist only of changes in the database since the last full backup. A differential backup typically takes up far less space than a full backup. Note, however, that a differential backup is not independent and must be based on the latest full backup of the data. That means there must be a full backup as a base, then the differential can be applied. Optionally, you can then also use log backups to bring it to the appropriate point in time.

NOTE: In Cohesity, a VDI-based *differential* backup is referred to as an *incremental* backup.

- **Log Backup.** The transaction log backup is a sequential set of backup files. They comprise a record of all the transactions that have been performed against the database since the transaction log was last backed up. With transaction log backups, you can recover the database to a specific point in time.

Each log backup captures that part of the transaction log that was active when the backup was created, and it includes all transactions that were not backed up in a previous log backup. An uninterrupted sequence of log backups contains the complete (*unbroken*) log chain of the database.

The aim of the SQL DBA is to have a combination of backups so that the database can be *restored* to any point in time. A good combination of backups consists of having a full backup, differential (in Cohesity, *incremental*) backups, and log backups.

For example, all SQL database restores must begin with a full database backup, secondly, a differential can then be applied to the full, and finally, log backups can be applied in sequence to complete the database restore.

When the backups are applied during the database restore process, you are sequentially adding the captured changes to the database: FULL+DIFF+Log1+Log2+Log3 = Restored Database.

IMPORTANT: All Microsoft VDI backups, their differentials, and their logs are dependent on a full backup to perform a database restore. Microsoft requires that in order to restore a SQL Database, you must start with a full backup, then its transaction logs can be applied. This means your backup retention policy must keep a full backup along with its log backups in order to successfully restore a database.

Simply put, a SQL VDI-based database restore requires a full backup to seed the database, then a differential and/or log backups are applied to the specified point in time.

Cohesity recommends retaining two sets of full backups with their differential and log backups.

TIP: A good backup plan always includes a combination of full, differential, and log backups.

Appendix B: Product Documentation

See our SQL Server product documentation for in-depth details:

- [MS SQL Requirements](#)
- [Cohesity MS SQL Best Practices](#)
- [Key Concepts](#)
- [Protect MS SQL \(VDI-based\)](#)

Your Feedback

Was this document helpful? [Send us your feedback!](#)

About the Authors

Scott Lorenz is a SQL Solutions Engineer at Cohesity. In his role, Scott focuses on business-critical applications, MS SQL Server databases, cloud storage, and enterprise data protection. Scott has over 26 years' experience as an enterprise DBA.

Document Version History

VERSION	DATE	DOCUMENT HISTORY
1.2	July 2024	Republishing
1.1	Mar 2023	Rebranding updates
1.0	Jun 2022	First release

ABOUT COHESITY

[Cohesity](#) is a leader in AI-powered data security and management. Aided by an extensive ecosystem of partners, Cohesity makes it easier to protect, manage, and get value from data – across the data center, edge, and cloud. Cohesity helps organizations defend against cybersecurity threats with comprehensive data security and management capabilities, including immutable backup snapshots, AI-based threat detection, monitoring for malicious behavior, and rapid recovery at scale. Cohesity solutions are delivered as a service, self-managed, or provided by a Cohesity-powered partner. Cohesity is headquartered in San Jose, CA, and is trusted by the world's largest enterprises, including six of the Fortune 10 and 44 of the Fortune 100.

Visit our [website](#) and [blog](#), follow us on [Twitter](#) and [LinkedIn](#) and like us on [Facebook](#).

© 2024. Cohesity, Inc. All Rights Reserved. The information supplied herein is the confidential and proprietary information of Cohesity and may only be used (a) by the intended recipients and (b) in conjunction with validly licensed Cohesity software and services. Find the terms of Cohesity licenses at www.cohesity.com/agreements.

Cohesity, the Cohesity logo, SnapTree, SpanFS, DataPlatform, DataProtect, Helios, the Helios logo, DataGovern, SiteContinuity, DataHawk, and other Cohesity marks are trademarks or registered trademarks of Cohesity, Inc. in the US and/or internationally. Other company and product names may be trademarks of the respective companies with which they are associated. This material (a) is intended to provide you information about Cohesity and our business and products; (b) was believed to be true and accurate at the time it was written, but is subject to change without notice; and (c) is provided on an "AS IS" basis. Cohesity disclaims all express or implied conditions, representations, warranties of any kind.