BACKUP AND RESTORE OPTIONS FOR SQL SERVER IN AZURE

CALGARY DATA USER GROUP

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ABOUT ME

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22 years in IT

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WHAT WE WILL COVER

SQL Server Options In Azure

    Infrastructure as a Service (IaaS)

    Platform as a Service (PaaS)

PaaS Backup/Restore Options

    Azure SQL Database

    Managed Instance

IaaS Backup/Restore Options

    Native Backups

    Automated Backups

    Recovery Service Vault

WHY WILL WE COVER IT?

TOO MANY CHOICES

SQL SERVER OPTIONS IN AZURE

HOW MANAGED IS MANAGED

INFRASTRUCTURE AS A SERVICE (IAAS)

SQL Server running on an Azure VM

   You can install SQL Server on an Azure VM

   Marketplace images available for SQL Server 2008R2 to 2019

   Infrastructure is client-managed

      OS Patching

      SQL Patching

   Backups can be client-managed

PLATFORM AS A SERVICE (PAAS)

THE INFRASTRUCTURE IS FULLY MANAGED, INCLUDING

PATCHING OF OS AND SQL SERVER

BACKUPS

TWO OPTIONS

AZURE SQL MANAGED INSTANCE

AZURE SQL SINGLE DATABASE

AZURE SQL MANAGED INSTANCE

Managed instance of SQL Server

Cross-database Queries

SQL Server Agent

AZURE SQL SINGLE DATABASE

Single database running on an Azure SQL Server

No cross-database or cross-instance communication

No SQL Server Agent

BACKUP/RESTORE OPTIONS FOR PAAS

BACKUP OPTIONS FOR PAAS

BACKUPS ARE FULLY MANAGED, INCLUDING:

    BACKUP SCHEDULE

    BACKUP LOCATION

CLIENT SETS BACKUP RETENTION (WITHIN LIMITS)

BACKUP FILES ARE NOT ACCESSIBLE

THIRD-PARTY TOOLS CANNOT BACK UP PAAS DATABASES

SINGLE DATABASES CAN BE EXPORTED TO A BACPAC FILE

BACKUP SCHEDULE FOR PAAS

Full backup runs on creation

Log backups run once full backup completes

Backup schedule

Full weekly

Differential daily

Log backup every 5-15 minutes based on transactional volume

BACKUP LOCATION FOR PAAS

Backup files are geo-redundant

 Three copies written locally

 Copy written to a paired data center for disaster recovery

BACKUP RETENTION FOR PAAS

Point-in-time recovery

    Defaults to 7 days (7-day limit for basic and hyperscale tier)

    Can be increased to 35 days and decreased to 1 day

Long-term retention

    Weekly backups

    Monthly backups
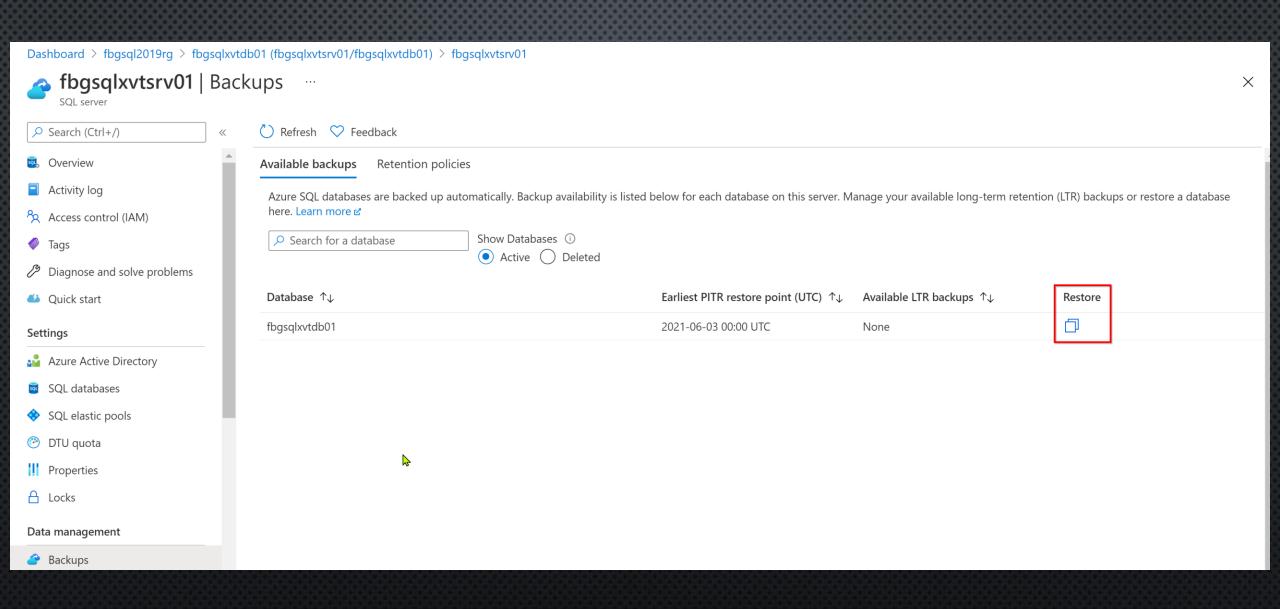
    Yearly backups
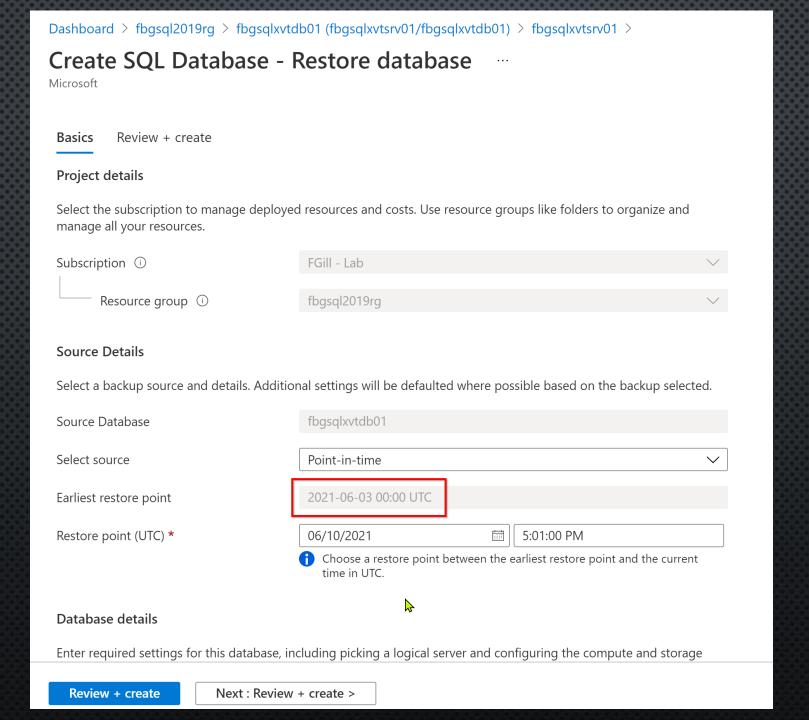
COPY-ONLY BACKUPS FOR MANAGED INSTANCE
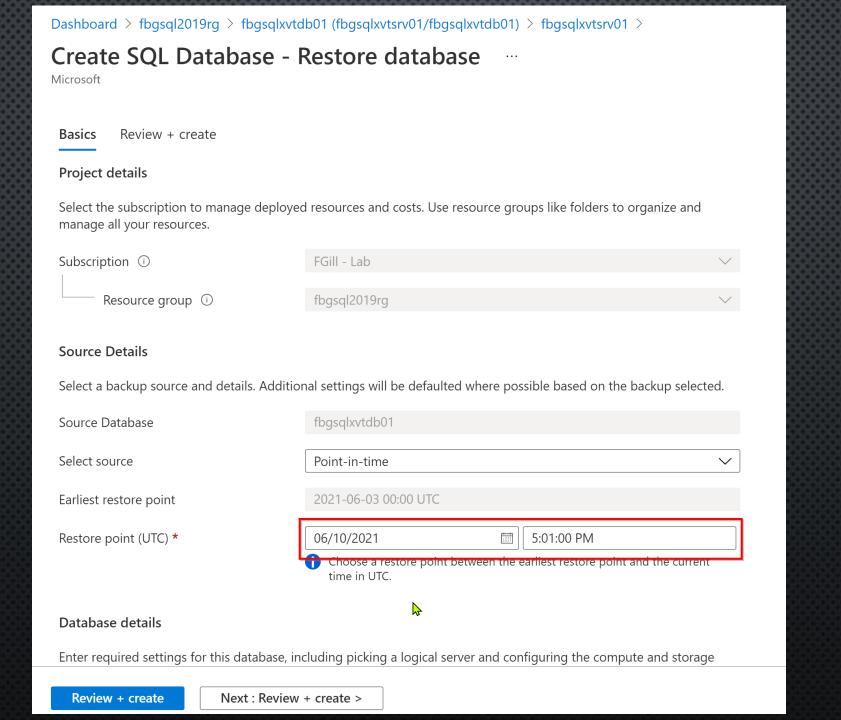
Copy-only backups can be taken for Managed Instance databases

Backups must be written to Azure Blob Storage

PAAS RETENTION AND RESTORE DEMO

fbgsqlxvtsrv01 | Backups ...

SQL server

Search (Ctrl+/)

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Quick start

Settings

- Azure Active Directory
- SQL databases
- SQL elastic pools
- DTU quota
- Properties
- Locks

Data management

- Backups

Refresh   Feedback

Available backups   Retention policies

Azure SQL databases are backed up automatically. Backup availability is listed below for each database on this server. Manage your available long-term retention (LTR) backups or restore a database here. Learn more

Search for a database

Show Databases ⓘ
◉ Active   ◯ Deleted

Database ↑↓	Earliest PITR restore point (UTC) ↑↓	Available LTR backups ↑↓	Restore
fbgsqlxvtdb01	2021-06-03 00:00 UTC	None	

Create SQL Database - Restore database ...

Microsoft

Basics   Review + create

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription ⓘ | FGill - Lab   ⌄ |

    Resource group ⓘ | fbgsql2019rg   ⌄ |

Source Details

Select a backup source and details. Additional settings will be defaulted where possible based on the backup selected.

Source Database | fbgsqlxvtdb01 |

Select source | Point-in-time   ⌄ |

Earliest restore point | 2021-06-03 00:00 UTC |

Restore point (UTC) * | 06/10/2021   📅 | | 5:01:00 PM |

ⓘ Choose a restore point between the earliest restore point and the current time in UTC.

Database details

Enter required settings for this database, including picking a logical server and configuring the compute and storage

| Review + create | | Next : Review + create > |

Create SQL Database - Restore database ...

Microsoft

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| fbgsqlxvtdb01 |

Select source

| Point-in-time ▽ |

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| 2021-06-03 00:00 UTC |

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fbgsqlxvtsrv01 | Backups

SQL server

🔍 Search (Ctrl+/)   «

- 🔵 Overview
- 📋 Activity log
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- 🔧 Diagnose and solve problems
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Settings

- Azure Active Directory
- SQL databases
- SQL elastic pools
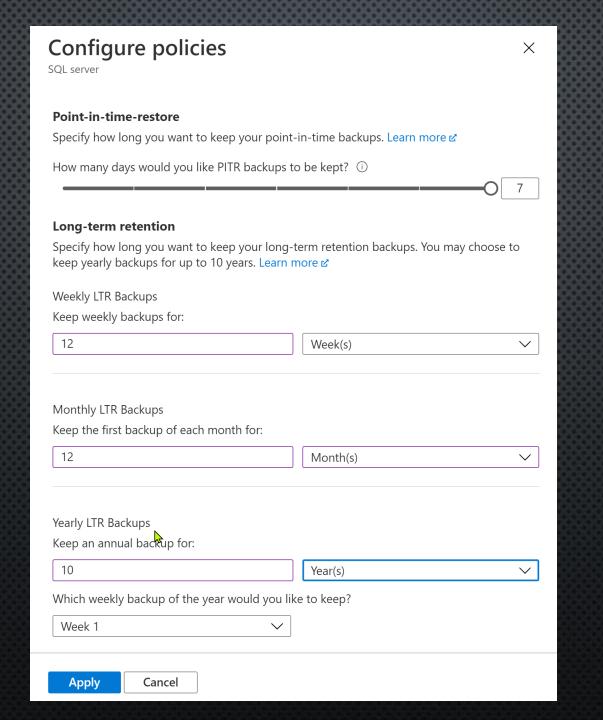

🔄 Refresh   💟 Feedback   ✏️ Configure policies   🚫 Remove LTR settings

Available backups   **Retention policies**

Configure and manage your automated backup retention policies below. Point-in-time restore (PITR) allows short-term backup retention of 1-35 days. Long-term retention policies enable you to backups for up to 10 years. Learn more ↗

🔍 Search for a database

ℹ️ Basic and Hyperscale databases are currently limited to a 7-day retention for point-in-time restore. Learn more ↗

☑ Database ↑↓	PITR ↑↓	Weekly LTR ↑↓	Monthly LTR ↑↓	Yearly LTR ↑↓	Pricing tier ↑↓
☑ fbgsqlxvtdb01	7 Days	--	--	--	Basic

Configure policies

SQL server

Point-in-time-restore

Specify how long you want to keep your point-in-time backups. Learn more ↗

How many days would you like PITR backups to be kept? ⓘ

[slider] `7`

Long-term retention

Specify how long you want to keep your long-term retention backups. You may choose to keep yearly backups for up to 10 years. Learn more ↗

Weekly LTR Backups

Keep weekly backups for:

| 12 | Week(s) ▾ |

Monthly LTR Backups

Keep the first backup of each month for:

| 12 | Month(s) ▾ |

Yearly LTR Backups

Keep an annual backup for:

| 10 | Year(s) ▾ |

Which weekly backup of the year would you like to keep?

| Week 1 ▾ |

Apply   Cancel

✓ Validation passed

Available backups | **Retention policies**

Configure and manage your automated backup retention policies below. Point-in-time restore (PITR) allows short-term backup retention of 1-35 days. Long-term retention policies enable you to keep full backups for up to 10 years. Learn more ⧉

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☑ Database ↑↓	PITR ↑↓	Weekly LTR ↑↓	Monthly LTR ↑↓	Yearly LTR ↑↓	Pricing tier ↑↓
☑ fbgsqlxvtdb01	7 Days	12 Weeks	12 Months	Keep week 1 for 10 Years	Basic

BACKUP/RESTORE OPTIONS FOR IAAS

NATIVE BACKUPS

IaaS is SQL Server running on an Azure VM

Backups can be taken using SQL Server Agent jobs

Roll your own

You can use Ola Hallengren's Maintenance Solution

OLA HALLENGREN'S MAINTENANCE SOLUTION

BACKUPS ARE EXECUTED USING THE DATABASEBACKUP STORED PROCEDURE

CREATING AND EXECUTING BACKUP JOBS IS THE SAME

BACKUP JOBS SCHEDULED BY THE CLIENT

AUTOMATED BACKUPS

SET ON THE SQL SERVER VIRTUAL MACHINE

SCHEDULE OPTIONS
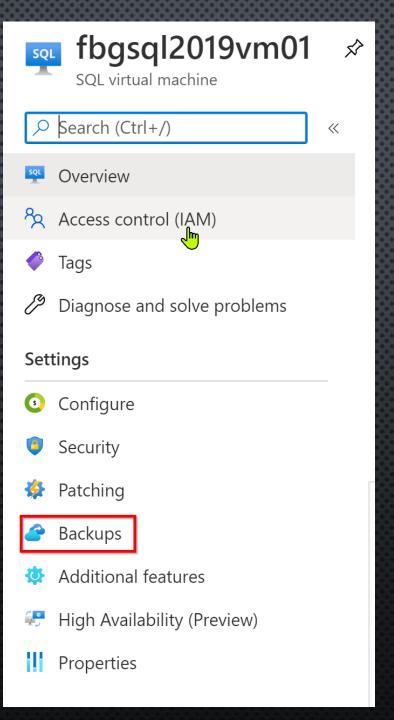
MANUAL – SCHEDULE FULL AND LOG BACKUPS

AUTOMATED – FULL AND LOG BACKUPS RUN BASED ON TRANSACTIONAL VOLUME

REQUIRES AN AZURE STORAGE ACCOUNT

AUTOMATED BACKUP DEMO

Subscription (change) : FGill - Lab

Subscription ID : 159ab367-1542-407b-a195-cb23fdd89c79

Tags (change) : Click here to add tags

Deployments : 1 Deploying,7 Failed,83 Succeeded

Location : West Central US

| Filter for any field... | Type == all ✕ | Location == all ✕ | ⁺▽ Add filter |

Showing 1 to 15 of 15 records.   ☐ Show hidden types ⓘ

No grouping ▾   List view ▾

☐ Name ↑↓	Type ↑↓	Location ↑↓	
☐ 🟦 fbgconagrasa02	Storage account	East US	⋯
☐ ‹∙› fbgsql2019rg-vnet	Virtual network	East US 2	⋯
☐ ☁ fbgsql2019rsv	Recovery Services vault	West Central US	⋯
☐ 🖥 fbgsql2019vm01	Virtual machine	East US 2	⋯
☐ 🟦 fbgsql2019vm01	SQL virtual machine	East US 2	⋯

fbgsql2019vm01

SQL virtual machine

Search (Ctrl+/)

SQL Overview

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Configure

Security

Patching

Backups

Additional features

High Availability (Preview)

Properties

fbgsql2019vm01 | Backups

SQL virtual machine

Search (Ctrl+/)

♥ Feedback

Overview

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Automated backup

Configure backups for databases in your virtual machine. All your SQL Server databases in this virtual machine will be backed up automatically per the settings you choose. If you decide to change settings via SQL Server Managed Backup in the future, the new settings will override the Automated Backup settings.

Automated backup   Disable   Enable

fbgsql2019vm01 | Backups

SQL virtual machine

♡ Feedback
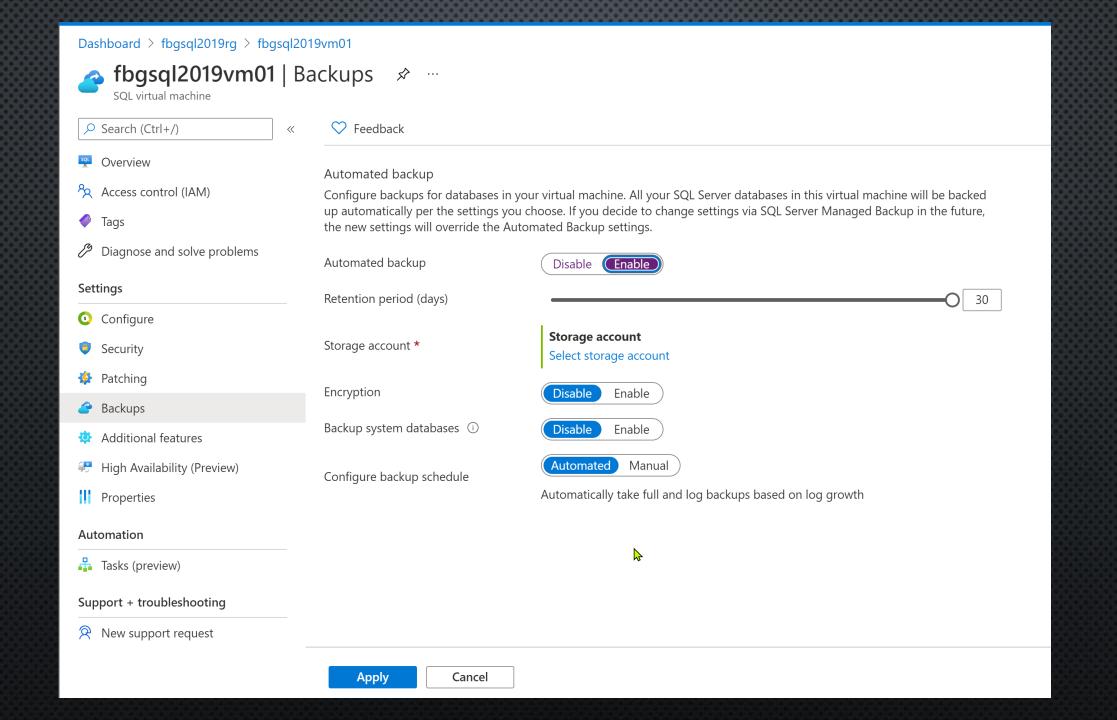
Automated backup

Configure backups for databases in your virtual machine. All your SQL Server databases in this virtual machine will be backed up automatically per the settings you choose. If you decide to change settings via SQL Server Managed Backup in the future, the new settings will override the Automated Backup settings.

Automated backup	Disable **Enable**
Retention period (days)	� ────────────○ 30
Storage account *	**Storage account** Select storage account
Encryption	**Disable** Enable
Backup system databases ⓘ	**Disable** Enable
Configure backup schedule	**Automated** Manual

Automatically take full and log backups based on log growth

Apply   Cancel
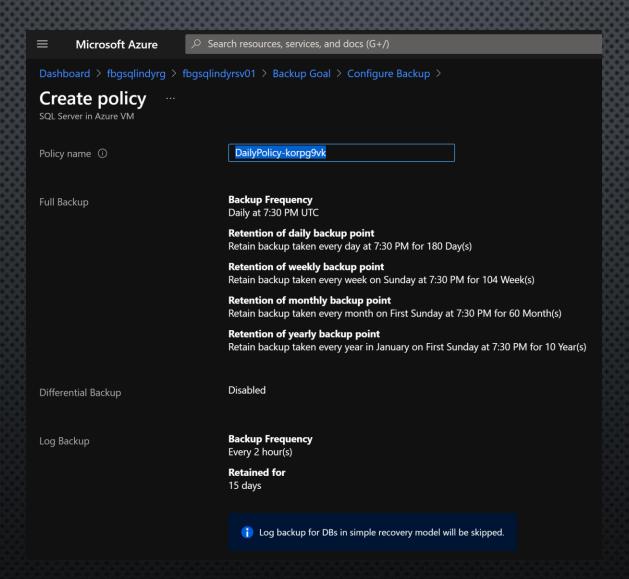
AZURE RECOVERY SERVICES VAULT

One stop for all your backups

Configure VM backups and SQL Server backups

VM backup is required to run database backups

CREATE BACKUP POLICY
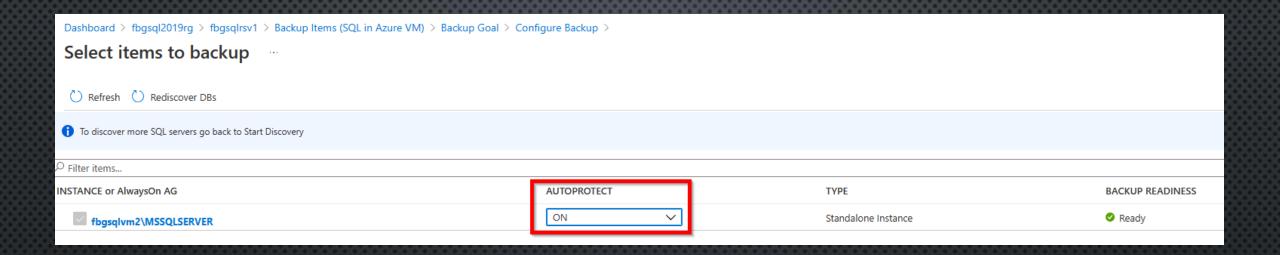
RECOVERY SERVICE VAULT AUTOPROTECT

Auto-protect can be enabled for each SQL instance

When configuring backups for an instance, set Autoprotect on for the instance

The backup policy schedule will apply to databases added to the instance

Select items to backup ...

🔄 Refresh   🔄 Rediscover DBs

ℹ️ To discover more SQL servers go back to Start Discovery

🔍 Filter items...

INSTANCE or AlwaysOn AG	AUTOPROTECT	TYPE	BACKUP READINESS
☑️ **fbgsqlvm2\MSSQLSERVER**	ON ⌄	Standalone Instance	✅ Ready

AZURE RECOVERY SERVICES VAULT – THINGS TO KNOW

BACKUPS CAN BE LOCALLY REDUNDANT OR GEO-REDUNDANT

GEO-REDUNDANT COSTS MORE

FOR SQL SERVER VMS, SET VM BACKUP OS DISK ONLY

PORTAL SHOWS BACKUP HEALTH FOR EACH BACKUP ITEM

BACKUPS ENABLED AND DISABLED AT THE DATABASE LEVEL

IMPORTANT NOTE – IF A FULL BACKUP FAILS, BUT THE LOG BACKUP ARE RUNNING SUCCESSFULLY, THE BACKUP STATUS WILL SHOW HEALTHY

AZURE RECOVERY SERVICES VAULT – MORE THINGS TO KNOW

AVAILABILITY GROUP DATABASES CAN BE BACKED UP USING RECOVERY SERVICES VAULT

FULL BACKUPS WILL RUN AGAINST THE PRIMARY NODE

RSV WILL NOT ALLOW COPY-ONLY BACKUPS TO BE RUN

LOG BACKUPS WILL RUN ACCORDING TO BACKUP PREFERENCE FOR THE AG

AZURE RECOVERY SERVICES VAULT – RESTORE

POINT-IN-TIME RESTORE AVAILABLE TO THREE DESTINATIONS

ALTERNATE LOCATION

OVERWRITE EXISTING DATABASE

RESTORE TO FILE

DESTINATION MUST BE IN THE SAME SUBSCRIPTION AS THE SOURCE

AZURE RECOVERY SERVICES VAULT DEMO

RESOURCES

AUTOMATED BACKUPS FOR AZURE SQL DATABASE AND MANAGED INSTANCE – [AUTOMATIC, GEO-REDUNDANT BACKUPS - AZURE SQL DATABASE & AZURE SQL MANAGED INSTANCE | MICROSOFT DOCS](#)

OLA HALLENGREN'S MAINTENANCE SOLUTION – [SQL SERVER BACKUP, INTEGRITY CHECK, INDEX AND STATISTICS MAINTENANCE (HALLENGREN.COM)](#)

BACKUP AND RESTORE OPTIONS FOR SQL SERVER ON AZURE VMS – [BACKUP AND RESTORE FOR SQL SERVER ON AZURE VMS - SQL SERVER ON AZURE VM | MICROSOFT DOCS](#)

AZURE RECOVERY SERVICES VAULT FOR SQL SERVER – [TUTORIAL - BACK UP SQL SERVER DATABASES TO AZURE - AZURE BACKUP | MICROSOFT DOCS](#)

AZURE COST CALCULATOR – [PRICING CALCULATOR | MICROSOFT AZURE](#)