

Azure SQL Server Database Failover Groups

In this tutorial I'm going to show how to:

- Create a Failover Group
- Testing Failover End Points through SQL Server Management
- Testing Failover End Points through Command Prompt
- Make a Failover

Step 01: Create Failover Group

For this exercise we need 2 SQL Server/Database instances.

Create the first SQL Server/Database in Central US region.

- Resource group: rg-NetworkServices
- Azure SQL Server: patsam-server-centralus
- Azure SQL Database: patsam-database-centralus

[Home](#) > [SQL servers](#) > [Create SQL Database Server](#)

Create SQL Database Server

Microsoft

[Basics](#) [Networking](#) [Additional settings](#) [Tags](#) [Review + create](#)

SQL database server is a logical container for managing databases and elastic pools. Complete the Basic tab, then go to Review + Create to provision with smart defaults, or visit each tab to customize. [Learn more](#)

Project details

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

* Subscription ⓘ

Visual Studio Enterprise – MPN

* Resource group ⓘ

rg-NetworkServices

[Create new](#)

Server details

Enter required settings for this server, including providing a name and location.

* Server name

patsam-server-centralus

.database.windows.net

* Location

(US) Central US

Administrator account

* Server admin login

patsam

* Password

* Confirm password

Review + create

Next : Networking >

SQL database



* Database name

patsam-database-centralus



* Select source ⓘ

Blank database



Server

patsam-server-centralus (central...



Want to use SQL elastic pool? ⓘ



Yes



Not now

* Pricing tier ⓘ

Basic: 2 GB storage



* Collation ⓘ

SQL_Latin1_General_CP1_CI_AS



Create the second SQL Server/Database in East Asia region.

- Resource group: rg-NetworkServices
- Azure SQL Server: patsam-server-eastasia
- Azure SQL Database: patsam-database- eastasia

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Create SQL Database Server

Microsoft

[Basics](#) [Networking](#) [Additional settings](#) [Tags](#) [Review + create](#)

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

* Subscription ⓘ

Visual Studio Enterprise – MPN

* Resource group ⓘ

rg-NetworkServices

[Create new](#)

Server details

Enter required settings for this server, including providing a name and location.

* Server name

patsam-server-eastasia

✓

.database.windows.net

* Location

(Asia Pacific) East Asia

✓

Administrator account

* Server admin login

patsam

✓

* Password

.....

✓

* Confirm password

.....

✓

[Review + create](#) [Next : Networking >](#)

Home > patsam-server-eastasia > SQL database

SQL database

* Database name
 ✓

* Select source ⓘ
 ▼

Server
patsam-server-eastasia (eastasia) 🔒

Want to use SQL elastic pool? ⓘ
☐ Yes ☒ Not now

* Pricing tier ⓘ
 >

* Collation ⓘ
 ✓

Now we can see the 2 SQL Server/SQL database instances we created.

Home > SQL servers

SQL servers

RPSP Services Ltd

+ Add Edit columns Refresh Assign tags

Subscriptions: Visual Studio Enterprise – MPN – Don't see a subscription? [Open Directory + Subscription settings](#)

Filter by name... All resource groups All locations All tags No grouping

NAME ⓘ	STATUS	LOCATION ⓘ	SUBSCRIPTION ⓘ
patsam-server-centralus	Available	Central US	Visual Studio Enterprise – MPN
patsam-server-eastasia	Available	East Asia	Visual Studio Enterprise – MPN

Home > SQL databases

SQL databases

RPSP Services Ltd

+ Add Reservations Edit columns Refresh Assign tags Delete

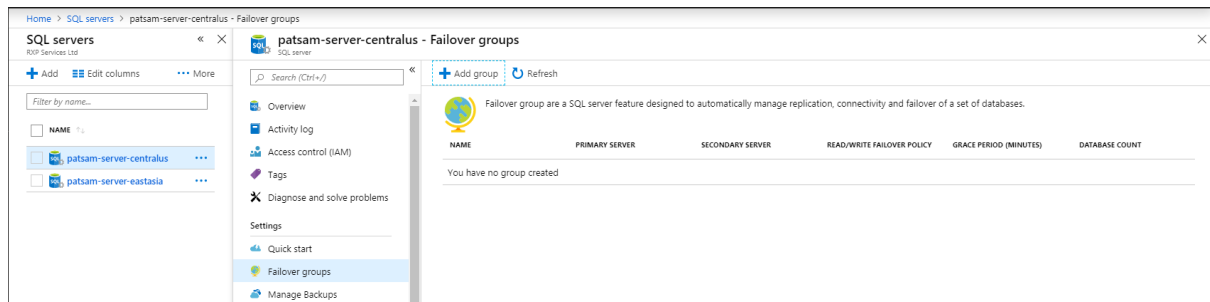
Subscriptions: Visual Studio Enterprise – MPN – Don't see a subscription? [Open Directory + Subscription settings](#)

Filter by name... All resource groups All locations All tags No grouping

NAME ⓘ	STATUS	REPLICATION ROLE	SERVER	PRICING TIER	LOCATION ⓘ	SUBSCRIPTION ⓘ
patsam-database-centralus ...	Online	None	patsam-server-centralus	Basic	Central US	Visual Studio Enterprise – MPN
patsam-database-eastasia (...)	Online	None	patsam-server-eastasia	Basic	East Asia	Visual Studio Enterprise – MPN

Next go to one of the SQL Servers and create a Failover Group. I selected “patsam-server-centralus”.

SQL Server → Failover Groups



Click + Add Group

- Failover group: patsam-failovergroup
- Secondary server: Click Configure Required Settings and add the other SQL Server we created in East Asia region
- Failover policy: Automatic
- Grace period: 1 hour
- Selected database: Database on Central US

** Grace Period: If in case primary server goes down then it will wait for Grace Period time we have selected before initiating the Failover.

Home > SQL servers > patsam-server-centralus -

Failover group

Create a failover group to automatically failover databases in it.

* Failover group name
patsam-failovergroup ✓
.database.windows.net

* Secondary server
Configure required settings >

Read/Write failover policy
Automatic ✓

Read/Write grace period (hours)
1 hours ✓

Database within the group
Select databases to add 🔒

Home > SQL servers > patsam-server-centralus - Failover groups > Failover group > Server

Failover group

Create a failover group to automatically failover databases in it.

* Failover group name

patsam-failovergroup

.database.windows.net

* Secondary server

patsam-server-eastasia (East Asia)

Read/Write failover policy

Automatic

Read/Write grace period (hours)

1 hours

Database within the group

Select databases to add

Server

+ Create a new server

SQL

patsam-server-centralus

Central US

rg-Ne...

SQL

patsam-server-eastasia

East Asia

rg-Ne...

Home > SQL servers > patsam-server-centralus - Failover groups > Failover group > Databases

Failover group

Create a failover group to automatically failover databases in it.

* Failover group name

patsam-failovergroup

.database.windows.net

* Secondary server

patsam-server-eastasia (East Asia)

Read/Write failover policy

Automatic

Read/Write grace period (hours)

1 hours

Database within the group

Select databases to add

Databases

for failover group

Select all

Selected/Eligible databases
1/1

Filter items...

	NAME	ROLE	SECONDARY SERVER	STATUS
<input checked="" type="checkbox"/>	patsam-database-centralus			Online
Summary				
Databases on secondary (excluding ones in Elastic Pools)				1
Elastic Pools on secondary server				0
Monthly cost				AUD 6.85

Click Create.

[Home](#) > [SQL servers](#) > [patsam-server-centralus](#)

Failover group

□ ×

Create a failover group to automatically failover databases in it.

* Failover group name

patsam-failovergroup ✓

.database.windows.net

* Secondary server

patsam-server-eastasia (East Asia) >

Read/Write failover policy

Automatic ▼

Read/Write grace period (hours)

1 hours ▼

Database within the group

1 / 1 >

Create

We can see the newly created Failover Group.

The screenshot shows the Azure portal interface for 'patsam-server-centralus - Failover groups'. On the left, there's a sidebar with navigation options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings, Quick start, Failover groups (selected), and Manage Backups. The main content area shows a table of failover groups:

NAME	PRIMARY SERVER	SECONDARY SERVER	READ/WRITE FAILOVER POLICY	GRACE PERIOD (MINUTES)	DATABASE COUNT
patsam-failovergroup	patsam-server-centralus	patsam-server-eastasia	Automatic	60	1/1

Click on it and go inside it.

The screenshot shows the configuration details for the 'patsam-failovergroup'. At the top, there are tabs for 'Configuration details', 'Databases within group', 'Databases selected to be added (0)', and 'Databases selected for removal (0)'. Below the tabs is a world map with a blue line connecting Central US and East Asia. Below the map is a table with server roles:

SERVER	ROLE	READ/WRITE FAILOVER POLICY	GRACE PERIOD
patsam-server-centralus (Central US)	Primary	Automatic	1 hours
patsam-server-eastasia (East Asia)	Secondary		

Below the table, there are sections for 'Read/write listener endpoint' and 'Read-only listener endpoint', both showing the endpoint 'patsam-failovergroup.database.windows.net'.

We can see 2 server roles:

- Primary: patsam-server-centralus (Central US)
- Secondary: patsam-server-eastasia (East Asia)

It has 2 end points:

- Read/Write endpoint: patsam-failovergroup.database.windows.net
- Read only endpoint: patsam-failovergroup.secondary.database.windows.net

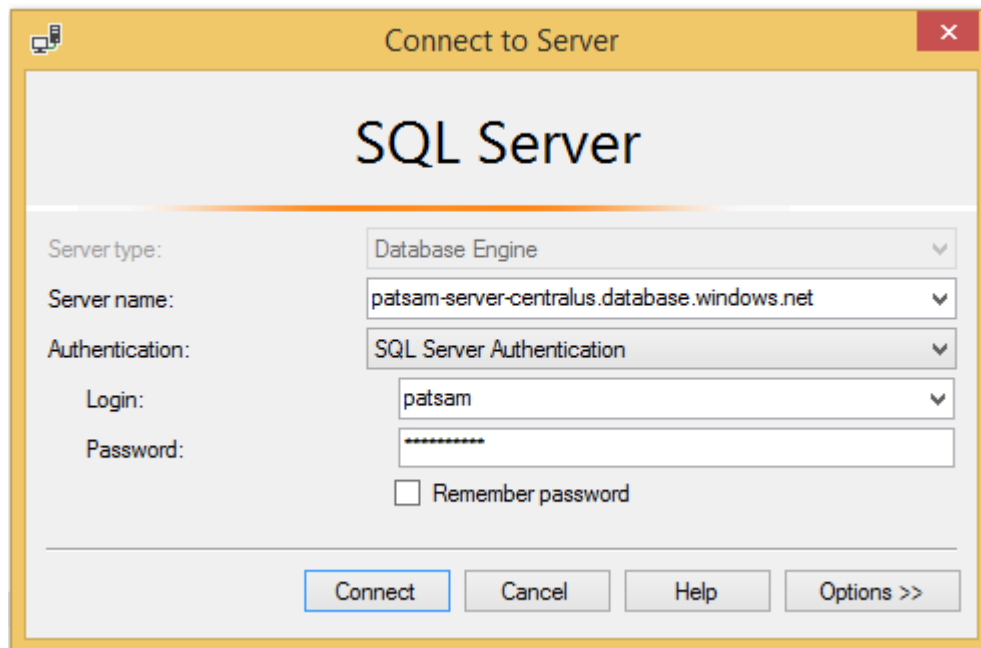
We will be using these endpoints to connect to the Database.

Step 02: Testing Failover End Points through SQL Server Management

As the first step, try to connect to each Database on each Server separately and make sure we have access to those Databases.

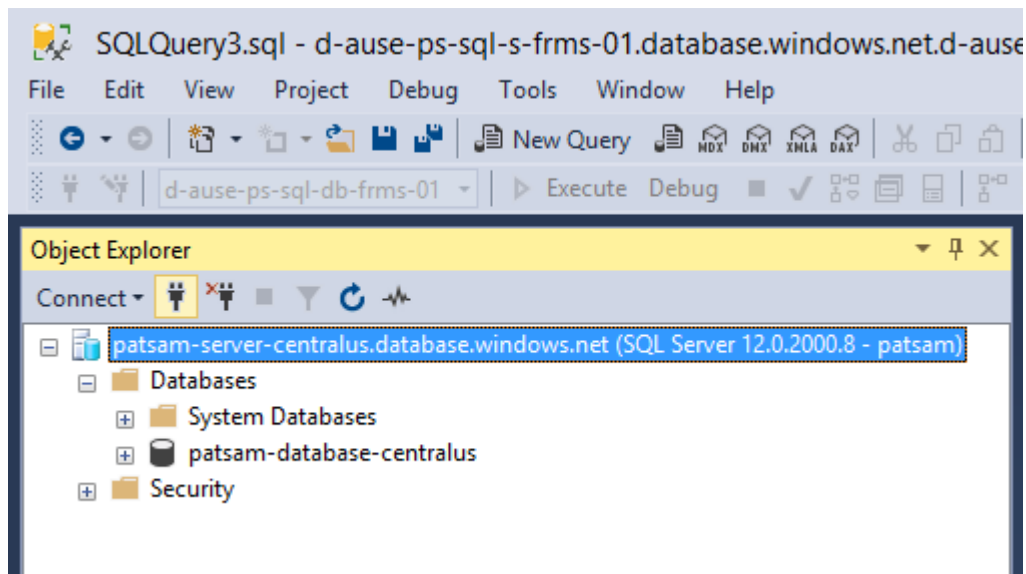
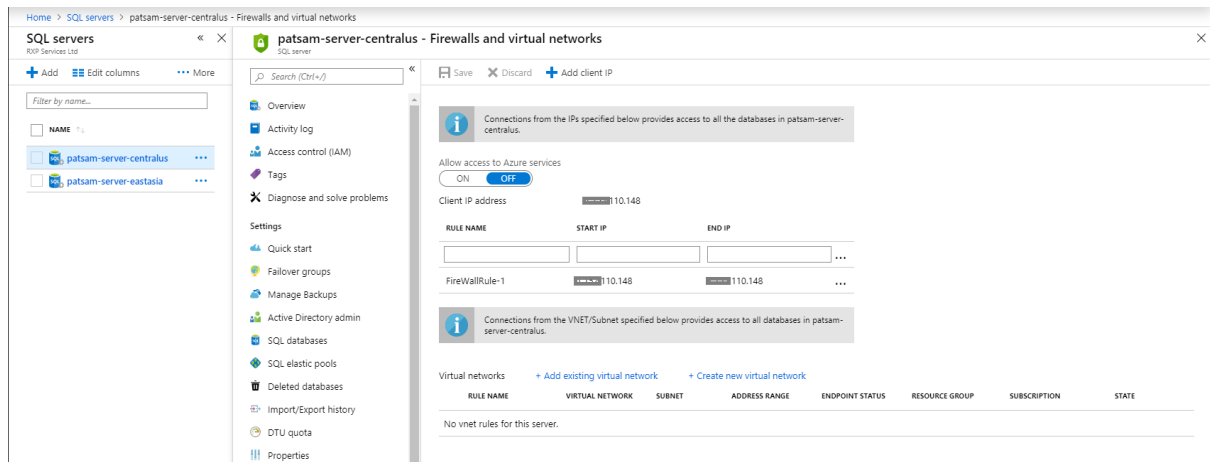
First try to connect to patsam-server-centralus Server.

- Server name: patsam-server-centralus.database.windows.net



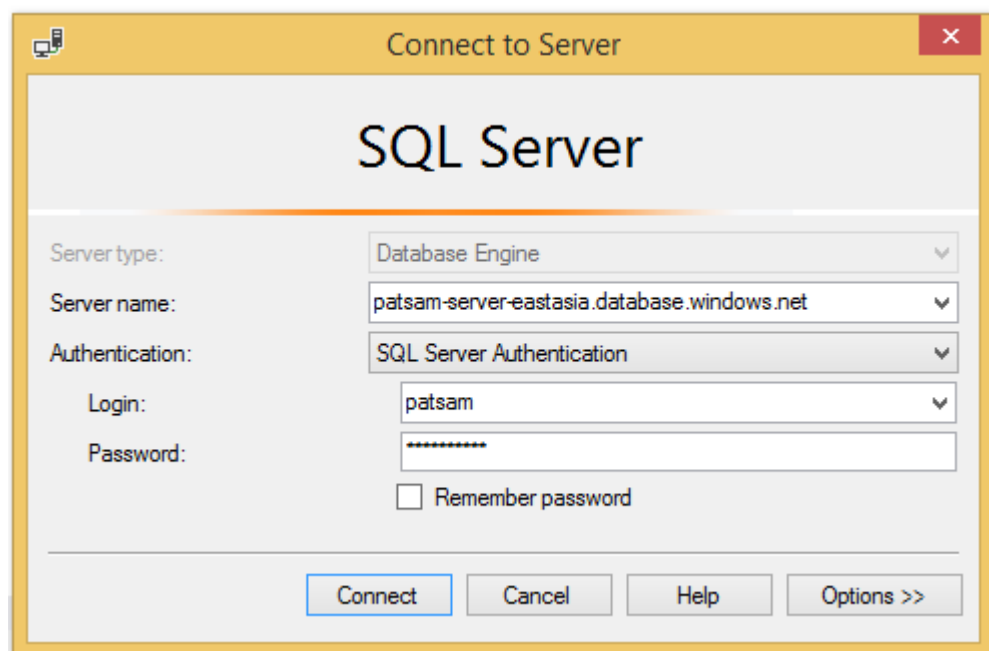
If you been asked to add a New Firewall Rule, make sure you add a one.

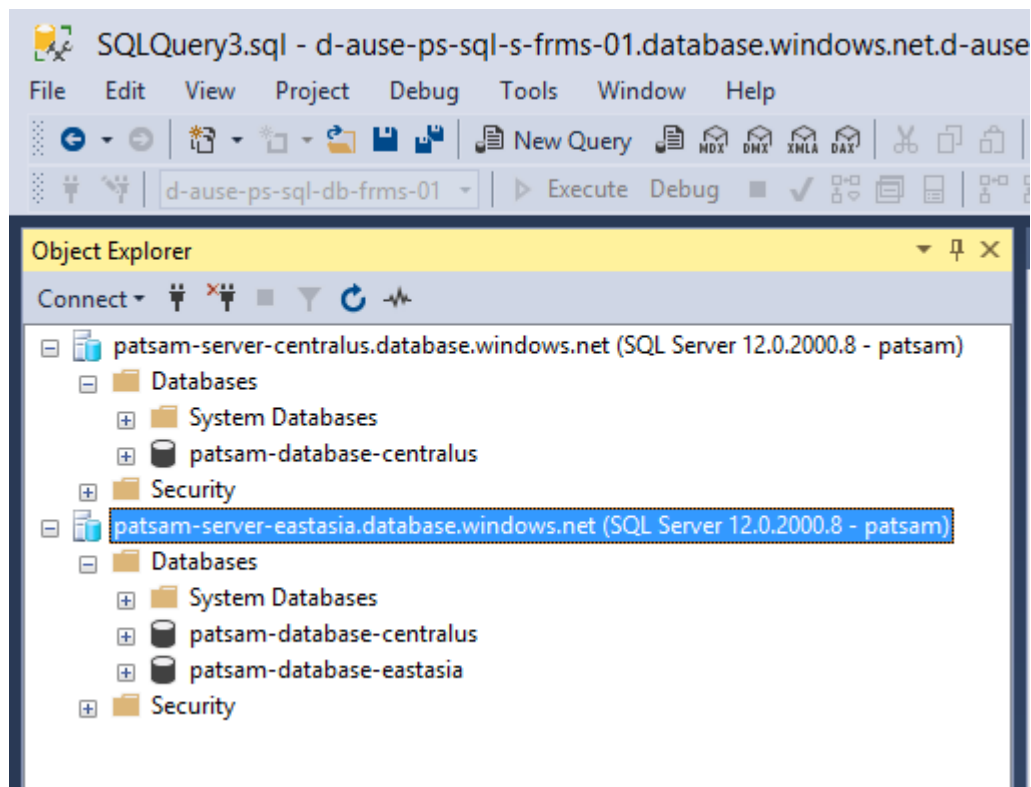




Same way try to connect to patsam-server-eastasia Server.

- Server name: patsam-server-eastasia.database.windows.net

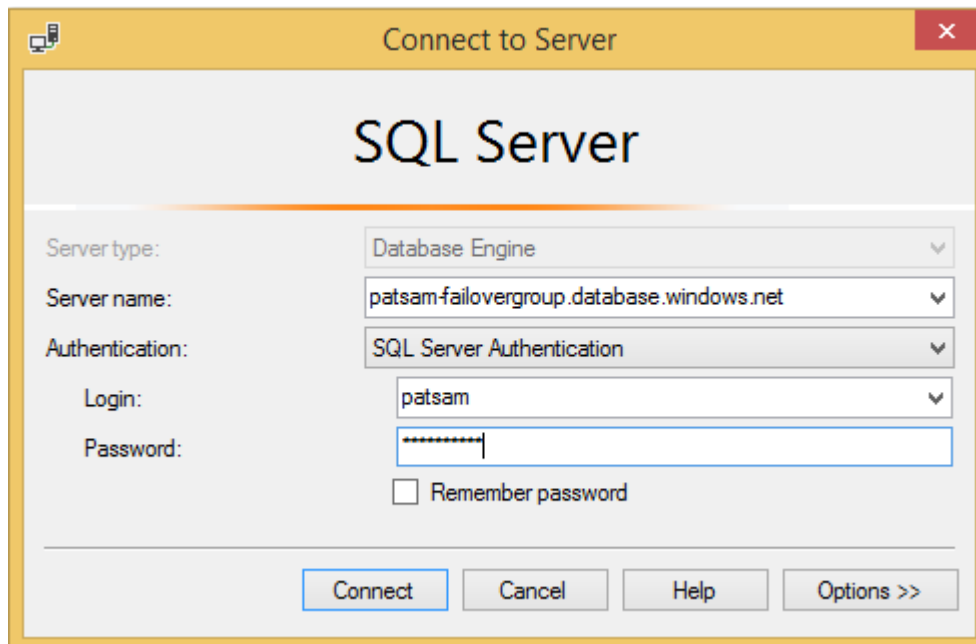




Once we make sure we can connect to each Database, next we need to try connecting to them through Failover Group end points.

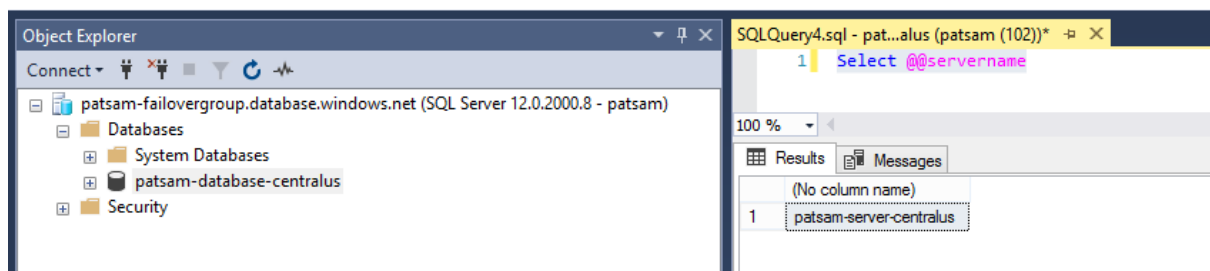
First try to connect through the Read/Write endpoint.

- patsam-failovergroup.database.windows.net



Once you connect to it, run below SQL Query to find out the Server Name.

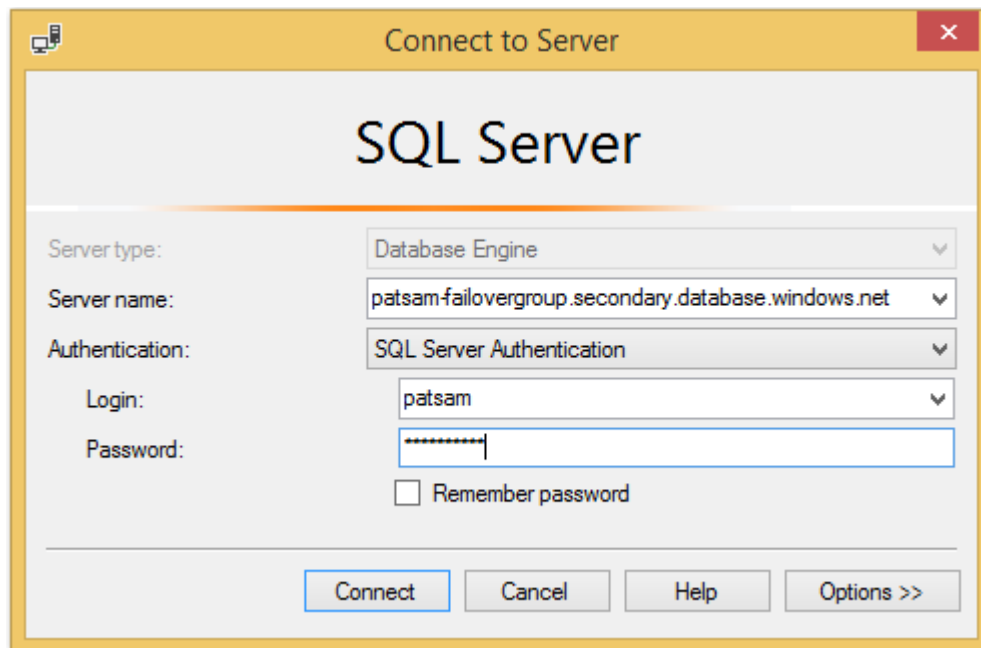
Select @@servername



It gives the result as “patsam-server-centralus”. Which is correct. Because it is the Primary Database.

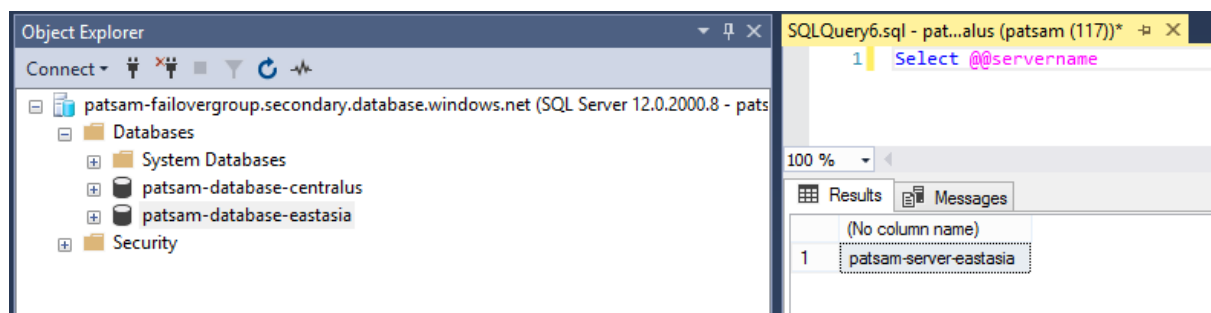
As the second step try to connect through the Read-only endpoint.

- patsam-failovergroup.secondary.database.windows.net



Once you connect to it run below SQL Query to find out the Server Name.

`Select @@servername`



It gives the result as “patsam-server-eastasia”. Which is correct. Because it is the Secondary Database.

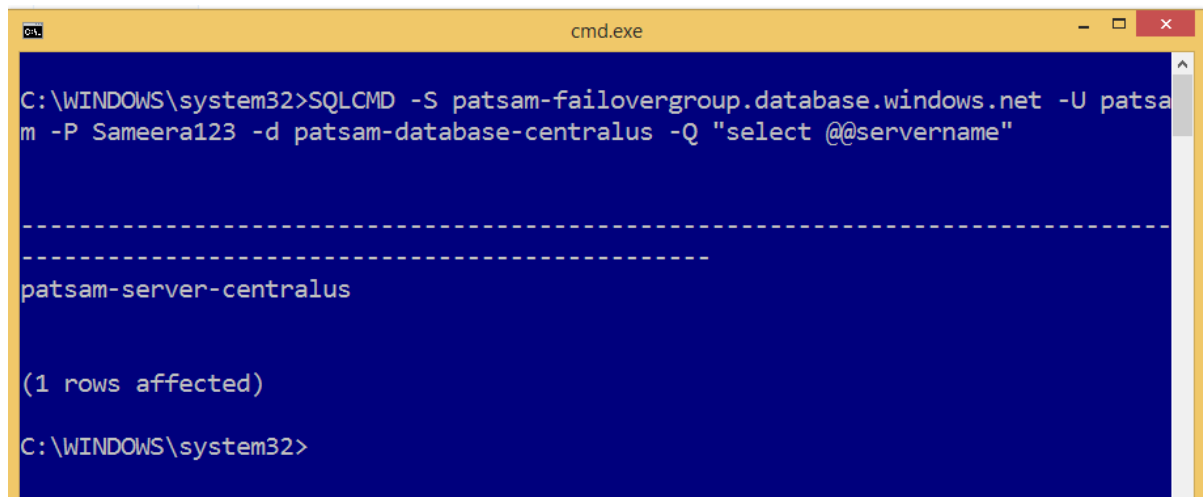
Step 03: Testing Failover End Points through Command Prompt

First through the Read/Write endpoint.

- patsam-failovergroup.database.windows.net

Run bellow command on Command Prompt.

SQLCMD -S patsam-failovergroup.database.windows.net -U patsam -P Sameera123 -d patsam-database-centralus -Q "select @@servername"



```
C:\WINDOWS\system32>SQLCMD -S patsam-failovergroup.database.windows.net -U patsam -P Sameera123 -d patsam-database-centralus -Q "select @@servername"

-----
patsam-server-centralus

(1 rows affected)

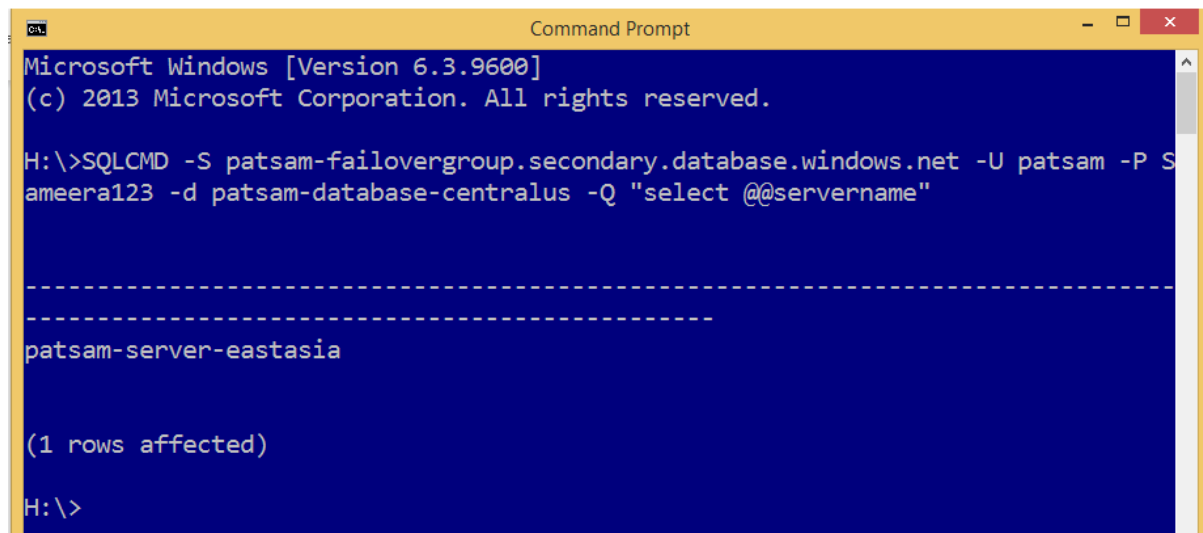
C:\WINDOWS\system32>
```

Next try to connect through the Read-only endpoint.

- patsam-failovergroup.secondary.database.windows.net

Run bellow command on Command Prompt.

SQLCMD -S patsam-failovergroup.secondary.database.windows.net -U patsam -P Sameera123 -d patsam-database-centralus -Q "select @@servername"



```
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

H:\>SQLCMD -S patsam-failovergroup.secondary.database.windows.net -U patsam -P Sameera123 -d patsam-database-centralus -Q "select @@servername"

-----
patsam-server-eastasia

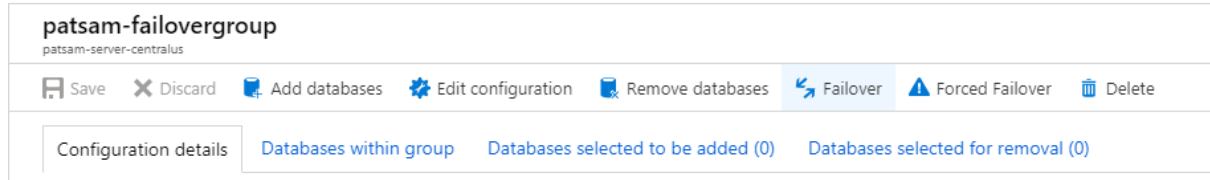
(1 rows affected)

H:\>
```

Step 04: Make a Failover

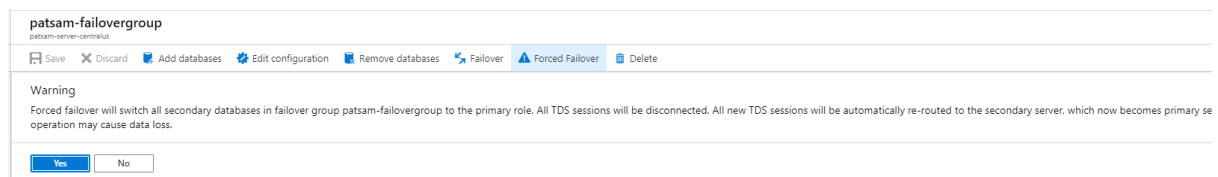
There are 2 ways to do Failover.

- Failover
- Forced Failover

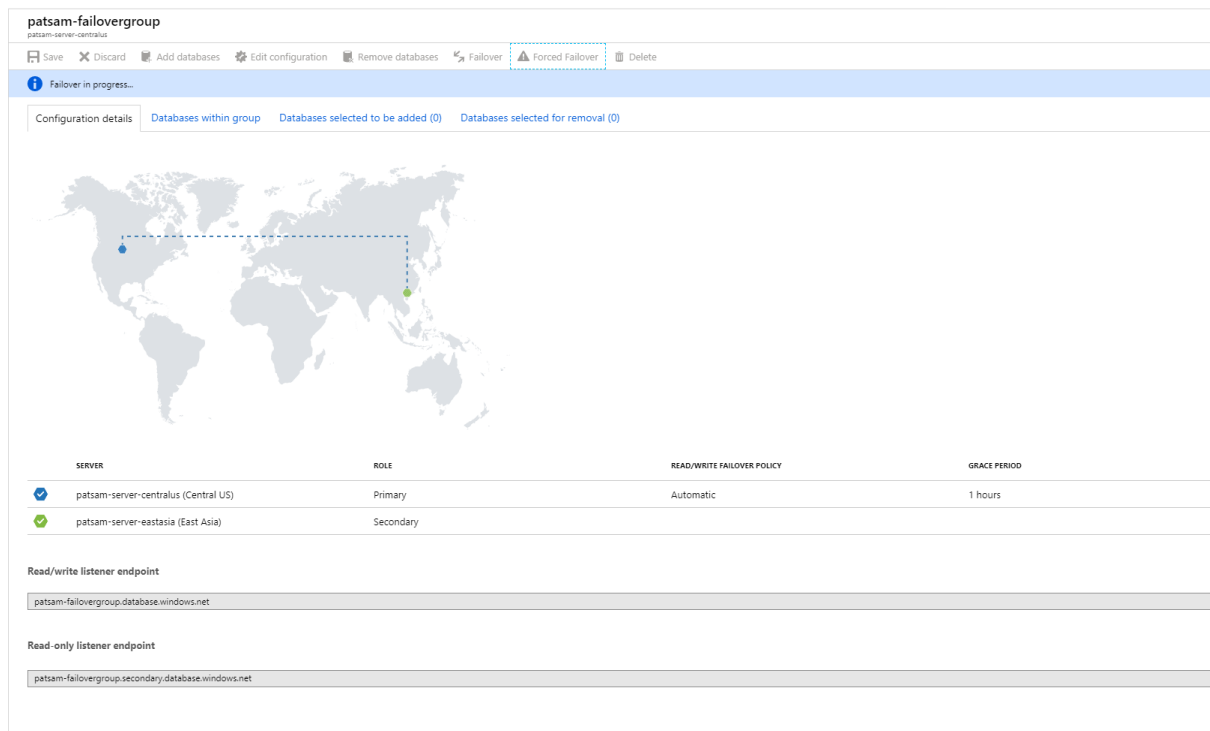


In my case I'm going to do "Forced Failover" because it going to Failover right away.

Click on Forced Failover.



When it's doing the Failover, it will display on the map with a dotted line.



Once it completes notice Primary/Secondary roles gets swapped.

- Read/Write endpoint: patsam-server-eastasia
- Read-only endpoint: patsam-server-centralus

	SERVER	ROLE
	patsam-server-eastasia (East Asia)	Primary
	patsam-server-centralus (Central US)	Secondary

patsam-failovergroup

patsam-server-centralus

Save

Discard

Add databases

Edit configuration

Remove databases

Failover

Forced Failover

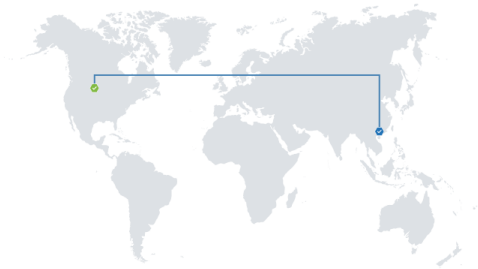
Delete



Configuration details

Databases within group

Databases selected to be added (0)

Databases selected for removal (0)



SERVER	ROLE	READ/WRITE FAILOVER POLICY	GRACE PERIOD
 patsam-server-eastasia (East Asia)	Primary	Automatic	1 hours
 patsam-server-centralus (Central US)	Secondary		

Read/write listener endpoint

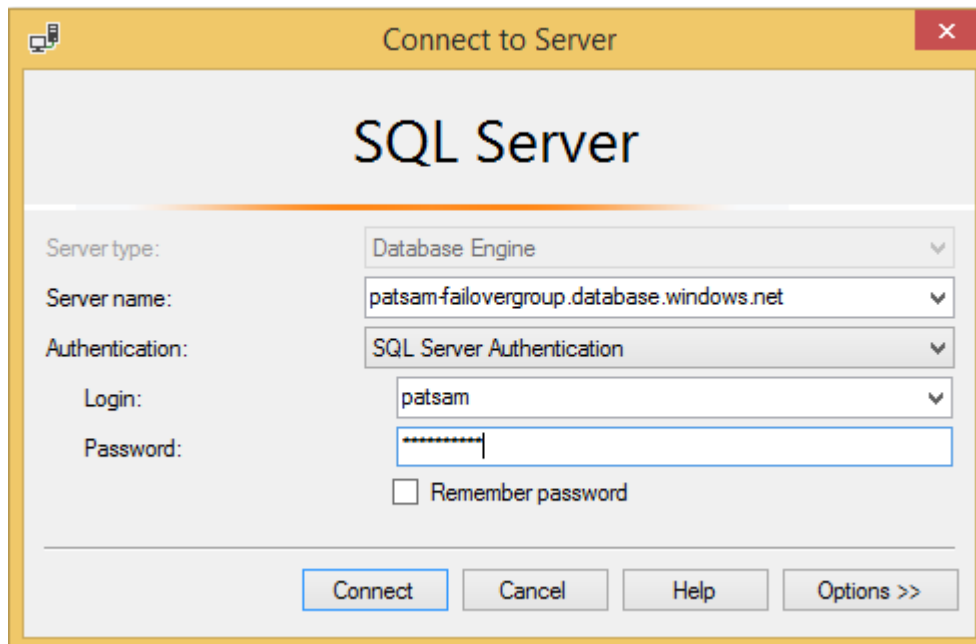
patsam-failovergroup.database.windows.net

Read-only listener endpoint

patsam-failovergroup.secondary.database.windows.net

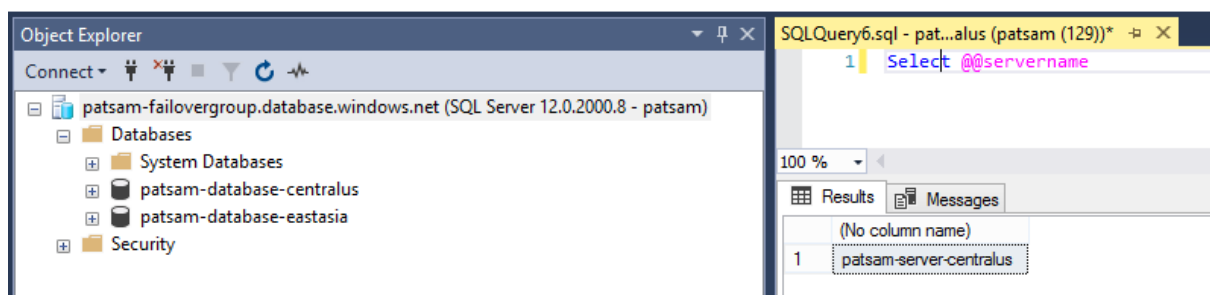
Now again try to connect through the Read/Write endpoint.

- patsam-failovergroup.database.windows.net



Once you connect to it run below SQL Query to find out the Server Name.

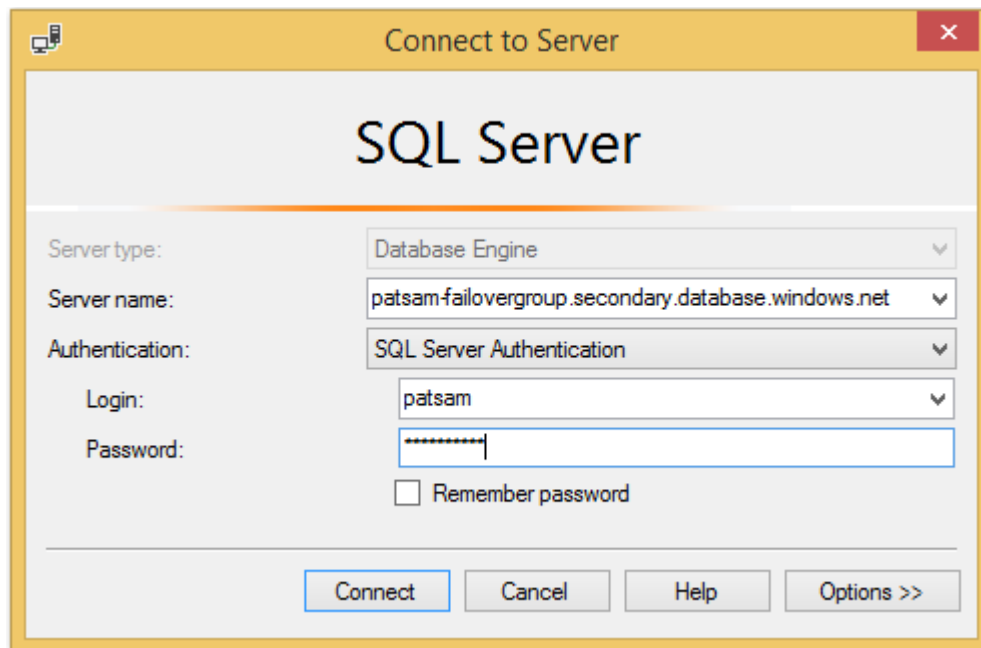
Select @@servername



It gives the result as “patsam-server-centralus”. Which is correct. Because it is the Primary Database now after the Failover.

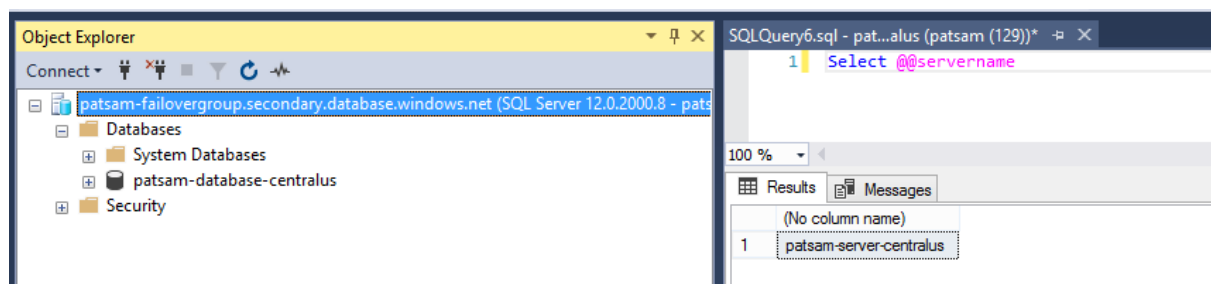
Next try to connect through the Read-only endpoint.

- patsam-failovergroup.secondary.database.windows.net



Once you connect to it run below SQL Query to find out the Server Name.

`Select @@servername`



It gives the result as “patsam-server-centralus”. Which is correct. Because it is the Secondary Database now after the Failover.