

Azure SQL Database - how to provision, access and development guide

Azure SQL Database is a cloud-based relational database service provided by Microsoft Azure, designed to meet the demands of modern, data-driven applications. Leveraging the power of Microsoft SQL Server, Azure SQL Database offers a fully managed, scalable, and secure platform for organisations to store, manage, and analyse their data in the cloud. Whether you are a small business or an enterprise, Azure SQL Database provides a flexible and cost-effective solution to meet your database needs.

Key Features and Uses:

- **Managed Service:** Azure SQL Database is a fully managed service, eliminating the need for organisations to worry about database administration tasks such as patching, backups, and monitoring. This allows businesses to focus on building and optimizing their applications.
- **Scalability:** With Azure SQL Database, you can easily scale your database resources up or down based on demand. This flexibility ensures that your application performance remains optimal, even during peak usage periods.
- **High Availability:** Azure SQL Database offers built-in high availability features, including automatic backups, geo-replication, and failover capabilities. This ensures that your data is protected against unexpected failures, providing a reliable and resilient database solution.
- **Security and Compliance:** Benefit from robust security features, including advanced threat protection, data encryption, and compliance certifications. Azure SQL Database helps organisations meet regulatory requirements and safeguard sensitive information.
- **Advanced Analytics:** Integrate seamlessly with Azure services like Azure Machine Learning and Power BI to unlock advanced analytics capabilities. This enables organisations to derive valuable insights from their data, driving informed decision-making.
- **Compatibility:** Azure SQL Database is compatible with existing SQL Server applications, making it easy for organisations to migrate their on-premises databases to the cloud without significant code changes.

Benefits:

- **Cost Efficiency:** Pay only for the resources you use, with the ability to scale up or down as needed. This cost-effective model allows organisations to optimize their database expenses and allocate resources efficiently.
- **Global Reach:** Azure SQL Database provides global distribution, allowing you to deploy databases in multiple regions. This ensures low-latency access for users worldwide and enhances the overall performance of your applications.
- **Time-to-Market:** With a managed service and simplified administration, developers can focus on building features and functionality rather than managing infrastructure. This accelerates development cycles and reduces time-to-market for new applications.
- **Reliability and Disaster Recovery:** Benefit from built-in high availability and disaster recovery features, ensuring that your data is always available and protected. This enhances the reliability of your applications and minimizes downtime.
- **Continuous Innovation:** Azure SQL Database is part of the broader Azure ecosystem, providing access to a wide range of integrated services. This allows organizations to leverage the latest technologies and innovations as they evolve in the Azure cloud environment.

In order to create your own Azure SQL Database , please follow the steps as mentioned below -

1. Click "Create a Resource" on the homepage and then select "Databases" on the left pane as below -

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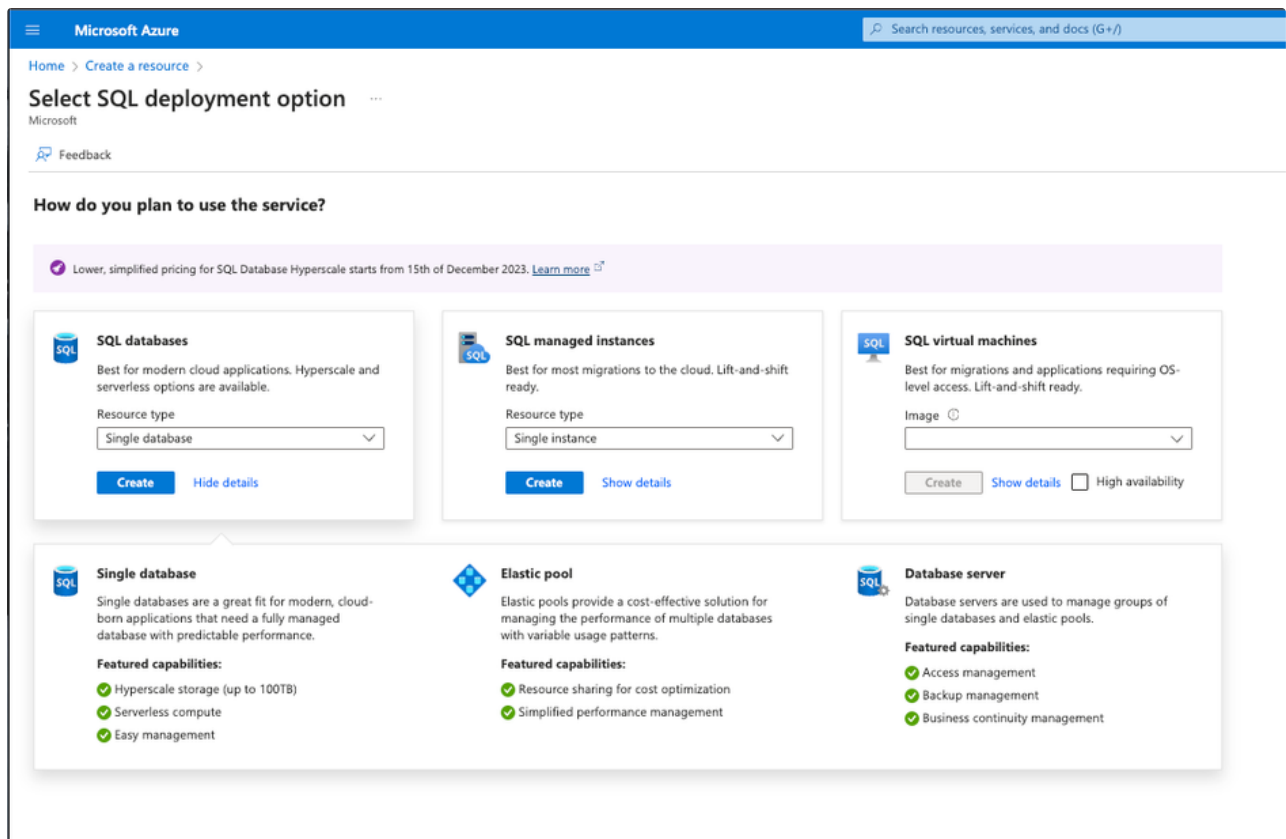
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2. Select "Azure SQL" on the right hand side, and then you will get the following page which asks what kind of service is required. We do not need managed instances nor virtual machines, hence we will be selecting SQL database, which is the first option as below -



- Once you click on "Create", you will land in a page like this. Fill in your server name and select location as Australia East. Server name can be anything but needs to be unique in the region. If there is a name collision, it will prompt you to change it to something unique. Next, under "Authentication method", select "Use both SQL and Microsoft Entra authentication. Set your Deakin id as the admin. Also, set a Server admin login, which is different from your Deakin id. Click "Ok" when done at the bottom of the page.

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Create SQL Database Server

Microsoft

Server details

Enter required settings for this server, including providing a name and location. This server will be created in the same subscription and resource group as your database.

Server name *

db-server-capstone-sit782

✓



.database.windows.net



Location *

(Asia Pacific) Australia East

▼

Authentication

 Azure Active Directory (Azure AD) is now Microsoft Entra ID. [Learn more](#) 

Select your preferred authentication methods for accessing this server. Create a server admin login and password to access your server with SQL authentication, select only Microsoft Entra authentication [Learn more](#)  using an existing Microsoft Entra user, group, or application as Microsoft Entra admin [Learn more](#) , or select both SQL and Microsoft Entra authentication.

Authentication method

☐ Use Microsoft Entra-only authentication

☒ Use both SQL and Microsoft Entra authentication

☐ Use SQL authentication

Set Microsoft Entra admin

s223446723@deakin.edu.au

Admin Object/App ID: 57b0ef30-b9d6-44f7-9193-a171191d7858

[Set admin](#)

Server admin login *

azureadmin

✓

Password *

✓

Confirm password *

✓

✓ Password and confirm password must match.

OK

4. Under “Basics” tab, select the resource group name which you had created earlier during Azure Blob Storage creation. Next type in your database name (this is different than database server name). Select the database server which you named in the previous step next.

Under SQL Elastic pool, select “No”, since you will not need this in Capstone. Select Workload as Development and select Backup Storage Redundancy as LRS (similar to what was selected during Azure Blob Storage creation). Select “Networking” once all the above steps are completed to go to the next step.

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Home > Create a resource > Select SQL deployment option >

Create SQL Database

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Basics Networking Security Additional settings Tags Review + create

Create a SQL database with your preferred configurations. Complete the Basics tab then go to Review + Create to provision with smart defaults, or visit each tab to customize. [Learn more](#)

Want to try Azure SQL Database for free? Create a free serverless database with the first 100,000 vCore seconds, 32GB of data, and 32GB of backup storage free per month for the lifetime of the subscription. [Learn more](#)

Apply offer (Preview)

Lower, simplified pricing for SQL Database Hyperscale starts from 15th of December 2023. [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 *

Azure for Students

Resource group *

rg_Capstone_SIT782

Create new

Database details

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

Database name *

db-capstone-sit782

Server *

(new) db-server-capstone-sit782 (Australia East)

Create new

Want to use SQL elastic pool?

Yes

No

Workload environment

Development

Production

Default settings provided for Development workloads. Configurations can be modified as needed.

Compute + storage *

General Purpose - Serverless

Standard-series (Gen5), 1 vCore, 32 GB storage, zone redundant disabled

Configure database

Backup storage redundancy

Choose how your PITR and LTR backups are replicated. Geo restore or ability to recover from regional outage is only available when geo-redundant storage is selected.

Backup storage redundancy

Locally-redundant backup storage

Zone-redundant backup storage

Geo-redundant backup storage

Cost summary

General Purpose (GP_S_Gen5_1)

Cost per GB (in USD)

0.14

Max storage selected (in GB)

x 41.6

ESTIMATED STORAGE COST / MONTH

5.74 USD

COMPUTE COST / VCORE SECOND ¹

0.000172 USD

NOTES

¹ Serverless databases are billed in vCore seconds based on a combination of CPU and memory utilization. [Learn more about serverless billing](#)

Review + create

Next : Networking >

5. Under Networking, select Connectivity method as “Public endpoint” and under Firewall rules, select “No” for “Allow Azure services and resources to access this server” and “Yes” for “Add current client IP address”. The connection policy should be set as “Default” and under Encryption, select “Minimum TLS version” as “TLS 1.2”.

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

Configure network access and connectivity for your server. The configuration selected below will apply to the selected server 'db-server-capstone-sit782' and all databases it manages. [Learn more](#)

Network connectivity

Choose an option for configuring connectivity to your server via public endpoint or private endpoint. Choosing no access creates with defaults and you can configure connection method after server creation. [Learn more](#)

Connectivity method *

☐ No access

☒ Public endpoint

☐ Private endpoint

Firewall rules

Setting 'Allow Azure services and resources to access this server' to Yes allows communications from all resources inside the Azure boundary, that may or may not be part of your subscription. [Learn more](#)

Setting 'Add current client IP address' to Yes will add an entry for your client IP address to the server firewall.

Allow Azure services and resources to access this server *

Add current client IP address *

Connection policy

Configure how clients communicate with your SQL database server. [Learn more](#)

Connection policy

☒ Default - Uses Redirect policy for all client connections originating inside of Azure (except Private Endpoint connections) and Proxy for all client connections originating outside Azure

☐ Proxy - All connections are proxied via the Azure SQL Database gateways

☐ Redirect - Clients establish connections directly to the node hosting the database

Encrypted connections

This server supports encrypted connections using Transport Layer Security (TLS). For information on TLS version and certificates, refer to connecting with TLS/SSL. [Learn more](#)

Minimum TLS version



Cost summary

General Purpose (GP_S_Gen5_1)	
Cost per GB (in USD)	0.14
Max storage selected (in GB)	x 41.6
ESTIMATED STORAGE COST / MONTH	
5.74 USD	
COMPUTE COST / VCORE SECOND¹	
0.000172 USD	

NOTES

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[Review + create](#)

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6. Select “Additional settings” next. Under Data source, select “None” as “Data source”. If you select “Sample”, it will create the AdventureWorks database, but this will also consume space in your new database. Use this if you are new to database development, but

is not required.

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Home > Create a resource > Select SQL deployment option >

Create SQL Database

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BasicsNetworkingSecurityAdditional settingsTagsReview + create

Customize additional configuration parameters including collation & sample data.

Data source

Start with a blank database, restore from a backup or select sample data to populate your new database.

Use existing data *

NoneBackupSample

Database collation

Database collation defines the rules that sort and compare data, and cannot be changed after database creation. The default database collation is SQL_Latin1_General_CP1_CI_AS. [Learn more](#)

Collation * ⓘ

SQL_Latin1_General_CP1_CI_AS


[Find a collation](#)

Maintenance window

Select a preferred maintenance window from the drop down. Please note, during a maintenance event, Azure SQL Database are fully available and accessible but some of the maintenance updates require a failover as Azure takes SQL DB instances offline for a short time to apply the maintenance updates. If the database is part of elastic pool, the maintenance configuration of elastic pool will be applied. [Learn more](#)

Maintenance window

System default (5pm to 8am) ✓



Cost summary

General Purpose (GP_S_Gen5_1)	
Cost per GB (in USD)	0.14
Max storage selected (in GB)	x 41.6
ESTIMATED STORAGE COST / MONTH	5.74 USD
COMPUTE COST / VCORE SECOND ¹	0.000172 USD

NOTES
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Review + create

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Next: Tags >

- Click "Review and Create" next, which will validate the settings provided. After it has been completed, you will get a page similar to the one below. You will also be able to see the pricing for this new resource. Click "Create" and once it has been completed, click on "Go to

Resource" from the notification tab.

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Home > Create a resource > Select SQL deployment option >

Create SQL Database

Microsoft

BasicsNetworkingSecurityAdditional settingsTagsReview + create

Product details

SQL database
by Microsoft
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Estimated cost

Storage cost 5.74 USD / month + Compute cost 0.000172 USD / vCore second

Terms

By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. For additional details see [Azure Marketplace Terms](#).

Basics

Subscription	Azure for Students
Resource group	rg_Capstone_SIT782
Region	Australia East
Database name	db-capstone-sit782
Server	(new) db-server-capstone-sit782
Authentication method	SQL and Microsoft Entra authentication
Server admin login	azureadmin
Microsoft Entra Admin	s223446723@deakin.edu.au
Compute + storage	General Purpose - Serverless: Standard-series (Gen5), 1 vCore, 32 GB storage, zone redundant disabled
Backup storage redundancy	Locally-redundant backup storage

Networking

Allow Azure services and resources to access this server	No
Add current client IP address	Yes
118.210.201.46	
Private endpoint	None
Minimum TLS version	1.2
Connection Policy	Default

Security

Identity	Not enabled
Transparent data encryption (Server level)	Service-managed key selected
Database level customer-managed key	Not configured
Database level user assigned managed identity	Not configured
Advanced data security	Not now
Always encrypted with secure enclaves	Not configured
Sql Ledger(Database)	Disabled
Digest Storage	Disabled

Additional settings

Use existing data	Blank
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SQL

Cost summary

General Purpose (GP_S_Gen5_1)

Cost per GB (in USD)0.14

Max storage selected (in GB)x 41.6

ESTIMATED STORAGE COST / MONTH5.74 USD

COMPUTE COST / VCORE SECOND¹0.000172 USD

NOTES

¹ Serverless databases are billed in vCore seconds based on a combination of CPU and memory utilization. [Learn more about serverless billing](#)

Create

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8. Once you click “Go to Resource”, you will land in the following page -

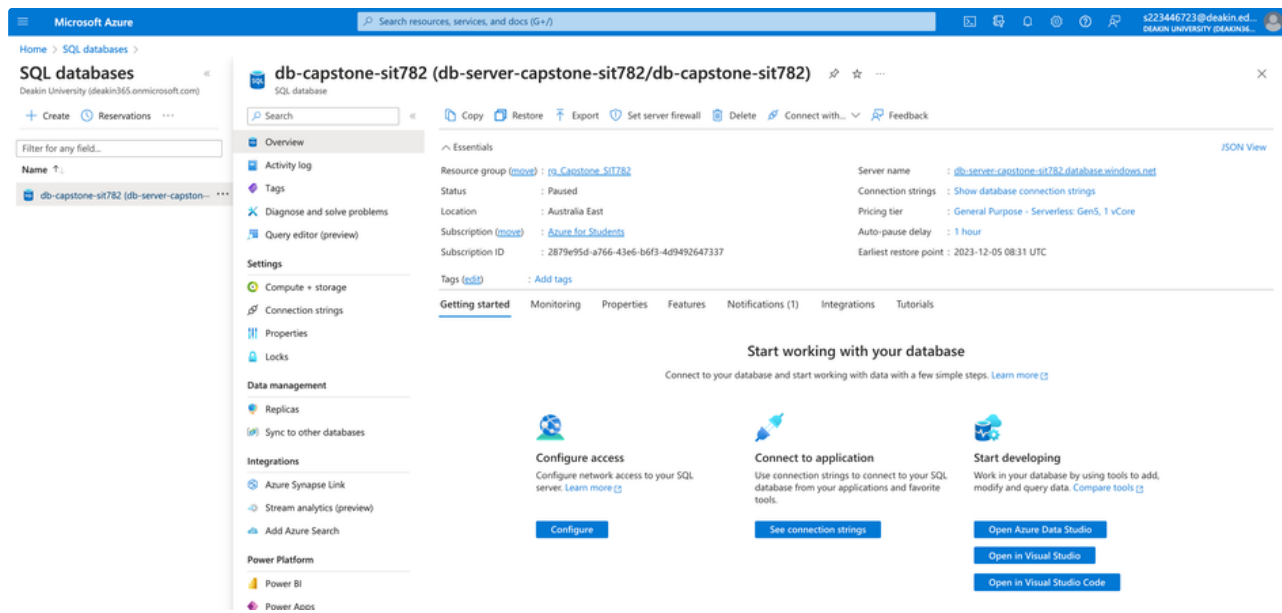
The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo, a search bar, and user information. The left sidebar contains a list of resources, with 'db-capstone-sit782 (db-server-capstone-sit782)' selected. The main content area displays the 'Overview' page for this database. Key details include: Resource group (rg-Capstone-SIT782), Status (Paused), Location (Australia East), Subscription (Azure for Students), and Subscription ID (2879e95d-4766-43e6-b6f3-4d9492647337). The 'Settings' section on the left lists various configuration options like Compute + storage, Connection strings, Properties, Locks, Data management, Integrations, Power Platform, and Security. The 'Getting started' section provides links to 'Configure', 'See connection strings', and 'Open Azure Data Studio'. A 'Start working with your database' section offers guidance on connecting to the database.

9. This page is the homepage where all changes to the newly created database server and database can be made. One of the critical options to select now is the “Auto-pause delay”. This will put the database to sleep if not used for 1 hour. This will help save you running cost for your database. To enable this, select “Compute + storage” on the left pane. Once you click this, you will land in a page like this -

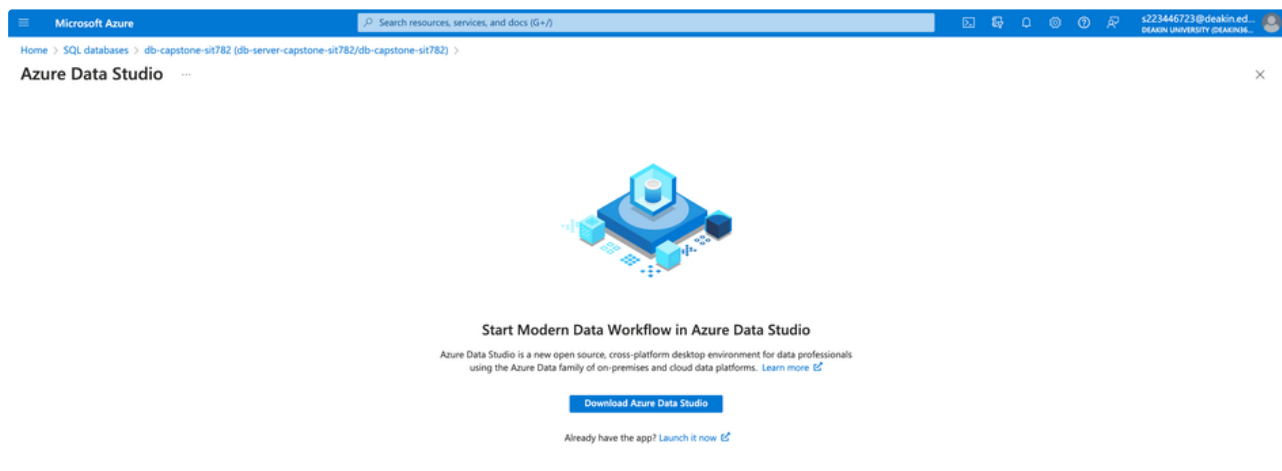
The screenshot shows the 'Compute + storage' configuration page for the SQL database 'db-capstone-sit782'. The left sidebar is the same as the previous screenshot, but the 'Compute + storage' option is selected. The main content area displays various configuration options: Service tier (General Purpose), Compute tier (Serverless), Compute Hardware (Standard-series), Max vCores (1), Min vCores (0.5), Auto-pause delay (1 hour), Data max size (32 GB), and a 'Would you like to make this database zone redundant?' checkbox. A 'Cost summary' section on the right provides pricing details: General Purpose (GP, 5, Gen5, 1) at 0.14 USD per GB, Max storage at 41.6 USD, Estimated storage cost at 5.74 USD, and Compute cost at 0.000172 USD. A 'NOTES' section at the bottom explains that serverless databases are billed in vCore seconds based on a combination of CPU and memory utilization.

Here you can set min and max virtual cores for your database, the size of the database and most importantly, set the auto-pause delay.

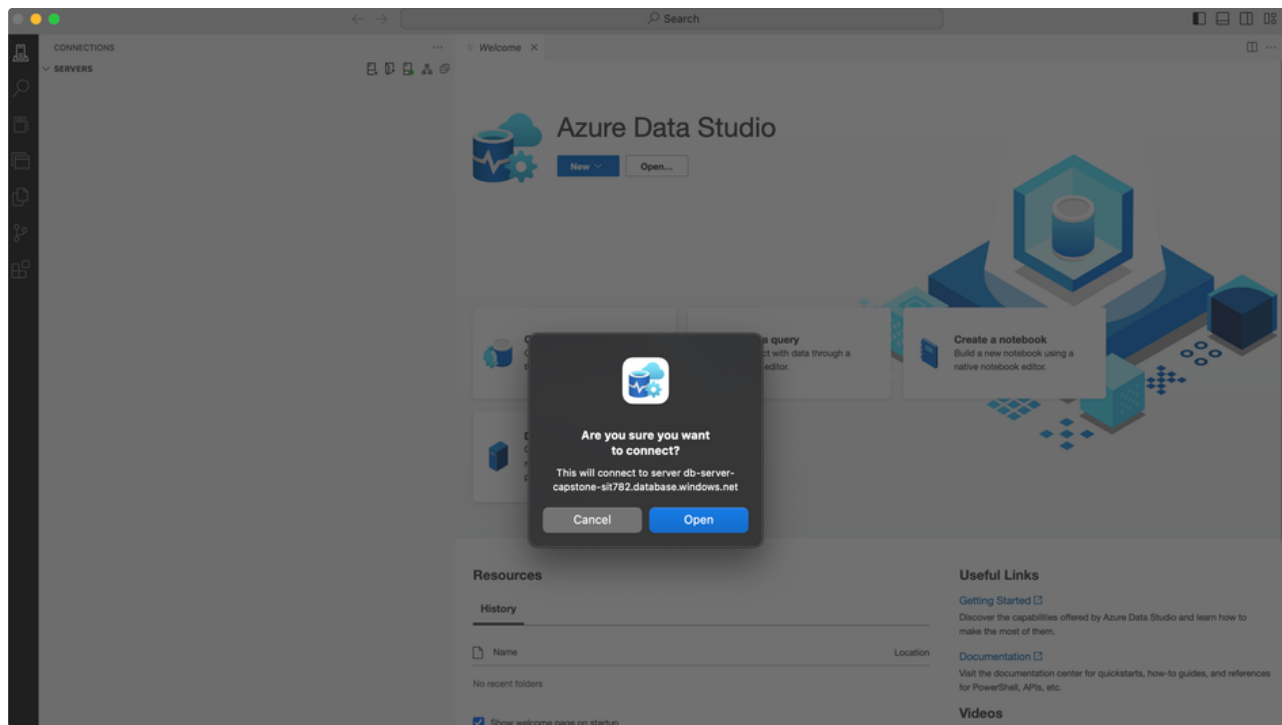
10. Once you have configured these settings, click on “Overview” to go back to the home page for the resource. Next, we will see how you can connect to this database which you just created. In the home page, under “Start developing”, click on “Open Azure Data Studio”. This will take you to a page where you can download this software to connect to the database created.



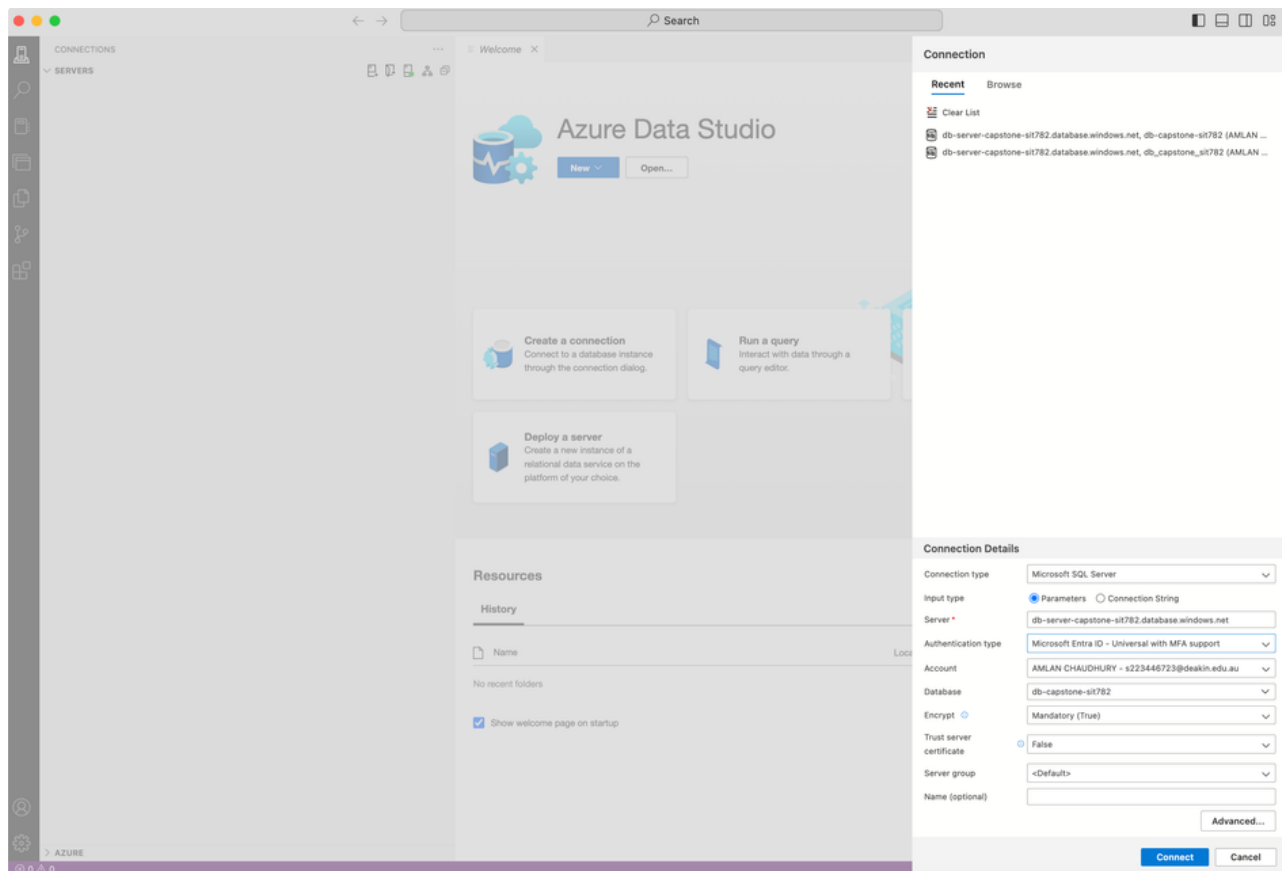
11. Click on “Launch it now”, after you have installed Azure Data Studio using the Download option in this page.



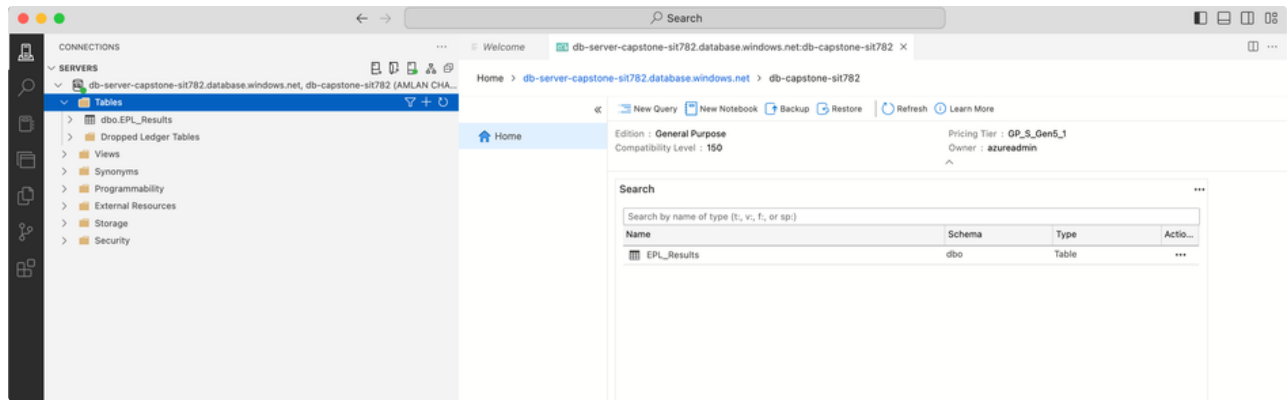
12. Clicking on “Launch it now” will open Azure Data Studio and you will get a page like this -



13. Click on "Open". Next under "Authentication Type", select "Microsoft Entra ID" and then authenticate to login. Click "Connect" to login.



14. After you have logged in successfully, you will see a page like this -



15. We will create a table next, using the script below. The structure of this table is aligned to the structure of the EPL Results which was created earlier ([Azure Blob Storage - how to provision, access and development guide](#)).

```

1 CREATE TABLE [dbo].[EPL_Results] (
2     [Date_Of_Match]          VARCHAR (50) NULL,
3     [Time_Of_Match]          VARCHAR (50) NULL,
4     [Home_Team]              VARCHAR (50) NULL,
5     [Away_Team]              VARCHAR (50) NULL,
6     [Full_Time_Home_Goals]    INT          NULL,
7     [Full_Time_Away_Goals]    INT          NULL,
8     [Full_Time_Result]       CHAR (10)    NULL,
9     [Halftime_Home_Goals]     INT          NULL,
10    [Halftime_Away_Goals]     INT          NULL,
11    [Halftime_Result]         CHAR (10)    NULL,
12    [Referee]                 VARCHAR (50) NULL,
13    [Home_Team_Shots]          INT          NULL,
14    [Away_Team_Shots]          INT          NULL,
15    [Home_Team_Shots_On_Goal] INT          NULL,
16    [Away_Team_Shots_On_Goal] INT          NULL,
17    [Home_Team_Fouls]          INT          NULL,
18    [Away_Team_Fouls]          INT          NULL,
19    [Home_Team_Corners]        INT          NULL,
20    [Away_Team_Corners]        INT          NULL,
21    [Home_Team_Yellow_Cards]   INT          NULL,
22    [Away_Team_Yellow_Cards]   INT          NULL,
23    [Home_Team_Red_Cards]      INT          NULL,
24    [Away_Team_Red_cards]      INT          NULL
25 );
26

```

If you have followed all of the steps one after the other, then you will be able to create your database server, database and also will be able to connect to it from your local machine.