

# Data Management Using Microsoft SQL Server

Session: 4

SQL Azure

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# Objectives

- Explain SQL Azure
- List the benefits of SQL Azure
- State the differences between SQL Azure and on-premises SQL Server
- List the steps to connect SQL Azure with SSMS

- Cloud computing is a technology trend, that involves the delivery of software, platforms, and infrastructure as services through the Internet or networks.
- Windows Azure is a key offering in Microsoft's suite of cloud computing products and services.
- The database functions of Microsoft's cloud platform are provided by Windows Azure SQL Database, which is commonly known as SQL Azure.
- SQL Azure can be used to store and manage data using queries and other functions that are similar to SQL Server 2012.
- The data on SQL Azure does not have the constraint of being location-specific.
- This means that the data stored in SQL Azure can be viewed and edited from any location, as the entire data is stored on cloud storage platform.

Consider a scenario of the Income Tax department.

During the month of March, the department is flooded with heavy workload. During the rest of the year, the workload may be less.

As a result, resources, server, and computing power are under-utilized during those months and over-utilized during peak periods.

In such a scenario, using a cloud database service like SQL Azure can help in optimal use of resources only as and when required.

SQL Azure is a cloud based relational database service that leverages existing SQL Server technologies.

Microsoft SQL Azure extends the functionality of Microsoft SQL Server for developing applications that are Web-based, scalable, and distributed.

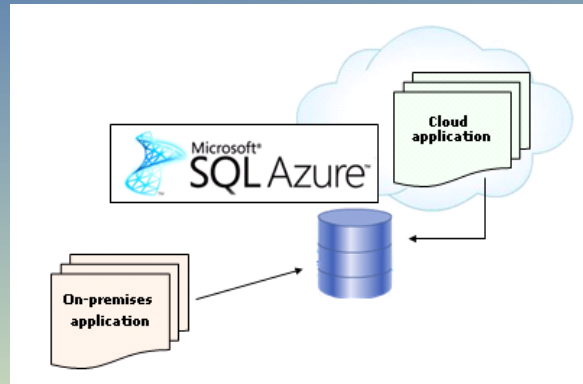
SQL Azure enables users to perform relational queries, search operations, and synchronize data with mobile users and remote back offices.

SQL Azure can store and retrieve both structured and unstructured data. Both cloud based as well as on-premises applications can use the SQL Azure database.

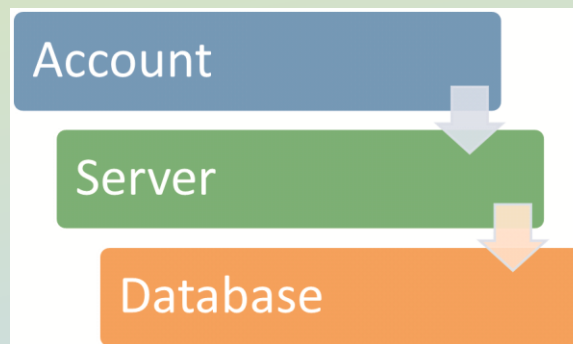
Applications retrieve data from SQL Azure through a protocol known as Tabular Data Stream (TDS).

Whenever on-premises applications involve interaction with SQL Server Database Engine, this protocol is used by the client and the server.

- Following figure shows the simplified view of SQL Azure architecture:



- The process of SQL Azure operation is explained in the model as shown in the following figure:



- The three core objects in the SQL Azure operation model are as follows:

### Account

- An SQL Azure account must first be created before adding servers that will help to store and manage the data.
- This account is created for billing purposes.
- The subscription for an account is recorded and metered and an individual is charged according to the usage.
- To create an account, the credentials need to be provided.
- After the user account is created, the requirements need to be provided for the SQL Azure database.
- This includes the number of databases required, database size, and so on.

### Server

- The SQL Azure server is the object that helps to interact between the account and the database.
- After the account is registered, the databases are configured using the SQL Azure server.
- Other settings such as firewall settings and Domain Name System (DNS) assignment are also configured in the SQL Azure server.



## Database

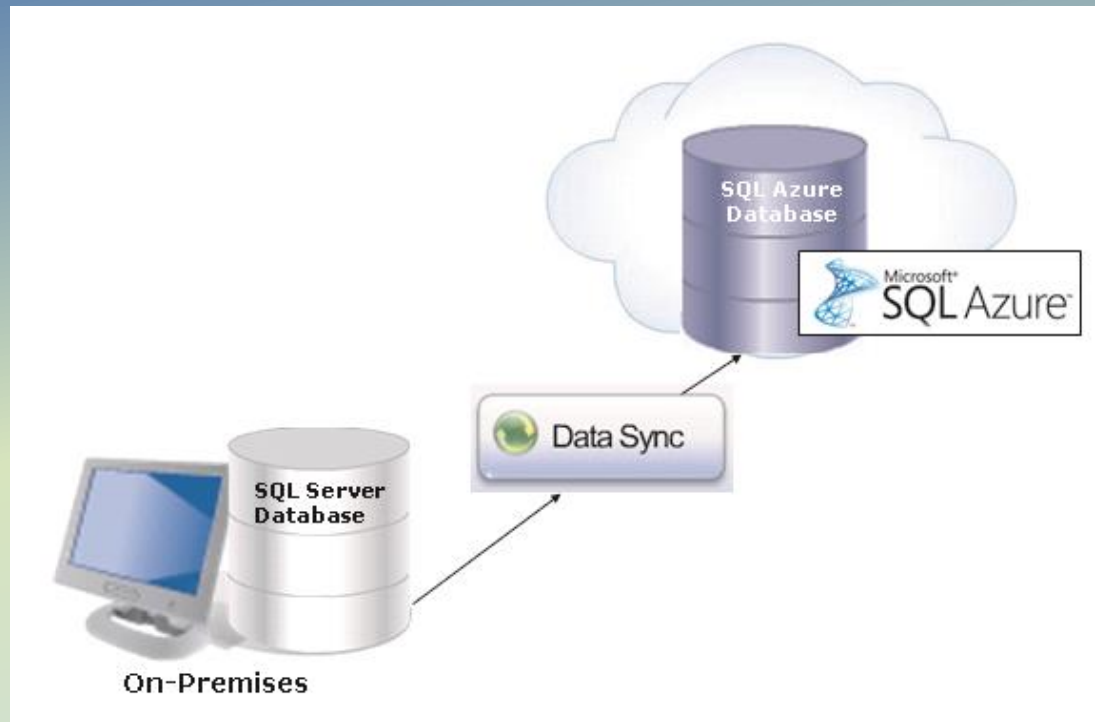
- The SQL Azure database stores all the data in a similar manner as any on-premises SQL Server database would store the data.
- Though present on the cloud, the SQL Azure database has all the functionalities of a normal RDBMS such as tables, views, queries, functions, security settings, and so on.

## Others

- In addition to these core objects, there is an additional object in SQL Azure.
- This object is the SQL Azure Data Sync technology.
- The SQL Azure Data Sync technology is built on Microsoft Sync Framework and SQL Azure database.



- SQL Azure Data Sync helps to synchronize data on the local SQL Server with the data on SQL Azure as shown in the following figure:



- Data Sync also has data management capabilities that help to easily share data between different SQL databases.
- Data Sync is not only used for synchronizing on-premises to SQL Azure, but also to synchronize one SQL Azure account to another.

➤ The benefits of using SQL Azure are as follows:

## Lower cost

- SQL Azure provides several functions similar to on-premises SQL Server at a lower cost when compared to on-premises instances of SQL Server.

## Usage of TDS

- TDS is used in on-premises SQL Server databases for client libraries.
- Hence, most developers are familiar with TDS and its use.

## Automatic failover measures

- SQL Azure stores multiple copies of data on different physical locations.
- Even if there is a hardware failure due to heavy usage or excessive load, SQL Azure helps to maintain the business operations by providing availability of data through other physical locations.

## Flexibility in service usage

- Even small organizations can use SQL Azure as the pricing model for SQL Azure is based on the storage capacity that is used by an organization.

## Transact-SQL support

- As SQL Azure is completely based on the relational database model, it also supports Transact-SQL operations and queries.
- This concept is similar to the working of the on-premises SQL Servers. Hence, administrators do not need any additional training or support to use SQL Azure.



# Difference between SQL Azure and On-Premises SQL Server 1-2

- The major difference between SQL Azure and on-premises SQL Server is the presence of physical hardware and storage.
- Some other key distinctions between SQL Azure and on-premises SQL Server are as follows:

## Tools

- On-premises SQL Server provides a number of tools for monitoring and management.
- All these tools may not be supported by SQL Azure in this version.

## Backup

- Backup and restore function must be supported in on-premises SQL Server for disaster recovery.
- For SQL Azure, as all the data is on the cloud platform, backup and restore is not required.

## USE statement

- The `USE` statement is not supported by SQL Azure.
- Hence, the user cannot switch between databases in SQL Azure as compared to on-premises SQL Server.



# Difference between SQL Azure and On-Premises SQL Server 2-2

## Authentication

- SQL Azure supports only SQL Server authentication and on-premises SQL Server supports both SQL Server authentication and Windows Authentication.

## Transact-SQL support

- Not all Transact-SQL functions are supported by SQL Azure.

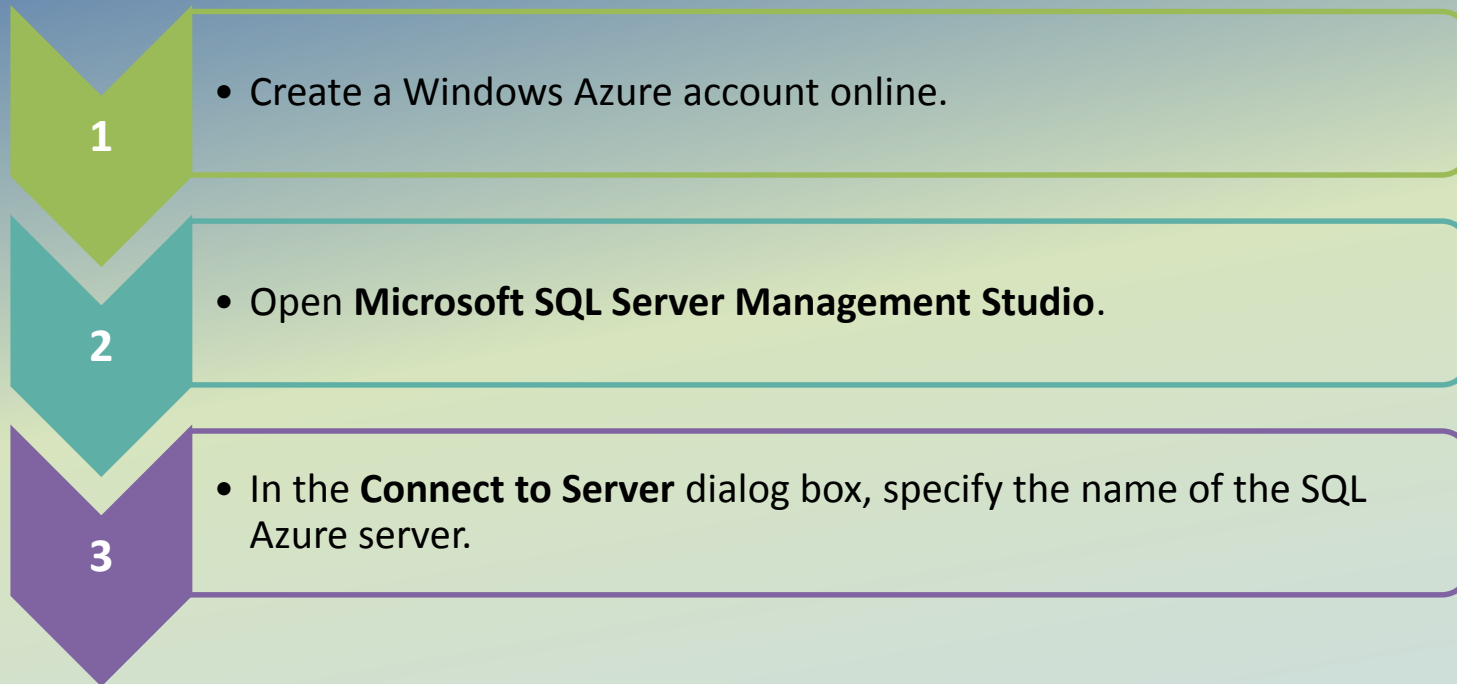
## Accounts and Logins

- In SQL Azure, administrative accounts are created in the Azure management portal.
- Hence, there are no separate instance-level user logins.

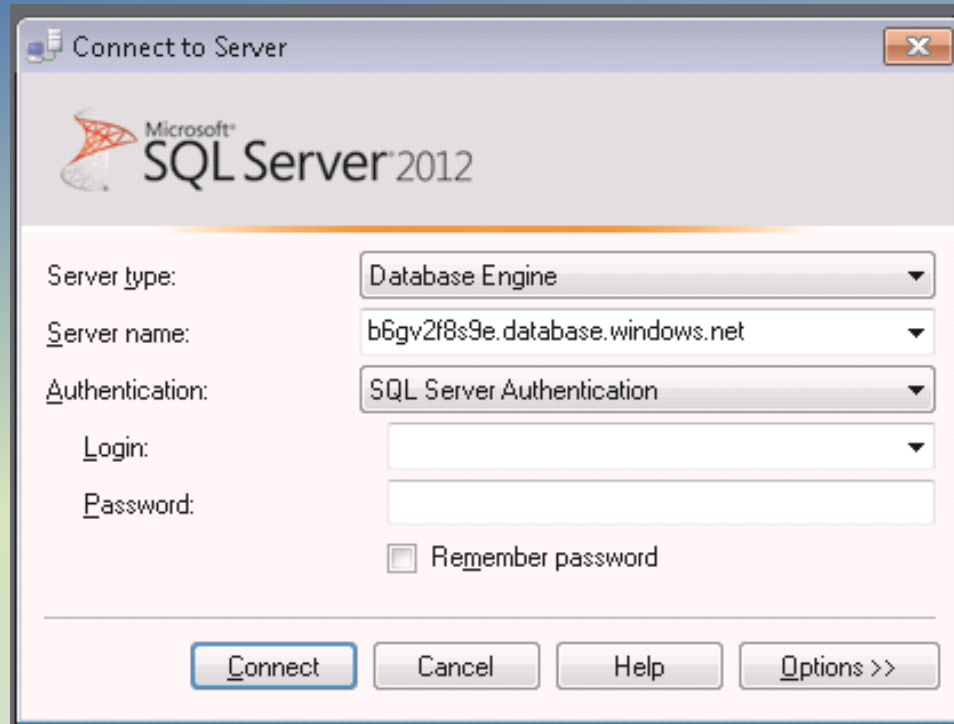
## Firewalls

- Firewall settings for allowed ports and IP addresses can be managed on physical servers for on-premises SQL Server.
- As an SQL Azure database is present on cloud, authentication through logins is the only method to verify the user.

- To access SQL Azure with SSMS, a Windows Azure account must be created.
- The process of connecting SQL Azure with SSMS is as follows:



- This is shown in the following figure:



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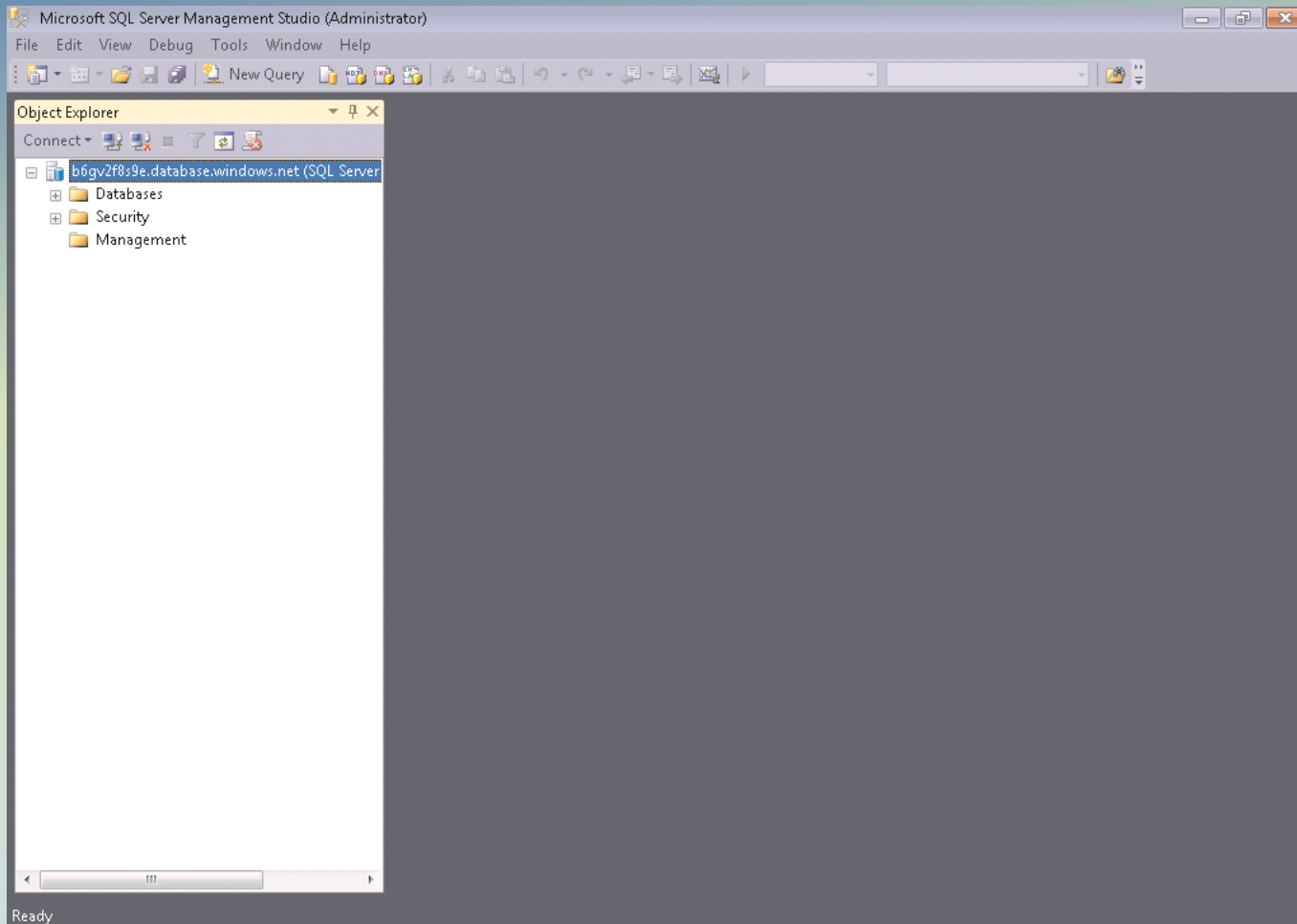
- In the **Authentication** box, select **SQL Server Authentication**.

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- In the **Login** box, type the name of the SQL Azure administrator account and the password.

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- Click **Connect**. The database is displayed as shown in the following figure:





- Microsoft SQL Azure is a cloud based relational database service that leverages existing SQL Server technologies.
- SQL Azure enables allow users to perform relational queries, search operations, and synchronize data with mobile users and remote back offices.
- SQL Azure can store and retrieve both structured and unstructured data.
- Applications retrieve data from SQL Azure through a protocol known as Tabular Data Stream (TDS).
- The three core objects in the SQL Azure operation model are account, server, and database.
- SQL Azure Data Sync helps to synchronize data on the local SQL Server with the data on SQL Azure.
- Users can connect to SQL Azure using SSMS.