

Data Management Using Microsoft SQL Server

Session: 4

SQL Azure



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

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Introduction

- 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.

SQL Azure 1-6

Consider a scenario of the Income Tax department.

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

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

SQL Azure 2-6

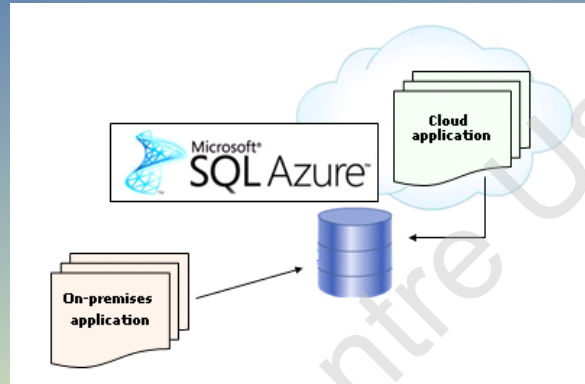
Microsoft SQL Azure extends the functionality of Microsoft SQL Server for developing applications that are Web-based, scalable, and distributed.

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.

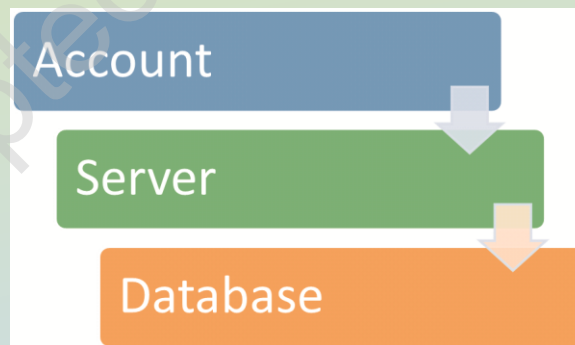
Whenever on-premises applications involve interaction with SQL Server Database Engine, this protocol is used by the client and the server.

SQL Azure 3-6

- 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

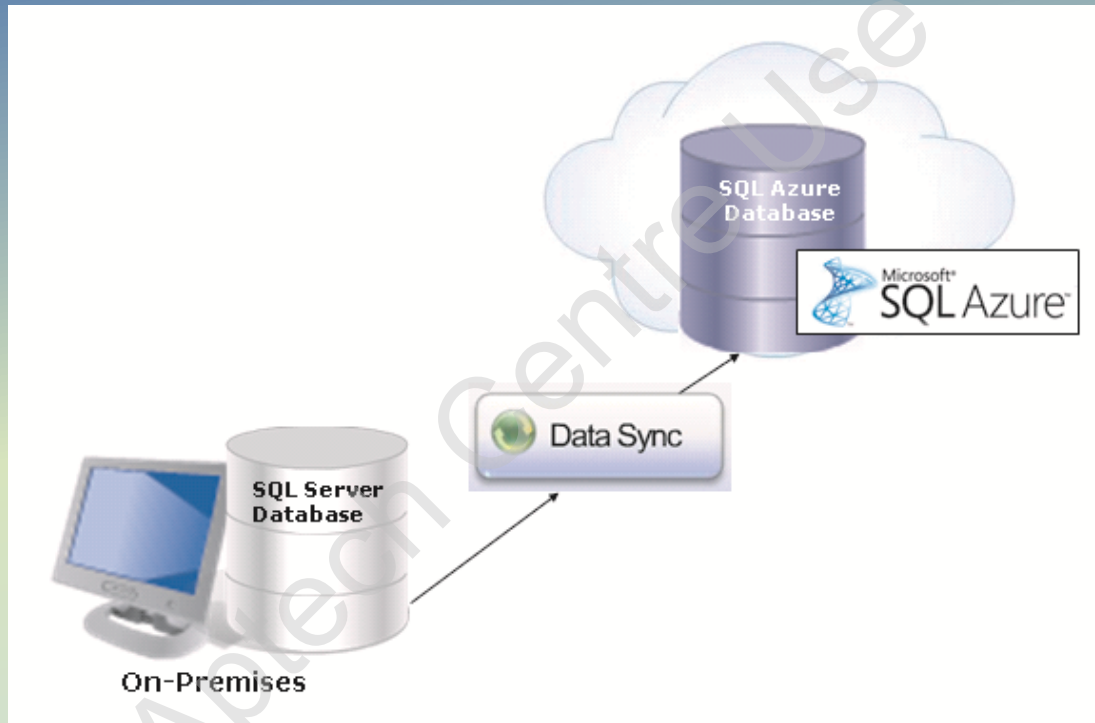
- The SQL Azure database stores all the data in a similar manner as any on-premises SQL Server database would store the data.
- Though present on the cloud, the SQL Azure database has all the functionalities of a normal RDBMS such as tables, views, queries, functions, security settings, and so on.

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 6-6

- 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.

Benefits of SQL Azure

➤ 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

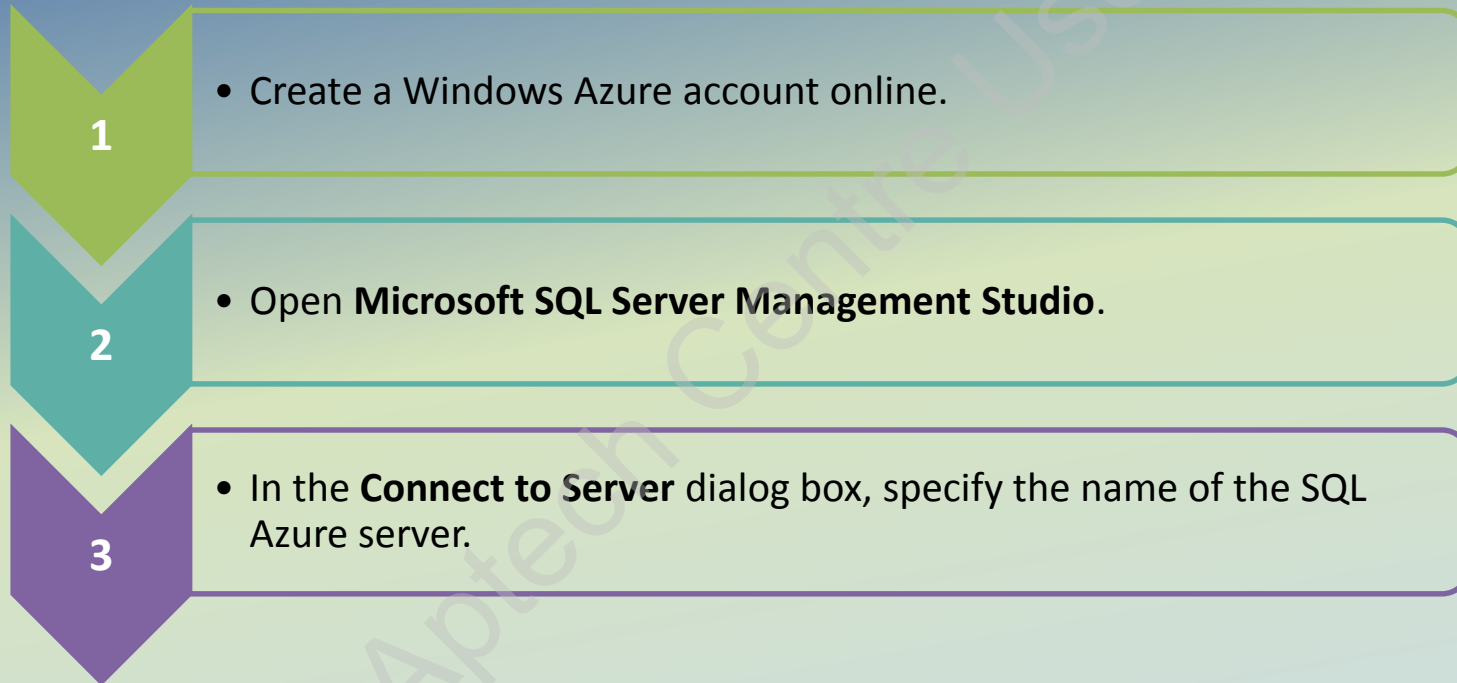
- In SQL Azure, administrative accounts are created in the Azure management portal.
- Hence, there are no separate instance-level user logins.

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.

Connect to SQL Azure with SSMS 1-3

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



Connect to SQL Azure with SSMS 2-3

- This is shown in the following figure:



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

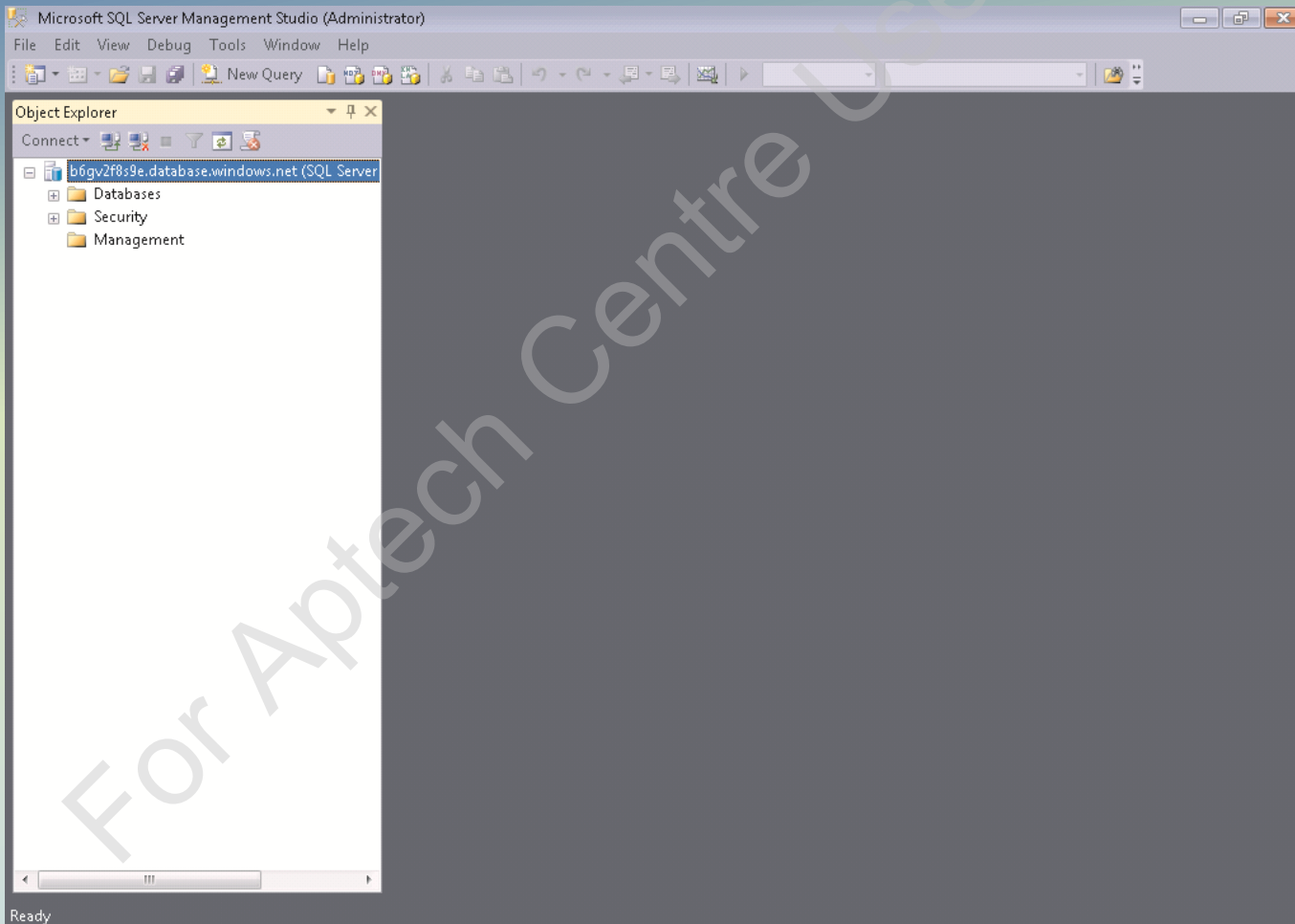
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- In the **Login** box, type the name of the SQL Azure administrator account and the password.

Connect to SQL Azure with SSMS 3-3

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



Summary

- 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.