

Intro into Azure AZ900- Cloud Computing

1. Define cloud computing.

Is the delivery of computing services over the internet.

Computing services include common IT infrastructure such as virtual machines, storage, databases and networking.

2. Compare cloud pricing models.

Pay as- you- go based on consumption, monthly subscription, pricing calculator,

Benefits

- Elasticity
 - Agility
 - Deploy globally in minutes
-
- A single fact is called a datum while data is a plural term.
 - Data are facts such as numbers and text descriptors about some entity.
 - Entity is the object you want to describe like customers, name or orders.
 - Structured data has defined schema.

Relational database model

Key advantages:

- use of **table** > efficient, flexible way to store access structured information.
- useful for storing any information containing related data elements that must be organised in a rules- based, consistent structure.

An **entity** can be anything for which you want to record information; typically important objects and events.

Normalization is a term used by database professionals for a schema design process that minimises data duplication and enforces data integrity.

1. Separate each entity into its own table
2. Separate each unique attribute into its own column
3. Define a primary key for each entity instance or row that uniquely identifies that row.
4. Define foreign key columns to link related tables.

SQL STATEMENTS

1. Data Definition Language (DDL)

Used to define and manage database tables and other objects.

CREATE ALTER DROP RENAME

2. Data Control Language (DCL)

GRANT DENY

The screenshot displays the Microsoft Azure portal interface for the AdventureWorks database. The left sidebar shows the 'AdventureWorks (sahraserver/AdventureWorks)' database with a tree view of tables, views, and stored procedures. The main area shows the 'Query editor (preview)' with a SQL query that selects product details from the SalesLT.Product table, including ProductID, Name, ListPrice, and ProductCategoryID. The query is executed, and the results are displayed in a table with 6 rows and 4 columns. The right sidebar shows a 'Query editor (preview)' with a SQL query that selects product details from the SalesLT.Product table, including ProductID, Name, ListPrice, and ProductCategoryID. The query is executed, and the results are displayed in a table with 6 rows and 4 columns.

ProductID	ProductName	Category	ListPrice
771	Mountain-100 Silver, 38	Mountain Bikes	3399.9900
772	Mountain-100 Silver, 42	Mountain Bikes	3399.9900
773	Mountain-100 Silver, 44	Mountain Bikes	3399.9900
774	Mountain-100 Silver, 48	Mountain Bikes	3399.9900
775	Mountain-100 Black, 38	Mountain Bikes	3374.9900
776	Mountain-100 Black, 42	Mountain Bikes	3374.9900

```
(  
    CustomerID INT PRIMARY KEY,  
    Name VARCHAR(20) NOT NULL,  
    Email VARCHAR(20),  
    Type VARCHAR(20),  
    Active VARCHAR(3) NOT NULL  
);
```

INT giving identity to the attribute


```
GRANT SELECT, INSERT, UPDATE  
ON Customer  
TO dbo;
```

```
GRANT SELECT, INSERT, UPDATE  
ON OrderHeader  
TO dbo;
```

Grants to dbo to select insert update

Admins will create users using syntax CREATE USER

```
INSERT INTO Customer(CustomerID, Name, Email, Type, Active)  
VALUES(1001, 'John Smith', 'jsmith@gmail.com', 'Consumer', 'Yes');
```



D3: Explore non-relational data in Azure

Blob

- ❖ stores binary large objects.
- ❖ They are an efficient way to store data.
- ❖ Stored in containers in azure storage account.
- ❖ Can be stored in hierarchy.

Azure data lake store gen 1

- a separate service for hierarchy data storage for analytical data lakes like big data.

To create an Azure Data Lake Store Gen2 files system, you must enable the Hierarchical Namespace option of an Azure Storage account. You can do this when initially creating the storage account, or you can upgrade an existing Azure Storage account to support Data Lake Gen2. Be aware however that upgrading is a one-way process – after upgrading a storage account to support a hierarchical namespace for blob storage, you can't revert it to a flat namespace.

•

Now that you have an Azure Storage account, you can create a container for blob data.

The screenshot shows the Microsoft Azure portal interface for a storage account. The top navigation bar includes the Microsoft Azure logo, a search bar, and user information. The left sidebar shows the navigation menu with options like Overview, Diagnose and solve problems, Access Control (IAM), Settings, Shared access tokens, Access policy, Properties, and Metadata. The main content area displays the 'data' container. It includes a search bar, a list of actions (Upload, Change access level, Refresh, Delete, Change tier, Acquire lease, Break lease, View snapshots, Create snapshot), and a table of blobs. The table has columns for Name, Modified, Access tier, Archive status, Blob type, Size, and Lease state. Two blobs are listed: '[.]' and 'product1.json'.

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
[.]						...
product1.json	1/11/2024, 3:41:32 A...	Hot (Inferred)		Block blob	323 B	Available

Microsoft Azure | Search resources, services, and docs (G+)

Home > sahranuur1 | Containers >

data Container

Search << Upload Change access level Refresh Delete Change tier Acquire lease Break lease View snapshots Create snapshot >>

Overview

Diagnose and solve problems

Access Control (IAM)

Settings

Shared access tokens

Access policy

Properties

Metadata

Authentication method: Access key (Switch to Microsoft Entra user account)

Location: data / product_data

Search blobs by prefix (case-sensitive) Show deleted blobs

Add filter

	Name	Modified	Access tier	Archive status	Blob type	Size	Lease state	
<input type="checkbox"/>	[-]							...
<input type="checkbox"/>	product1.json	1/11/2024, 3:41:32 A...	Hot (Inferred)		Block blob	323 B	Available	...

Azure Data Lake Store Gen2 support enables you to use hierarchical folders to organize and manage access to blobs. It also enables you to use Azure blob storage to host distributed file systems for common big data analytics platforms.

Microsoft Azure | Search resources, services, and docs (G+)

Home > sahranuur

sahranuur Storage account

Search << Add Directory Upload Refresh Delete Copy Paste Rename Acquire lease >>

Blob containers > data > product_data

Authentication method: Access key (Switch to Microsoft Entra user account)

Search blobs by prefix (case-sensitive) Only show active blobs

Sorting all 2 items

	Name ↑	Last modified	Access tier	Blob type	Size	Lease state	
<input type="checkbox"/>	[-]						...
<input type="checkbox"/>	product1.json	1/11/2024, 4:28:56 AM	Hot (Inferred)	Block blob	323 B	Available	...
<input type="checkbox"/>	product2.json	1/11/2024, 4:29:30 AM	Hot (Inferred)	Block blob	326 B	Available	...

Overview

Activity log

Tags

Diagnose and solve problems

Access Control (IAM)

Data migration

Events

Storage browser

Storage Mover

Data storage

Containers

File shares

Queues

Tables

Security + networking

Networking

Front Door and CDN

Access keys

Shared access signature

Encryption

Interface for managing Azure Storage Tables in the 'sahranuur' account.

Left Navigation Panel:

- Home > sahranuur
- Favorites
- Recently viewed
- Blob containers
 - \$logs
 - data
 - [View all](#)
- File shares
 - files
 - [View all](#)
- Queues
- Tables**
 - products
 - [View all](#)

Main Content Area:

Tables

Authentication method: Access key ([Switch to Microsoft Entra user account](#))

Search tables by prefix:

Show system-generated tables: ☐

Showing all 1 items

<input checked="" type="checkbox"/>	Name	Url	
<input checked="" type="checkbox"/>	products	https://sahranuur.table.core.windows.net/products	...

Explore files:

Interface for managing Azure Storage File Shares in the 'sahranuur' account.

Left Navigation Panel:

- Home > sahranuur
- sahranuur | Storage browser**
- Storage account
- Search
- Overview
- Activity log
- Tags
- Diagnose and solve problems
- Access Control (IAM)
- Data migration
- Events
- Storage browser**
- Storage Mover
- Data storage
 - Containers
 - File shares
 - Queues
 - Tables
- Security + networking
 - Networking
 - Front Door and CDN
 - Access keys

Main Content Area:

File shares

Search file shares by prefix:

Only show active file shares: ☐

Showing all 1 items

<input checked="" type="checkbox"/>	Name	Tier	Modified	Quota	
<input checked="" type="checkbox"/>	files	Transaction optimized	1/11/2024, 4:31:50 AM	5 TiB	...

Azure Files provides a way to create cloud-based file shares.

Explore azure tables:

The screenshot shows the Azure Storage browser interface for a storage account named 'sahranuur'. The left sidebar contains navigation options: Overview, Activity log, Tags, Diagnose and solve problems, Access Control (IAM), Data migration, Events, Storage browser (selected), Storage Mover, Data storage, Containers, and File shares. The main area displays a table named 'products' with the following columns: PartitionKey, RowKey, Timestamp, Name, Price, and Discontinued. The table shows two rows of data:

PartitionKey	RowKey	Timestamp	Name	Price	Discontinued
1	1	2024-01-11T12:37:33.88...	Widget	2.99	
1	2	2024-01-11T12:38:53.05...	kniknak	1.99	true

You have manually entered data into the table using the storage browser interface. In a real scenario, application developers can use the Azure Storage Table API to build applications that read and write values to tables, making it a cost effective and scalable solution for NoSQL storage.

Azure Cosmos DB:

View and create items

New item in sampledbs and samplecontainer. Items represent product data each with a unique id and other properties. This is a modified json file for the new item

The screenshot shows the Azure Cosmos DB Data Explorer interface for a database named 'sahranuur2'. The left sidebar contains navigation options: Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Cost Management, Quick start, Notifications, Data Explorer (selected), Settings, Features, Replicate data globally, Default consistency, Backup & Restore, Networking, and nps. The main area displays the 'SampleContainer' with a list of items. A new item is being created, and the JSON document is shown in the right pane:

```

1 {
2   "name": "Road Helmet,45",
3   "id": "123456789",
4   "categoryID": "123456789",
5   "SKU": "AB-1234-56",
6   "description": "The product called \"Road Helmet,45\" ",
7   "price": 48.74,
8   "_rid": "2IfAHM51A0BAAAAAAAAA==",
9   "_self": "dbs/2IfFAA==/colls/2IfAHM51A0=/docs/2IfAHM51A0",
10  "_etag": "\"0b003a04-0000-1100-0000-659Fe6910000\"",
11  "_attachments": "attachments/",
12  "_ts": 1704978065
13 }

```

Query the database :

Results show which includes JSON entities for any items with a **name** field containing the text "Helmet".

The screenshot displays the Azure Cosmos DB Data Explorer interface. On the left, a sidebar lists various management options like Overview, Activity log, Access control (IAM), Tags, and Data Explorer. The main panel is titled 'NOSQL API' and shows a tree view of the database structure, including 'SampleDB' and 'SampleContainer'. A query is entered in the 'Query 1' tab:

```
1 SELECT *
2 FROM c
3 WHERE CONTAINS(c.name, "Helmet")
```

 The 'Results' tab shows a single JSON document:

```
{
  "name": "Road Helmet,45",
  "id": "123456789",
  "categoryID": "123456789",
  "SKU": "AB-1234-56",
  "description": "The product called \"Road Helmet,45\" ",
  "price": 48.74,
  "_rid": "2IhFAHMS1A0BAAAAAAAAA==",
  "_self": "dbs/2IhFAA==/colls/2IhFAHMS1A0=/docs/2IhFAHMS1A0BAAAAAAAAA==/",
  "_etag": "\"0b003a04-0000-1100-0000-659fe6910000\"",
  "_attachments": "attachments/",
  "_ts": 1704978065
}
```

Summary:

Learned to create and query JSON entities in a Cosmos DB database by using the data explorer interface in the Azure portal. In a real scenario, an application developer would use one of the many programming language specific software development kits (SDKs) to call the NoSQL API and work with data in the database.

<https://learn.microsoft.com/api/achievements/share/en-us/sahranuur-7217/N7SRAWBF?sharingId=20C829D3B9FE7234>

Describe Azure Cosmos DB

- Supports multiple applications programming interfaces - APIs
- Internal data is abstracted enabling developers to use Cosmos DB to store and query data.
- Allows performed to be scaled up or down elastically for games.
- Uses PaaS (platform as a service).
- Its a foundational service in azure and is used by many of microsofts products for mission critical applications at global scale such a s
 - IoT and telematics
 - Retail and marketing. Microsoft uses Cosmos DB for its own e-commerce platforms.
 - Used in retail industry for storing catalog data.
 - Gaming- relies on the cloud to deliver customised and personalised content.
 - Web and Mobile applications.

<https://learn.microsoft.com/api/achievements/share/en-us/sahranuur-7217/9N487RWU?sharingId=20C829D3B9FE7234>

Broad data model support is what makes it possible for both healthcare providers and supply chain systems to both use Cosmos DB for entirely different applications. User expectations for low latency and instant page loads are higher than ever and on a holiday like Black Friday where millions of consumers are adding, removing, submitting and refreshing shopping carts, downtime and latency translate to lost revenue.

Asos runs their entire shopping cart and recommendation engine on Cosmos DB to take advantage of the low latency, high availability and elasticity necessary when adjusting the spikes in traffic. ASOS performs real time recommendation and personalization with materializing views in Cosmos by pre calculating vectors which describe the likelihood X user will want to purchase Y product and on a daily cadence, ASOS can surface lightweight real time recommendations to millions of concurrent users.

Microsoft Teams relies on the performance and scalability of Cosmos to handle everything from messaging and litigation to transportation services. Performance and availability challenge running a multi tenant SaaS platform means our software needs to scale as every tenant usage scales and cosmos DB is how teams can get this done reliably now.

[Choose an API in Azure Cosmos DB | Microsoft Learn](#)

Which storage solution replicates data to a secondary region, and maintains six copies of the data?

Read-access geo-redundant storage is the default replication option. Geo-redundant storage (GRS) copies the data synchronously three times within a single physical location in

the primary region by using LRS. The data is then copied asynchronously to a single physical location in the secondary region