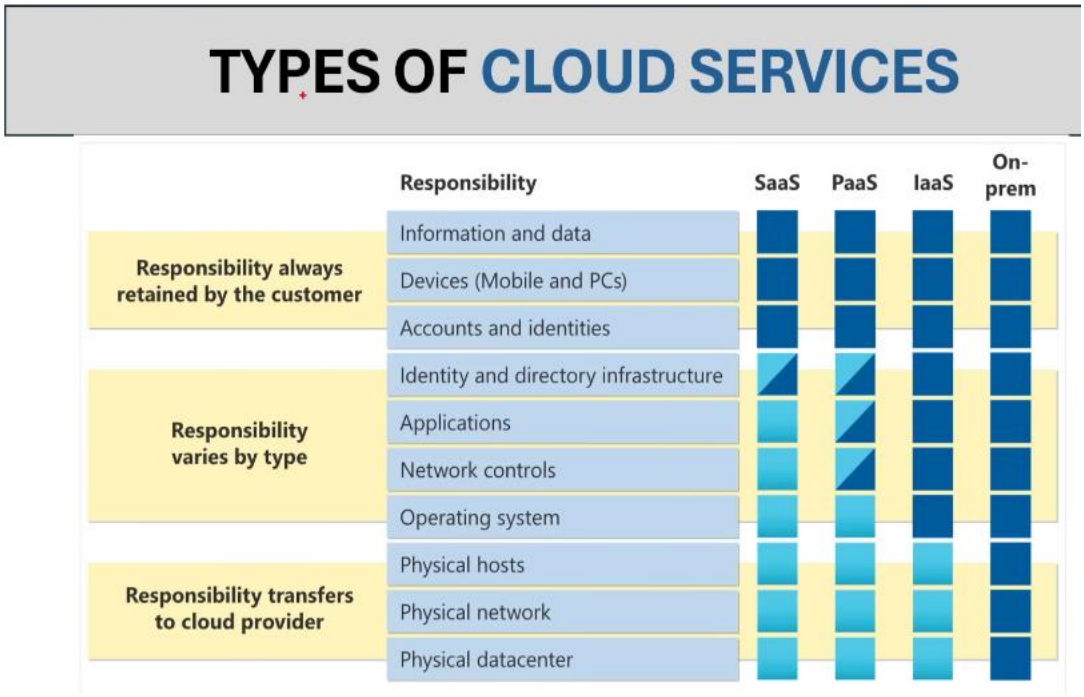
Azure

What is Cloud → central location to store data (store huge volume of data in a location and access it from anywhere in the world)

Cloud Computing → provides on demand computing resources (Pay as you go → pay for the services we are using)

Cloud has Data Centres (have remote servers and based on the Endpoint provided by Cloud we access the resources, highly secure)



On-premises : self-owned

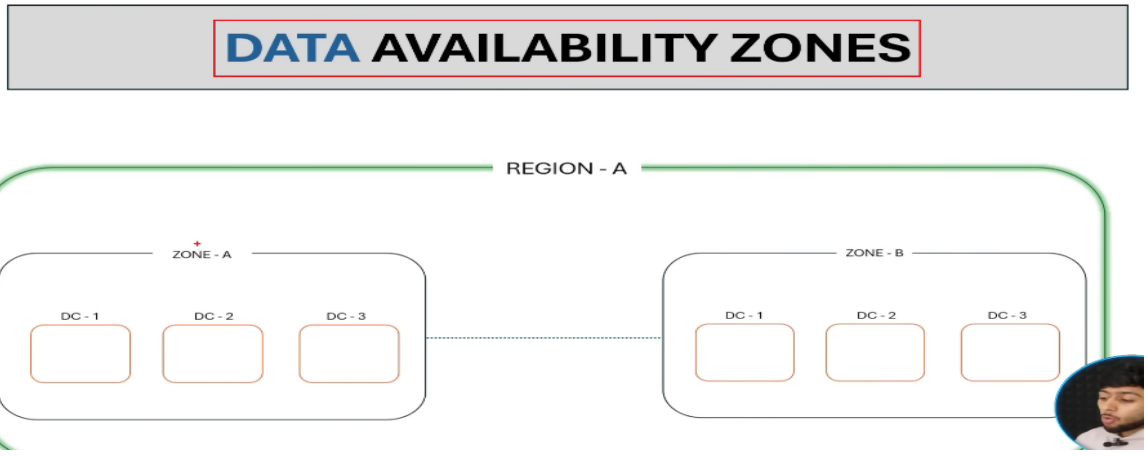
IaaS : Infrastructure as a service → Azure will simply provide the infrastructure eg. Virtual Machines, so once the VMs are ready Azure will not be responsible for any kind of upgrades or maintenance

PaaS: Platform as a Service → requesting for platform/application eg. Az SQL db (Managed by both Azure and us); we can configure the networking

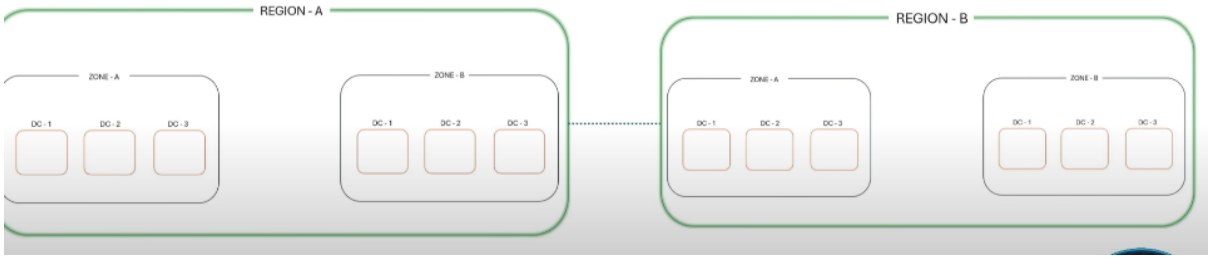
SaaS: Software as a Service → We only have to manage data, devices rest all by cloud eg. Fabric

Fault Tolerance

Azure replicates data to multiple Data Centers

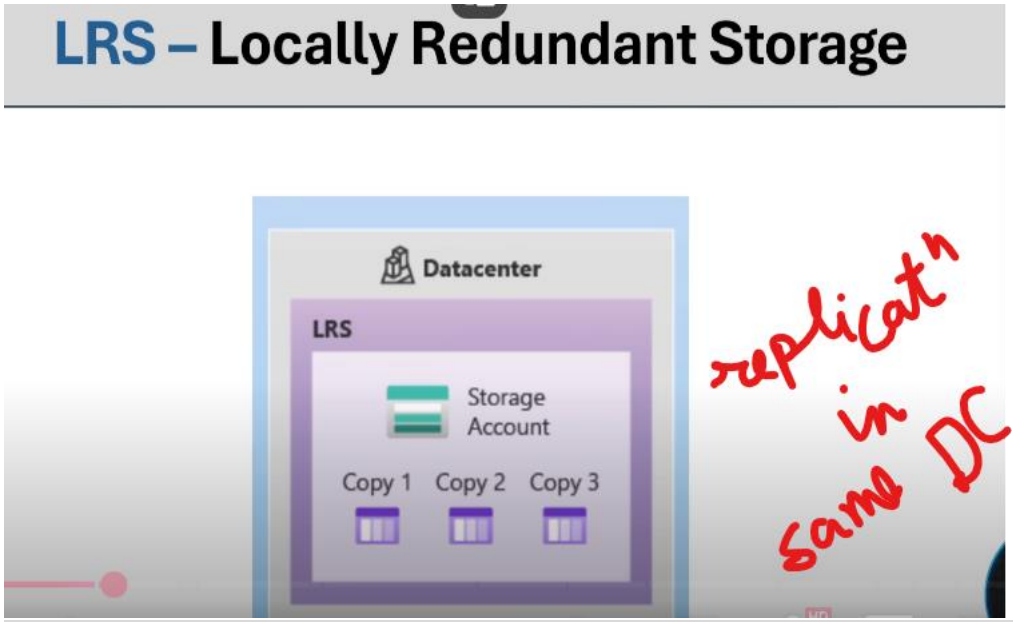


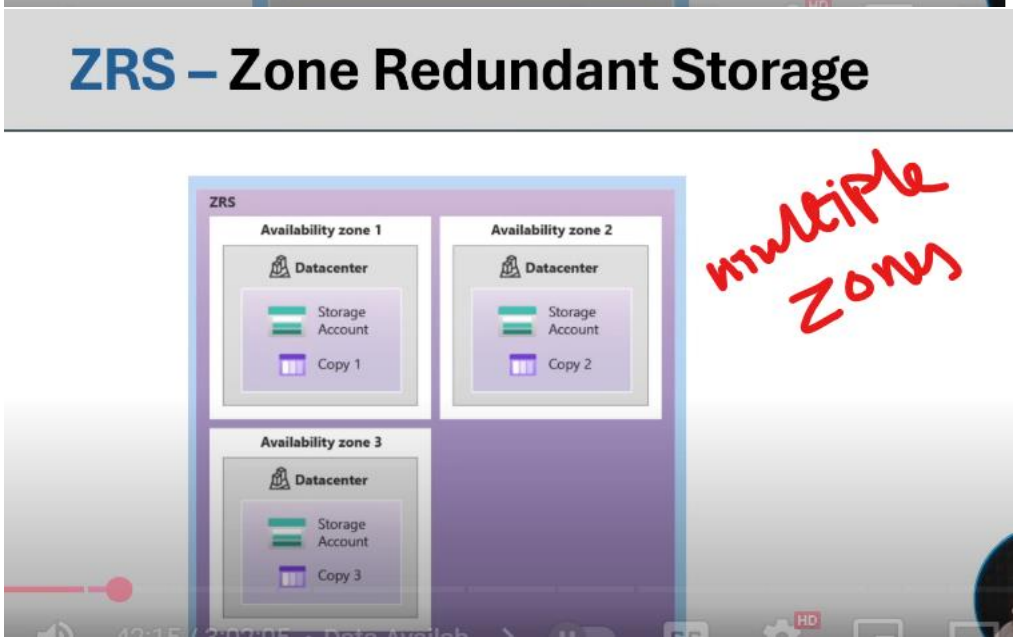
If one zone is effected, then another zone will be active

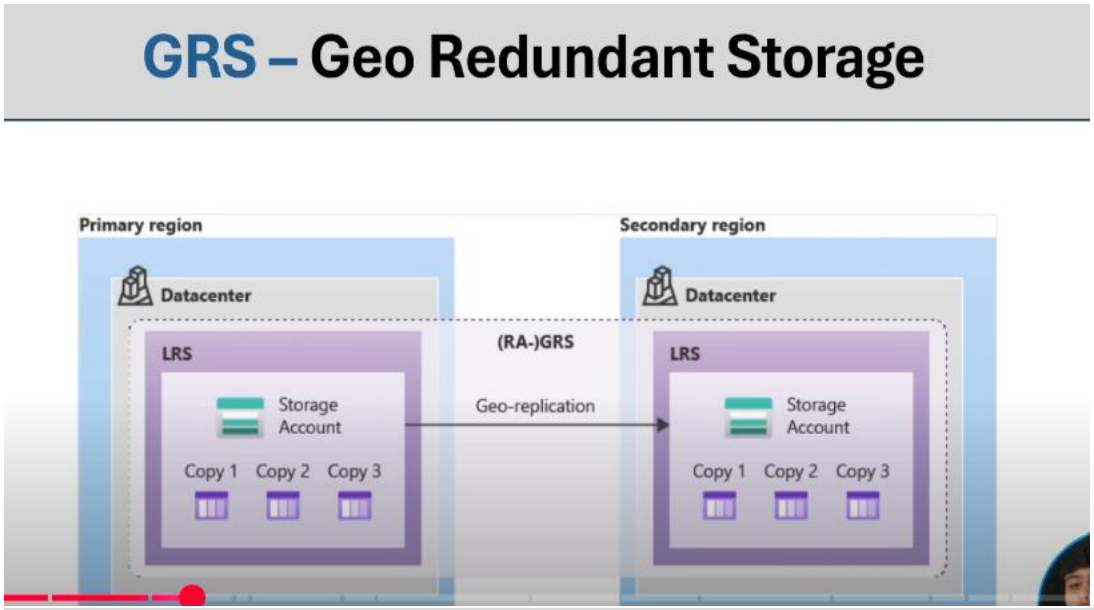


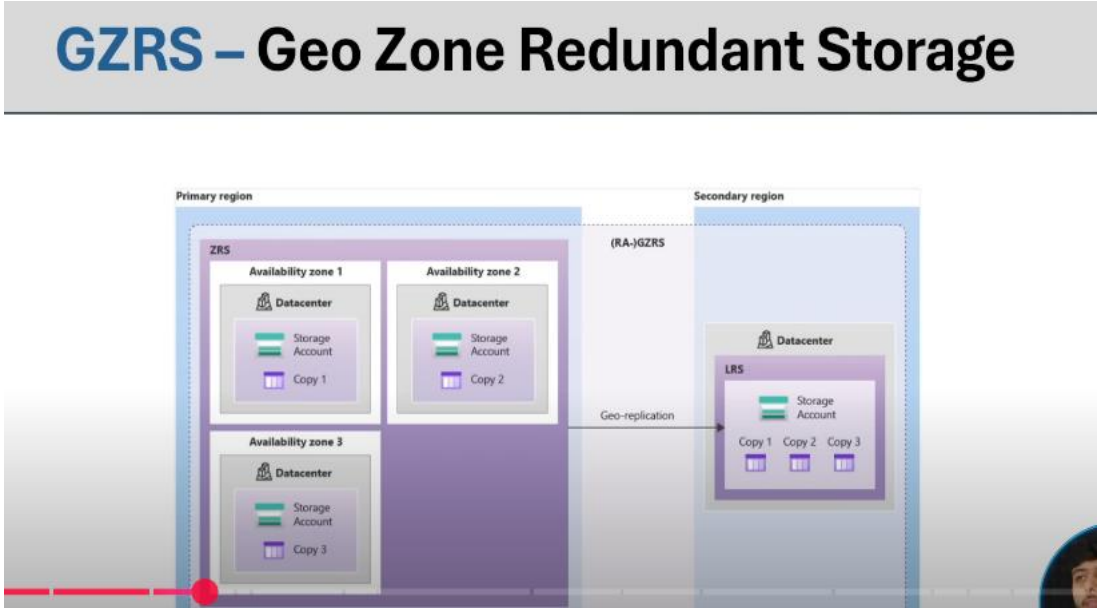
If entire region gets affected

That's the reason Azure gives 99.99% data availability

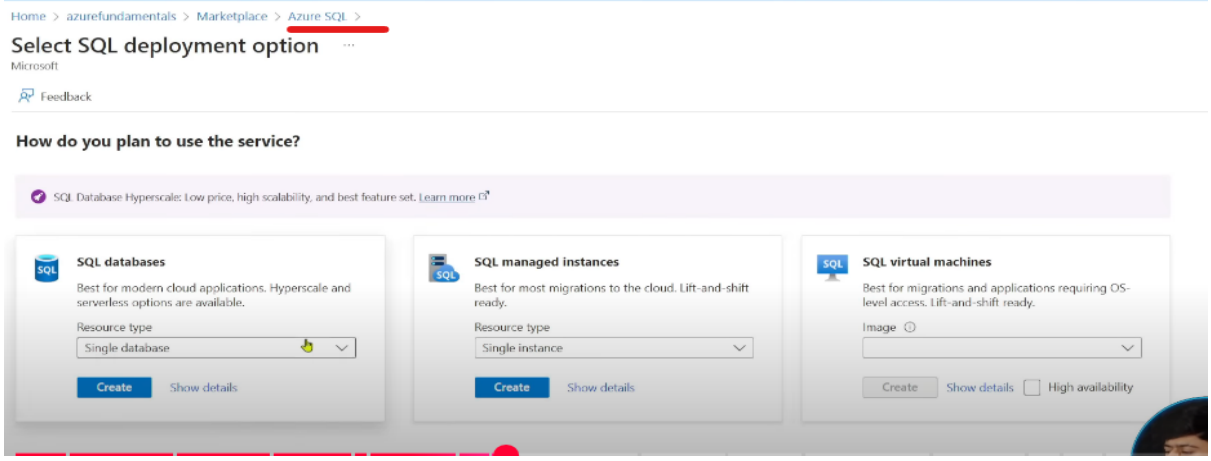




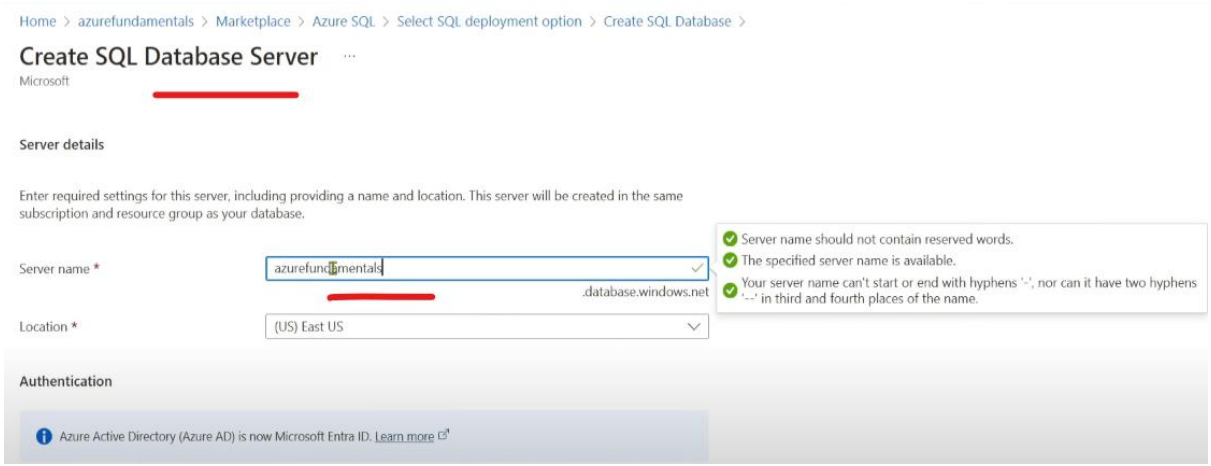


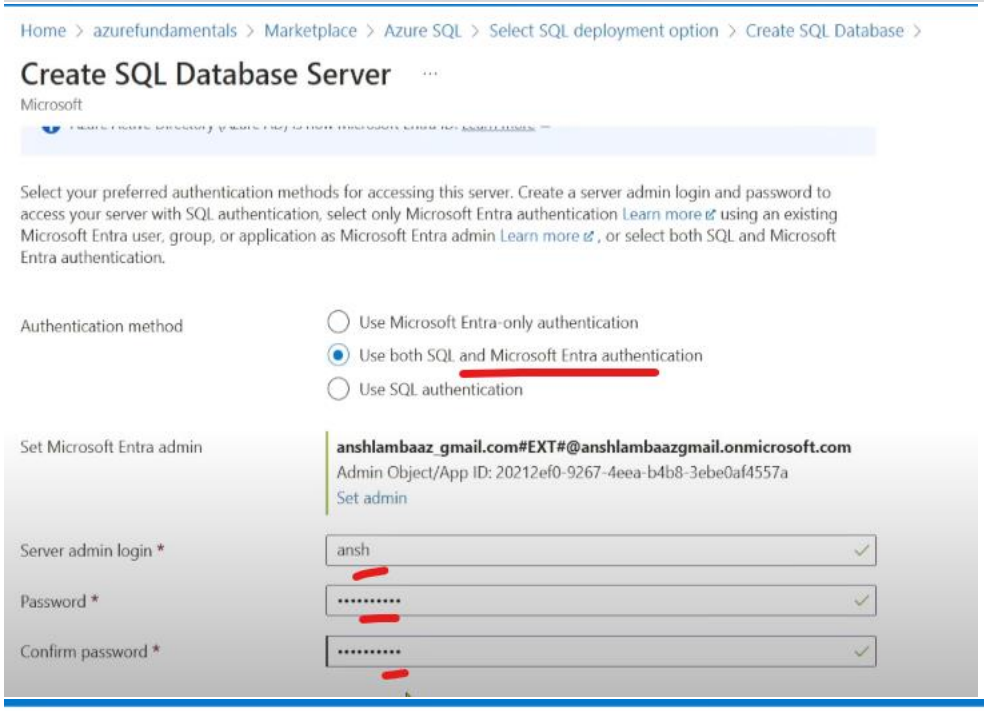


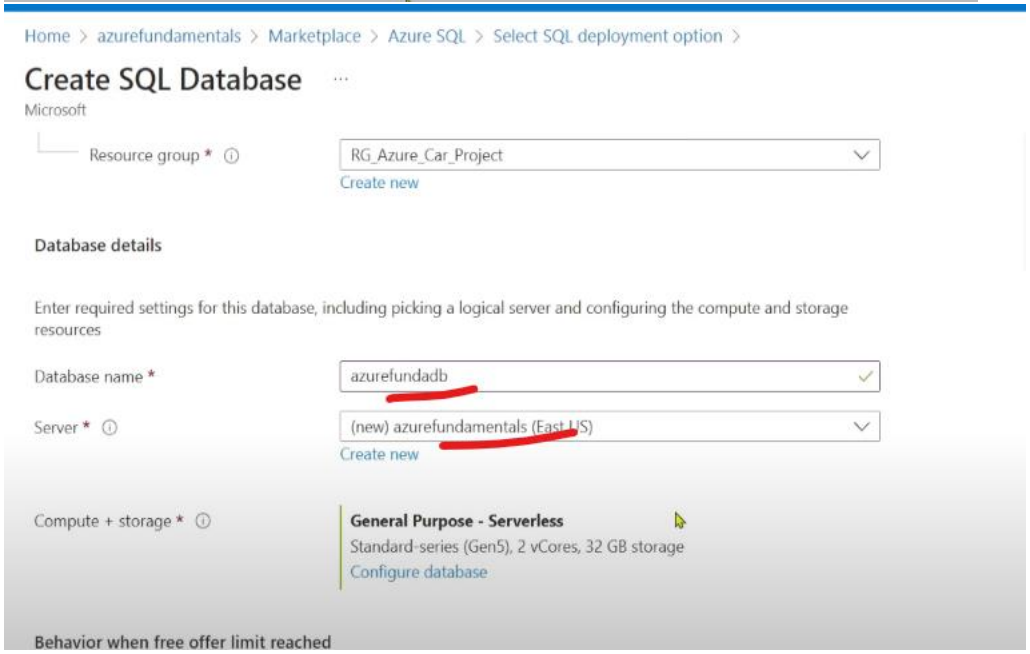
Now lets create Azure SQL database (for Structured data)
Search with Azure SQL → SQL databases

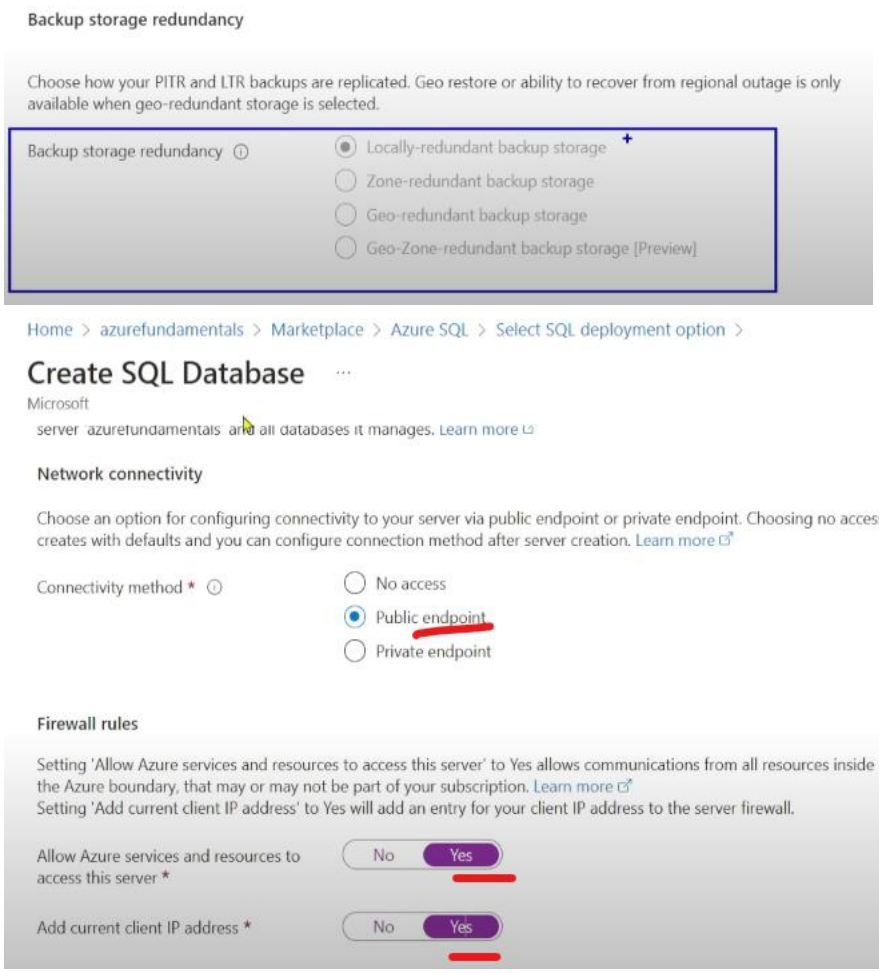


SQL managed instances: PaaS, SQL VM: IaaS

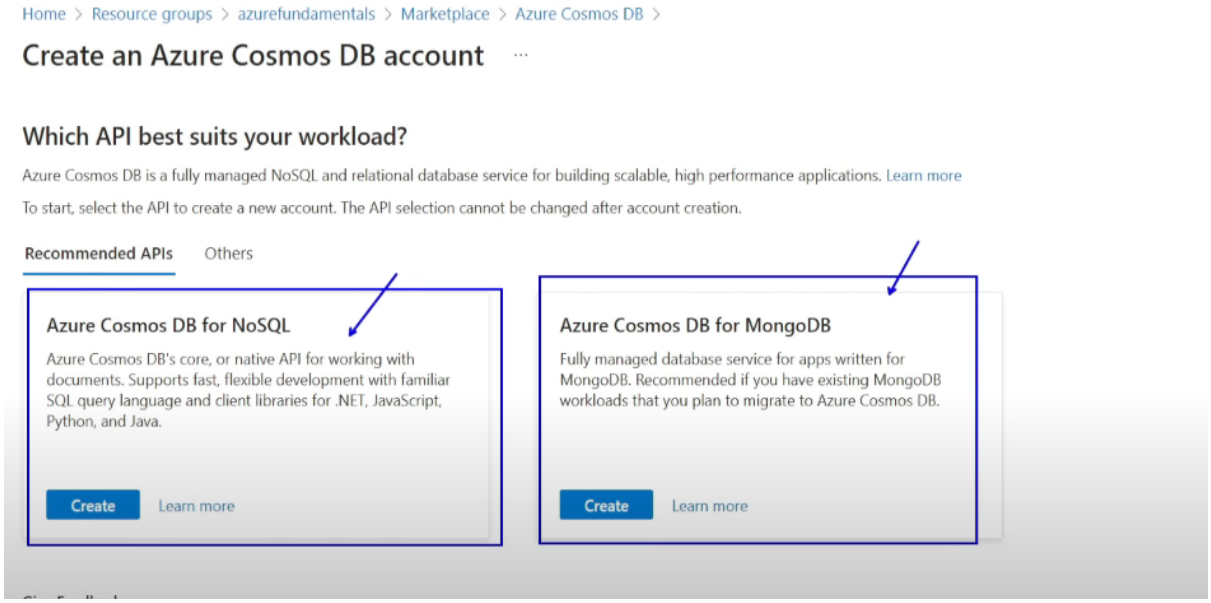

Home > azurefundamentals > Marketplace > Azure SQL > Select SQL deployment option > Create SQL Database >
Create SQL Database Server
Microsoft
Server details
Enter required settings for this server, including providing a name and location. This server will be created in the same subscription and resource group as your database.
Server name *
azurefundamentals
.database.windows.net
Server name should not contain reserved words.
The specified server name is available.
Your server name can't start or end with hyphens '-', nor can it have two hyphens '--' in third and fourth places of the name.
Location *
(US) East US
Authentication
Azure Active Directory (Azure AD) is now Microsoft Entra ID. Learn more


Home > azurefundamentals > Marketplace > Azure SQL > Select SQL deployment option > Create SQL Database >
Create SQL Database Server
Microsoft
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
anshlambaaz_gmail.com#EXT#@anshlambaazgmail.onmicrosoft.com
Admin Object/App ID: 20212ef0-9267-4eea-b4b8-3ebe0af4557a
Set admin
Server admin login *
ansh
Password *
Confirm password *

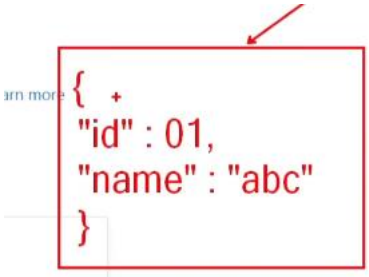

Home > azurefundamentals > Marketplace > Azure SQL > Select SQL deployment option >
Create SQL Database
Microsoft
Resource group *
RG_Azure_Car_Project
Create new
Database details
Enter required settings for this database, including picking a logical server and configuring the compute and storage resources
Database name *
azurefundadb
Server *
(new) azurefundamentals (East US)
Create new
Compute + storage *
General Purpose - Serverless
Standard-series (Gen5), 2 vCores, 32 GB storage
Configure database
Behavior when free offer limit reached



Now lets create Azure Cosmos db (for SemiStructured data/No SQL db→ Non Relational data)

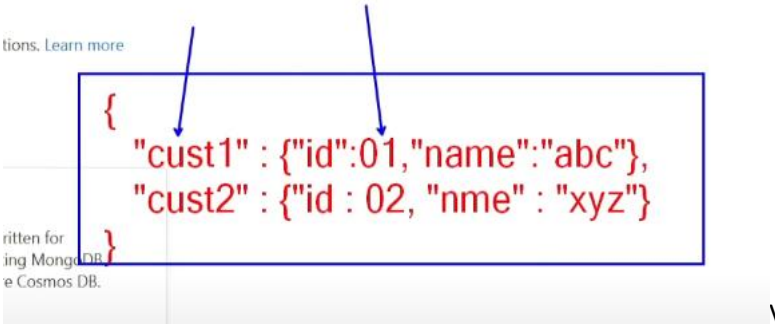


Azure Cosmos DB for NoSQL (previously Azure Core SQL) → mostly data in key value pair

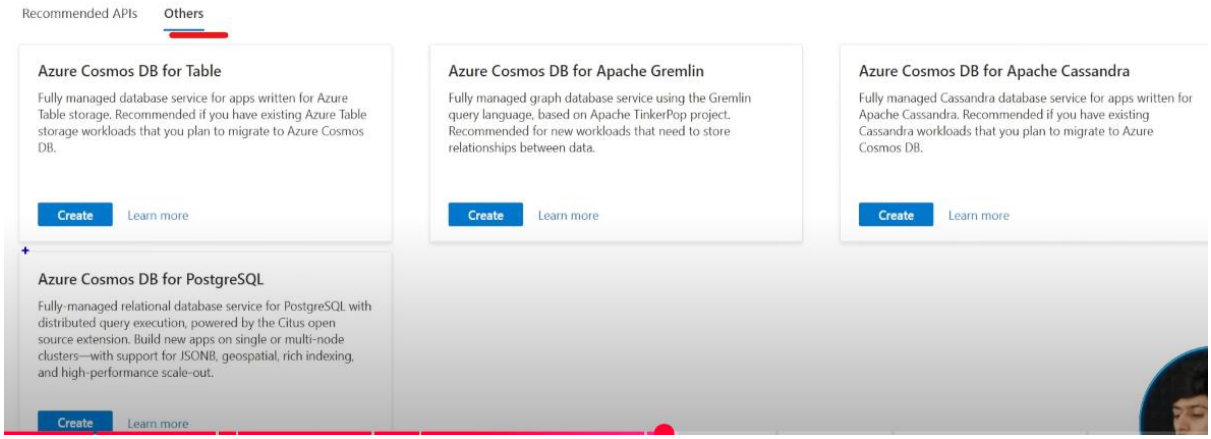


& we can use select query to operate on this data

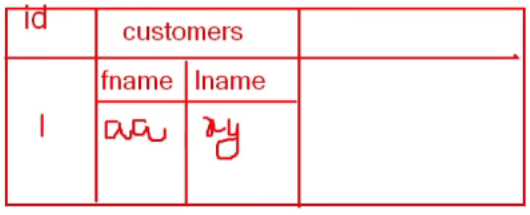
Azure Cosmos DB for MongoDB : special type of Azure Cosmos DB for NoSQL



Value is form of another child JSON



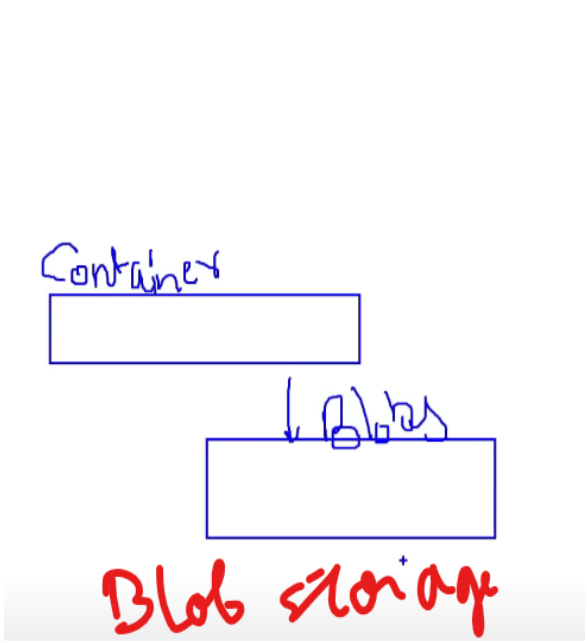
Azure Cosmos DB for Apache Gremlin : Graph databases (relation between nodes)
Azure Cosmos DB for Apache Cassandra: Hierarchy of columns within our data

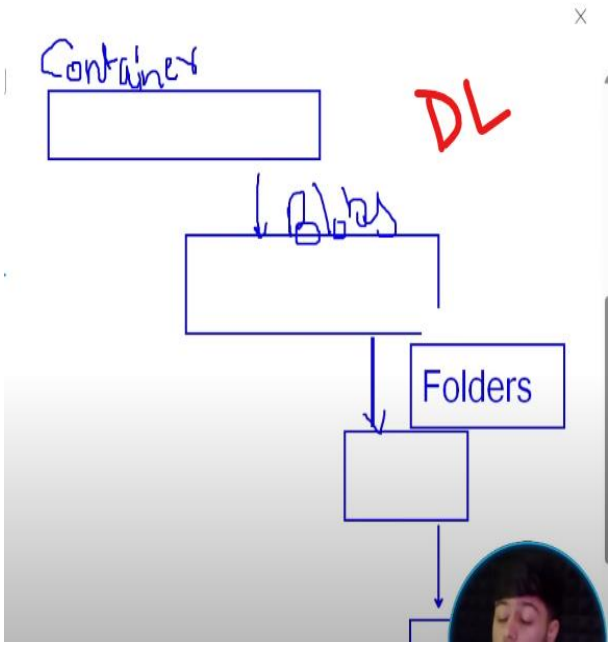


family of columns

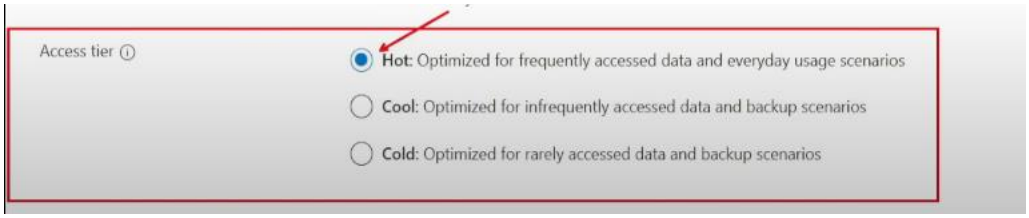
Blocks: when we store data in hard drive, it gets saved in form of Blocks, in Azure its get saved in Disks

Blobs: Data Lake is built on top of Blob Storage

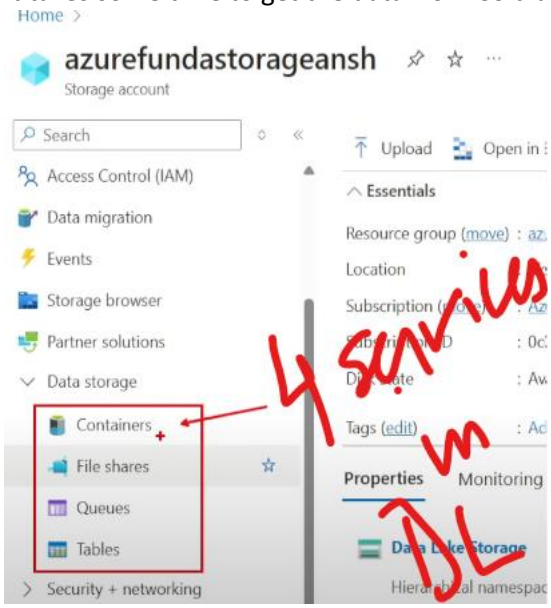




In Blobs, we cant create a directory under Blobs, in DL we can create hierarchy of folders

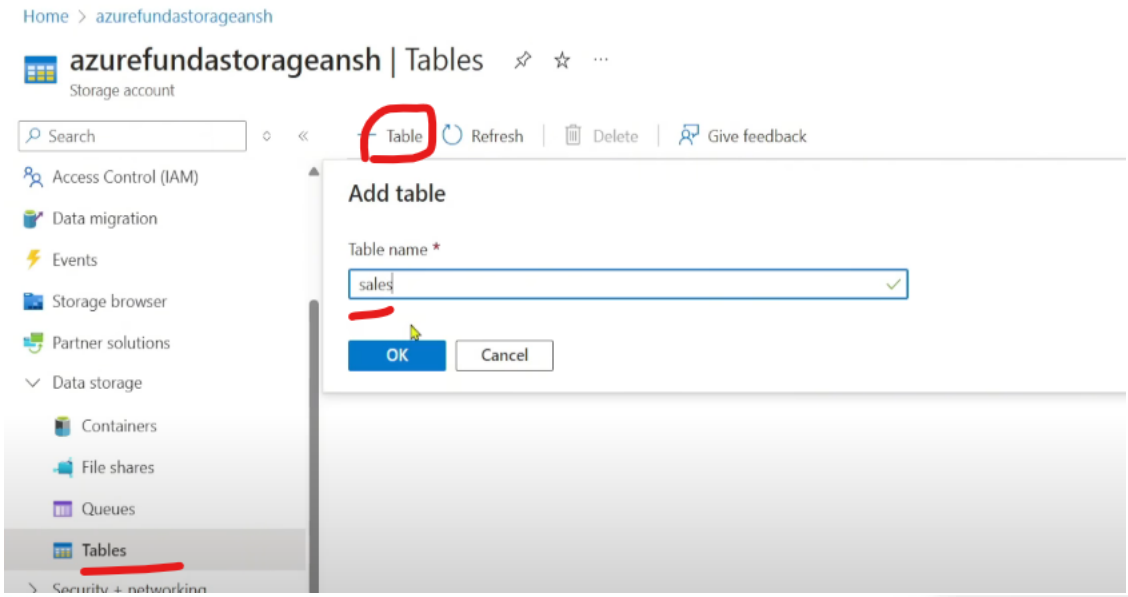


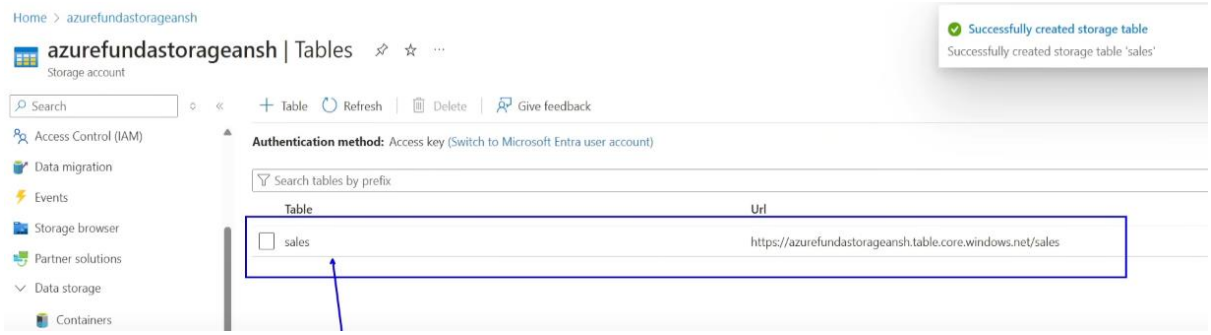
It takes some time to get the data from Cold and read it from there.



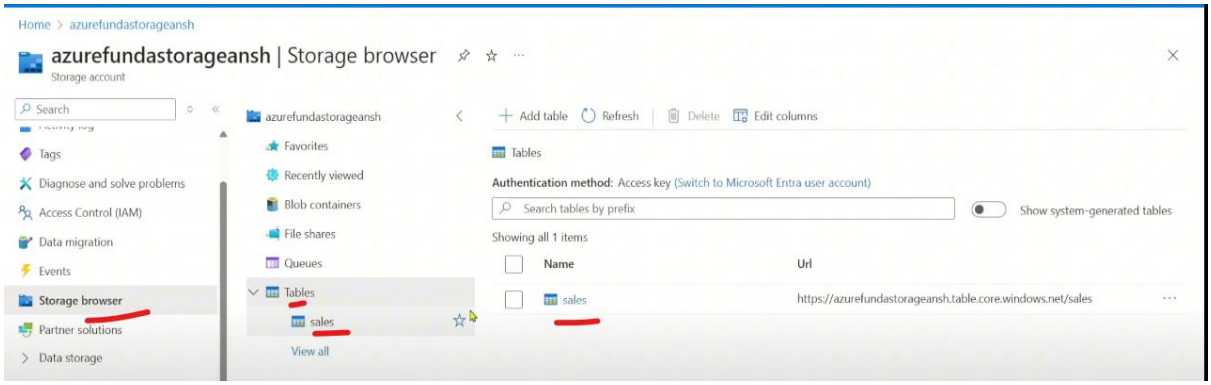
Containers : Data Lake
File Shares: lets say our org has 10-15 VMs, manager will push the files in central repository, to access the file for anyone in the team.
Queues: messaging service/real time data from IOT/sensors, data will come in Queues in form of packets in FIFO
Tables: semi structured data(key value data)

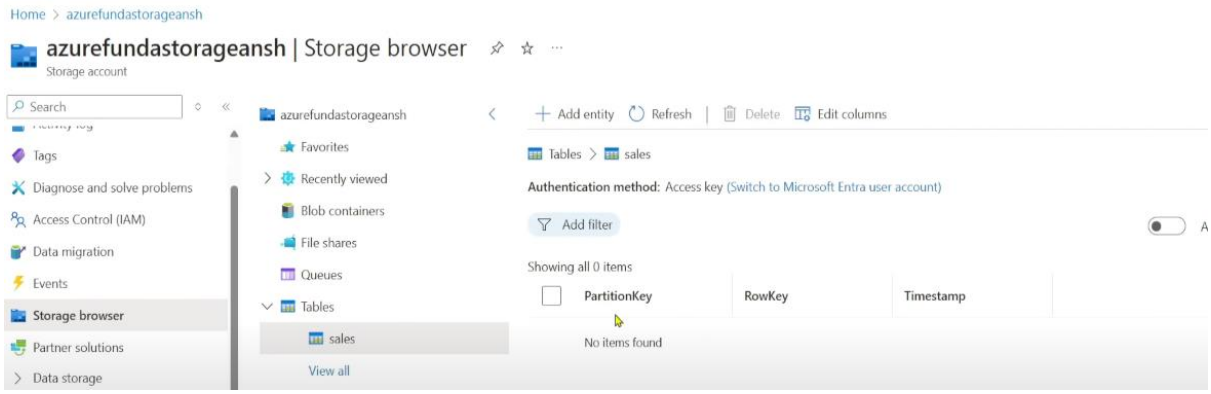
Lets create a Table





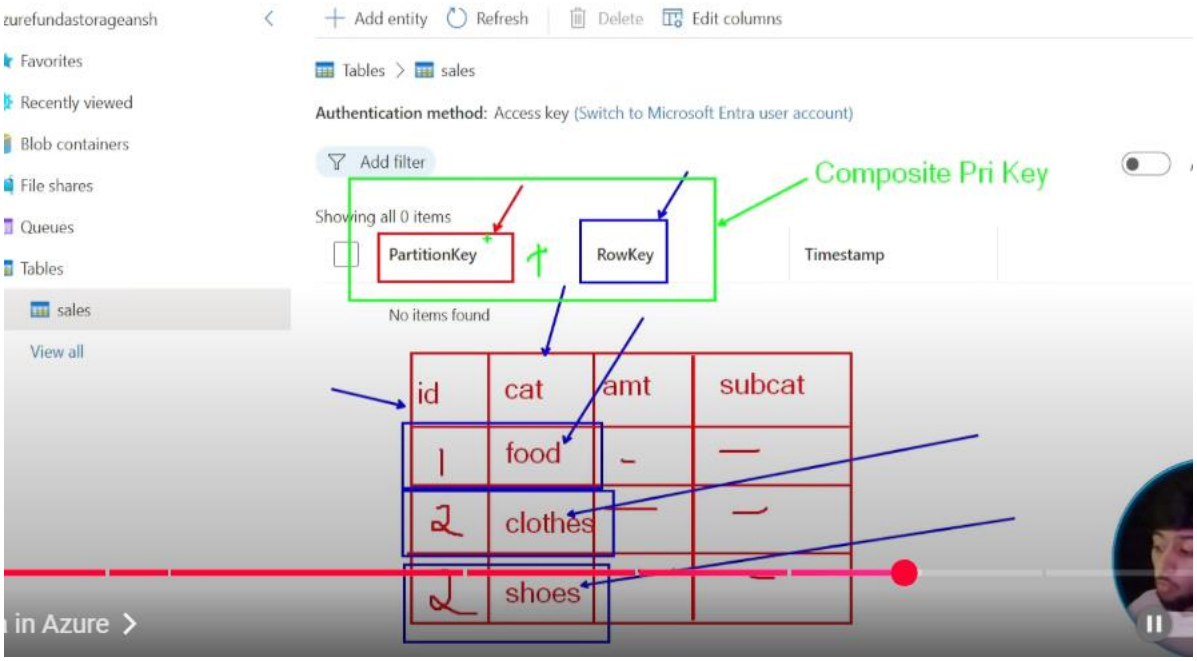
But we cant do anything over here, we have to go to Storage Browser



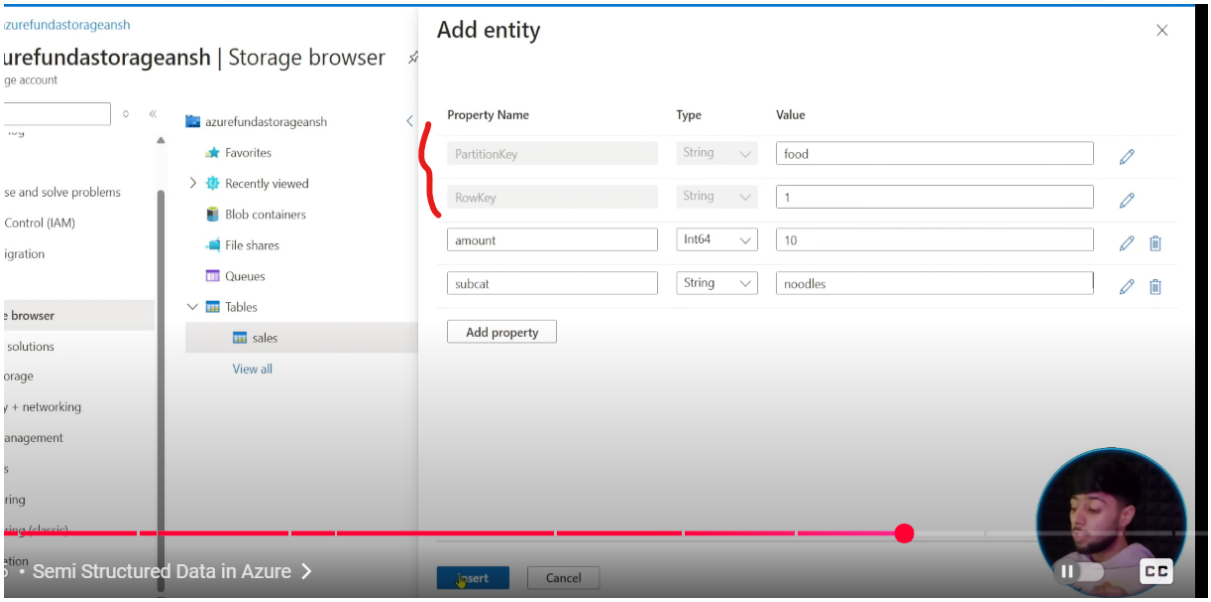


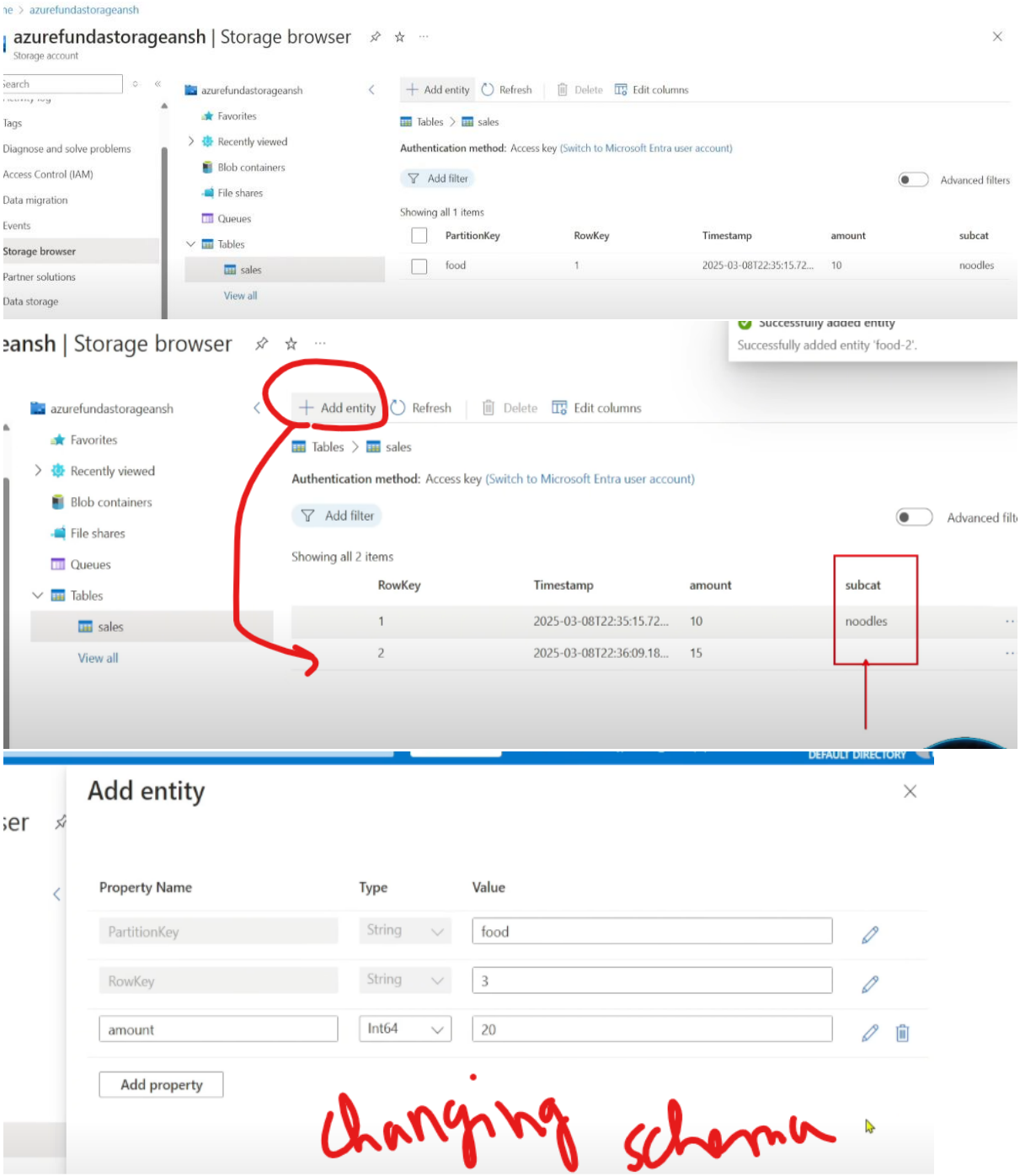
Rowkey : primary key for each partitions , combination of both PartitionKey and RowKey are treated as Composite Primary Key

Lets say PartitionKey is cat and RowKey is id

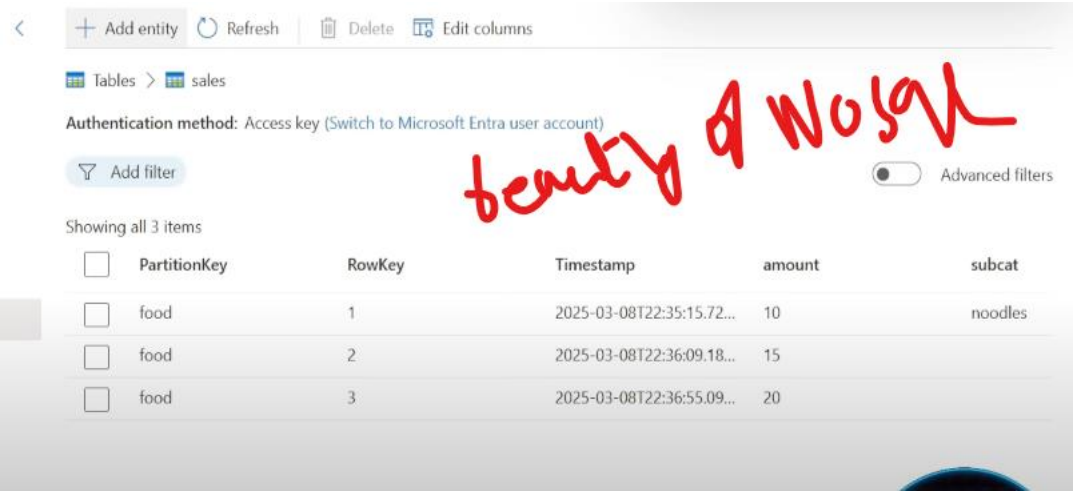


Click on Add Entity



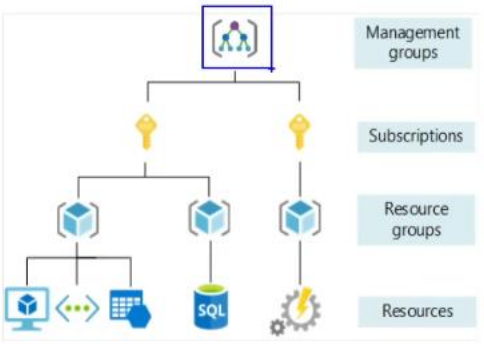

azurefundastorageansh | Storage browser
Storage account
Search
Tags
Diagnose and solve problems
Access Control (IAM)
Data migration
Events
Storage browser
Partner solutions
Data storage
azurefundastorageansh
Favorites
Recently viewed
Blob containers
File shares
Queues
Tables
sales
View all
Add entity
Refresh
Delete
Edit columns
Tables > sales
Authentication method: Access key (Switch to Microsoft Entra user account)
Add filter
Advanced filters
Showing all 1 items
PartitionKey
RowKey
Timestamp
amount
subcat
food
1
2025-03-08T22:35:15.72...
10
noodles
Successfully added entity
Successfully added entity 'food-2'.
eansh | Storage browser
Showing all 2 items
RowKey
Timestamp
amount
subcat
1
2025-03-08T22:35:15.72...
10
noodles
2
2025-03-08T22:36:09.18...
15
DEFAULT DIRECTORY

Add entity
Property Name
Type
Value
PartitionKey
String
food
RowKey
String
3
amount
Int64
20
Add property
changing schema



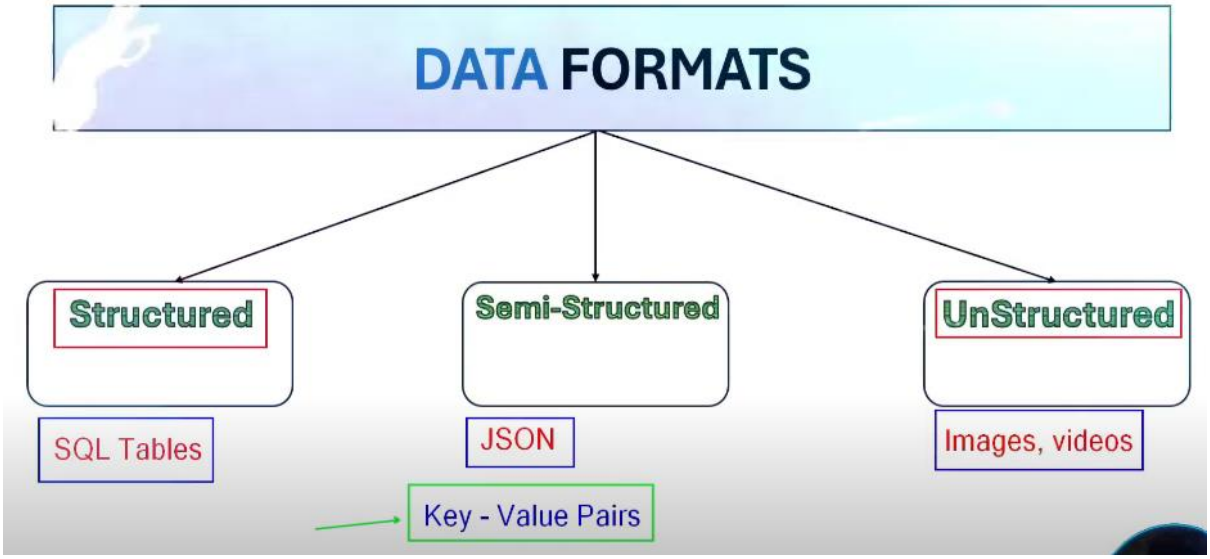
Management levels and hierarchy

Azure provides four levels of management: management groups, subscriptions, resource groups, and resources. The following diagram shows the relationship between these levels.

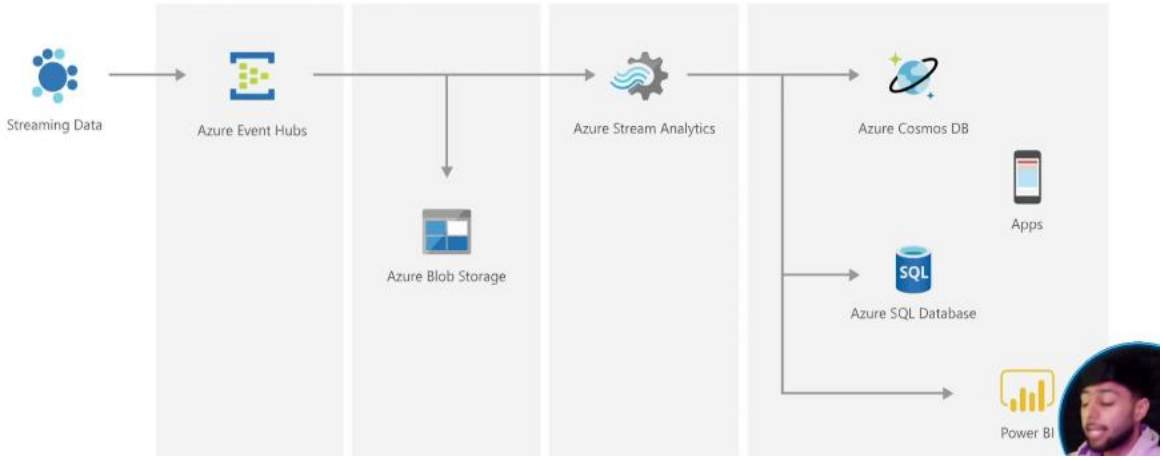


Management Groups/Tenants: Owner of the platform/Domain
Subscriptions: Purpose → To have different bills for different departments of the company
RG: folder to hold those resources

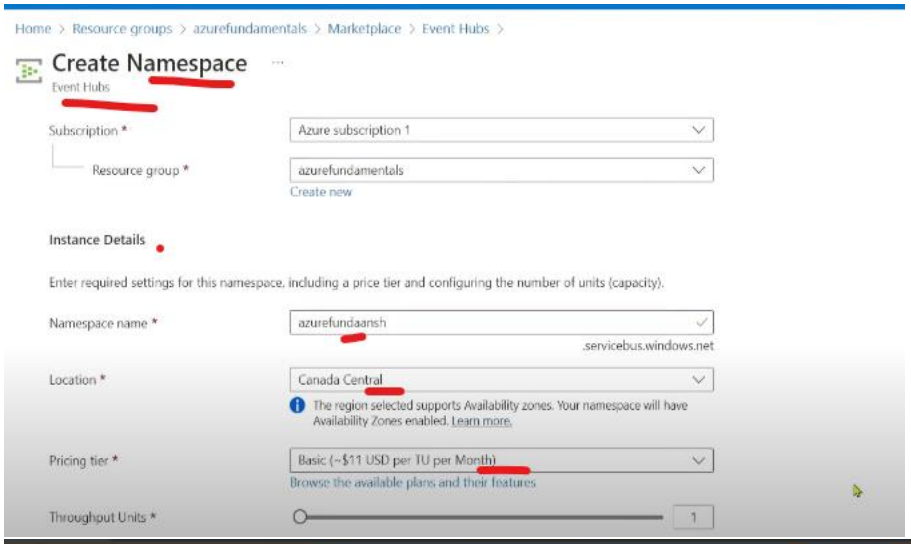
Entra ID: kind of Admin portal where we can manage users/MI/SPN

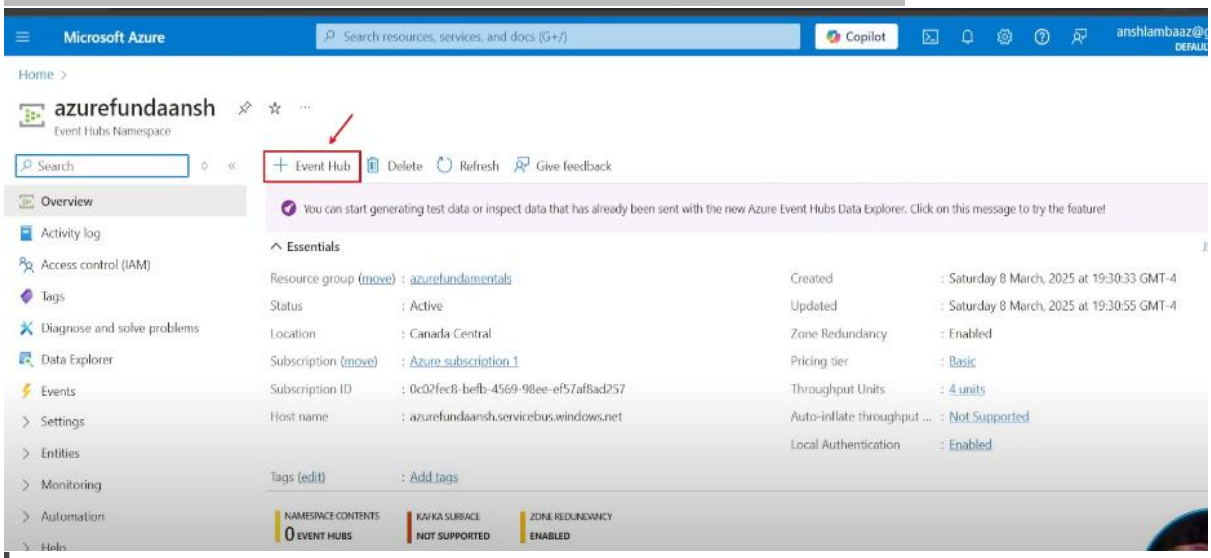


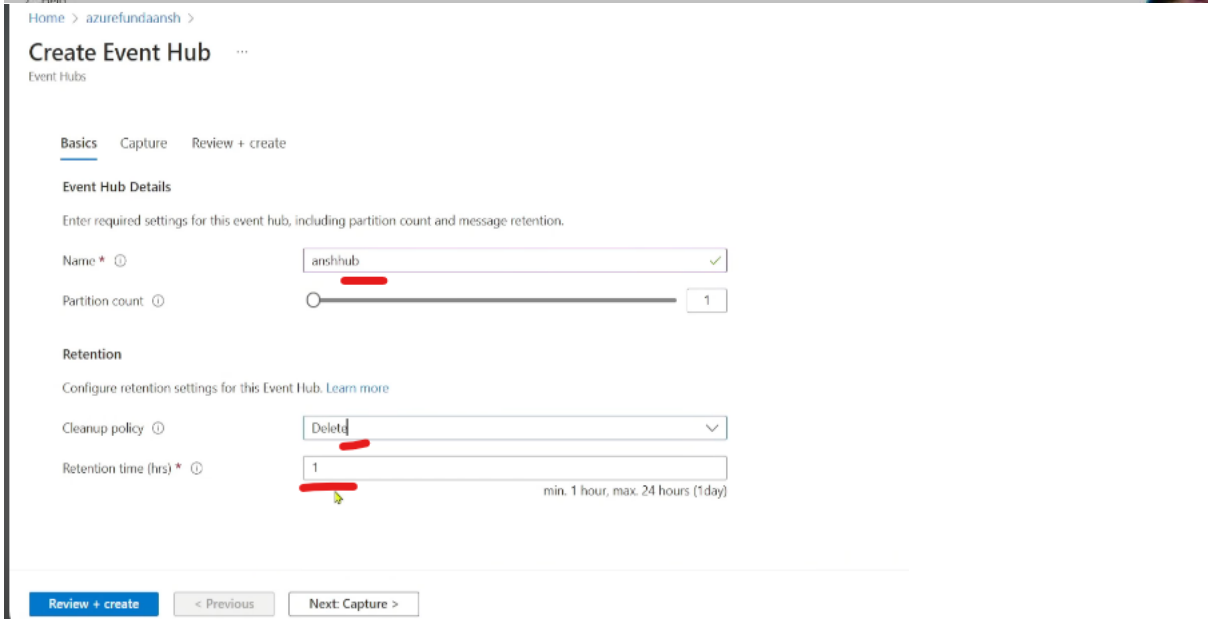
Structured: columns/rows, proper schema or structure
Semi-Structured: structure which is not fixed
UnStructured: mostly using in AI



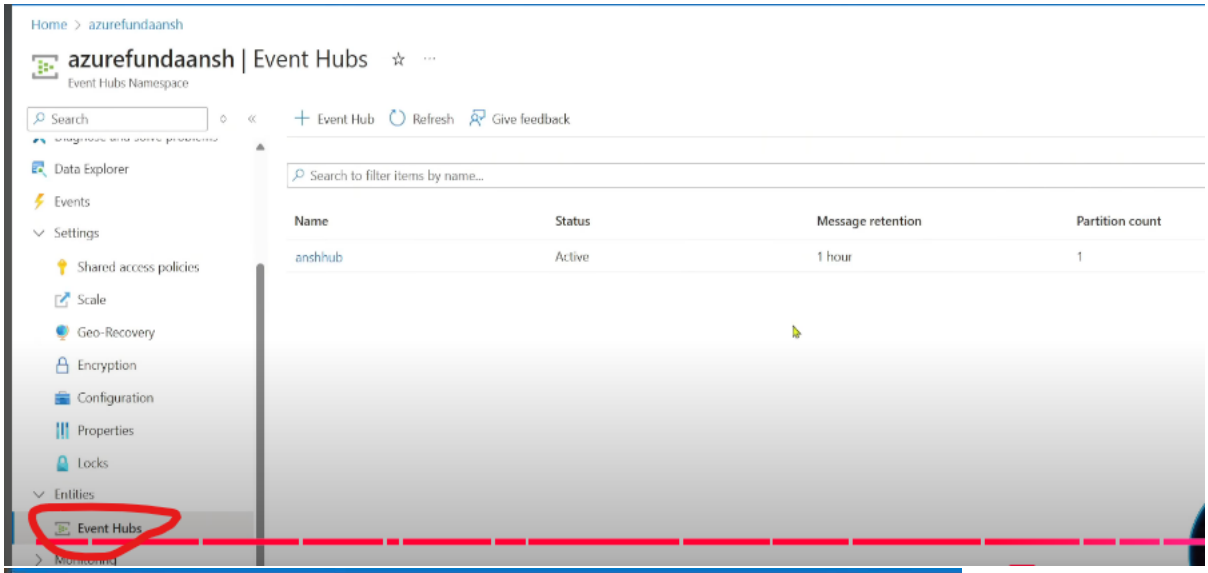
Event Hubs ingest data in real time manner and also provides us a temporary solution to store the data (for few days), these data will be consumed by Stream Analytics & Blob Storage.
Event Hubs are alternative to Apache Kafka, EV holds data in form of Events whereas AK holds data in form of Messages.
Stream Analytics → processing tool for data transformation

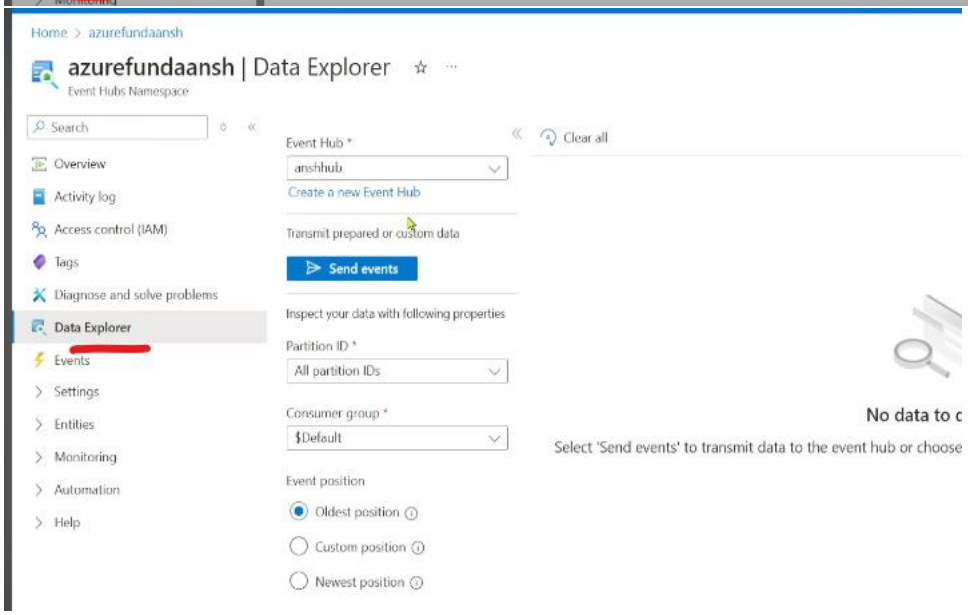




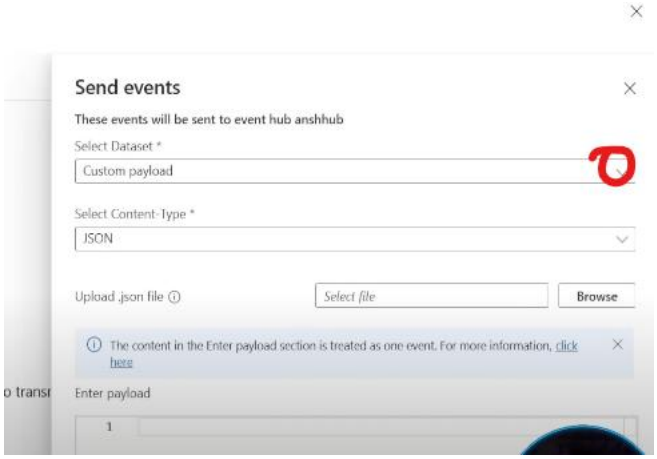


Retention time : time the data will stay in EH

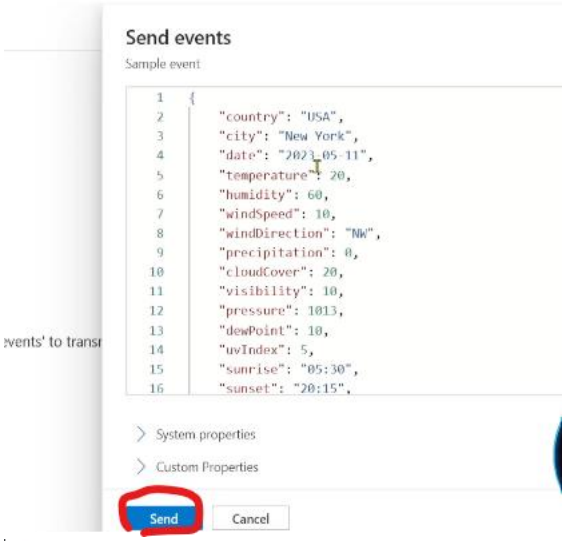


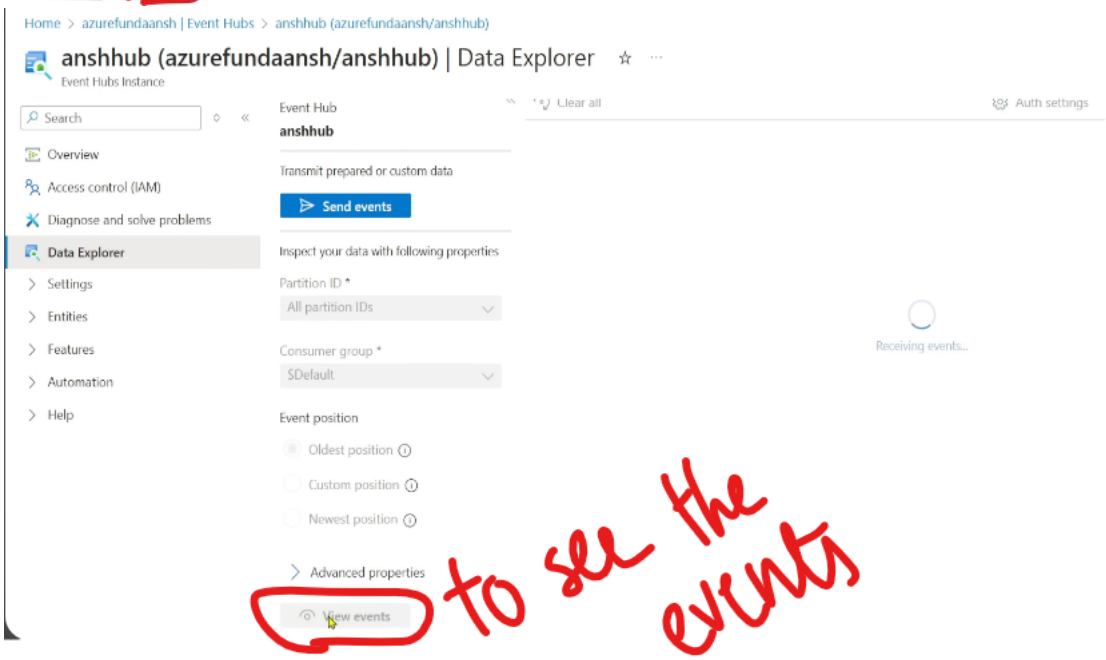


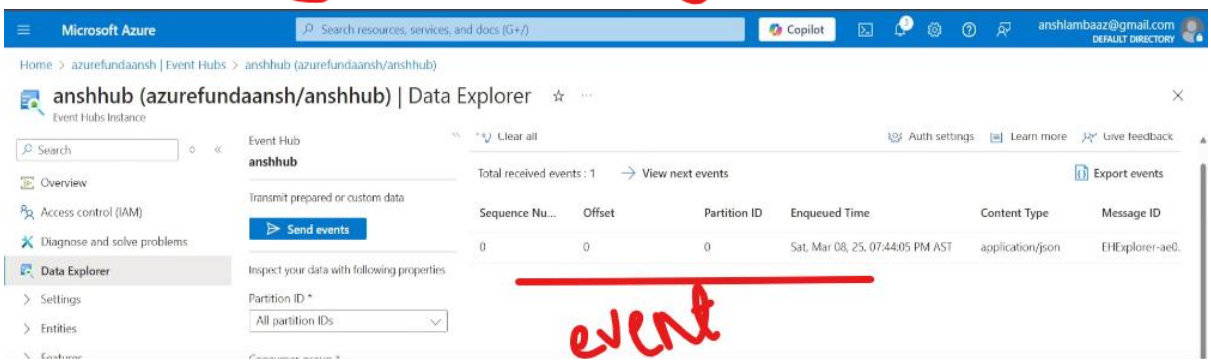
Send Events : provide a Streaming source and create a data to get ingested



Choose a sample template


Send events
Sample event
{
"country": "USA",
"city": "New York",
"date": "2023-05-11",
"temperature": 20,
"humidity": 60,
"windSpeed": 10,
"windDirection": "NW",
"precipitation": 0,
"cloudCover": 20,
"visibility": 10,
"pressure": 1013,
"dewPoint": 10,
"uvIndex": 5,
"sunrise": "05:30",
"sunset": "20:15",
System properties
Custom Properties
Send
Cancel


Home > azurefundaansh | Event Hubs > anshhub (azurefundaansh/anshhub)
anshhub (azurefundaansh/anshhub) | Data Explorer
Event Hubs Instance
Search
Overview
Access control (IAM)
Diagnose and solve problems
Data Explorer
Settings
Entities
Features
Automation
Help
Event Hub
anshhub
Transmit prepared or custom data
Send events
Inspect your data with following properties
Partition ID *
All partition IDs
Consumer group *
$Default
Event position
Oldest position
Custom position
Newest position
Advanced properties
View events
Clear all
Auth settings
Receiving events...
to see the events


Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
anshlambaaz@gmail.com
DEFAULT DIRECTORY
Home > azurefundaansh | Event Hubs > anshhub (azurefundaansh/anshhub)
anshhub (azurefundaansh/anshhub) | Data Explorer
Event Hubs Instance
Search
Overview
Access control (IAM)
Diagnose and solve problems
Data Explorer
Settings
Entities
Event Hub
anshhub
Transmit prepared or custom data
Send events
Inspect your data with following properties
Partition ID *
All partition IDs
Clear all
Auth settings
Learn more
Give feedback
Total received events : 1
View next events
Export events
Sequence Nu...
Offset
Partition ID
Enqueued Time
Content Type
Message ID
0
0
0
Sat, Mar 08, 25, 07:44:05 PM AST
application/json
EHExplorer-ae0.
event