

Lab17 – Understanding Geo-Redundant Storage (GRS) - Azure

Geo-redundant storage (GRS)

Geo-redundant storage (GRS) is designed to provide at least 99.99999999999999% (16 9's) durability of objects over a given year by replicating your data to a secondary region that is hundreds of miles away from the primary region. If your storage account has GRS enabled, then your data is durable even in the case of a complete regional outage or a disaster in which the primary region isn't recoverable.

If you opt for GRS, you have two related options to choose from:

- GRS replicates your data to another data center in a secondary region, but that data is available to be read only if Microsoft initiates a failover from the primary to secondary region.
- Read-access geo-redundant storage (RA-GRS) is based on GRS. RA-GRS replicates your data to another data center in a secondary region, and also provides you with the option to read from the secondary region. With RA-GRS, you can read from the secondary region regardless of whether Microsoft initiates a failover from the primary to secondary region.

For a storage account with GRS or RA-GRS enabled, all data is first replicated with locally redundant storage (LRS). An update is first committed to the primary location and replicated using LRS. The update is then replicated asynchronously to the secondary region using GRS. When data is written to the secondary location, it's also replicated within that location using LRS.

Both the primary and secondary regions manage replicas across separate fault domains and upgrade domains within a storage scale unit. The storage scale unit is the basic replication unit within the datacenter. Replication at this level is provided by LRS; for more information, see [Locally redundant storage \(LRS\): Low-cost data redundancy for Azure Storage](#).

Keep these points in mind when deciding which replication option to use:

- Zone-redundant storage (ZRS) provides highly availability with synchronous replication and may be a better choice for some scenarios than GRS or RA-GRS. For more information on ZRS, see [ZRS](#).

- Asynchronous replication involves a delay from the time that data is written to the primary region, to when it is replicated to the secondary region. In the event of a regional disaster, changes that haven't yet been replicated to the secondary region may be lost if that data can't be recovered from the primary region.
- With GRS, the replica isn't available for read or write access unless Microsoft initiates a failover to the secondary region. In the case of a failover, you'll have read and write access to that data after the failover has completed. For more information, please see [Disaster recovery guidance](#).
- If your application needs to read from the secondary region, enable RA-GRS.

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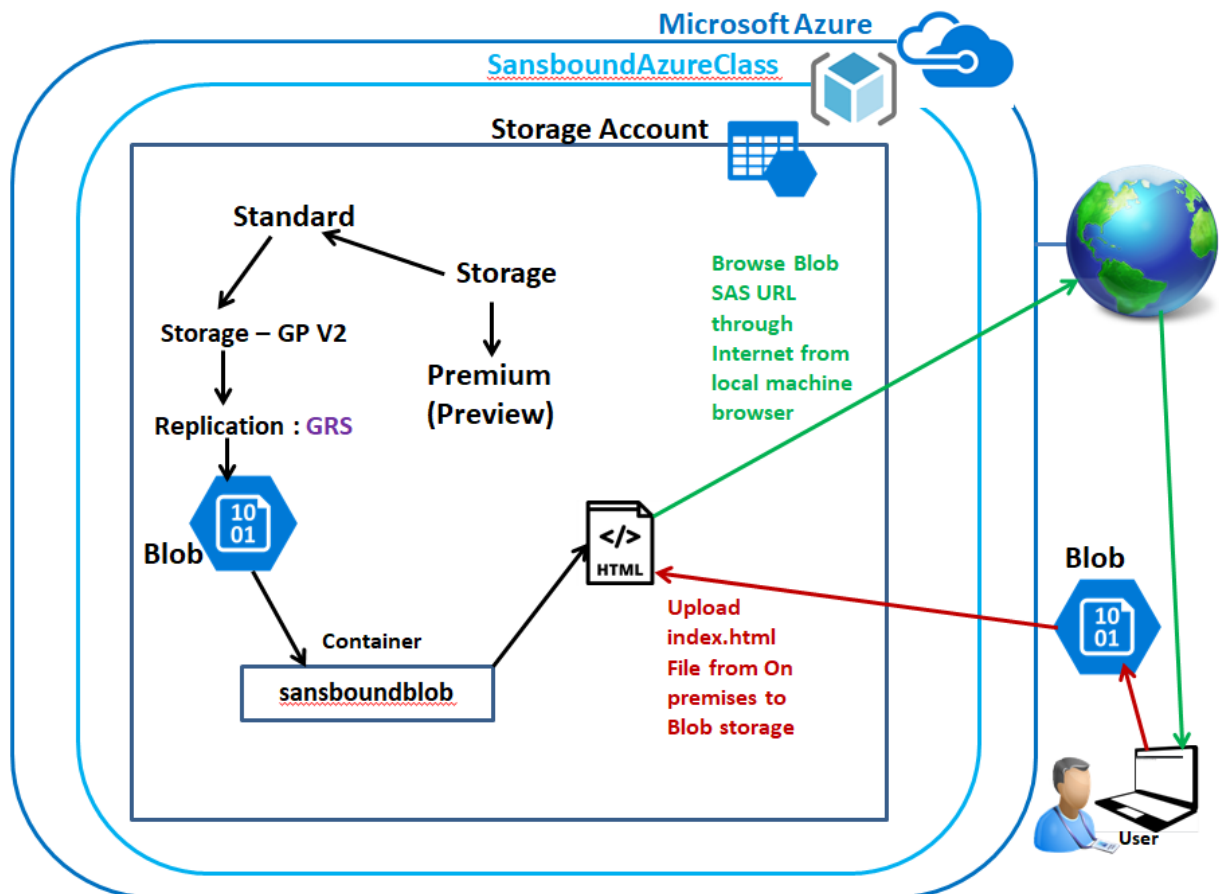
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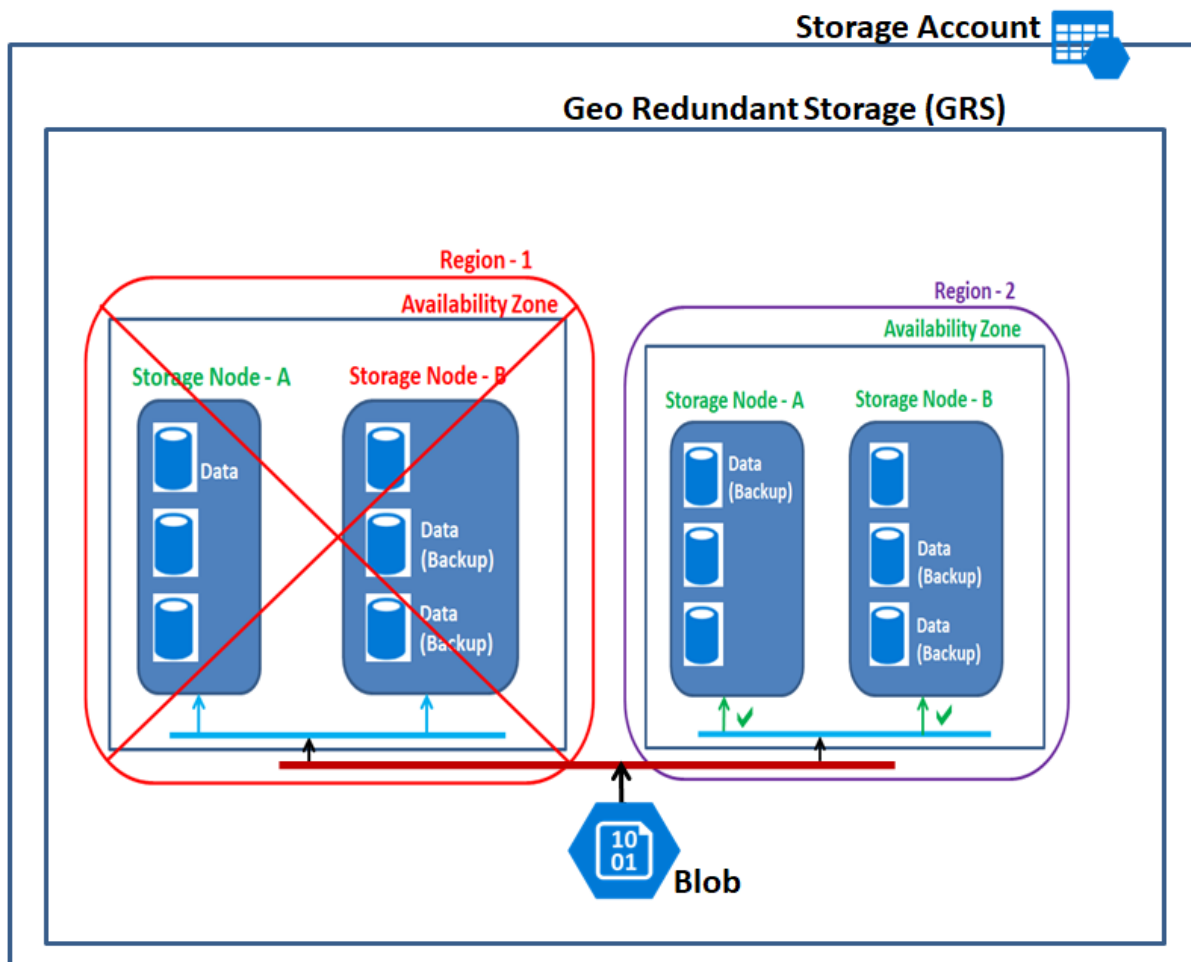
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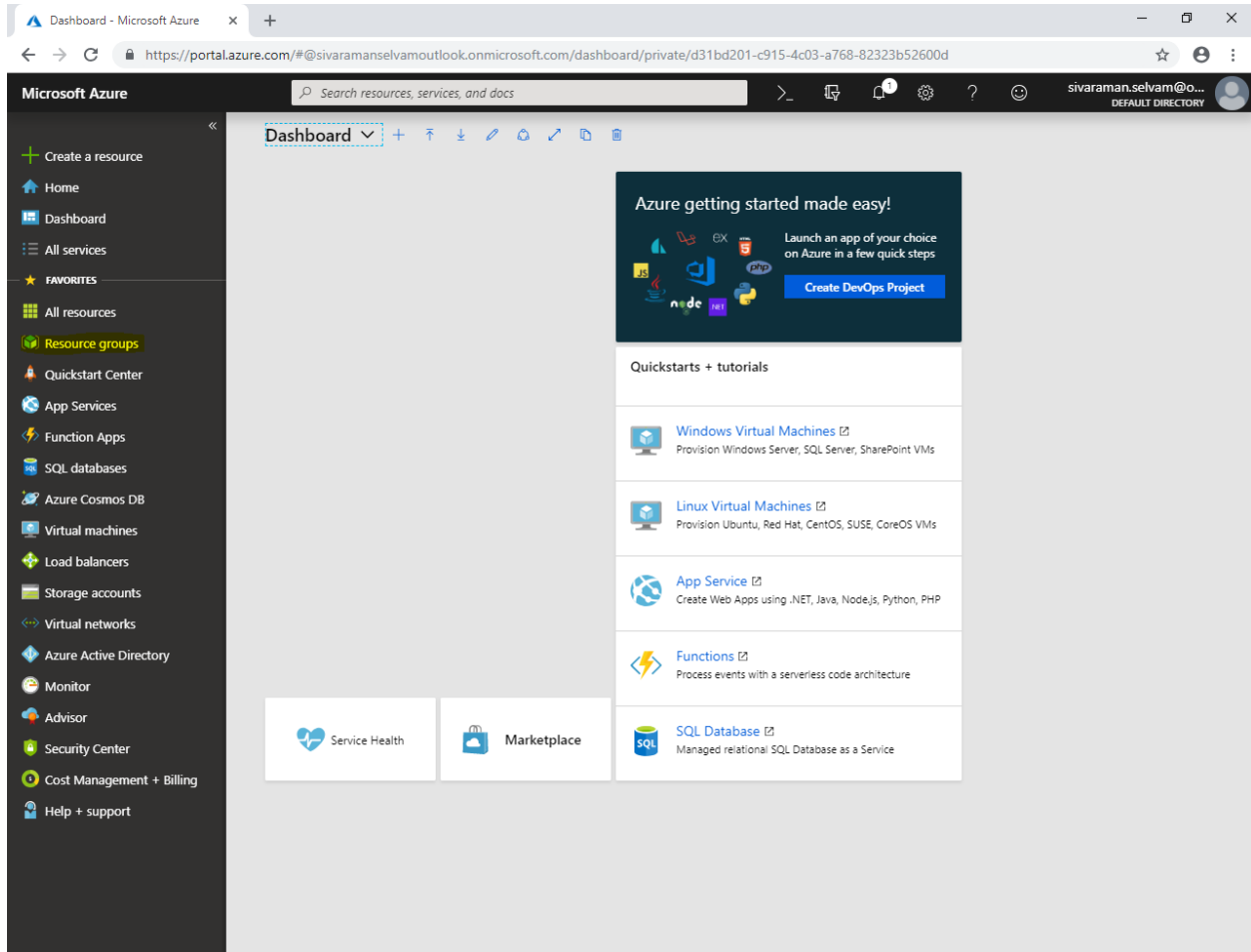
Topology:



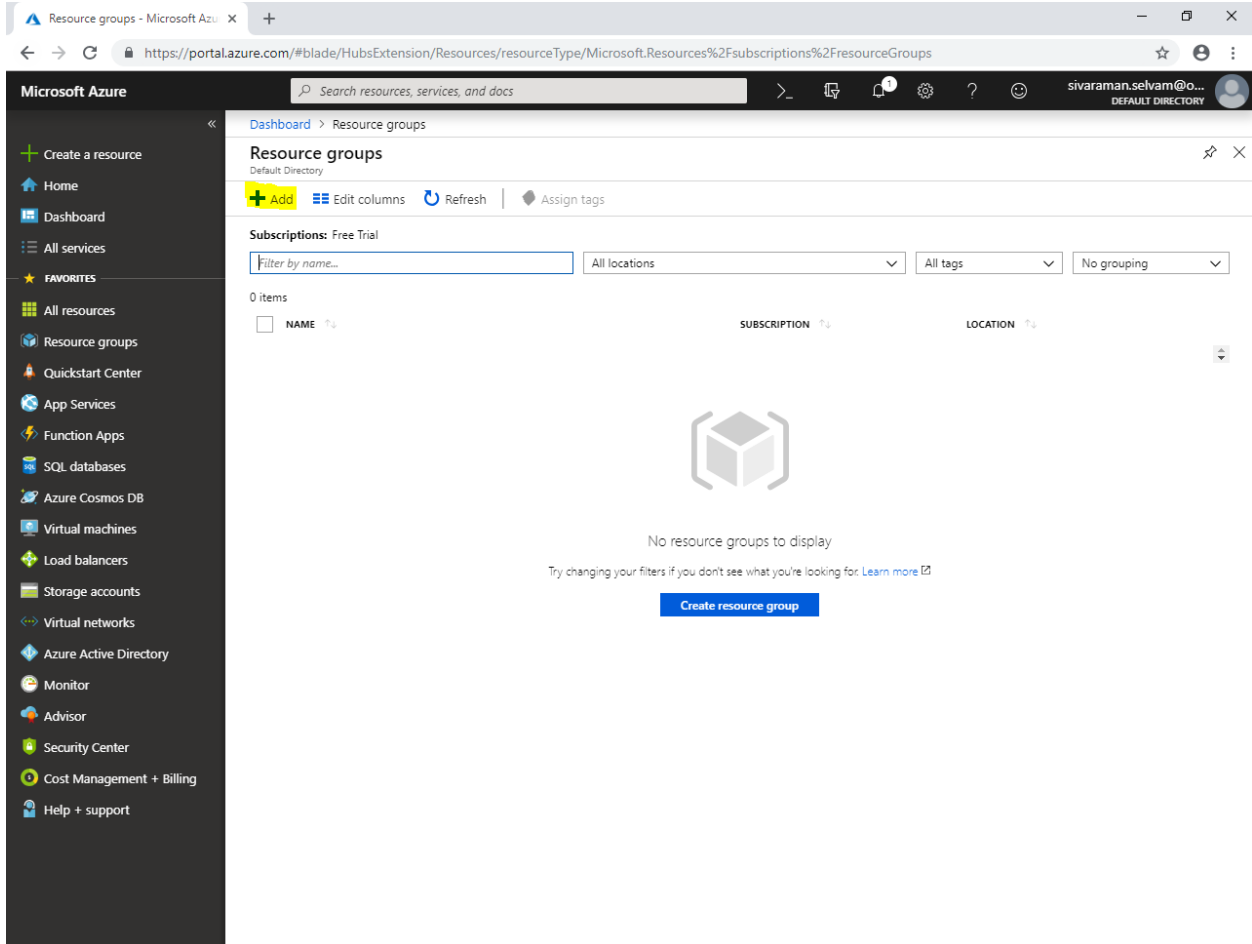
Back-End Topology (GRS):



In Azure portal, click **“Resource groups”**.



Click **"Add"**.



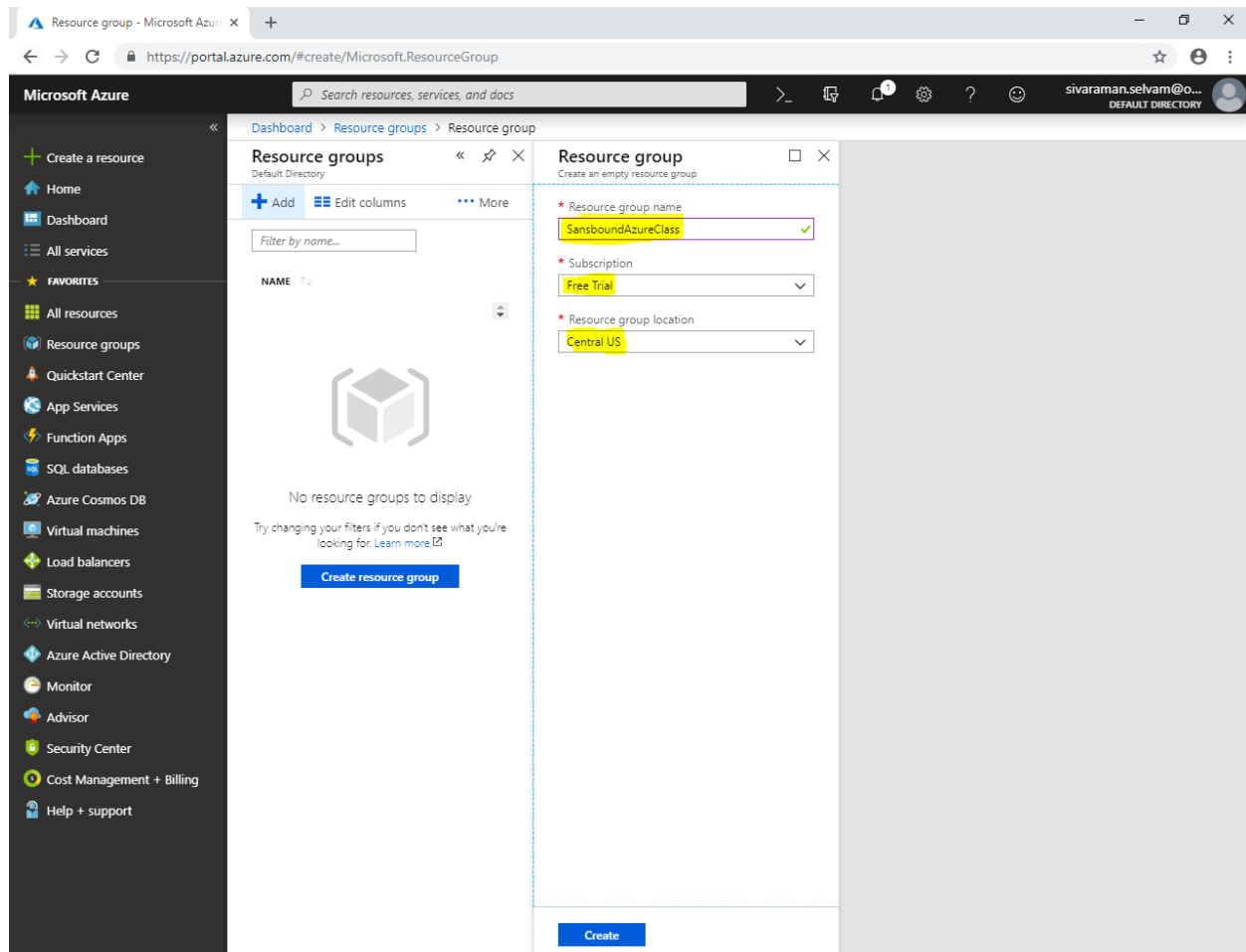
The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the 'Resource groups - Microsoft Azure' tab and a search bar. The left sidebar lists various Azure services and tools. The main content area is titled 'Resource groups' and displays a table with 0 items. A large blue button labeled 'Create resource group' is prominently displayed at the bottom of the main content area.

While create **“Resource group”**

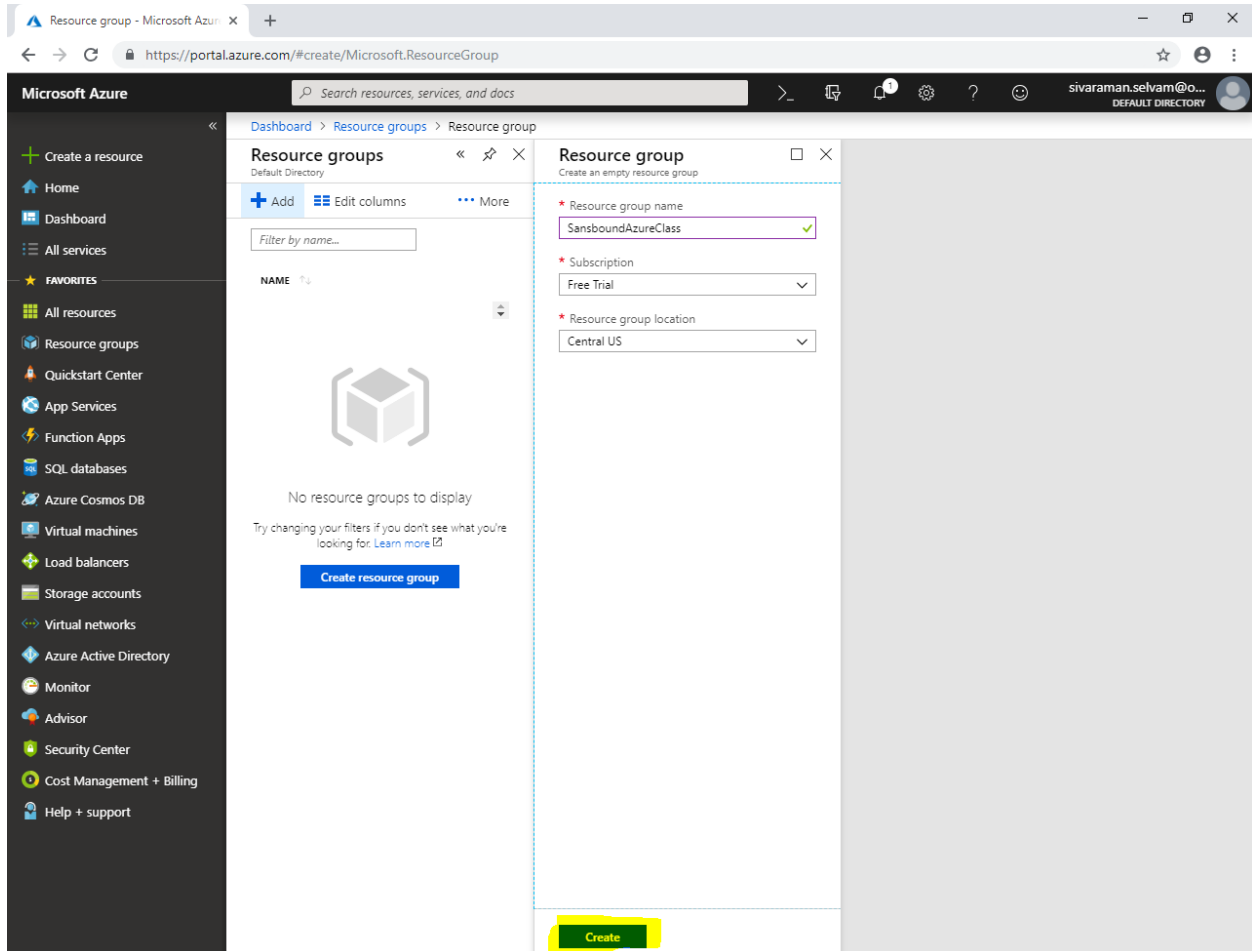
It requires **“Resource group name”**, type **“SansboundAzureClass”**.

In **“Subscription”**, select **“Free Trial”**.

In **“Resource group location”**.



Click **“Create”**.

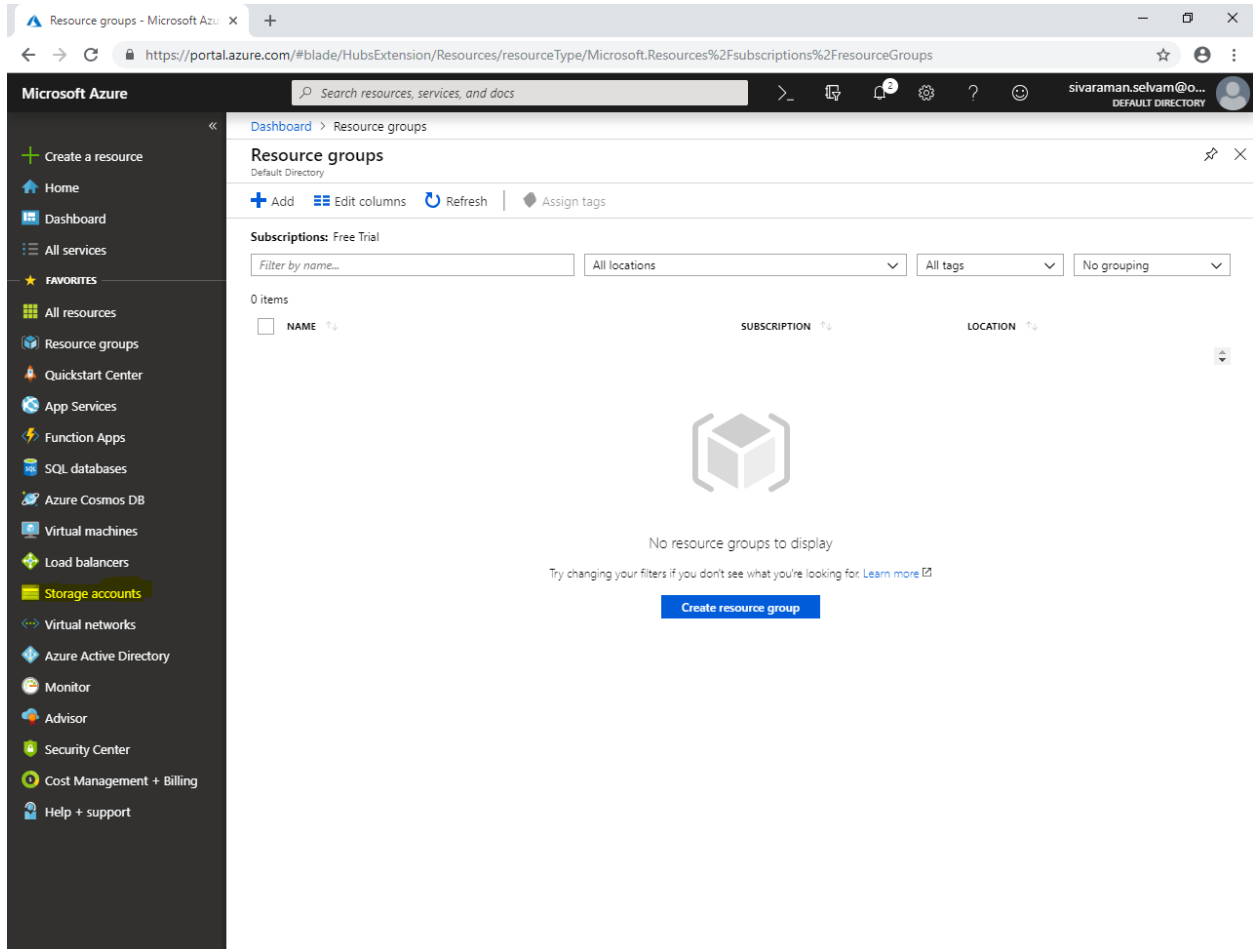


The screenshot shows the Microsoft Azure portal interface. On the left is a navigation sidebar with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area displays the 'Resource groups' page, which currently shows 'No resource groups to display' with a 'Create resource group' button. A modal window titled 'Resource group' is open on the right, allowing the creation of a new resource group. The modal contains the following fields:

- Resource group name:** SansboundAzureClass (with a green checkmark)
- Subscription:** Free Trial (dropdown menu)
- Resource group location:** Central US (dropdown menu)

A yellow 'Create' button is visible at the bottom of the modal.

Click **“Storage accounts”** in left side panel.



The screenshot shows the Microsoft Azure portal interface. The left sidebar contains the navigation menu, with 'Storage accounts' highlighted. The main content area displays the 'Resource groups' page. At the top, there's a search bar and a user profile. Below that, the 'Resource groups' section shows filters for 'Subscriptions: Free Trial', 'Filter by name...', 'All locations', 'All tags', and 'No grouping'. It indicates '0 items' and shows a table with columns 'NAME', 'SUBSCRIPTION', and 'LOCATION'. A large cube icon is centered on the page with the text 'No resource groups to display' and a link to 'Learn more'. A blue button labeled 'Create resource group' is at the bottom.

Click **"Add"**.

The screenshot shows the Microsoft Azure portal interface. The left sidebar contains navigation links such as 'Create a resource', 'Home', 'Dashboard', 'All services', and a 'FAVORITES' section with various services like 'All resources', 'Resource groups', 'Quickstart Center', 'App Services', 'Function Apps', 'SQL databases', 'Azure Cosmos DB', 'Virtual machines', 'Load balancers', 'Storage accounts', 'Virtual networks', 'Azure Active Directory', 'Monitor', 'Advisor', 'Security Center', 'Cost Management + Billing', and 'Help + support'. The main content area is titled 'Storage accounts' and includes a search bar, a '+ Add' button (highlighted in yellow), and options to 'Edit columns', 'Refresh', 'Assign tags', and 'Delete'. Below these are filters for 'Subscriptions: Free Trial', a 'Filter by name...' input field, and dropdown menus for 'All resource groups', 'All types', 'All locations', 'All tags', and 'No grouping'. A table with columns 'NAME', 'TYPE', 'KIND', 'RESOURCE GROUP', 'LOCATION', and 'SUBSCRIPTION' is shown, but it contains no data. A message states 'No storage accounts to display' and provides instructions on how to create a storage account, with a 'Create storage account' button at the bottom.

While create storage account,

Select “Subscription” as “Free Trial”.

Select “Resource group” as “SansboundAzureClass”.

In Storage account name “sansboundblob”.

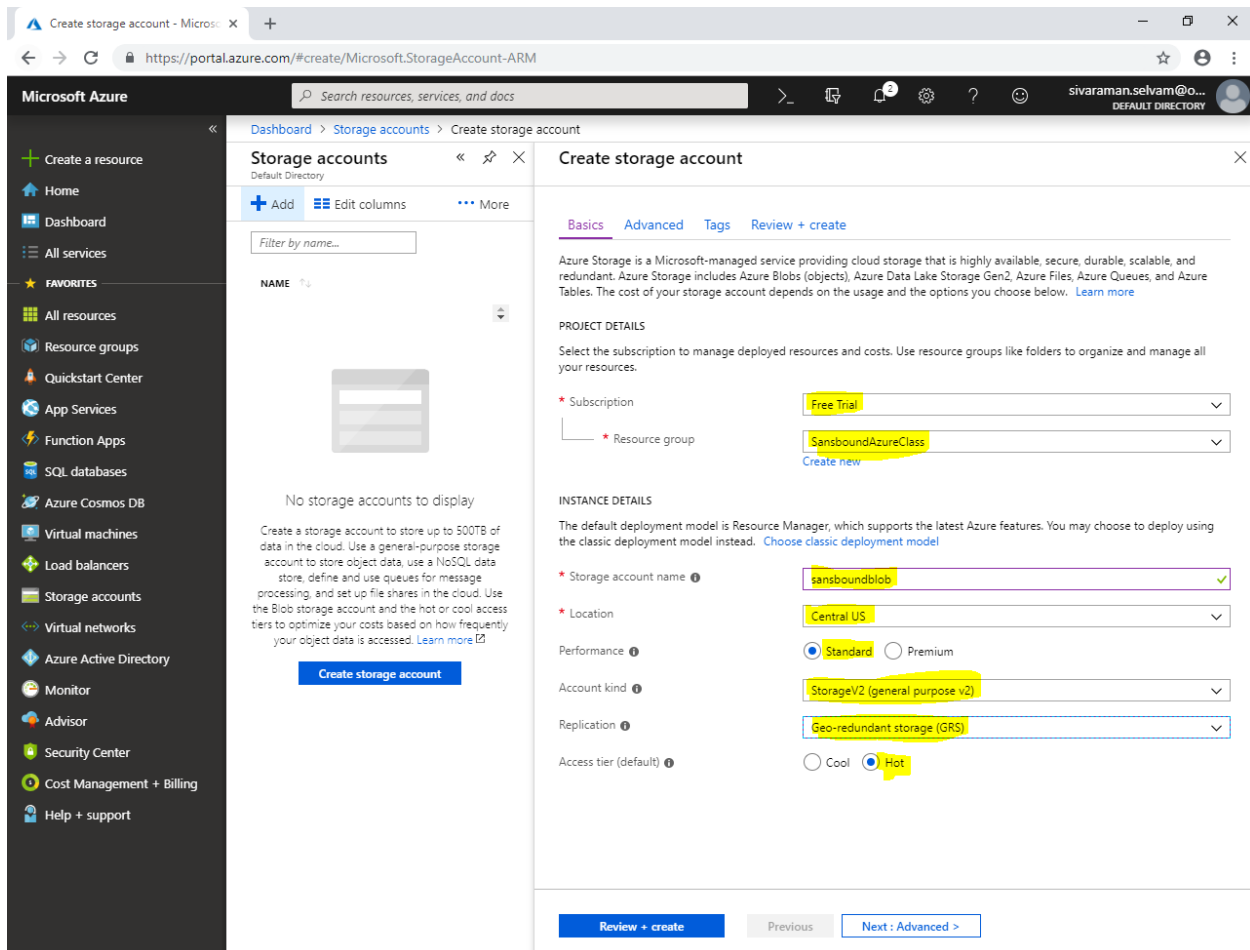
Select “Location” as “Central US”.

Select “Performance” as “Standard”.

Select “Account kind” as “Storage V2”.

Select “Replication” as “Geo-redundant storage (GRS)”.

Set “Access Tier” as “Hot”.



Microsoft Azure

Dashboard > Storage accounts > Create storage account

Storage accounts

Filter by name...

NAME

No storage accounts to display

Create a storage account to store up to 500TB of data in the cloud. Use a general-purpose storage account to store object data, use a NoSQL data store, define and use queues for message processing, and set up file shares in the cloud. Use the Blob storage account and the hot or cool access tiers to optimize your costs based on how frequently your object data is accessed. [Learn more](#)

Create storage account

Create storage account

Basics Advanced Tags Review + create

Azure Storage is a Microsoft-managed service providing cloud storage that is highly available, secure, durable, scalable, and redundant. Azure Storage includes Azure Blobs (objects), Azure Data Lake Storage Gen2, Azure Files, Azure Queues, and Azure Tables. The cost of your storage account depends on the usage and the options you choose below. [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: Free Trial

* Resource group: SansboundAzureClass

INSTANCE DETAILS

The default deployment model is Resource Manager, which supports the latest Azure features. You may choose to deploy using the classic deployment model instead. [Choose classic deployment model](#)

* Storage account name: sansboundblob

* Location: Central US

Performance: ☒ Standard ☐ Premium

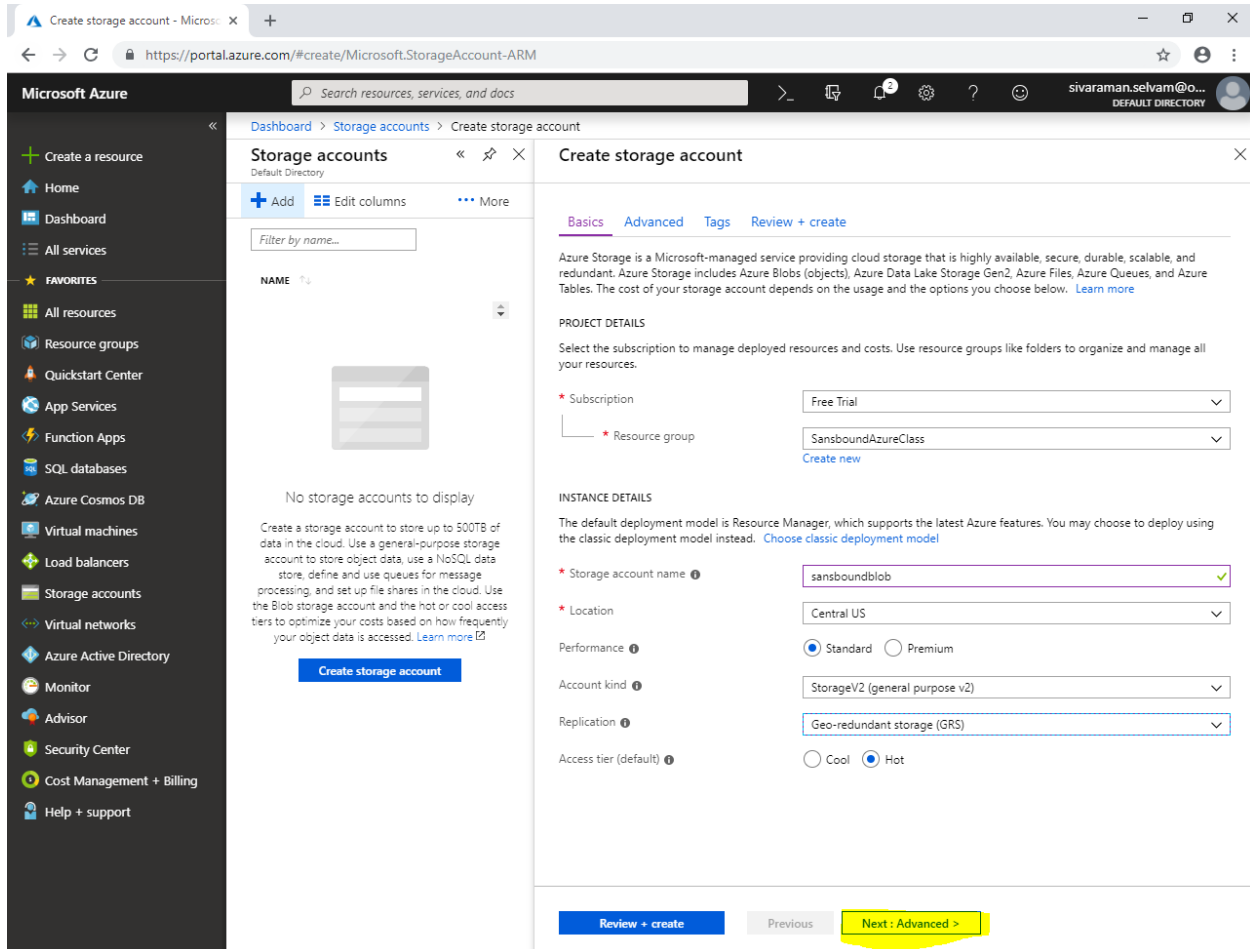
Account kind: StorageV2 (general purpose v2)

Replication: Geo-redundant storage (GRS)

Access tier (default): ☐ Cool ☒ Hot

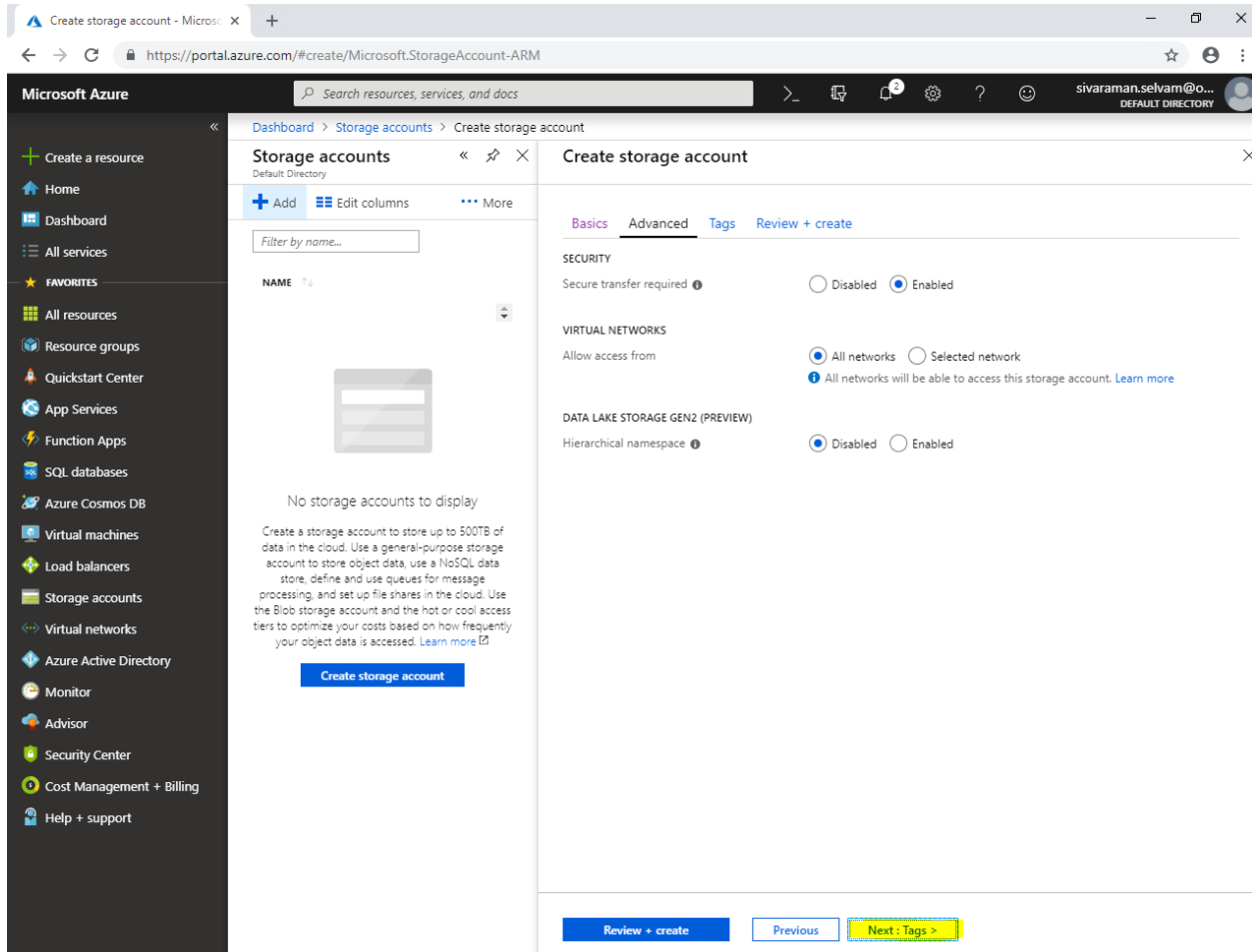
Review + create Previous Next: Advanced >

Click **"Next : Advanced >"**.



The screenshot shows the Azure portal interface for creating a storage account. The left sidebar contains navigation links like 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area is titled 'Create storage account' and includes tabs for 'Basics', 'Advanced', 'Tags', and 'Review + create'. The 'Basics' tab is active, showing fields for 'Subscription' (Free Trial), 'Resource group' (SansboundAzureClass), 'Storage account name' (sansboundblob), 'Location' (Central US), 'Performance' (Standard), 'Account kind' (StorageV2), 'Replication' (Geo-redundant storage), and 'Access tier' (Hot). The 'Next : Advanced >' button is highlighted in yellow.

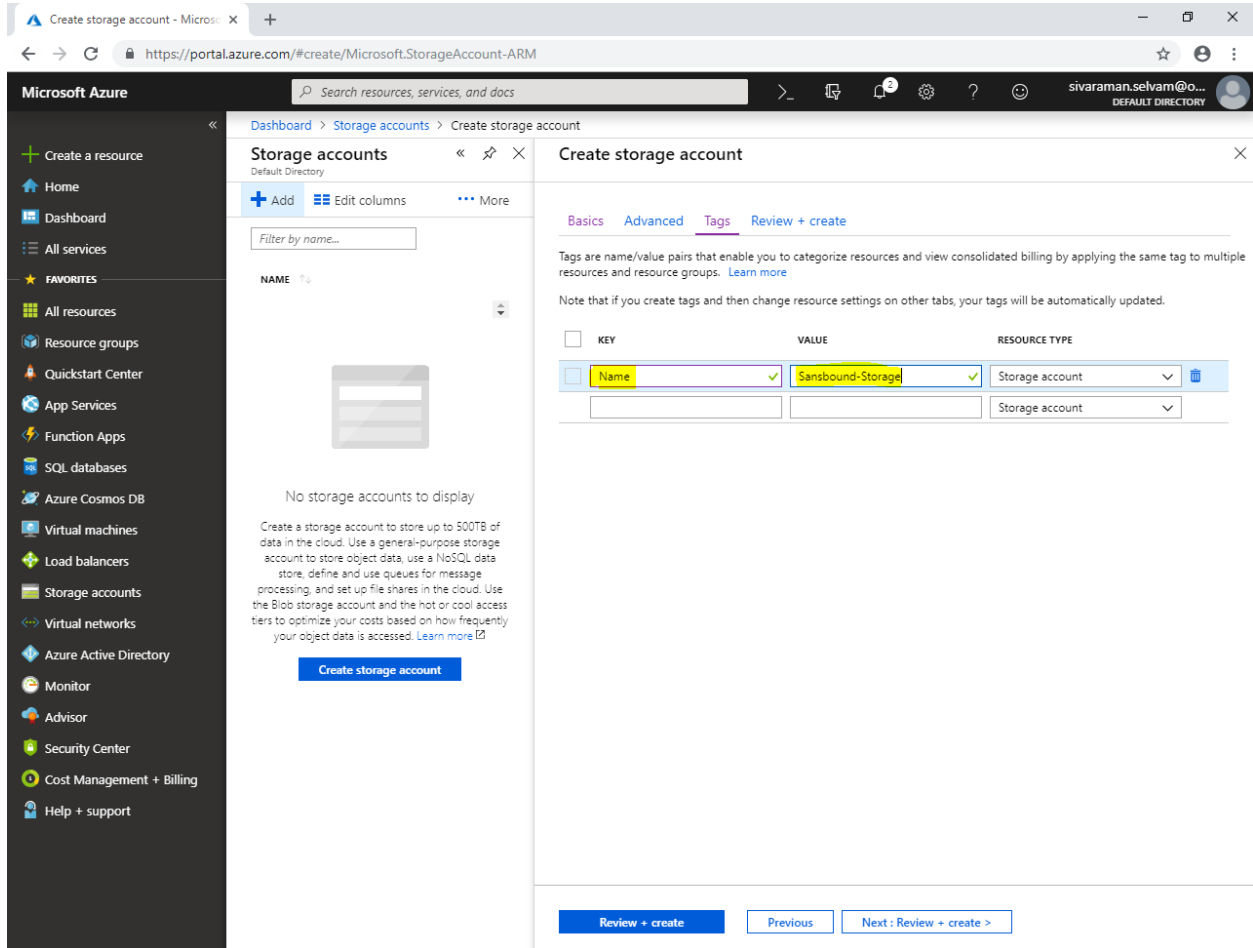
Click **"Next : Tags >"**.



The screenshot shows the Microsoft Azure portal interface for creating a storage account. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area is titled 'Storage accounts' and shows a list of storage accounts (currently empty) with a 'Create storage account' button. The right pane shows the 'Create storage account' wizard with tabs for 'Basics', 'Advanced', 'Tags', and 'Review + create'. The 'Tags' tab is selected and highlighted in yellow. The 'Tags' tab contains a table for adding tags, with columns for 'NAME' and 'VALUE'. Below the table, there is a 'Create storage account' button. At the bottom of the wizard, there are three buttons: 'Review + create', 'Previous', and 'Next : Tags >'. The 'Next : Tags >' button is highlighted in yellow.

In “Tags”,

Type “KEY” as “Name” and “VALUE” as “Sansbound-Storage”.

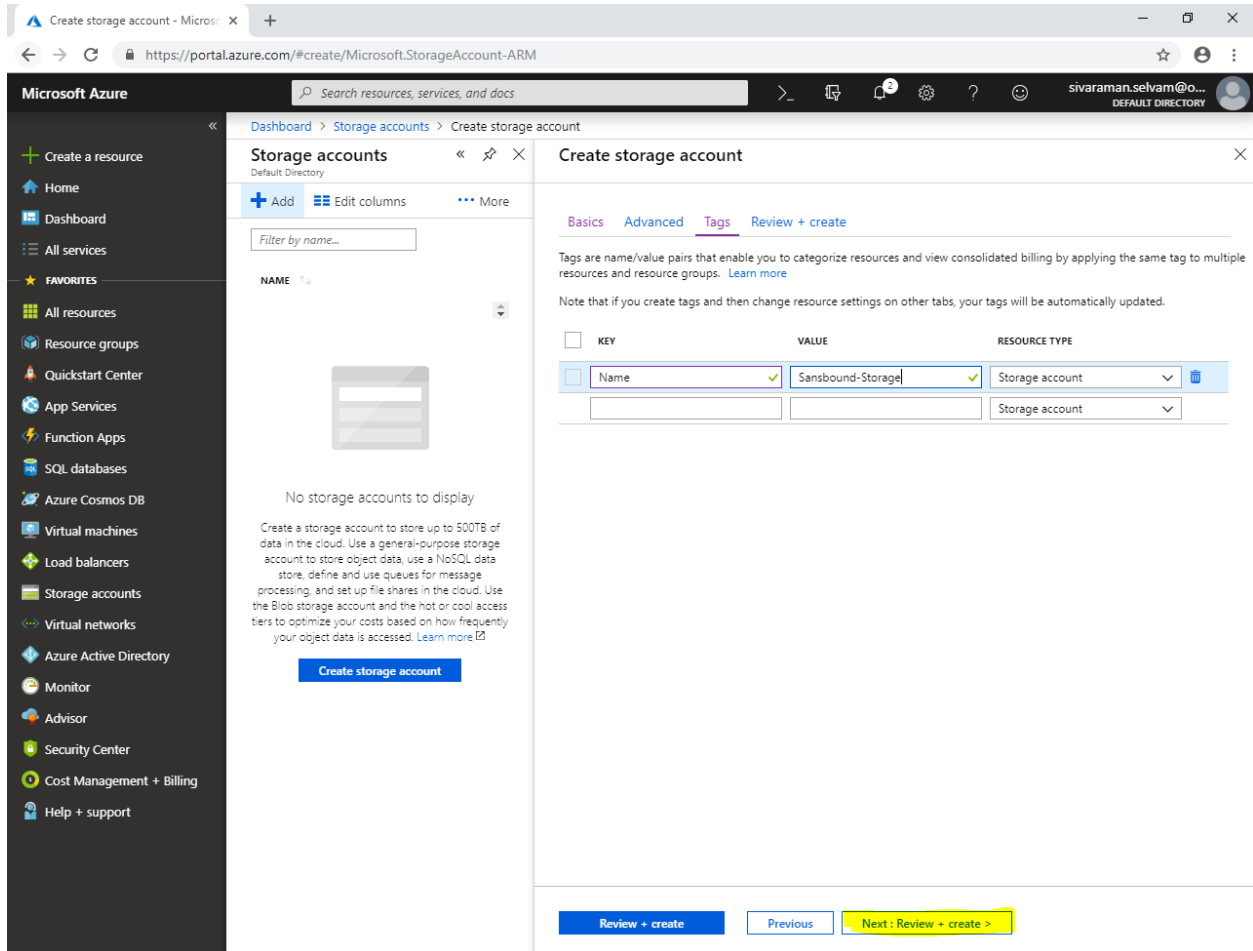


The screenshot shows the Microsoft Azure portal interface for creating a storage account. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main content area is titled 'Create storage account' and has tabs for 'Basics', 'Advanced', 'Tags', and 'Review + create'. The 'Tags' tab is active, displaying a table with the following content:

KEY	VALUE	RESOURCE TYPE
Name	Sansbound-Storage	Storage account
		Storage account

Below the table, there are buttons for 'Review + create', 'Previous', and 'Next: Review + create >'. The 'Review + create' button is highlighted in blue.

Click **“Next : Review + create”**.



The screenshot shows the Azure portal interface for creating a storage account. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main content area is titled 'Storage accounts' and shows a list of storage accounts (currently empty) with a 'Create storage account' button. The right pane displays the 'Create storage account' wizard, specifically the 'Review + create' step. It includes tabs for 'Basics', 'Advanced', 'Tags', and 'Review + create'. The 'Review + create' tab shows a summary of the configuration, including the storage account name 'Sansbound-Storage' and the resource type 'Storage account'. At the bottom, there are three buttons: 'Review + create', 'Previous', and 'Next : Review + create >'. The 'Next : Review + create >' button is highlighted in yellow.

Microsoft Azure

Search resources, services, and docs

Dashboard > Storage accounts > Create storage account

Storage accounts

Default Directory

+ Add Edit columns More

Filter by name...

NAME

No storage accounts to display

Create a storage account to store up to 500TB of data in the cloud. Use a general-purpose storage account to store object data, use a NoSQL data store, define and use queues for message processing, and set up file shares in the cloud. Use the Blob storage account and the hot or cool access tiers to optimize your costs based on how frequently your object data is accessed. [Learn more](#)

Create storage account

Create storage account

Basics Advanced Tags Review + create

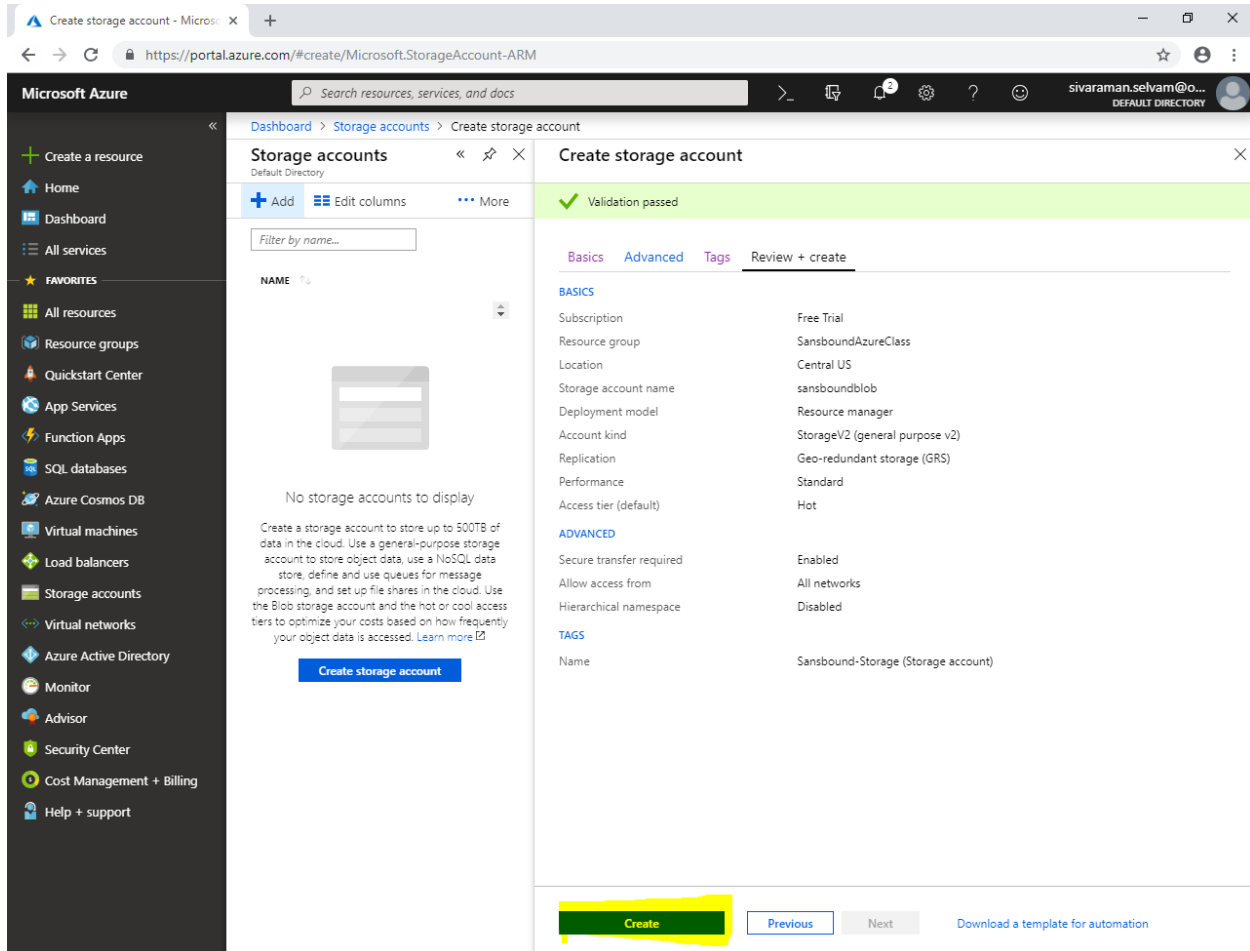
Tags are name/value pairs that enable you to categorize resources and view consolidated billing by applying the same tag to multiple resources and resource groups. [Learn more](#)

Note that if you create tags and then change resource settings on other tabs, your tags will be automatically updated.

KEY	VALUE	RESOURCE TYPE
Name	Sansbound-Storage	Storage account
		Storage account

Review + create Previous Next : Review + create >

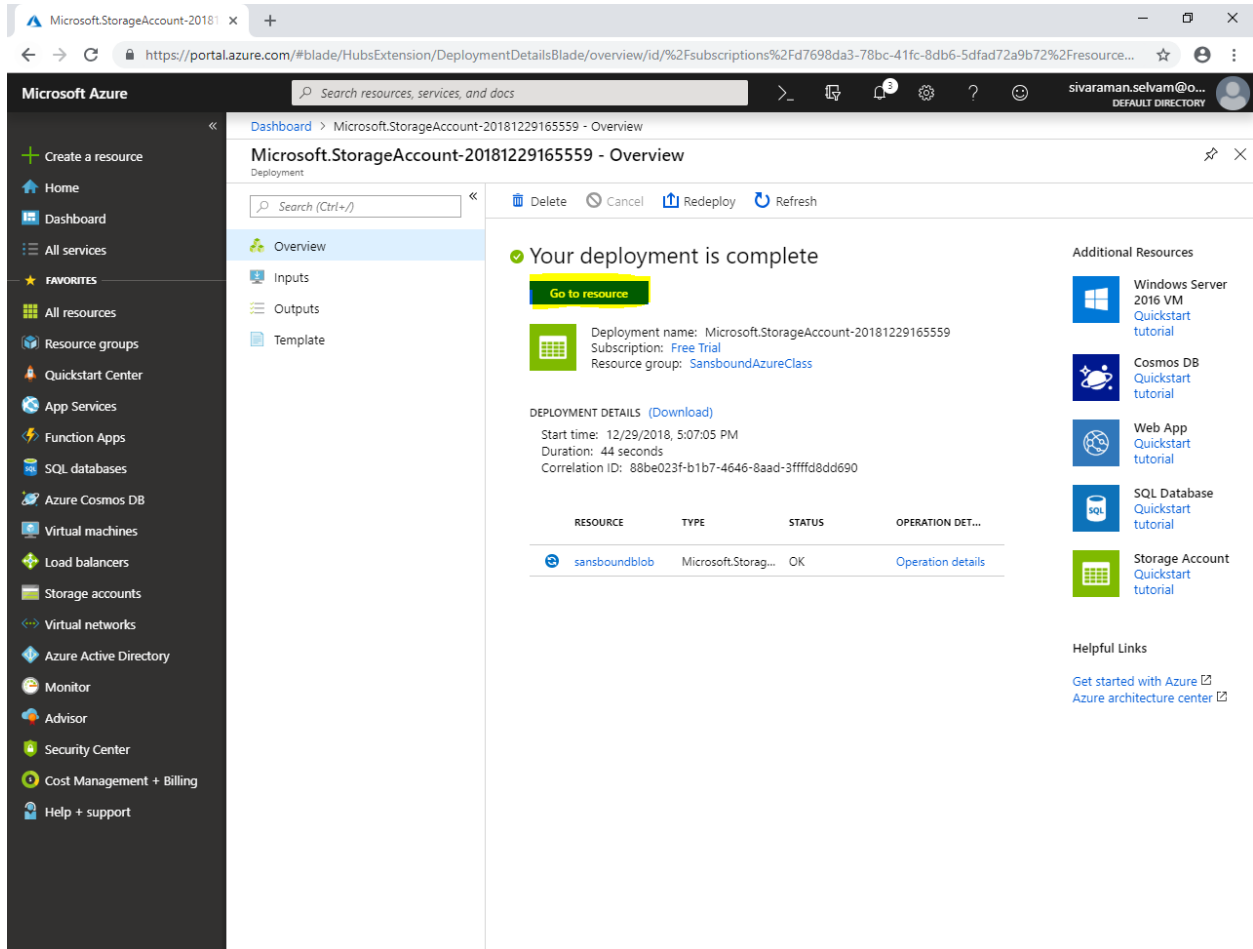
Click **“Create”**.



The screenshot shows the Microsoft Azure portal interface for creating a storage account. The left sidebar contains navigation options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area displays the 'Storage accounts' section with a 'Create storage account' button. The 'Create storage account' wizard is open, showing a 'Validation passed' message. The 'Basics' tab is selected, displaying configuration details for the storage account. The 'Create' button is highlighted in yellow.

Section	Property	Value
BASICS	Subscription	Free Trial
	Resource group	SansboundAzureClass
	Location	Central US
	Storage account name	sansboundblob
	Deployment model	Resource manager
	Account kind	StorageV2 (general purpose v2)
	Replication	Geo-redundant storage (GRS)
	Performance	Standard
	Access tier (default)	Hot
	ADVANCED	Secure transfer required
Allow access from		All networks
Hierarchical namespace		Disabled
TAGS	Name	Sansbound-Storage (Storage account)

Click **“Go to resource”**.



The screenshot shows the Microsoft Azure portal interface. The left sidebar contains navigation options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main content area displays the 'Overview' page for a deployment named 'Microsoft.StorageAccount-20181229165559'. A green checkmark indicates 'Your deployment is complete'. A yellow button labeled 'Go to resource' is prominent. Below this, deployment details are listed: Start time: 12/29/2018, 5:07:05 PM; Duration: 44 seconds; Correlation ID: 88be023f-b1b7-4646-8aad-3ffffd8dd690. A table at the bottom shows the resource 'sansboundblob' of type 'Microsoft.Storage...' with status 'OK'. On the right, 'Additional Resources' are suggested, including Windows Server 2016 VM, Cosmos DB, Web App, SQL Database, and Storage Account, each with a 'Quickstart tutorial' link. 'Helpful Links' at the bottom include 'Get started with Azure' and 'Azure architecture center'.

Microsoft Azure

Search resources, services, and docs

Dashboard > Microsoft.StorageAccount-20181229165559 - Overview

Microsoft.StorageAccount-20181229165559 - Overview

Deployment

Search (Ctrl+/)

Overview

Inputs

Outputs

Template

Delete Cancel Redeploy Refresh

✓ Your deployment is complete

Go to resource

Deployment name: Microsoft.StorageAccount-20181229165559
Subscription: Free Trial
Resource group: SansboundAzureClass

DEPLOYMENT DETAILS (Download)

Start time: 12/29/2018, 5:07:05 PM
Duration: 44 seconds
Correlation ID: 88be023f-b1b7-4646-8aad-3ffffd8dd690

RESOURCE	TYPE	STATUS	OPERATION DET...
sansboundblob	Microsoft.Storage...	OK	Operation details

Additional Resources

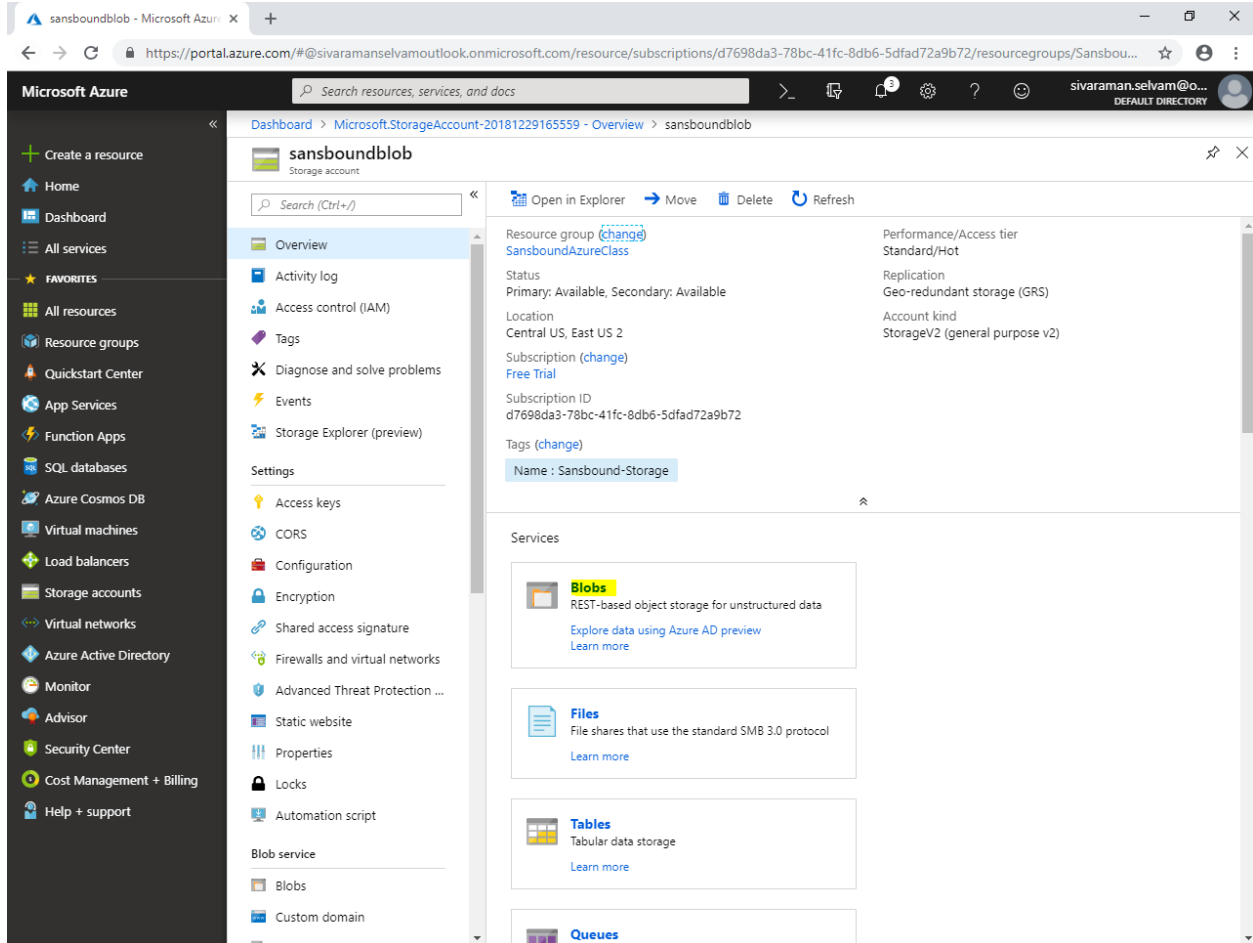
- Windows Server 2016 VM Quickstart tutorial
- Cosmos DB Quickstart tutorial
- Web App Quickstart tutorial
- SQL Database Quickstart tutorial
- Storage Account Quickstart tutorial

Helpful Links

- Get started with Azure
- Azure architecture center

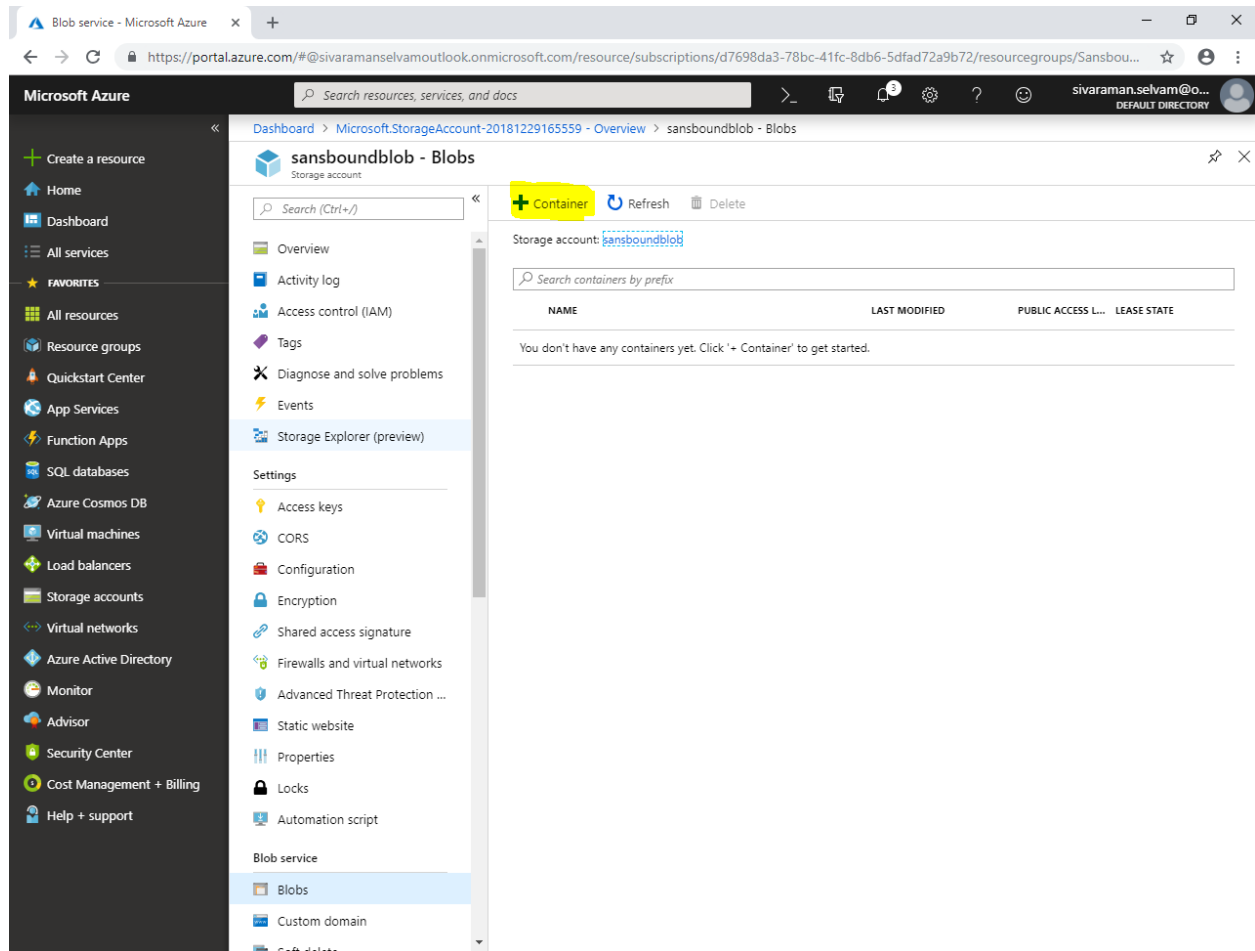
In “sansboundblob”,

Click “Blobs”.



The screenshot displays the Microsoft Azure portal interface. The left-hand navigation pane shows the 'Microsoft Azure' logo and a search bar. Below this, there are sections for 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The 'Storage accounts' section is expanded, showing a list of storage accounts. The 'sansboundblob' storage account is selected, and its 'Overview' page is displayed. The 'Overview' page shows the resource group 'SansboundAzureClass', the status 'Primary: Available, Secondary: Available', the location 'Central US, East US 2', and the subscription ID 'd7698da3-78bc-41fc-8db6-5dfad72a9b72'. The 'Tags' section shows 'Name : Sansbound-Storage'. The 'Services' section on the right lists 'Blobs', 'Files', 'Tables', and 'Queues'. The 'Blobs' service is highlighted, indicating it is the selected service for the storage account.

Click **“Container”** to create container and upload the files in container.



Note: Whatever the files upload into the container backup copy also available nearest geographical Region as backup. In case of **“Region -1”** was down, you can able to access the files from **Region -2**.