

Lab14 – Understanding Blob Storage - Azure

Blob storage

Azure Blob storage is Microsoft's object storage solution for the cloud. Blob storage is optimized for storing massive amounts of unstructured data. Unstructured data is data that does not adhere to a particular data model or definition, such as text or binary data.

About Blob storage

Blob storage is designed for:

- Serving images or documents directly to a browser.
- Storing files for distributed access.
- Streaming video and audio.
- Writing to log files.
- Storing data for backup and restore, disaster recovery, and archiving.
- Storing data for analysis by an on-premises or Azure-hosted service.

Users or client applications can access objects in Blob storage via HTTP/HTTPS, from anywhere in the world. Objects in Blob storage are accessible via the [Azure Storage REST API](#), [Azure PowerShell](#), [Azure CLI](#), or an Azure Storage client library. Client libraries are available for a variety of languages, including [.NET](#), [Java](#), [Node.js](#), [Python](#), [Go](#), [PHP](#), and [Ruby](#).

About Azure Data Lake Storage Gen2

Blob storage supports Azure Data Lake Storage Gen2, Microsoft's enterprise big data analytics solution for the cloud. Azure Data Lake Storage Gen2 offers a hierarchical file system as well as the advantages of Blob storage, including low-cost, tiered storage; high availability; strong consistency; and disaster recovery capabilities.

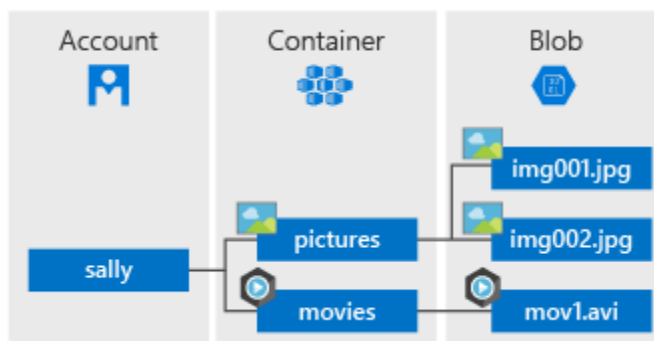
For more information about Data Lake Storage Gen2, see [Introduction to Azure Data Lake Storage Gen2 Preview](#).

Blob storage resources

Blob storage offers three types of resources:

- The **storage account**.
- A **container** in the storage account
- A **blob** in a container

The following diagram shows the relationship between these resources.



Storage accounts

A storage account provides a unique namespace in Azure for your data. Every object that you store in Azure Storage has an address that includes your unique account name. The combination of the account name and the Azure Storage service endpoint forms the endpoints for your storage account.

Containers

A container organizes a set of blobs, similar to a directory in a file system. A storage account can include an unlimited number of containers, and a container can store an unlimited number of blobs.

The container name must be lowercase. For more information about naming containers, see [Naming and Referencing Containers, Blobs, and Metadata](#).

Blobs

Azure Storage supports three types of blobs:

- **Block blobs** store text and binary data, up to about 4.7 TB. Block blobs are made up of blocks of data that can be managed individually.
- **Append blobs** are made up of blocks like block blobs, but are optimized for append operations. Append blobs are ideal for scenarios such as logging data from virtual machines.
- **Page blobs** store random access files up to 8 TB in size. Page blobs store the virtual hard drive (VHD) files serve as disks for Azure virtual machines. For more information about page blobs, see ([../articles/storage/blobs/storage-blob-pageblob-overview.md](#))

For more information about the different types of blobs, see [Understanding Block Blobs, Append Blobs, and Page Blobs](#).

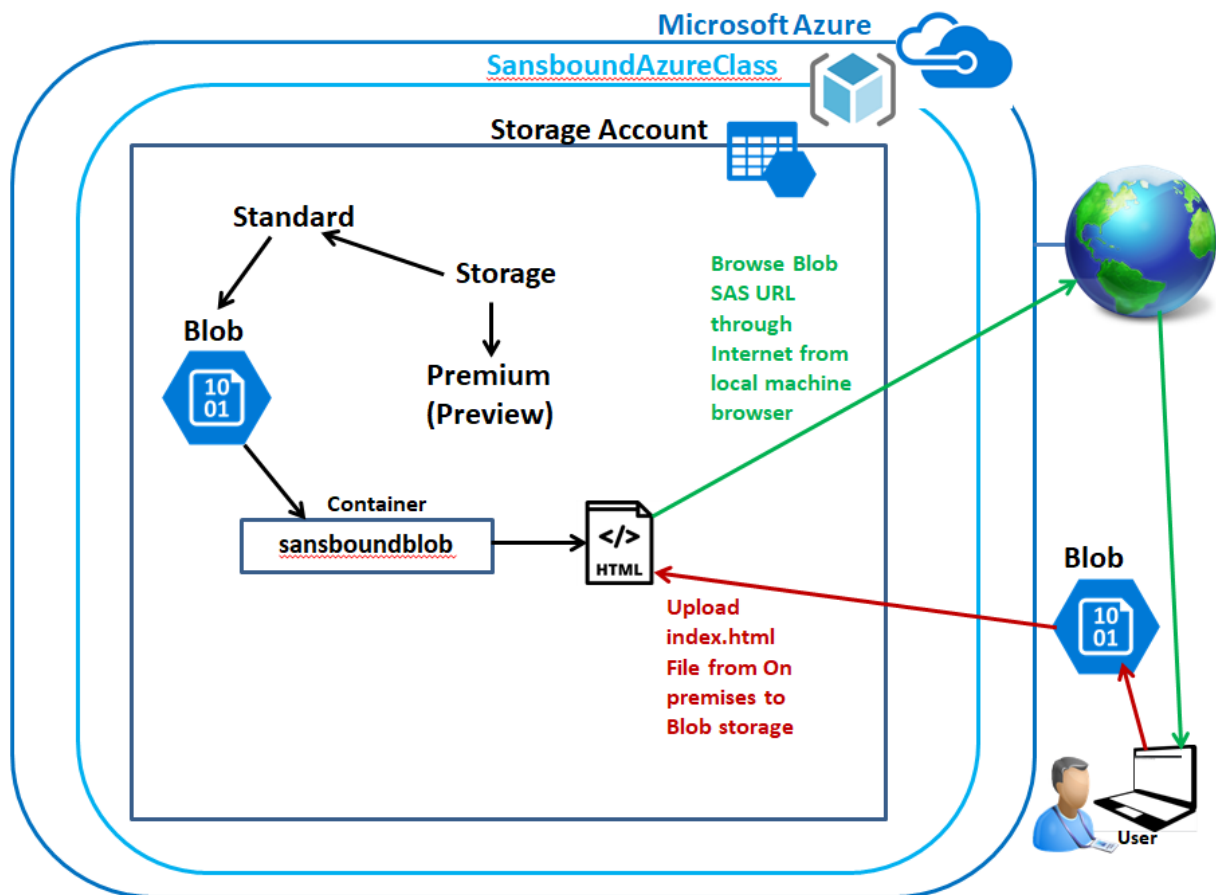
Move data to Blob storage

A number of solutions exist for migrating existing data to Blob storage:

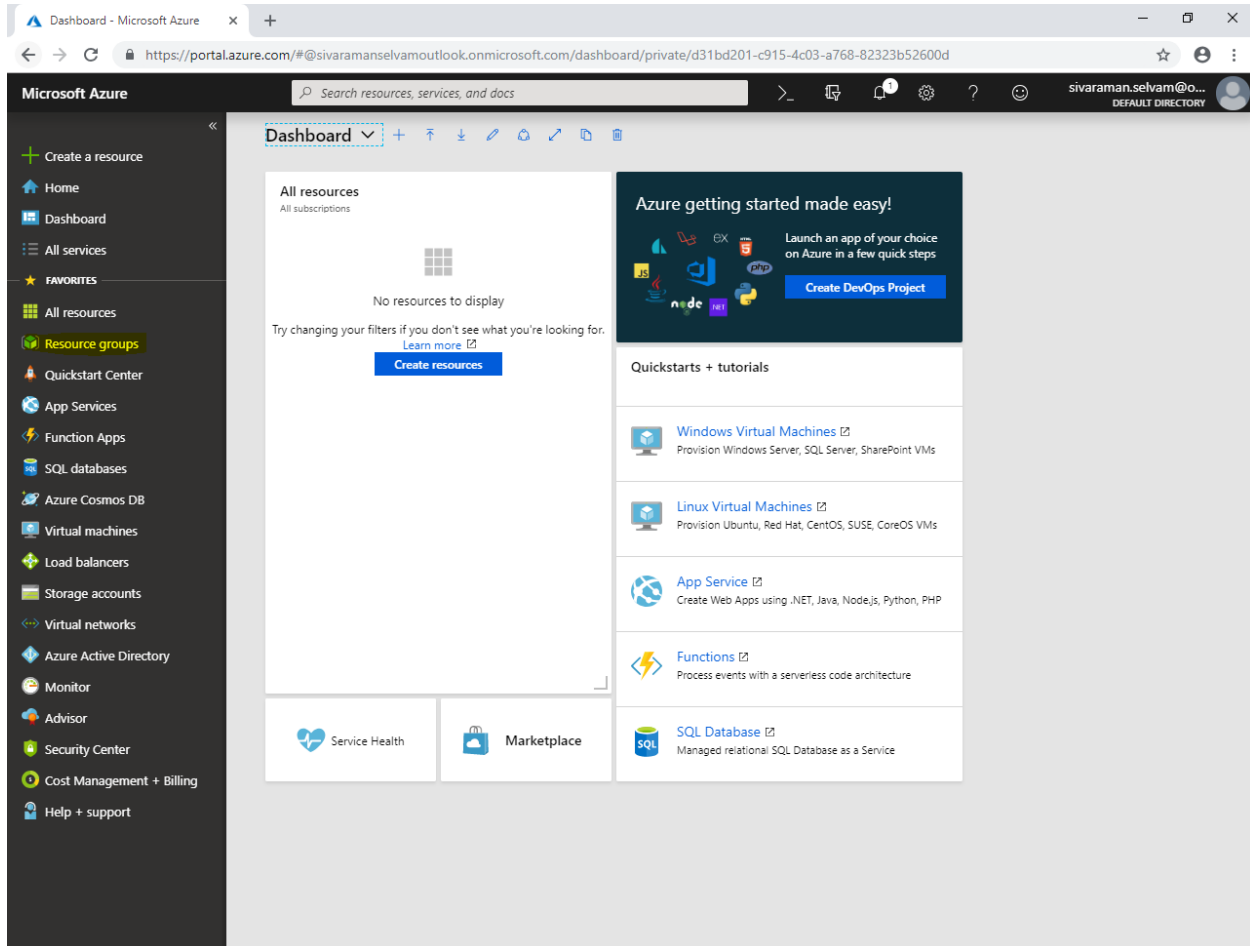
- **AzCopy** is an easy-to-use command-line tool for Windows and Linux that copies data to and from Blob storage, across containers, or across storage accounts. For more information about AzCopy, see [Transfer data with the AzCopy v10 \(Preview\)](#).
- The **Azure Storage Data Movement library** is a .NET library for moving data between Azure Storage services. The AzCopy utility is built with the Data Movement library. For more information, see the [reference documentation](#) for the Data Movement library.
- **Azure Data Factory** supports copying data to and from Blob storage by using the account key, shared access signature, service principal, or managed identities for Azure resources authentications. For more information, see [Copy data to or from Azure Blob storage by using Azure Data Factory](#).
- **Blobfuse** is a virtual file system driver for Azure Blob storage. You can use blobfuse to access your existing block blob data in your Storage account through the Linux file system. For more information, see [How to mount Blob storage as a file system with blobfuse](#).

- **Azure Data Box Disk** is a service for transferring on-premises data to Blob storage when large datasets or network constraints make uploading data over the wire unrealistic. You can use [Azure Data Box Disk](#) to request solid-state disks (SSDs) from Microsoft. You can then copy your data to those disks and ship them back to Microsoft to be uploaded into Blob storage.
- The **Azure Import/Export service** provides a way to export large amounts of data from your storage account to hard drives that you provide and that Microsoft then ships back to you with your data. For more information, see [Use the Microsoft Azure Import/Export service to transfer data to Blob storage](#).

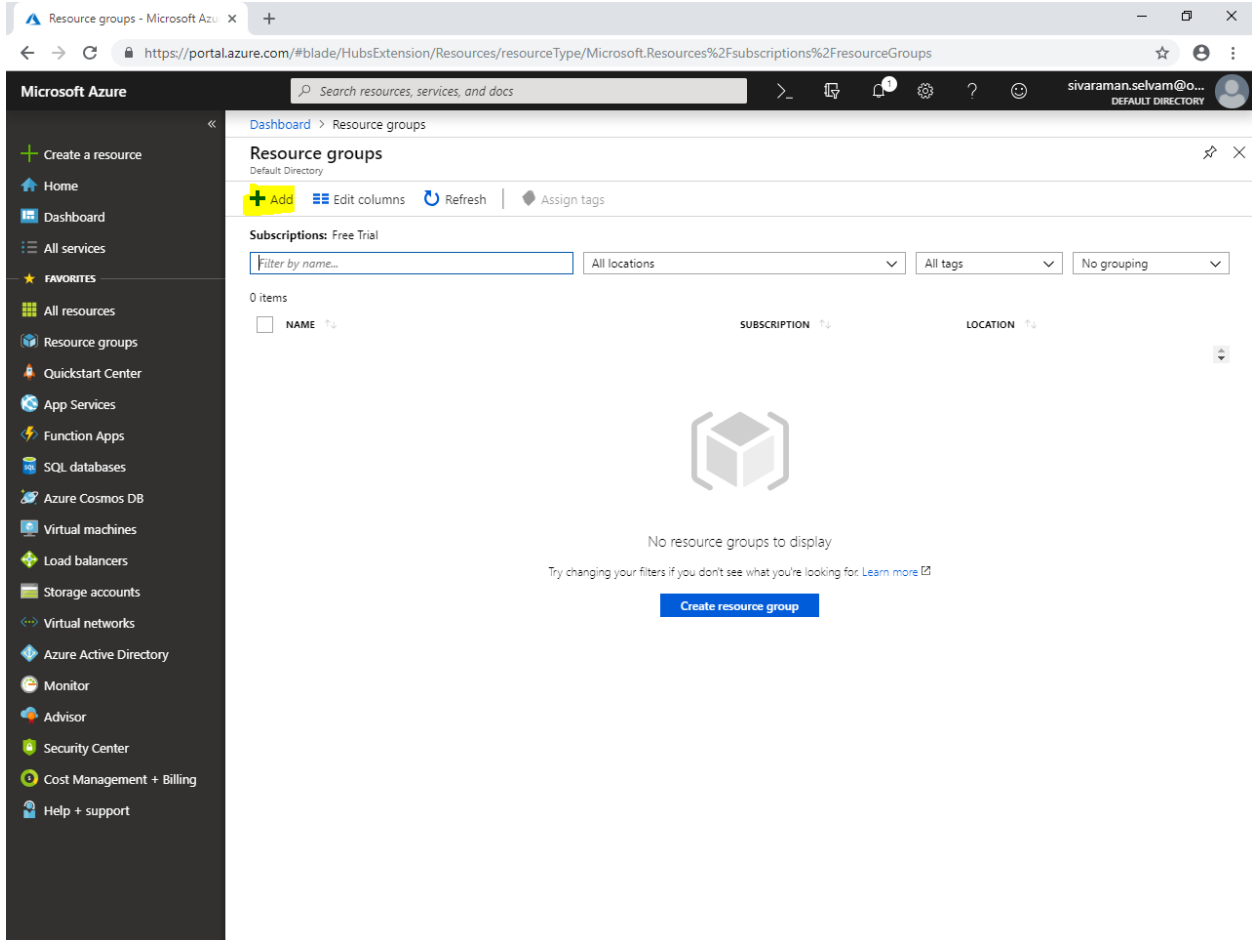
Topology



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



Click **"Add"**.



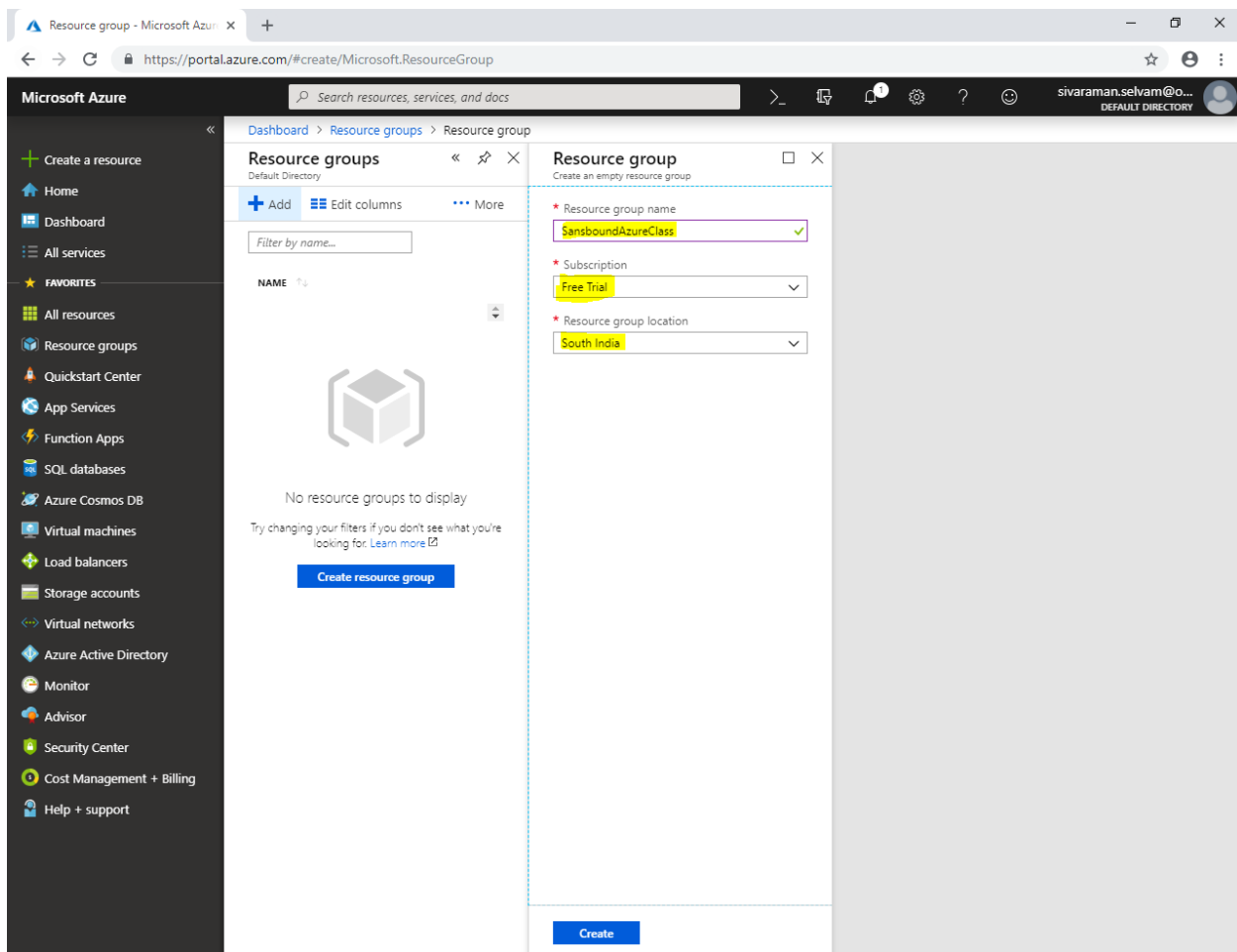
The screenshot shows the Microsoft Azure portal interface. The left sidebar contains navigation links such as 'Create a resource', 'Home', 'Dashboard', 'All services', and a 'FAVORITES' section with links to 'All resources', 'Resource groups', 'Quickstart Center', 'App Services', 'Function Apps', 'SQL 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 'Resource groups' and includes a search bar, a filter dropdown set to 'Subscriptions: Free Trial', and 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”**.

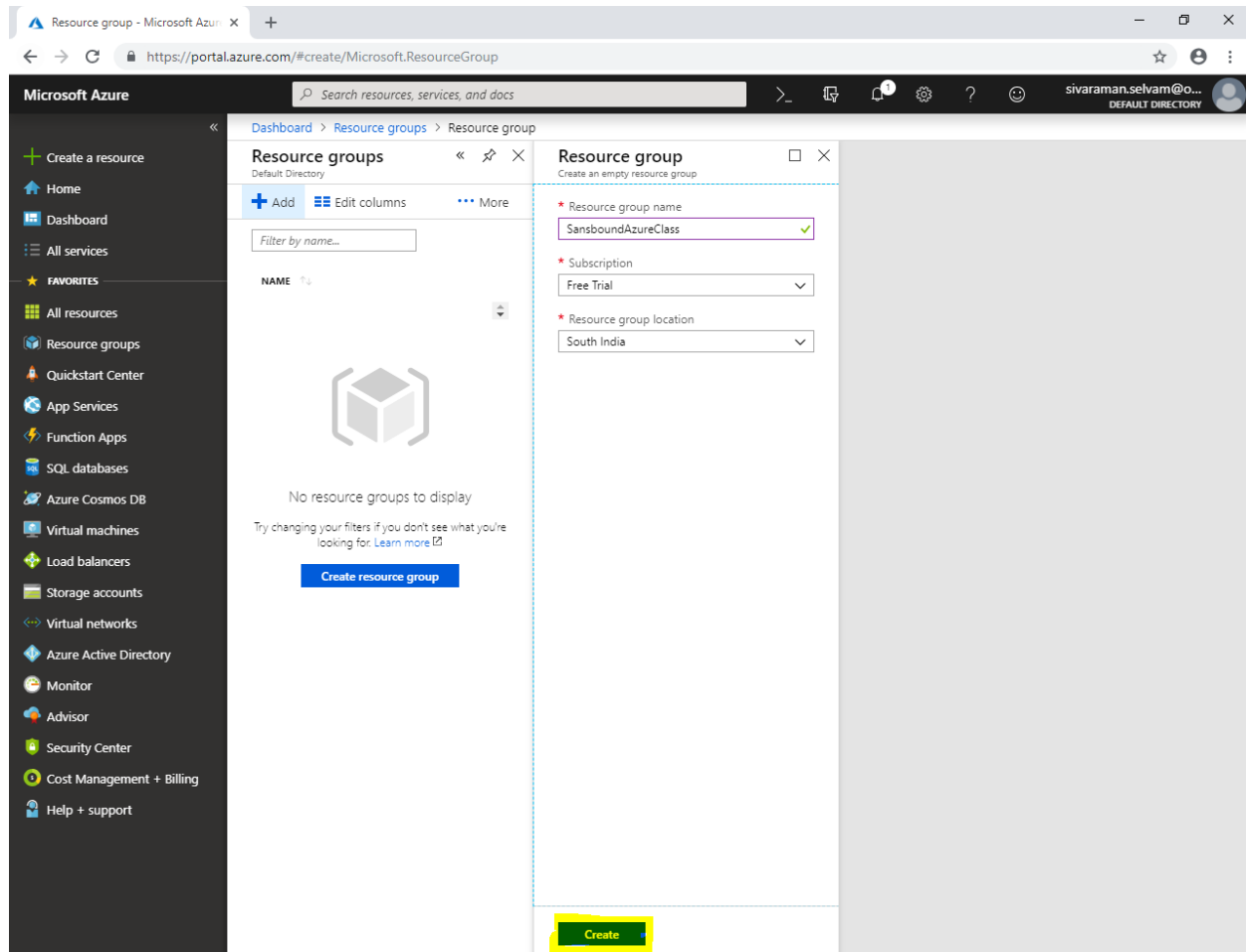
Type **“Resource group name”** as **“SansboundAzureClass”**.

Select **“Subscription”** as **“Free Trial”**.

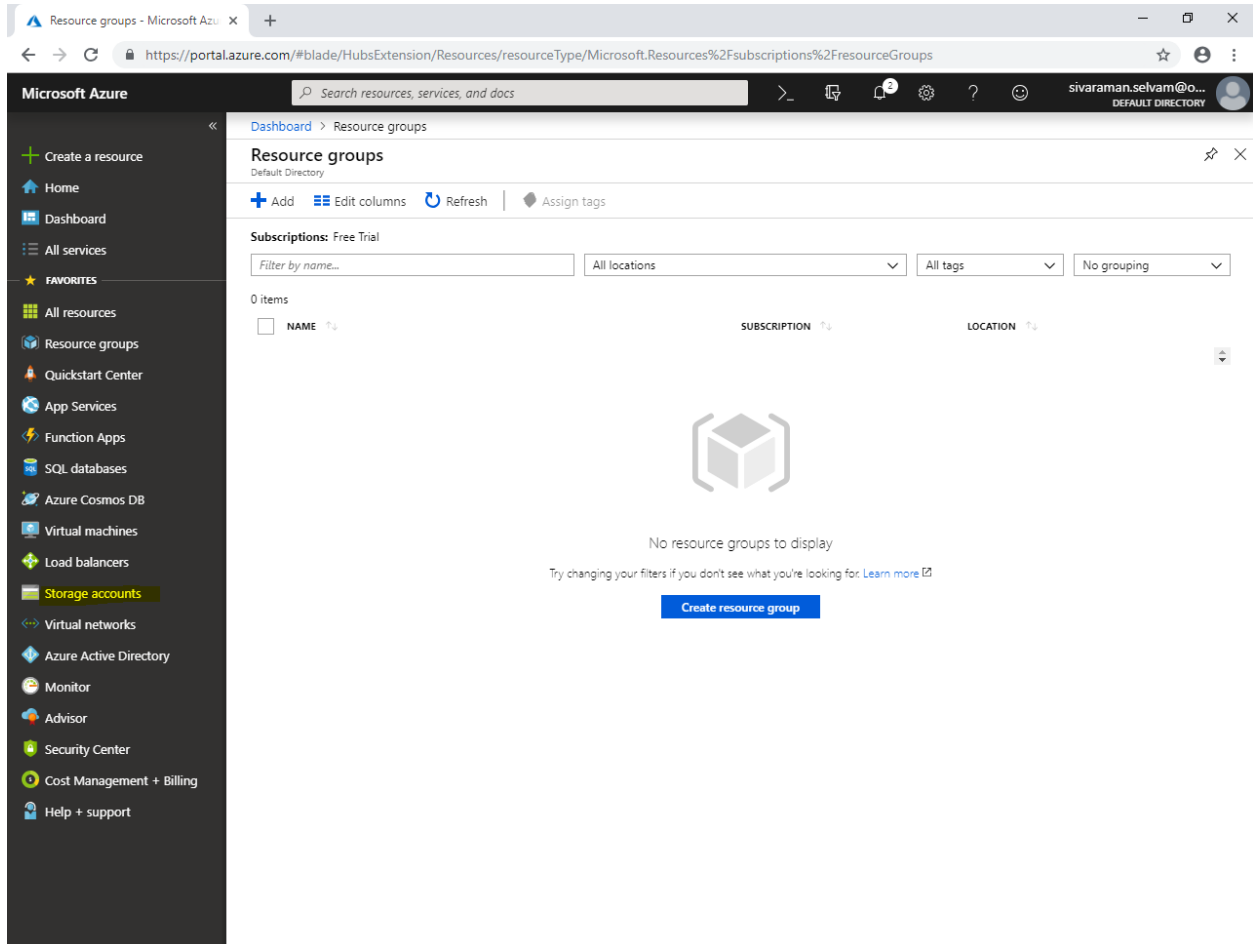
Select **“Resource group location”** as **“South India”**.



Click **“Create”**.

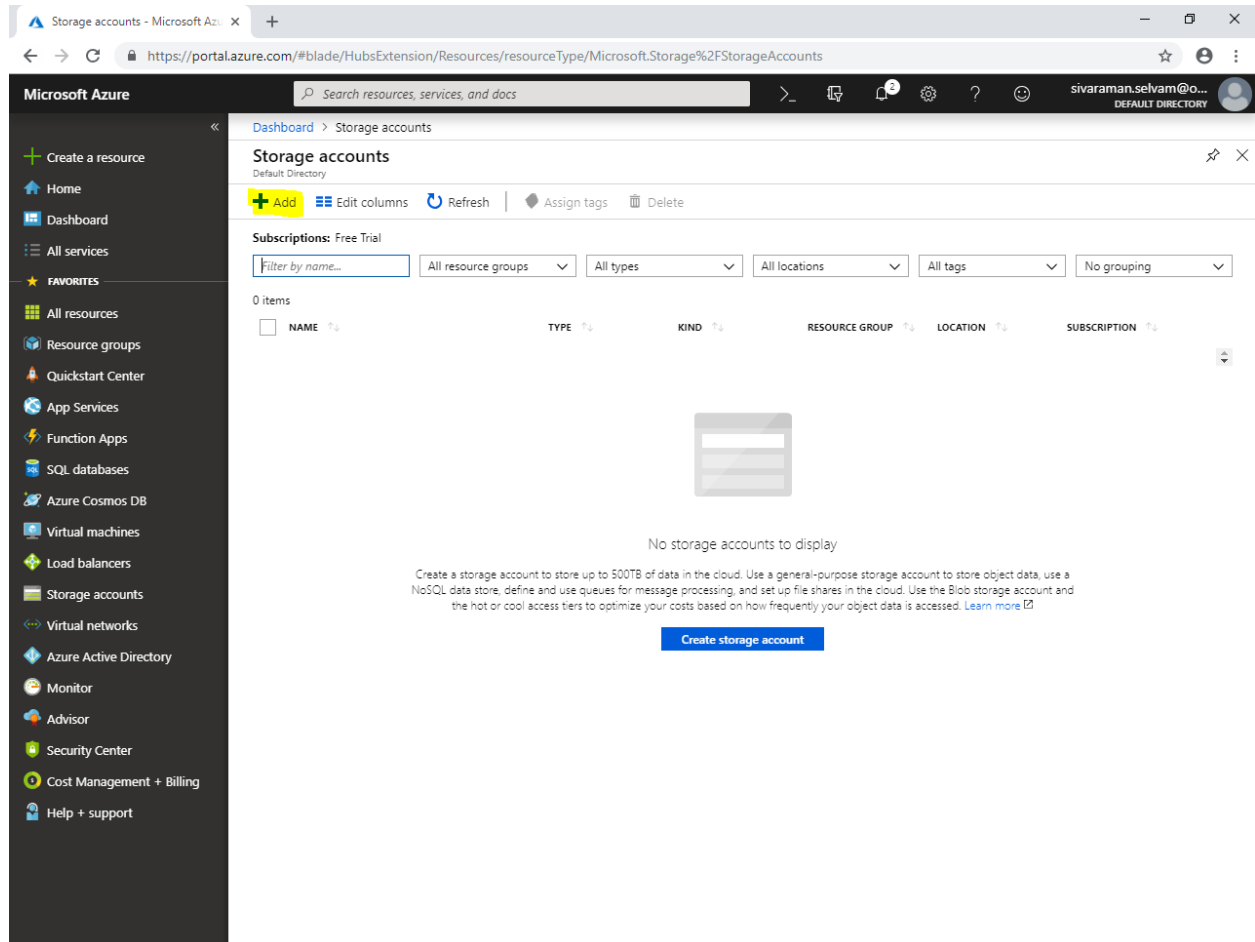


Click **“Storage accounts”** in left side panel.



The screenshot shows the Microsoft Azure portal interface. The left-hand navigation pane is visible, with 'Storage accounts' highlighted under the 'FAVORITES' section. The main content area is titled 'Resource groups' and shows a message: 'No resource groups to display'. Below this message is a button labeled 'Create resource group'. The top of the page shows the user's profile and the search bar.

Click **"Add"**.



The screenshot shows the Microsoft Azure portal interface. The left-hand navigation pane is visible, with 'Storage accounts' selected. The main content area displays the 'Storage accounts' page, which is currently empty. A message states 'No storage accounts to display' and provides instructions on how to create a storage account. A blue button labeled 'Create storage account' is prominently displayed at the bottom of the message. The top of the page shows the user's profile and a search bar.

While create storage account,

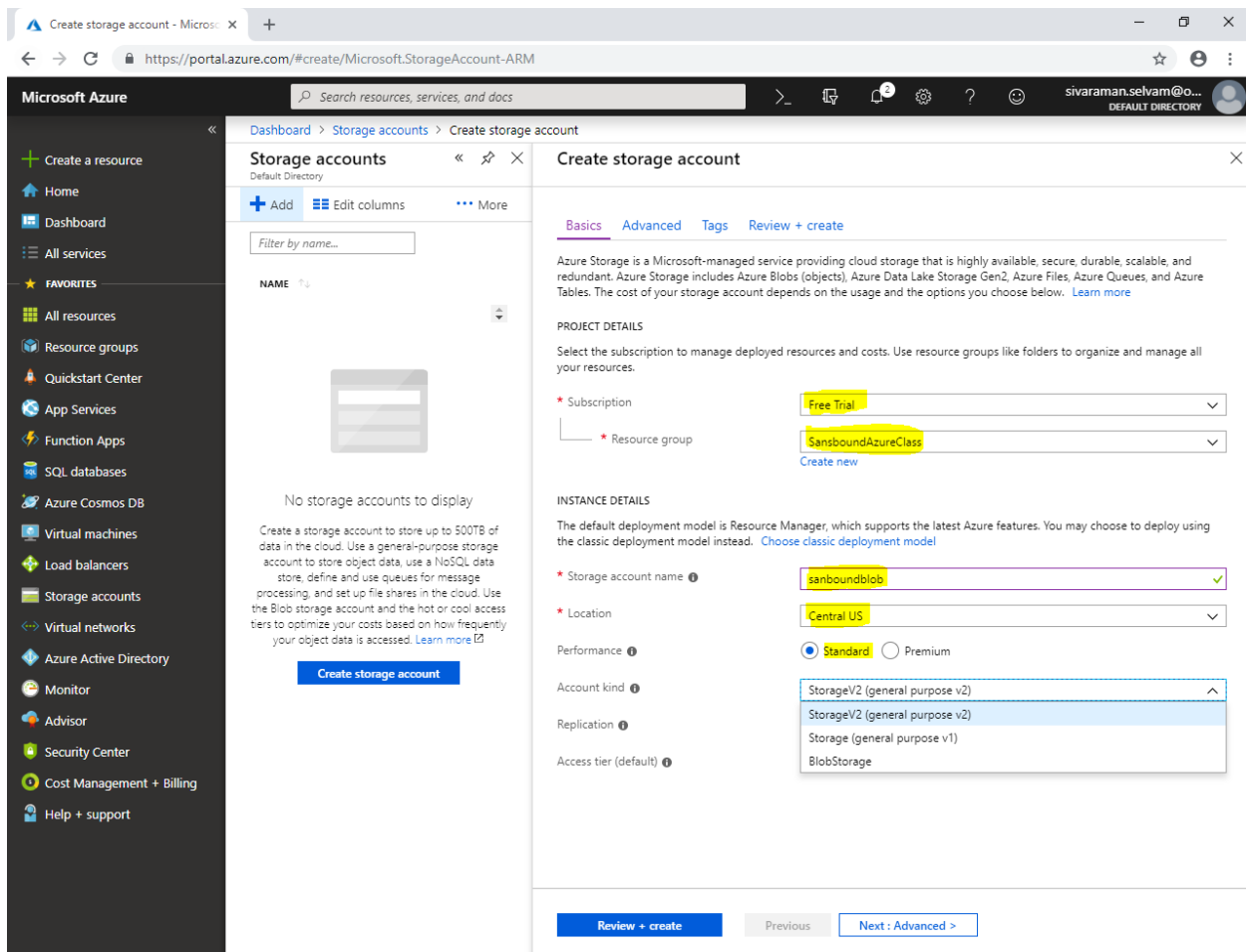
Select “Subscription” as “Free Trial”.

Select “Resource group” as “SansboundAzureClass”.

Type “Storage account name” as “sansboundblob”.

Select “Location” as “Central US”.

Set Performance as “Standard” (You can select “Premium” also, but it’s in preview state, that means they are introducing new feature / in under testing not fully completed).

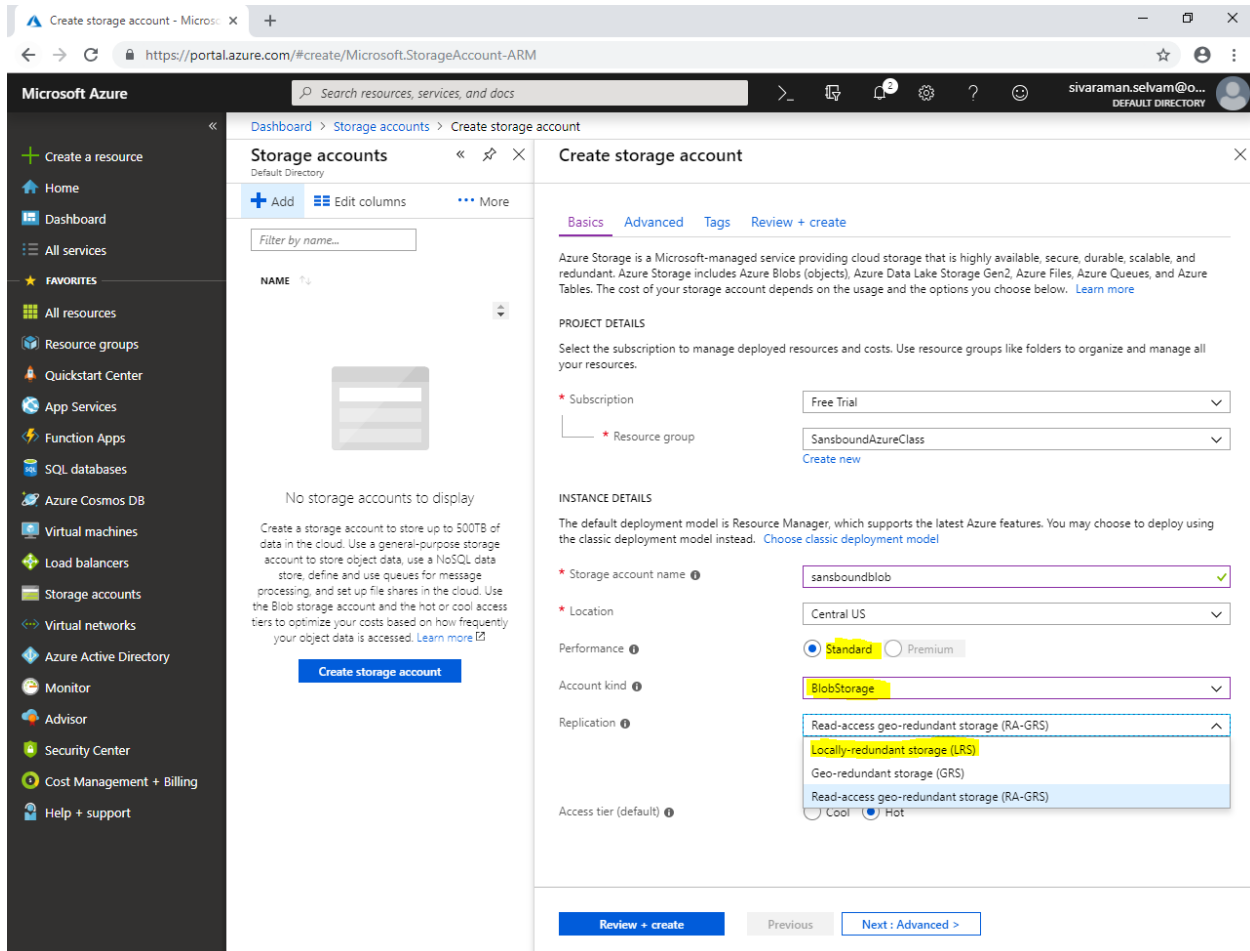


The screenshot displays the Microsoft Azure portal interface for creating a new storage account. The left sidebar shows the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main content area is titled 'Storage accounts' and includes a 'Create storage account' button. The 'Create storage account' wizard is open, showing the 'Basics' tab. The 'PROJECT DETAILS' section includes fields for 'Subscription' (set to 'Free Trial'), 'Resource group' (set to 'SansboundAzureClass'), and 'Storage account name' (set to 'sansboundblob'). The 'INSTANCE DETAILS' section includes fields for 'Location' (set to 'Central US'), 'Performance' (set to 'Standard'), 'Account kind' (set to 'StorageV2 (general purpose v2)'), 'Replication', and 'Access tier (default)' (set to 'BlobStorage'). The 'Review + create' button is visible at the bottom of the wizard.

In **"Performance"** click **"Standard"**.

Select **"Account kind"** as **"Blob Storage"**.

Select **"Replication"** as **"Locally-redundant storage"** (We will discuss LRS feature later briefly).

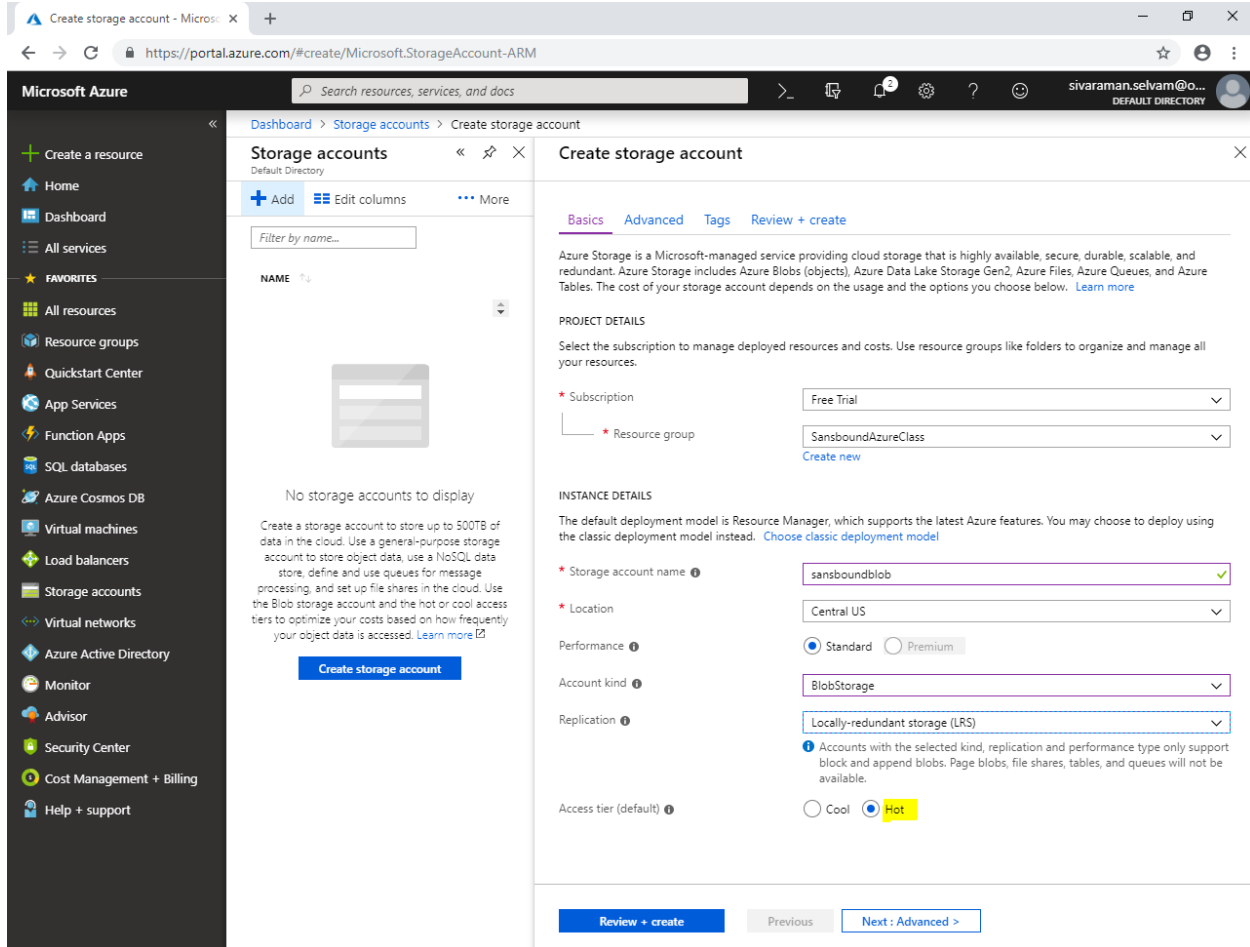


The screenshot shows the Azure portal interface for creating a storage account. The left sidebar contains navigation links for various Azure services. The main content area is titled 'Create storage account' and includes a 'Storage accounts' section with a 'No storage accounts to display' message. The 'Create storage account' form is displayed with the following details:

- Subscription:** Free Trial
- Resource group:** SansboundAzureClass
- Storage account name:** sansboundblob
- Location:** Central US
- Performance:** Standard
- Account kind:** BlobStorage
- Replication:** Locally-redundant storage (LRS)
- Access tier (default):** Hot

The 'Review + create' button is visible at the bottom of the form.

Set “Access tier” as “Hot”.



The screenshot shows the Azure portal interface for creating a new 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 includes a 'Storage accounts' section with a 'Filter by name...' input and a 'Create storage account' button. The 'Basics' tab is selected, showing the following configuration:

- Subscription:** Free Trial
- Resource group:** SansboundAzureClass
- Storage account name:** sansboundblob
- Location:** Central US
- Performance:** Standard
- Account kind:** BlobStorage
- Replication:** Locally-redundant storage (LRS)
- Access tier (default):** Hot

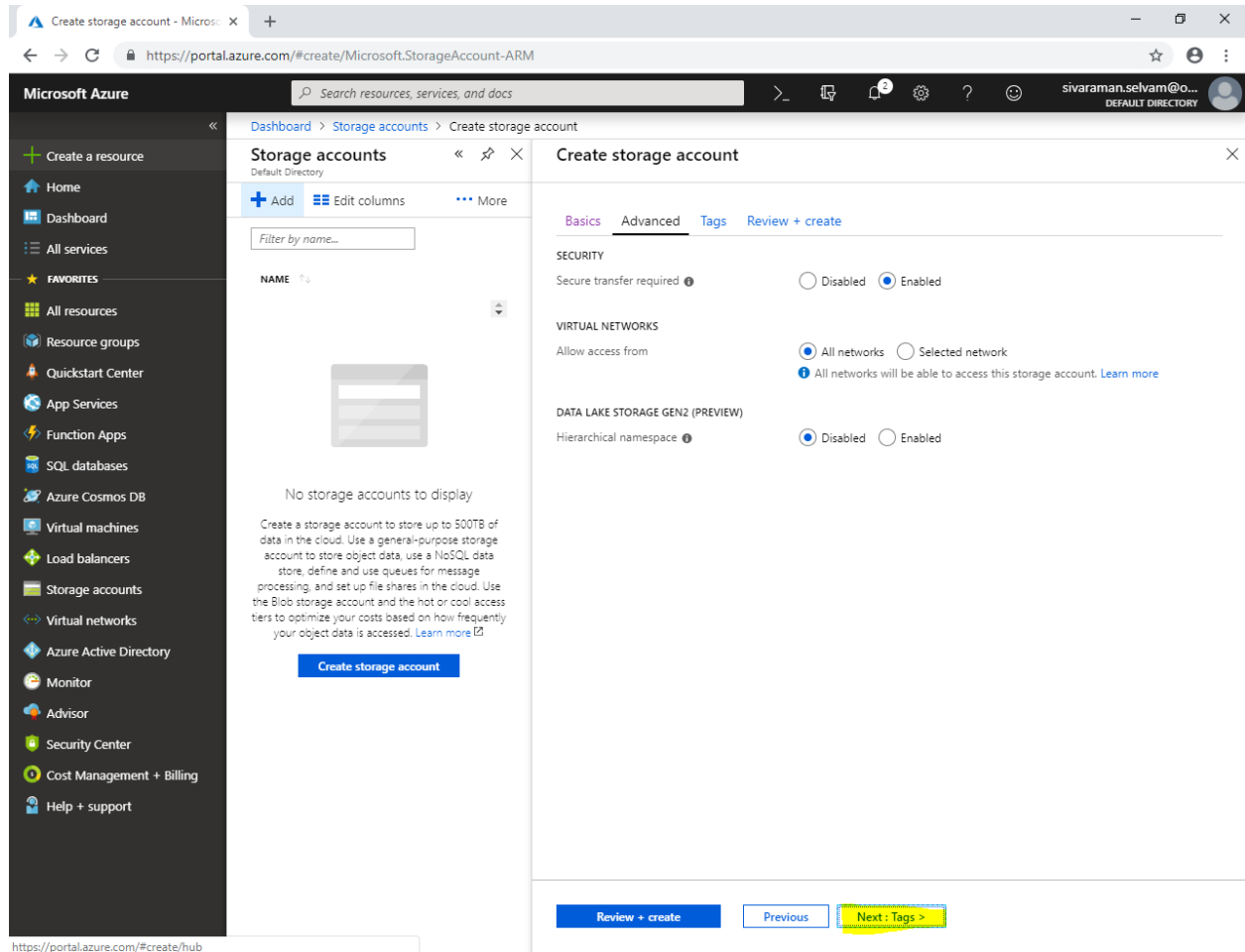
The 'Next: Advanced >' button is visible at the bottom right of the form.

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

The screenshot shows the Azure portal interface for creating a storage account. The left sidebar contains navigation links like 'Create a resource', 'Home', 'Dashboard', and various services. The main area is titled 'Create storage account' and is divided into two panes. The left pane shows a list of storage accounts (currently empty) with a 'Create storage account' button. The right pane shows the configuration details for the new storage account, including subscription, resource group, name, location, performance, account kind, replication, and access tier. The 'Next : Advanced >' button is highlighted in yellow.

In **“Advanced”**.

Click **“Next : Tags >”**.



The screenshot shows the Microsoft Azure portal interface for creating a storage account. The left sidebar contains navigation links for various Azure services. The main content area is titled 'Create storage account' and is divided into two panes. The left pane shows a list of storage accounts (currently empty) with a 'Create storage account' button at the bottom. The right pane shows the configuration options for the storage account, categorized into 'SECURITY', 'VIRTUAL NETWORKS', and 'DATA LAKE STORAGE GEN2 (PREVIEW)'. The 'Advanced' tab is selected, and the 'Next : Tags >' button is highlighted in yellow.

SECURITY

Secure transfer required ☐ Disabled ☒ Enabled

VIRTUAL NETWORKS

Allow access from ☒ All networks ☐ Selected network

All networks will be able to access this storage account. [Learn more](#)

DATA LAKE STORAGE GEN2 (PREVIEW)

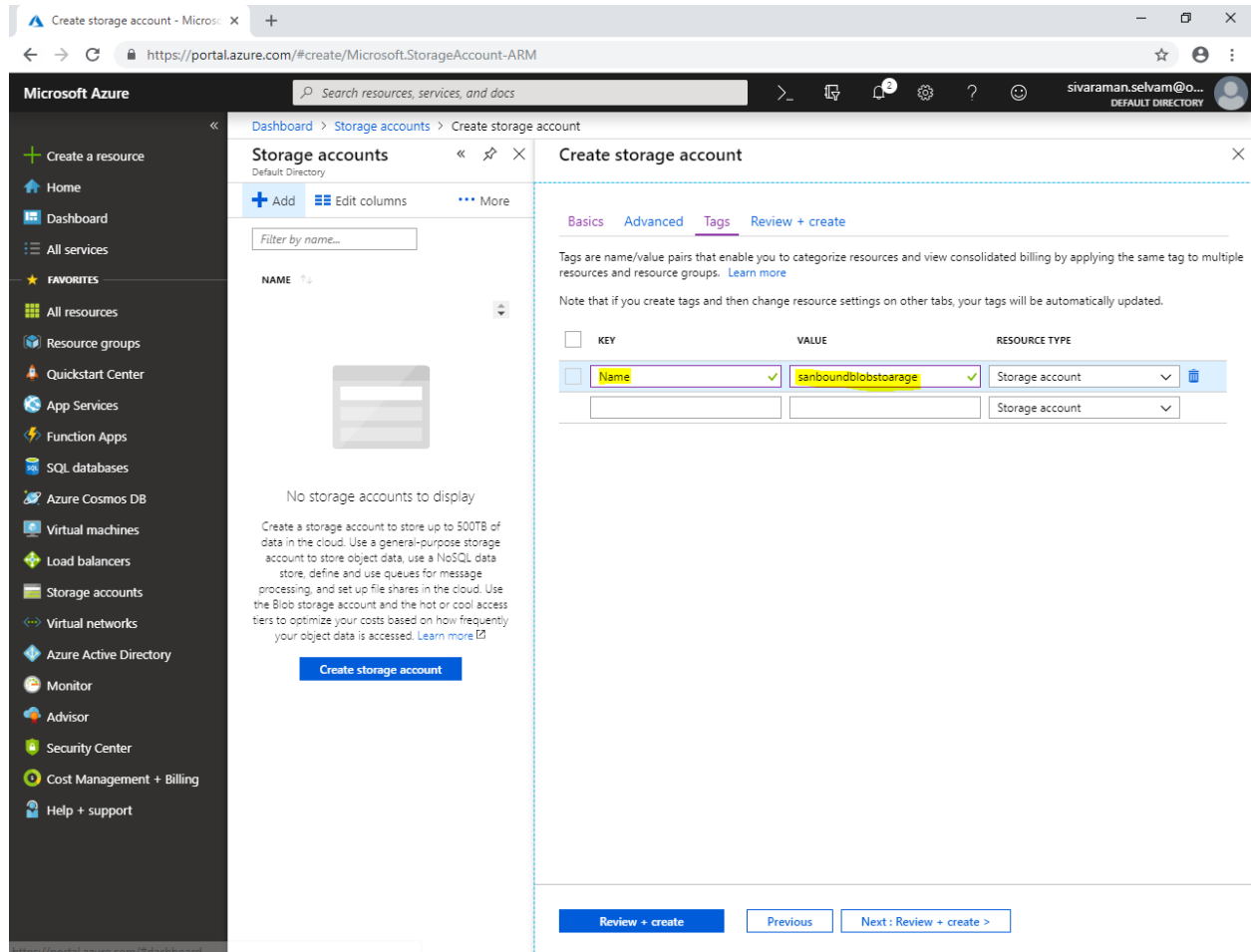
Hierarchical namespace ☒ Disabled ☐ Enabled

[Review + create](#) [Previous](#) [Next : Tags >](#)

In “Tags”,

Type “Key” value as “Name”.

Type “VALUE” as “sansboundblobstorage”.

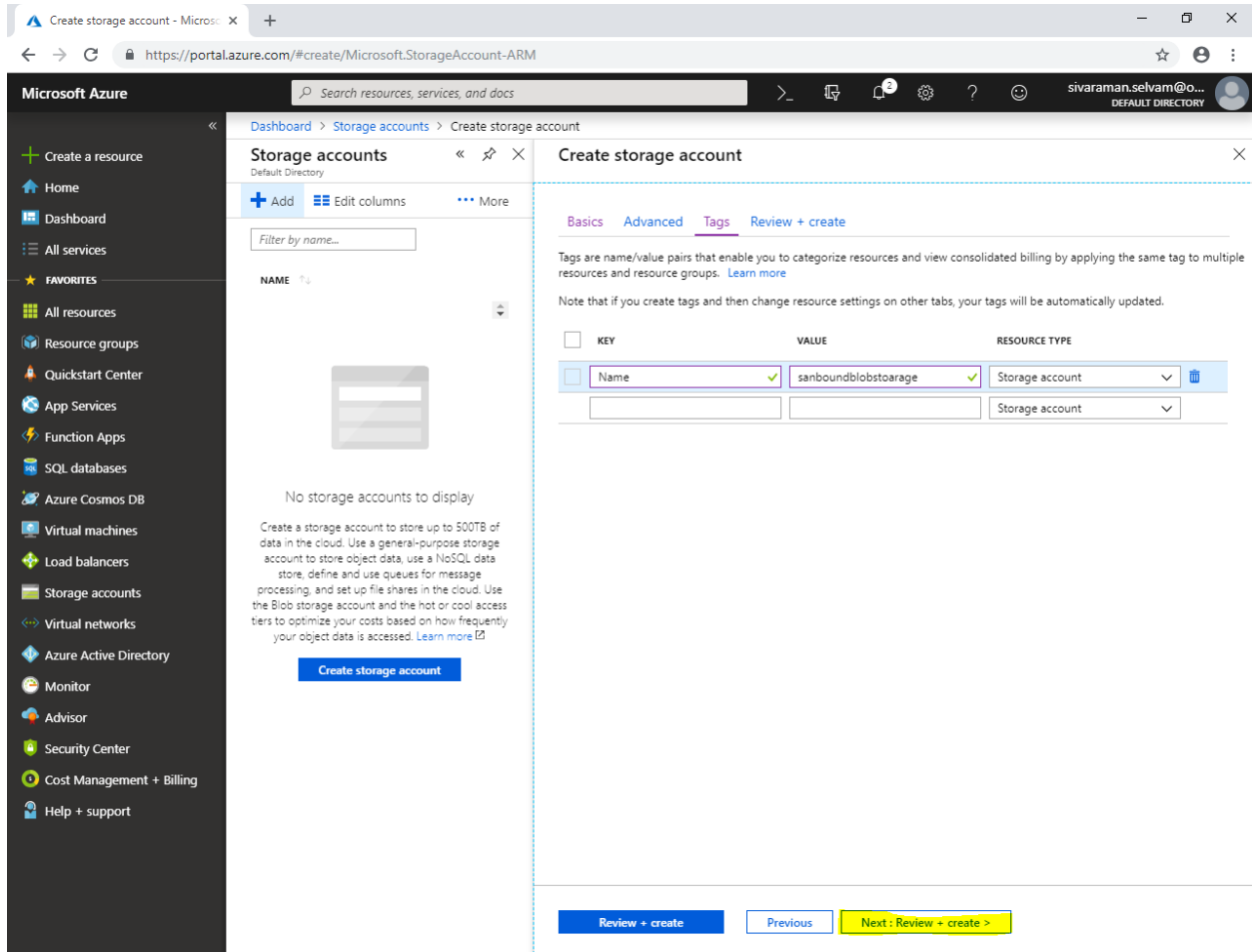


The screenshot shows the Microsoft Azure portal interface. On the left is the navigation pane with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area is titled 'Storage accounts' and 'Create storage account'. The 'Tags' tab is active, displaying a table with the following content:

KEY	VALUE	RESOURCE TYPE
Name	sansboundblobstorage	Storage account
		Storage account

Below the table 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 navigation links for various Azure services. The main content area is titled 'Create storage account' and includes tabs for 'Basics', 'Advanced', 'Tags', and 'Review + create'. The 'Review + create' tab is active, showing a summary of the configuration. Below the summary, there is a table with columns for 'KEY', 'VALUE', and 'RESOURCE TYPE'. The table contains two rows: one for 'Name' with value 'sanboundblobstorage' and resource type 'Storage account', and another for 'Resource type' with value 'Storage account' and 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

Basics Advanced Tags Review + create

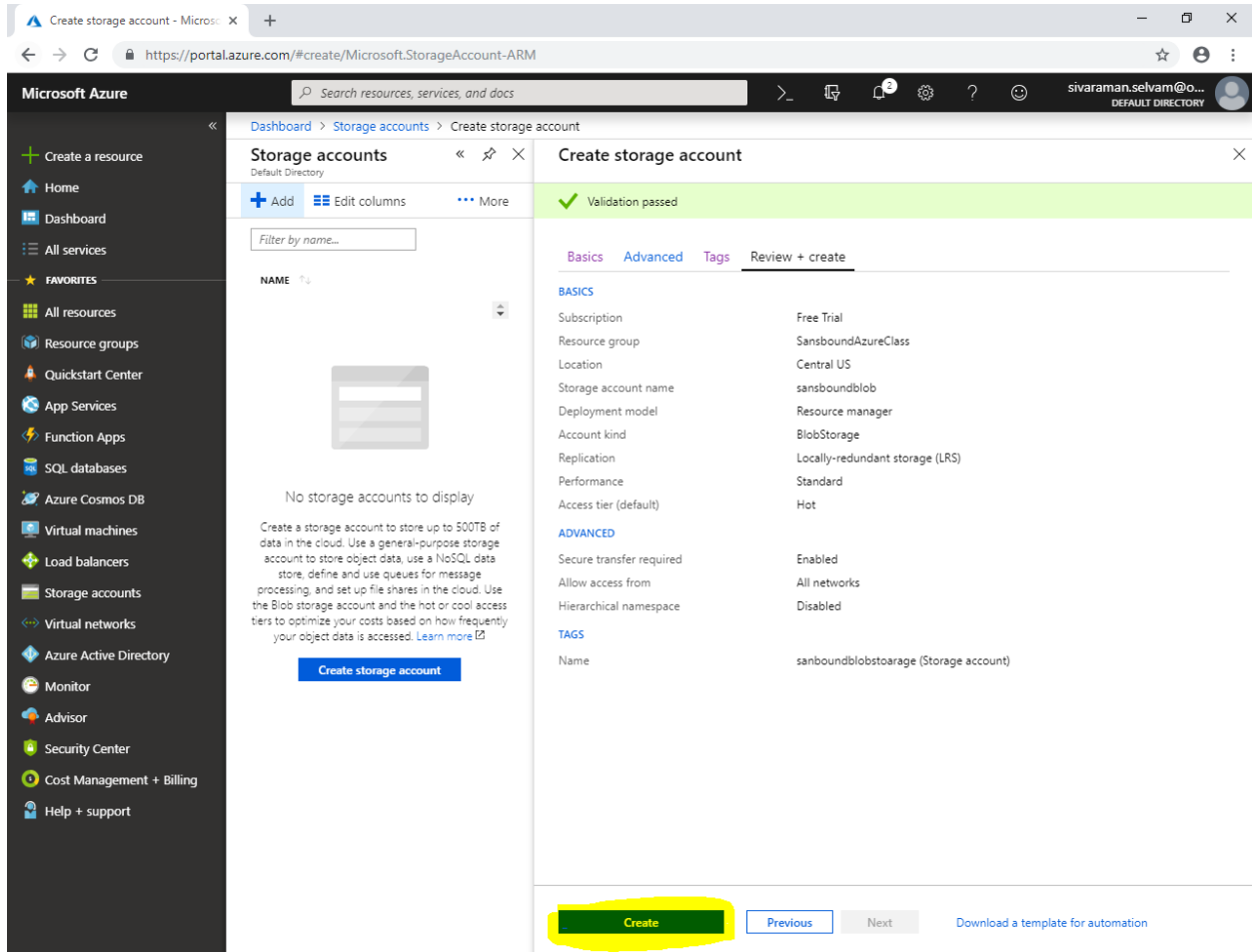
Tags are name/value pairs that enable you to categorize resources and view consolidated billing by applying the same tag to multiple resources and resource groups. [Learn more](#)

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	sanboundblobstorage	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 links for various Azure services. The main content area is titled 'Create storage account' and shows a 'Validation passed' status. The 'Basics' tab is active, displaying configuration details for the storage account. The 'Create' button at the bottom is highlighted in yellow.

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

Basics

Subscription	Free Trial
Resource group	SansboundAzureClass
Location	Central US
Storage account name	sansboundblob
Deployment model	Resource manager
Account kind	BlobStorage
Replication	Locally-redundant storage (LRS)
Performance	Standard
Access tier (default)	Hot

ADVANCED

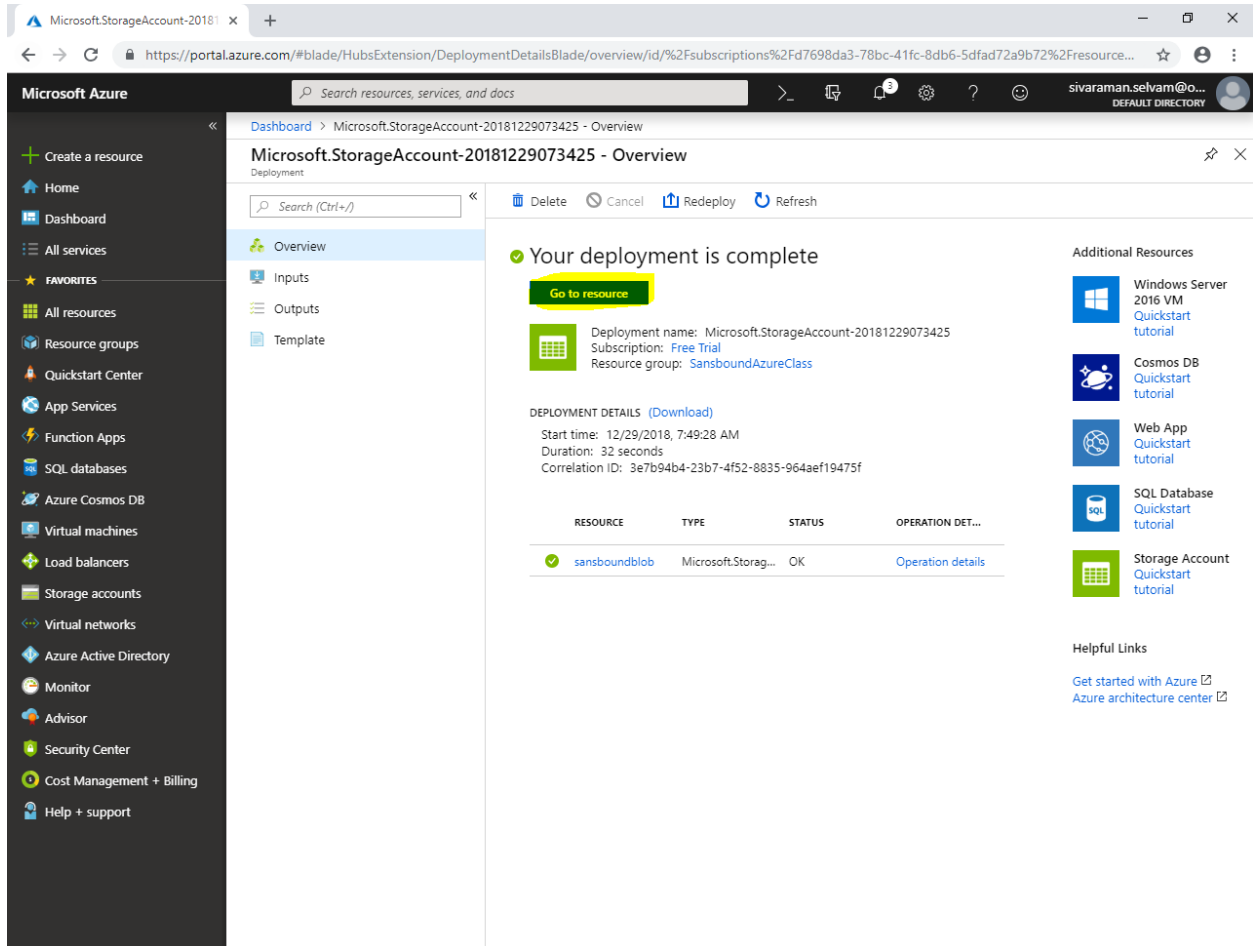
Secure transfer required	Enabled
Allow access from	All networks
Hierarchical namespace	Disabled

TAGS

Name	sanboundblobstorage (Storage account)
------	---------------------------------------

Create Previous Next Download a template for automation

Click **“Go to resource”**.



Microsoft Azure

Search resources, services, and docs

Dashboard > Microsoft.StorageAccount-20181229073425 - Overview

Microsoft.StorageAccount-20181229073425 - Overview

Deployment

Search (Ctrl+F)

Overview

Inputs

Outputs

Template

Delete Cancel Redeploy Refresh

✓ Your deployment is complete

Go to resource

Deployment name: Microsoft.StorageAccount-20181229073425
Subscription: [Free Trial](#)
Resource group: [SansboundAzureClass](#)

DEPLOYMENT DETAILS (Download)

Start time: 12/29/2018, 7:49:28 AM
Duration: 32 seconds
Correlation ID: 3e7b94b4-23b7-4f52-8835-964aef19475f

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

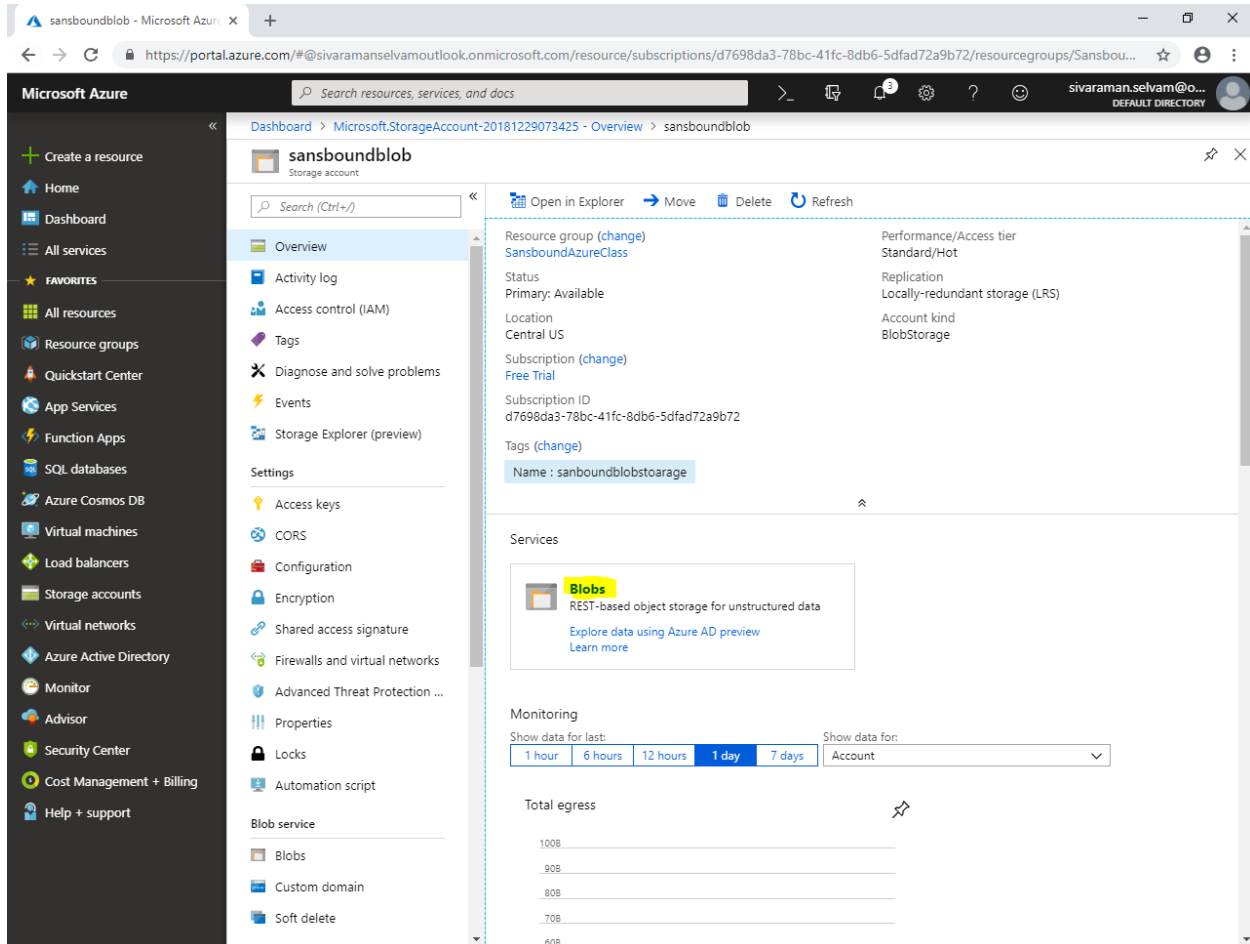
Additional Resources

- 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](#)

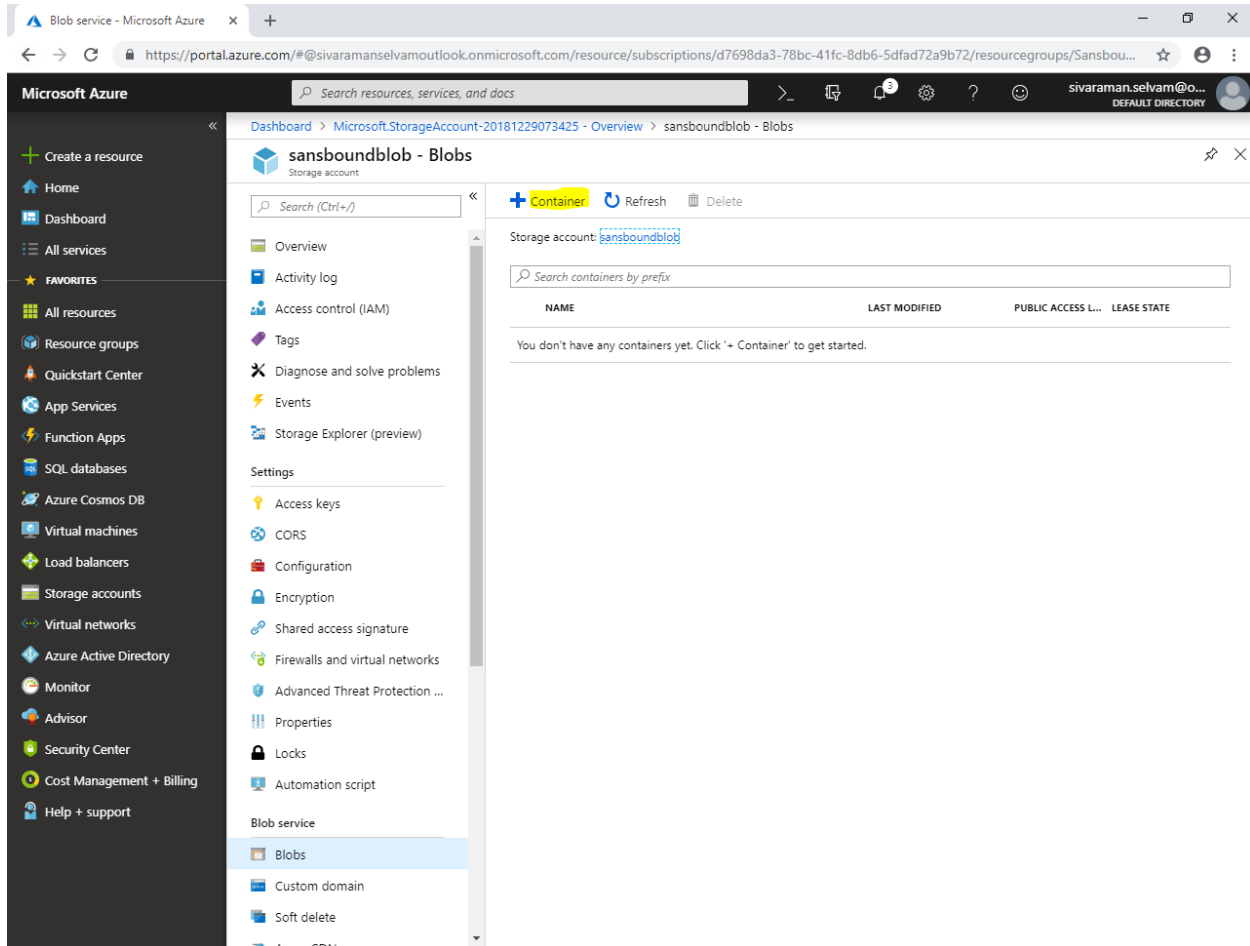
Click **"Blobs"**.



The screenshot displays the Microsoft Azure portal interface for a storage account named 'sansboundblob'. The left-hand navigation pane shows the 'Blobs' service selected under the 'Storage accounts' category. The main content area is divided into several sections:

- Overview:** Displays key information about the storage account, including the resource group (SansboundAzureClass), status (Primary; Available), location (Central US), and subscription ID (d7698da3-78bc-41fc-8db6-5dfad72a9b72).
- Services:** Highlights the 'Blobs' service as REST-based object storage for unstructured data, with a link to 'Explore data using Azure AD preview'.
- Monitoring:** Shows data for the last 1 day, with a dropdown menu set to 'Account'.
- Total egress:** A line graph showing data egress over time, with values ranging from 60B to 100B.

In Container, click **“Container”** to add.

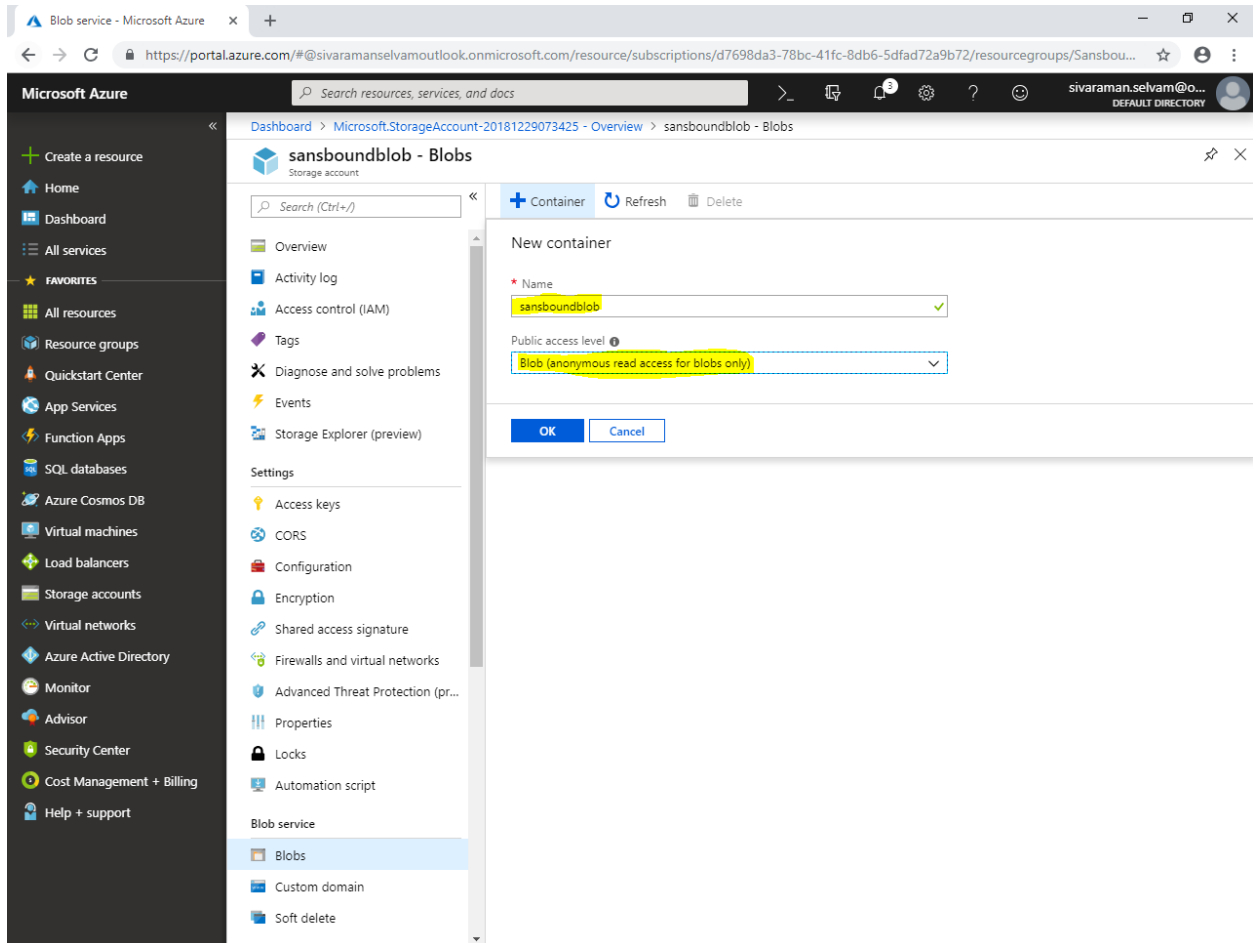


The screenshot shows the Microsoft Azure portal interface. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main content area displays the 'sansboundblob - Blobs' page for a storage account. At the top, there's a search bar and a '+ Container' button highlighted in yellow. Below this, a table is shown with columns: NAME, LAST MODIFIED, PUBLIC ACCESS L..., and LEASE STATE. A message below the table states: 'You don't have any containers yet. Click '+ Container' to get started.'

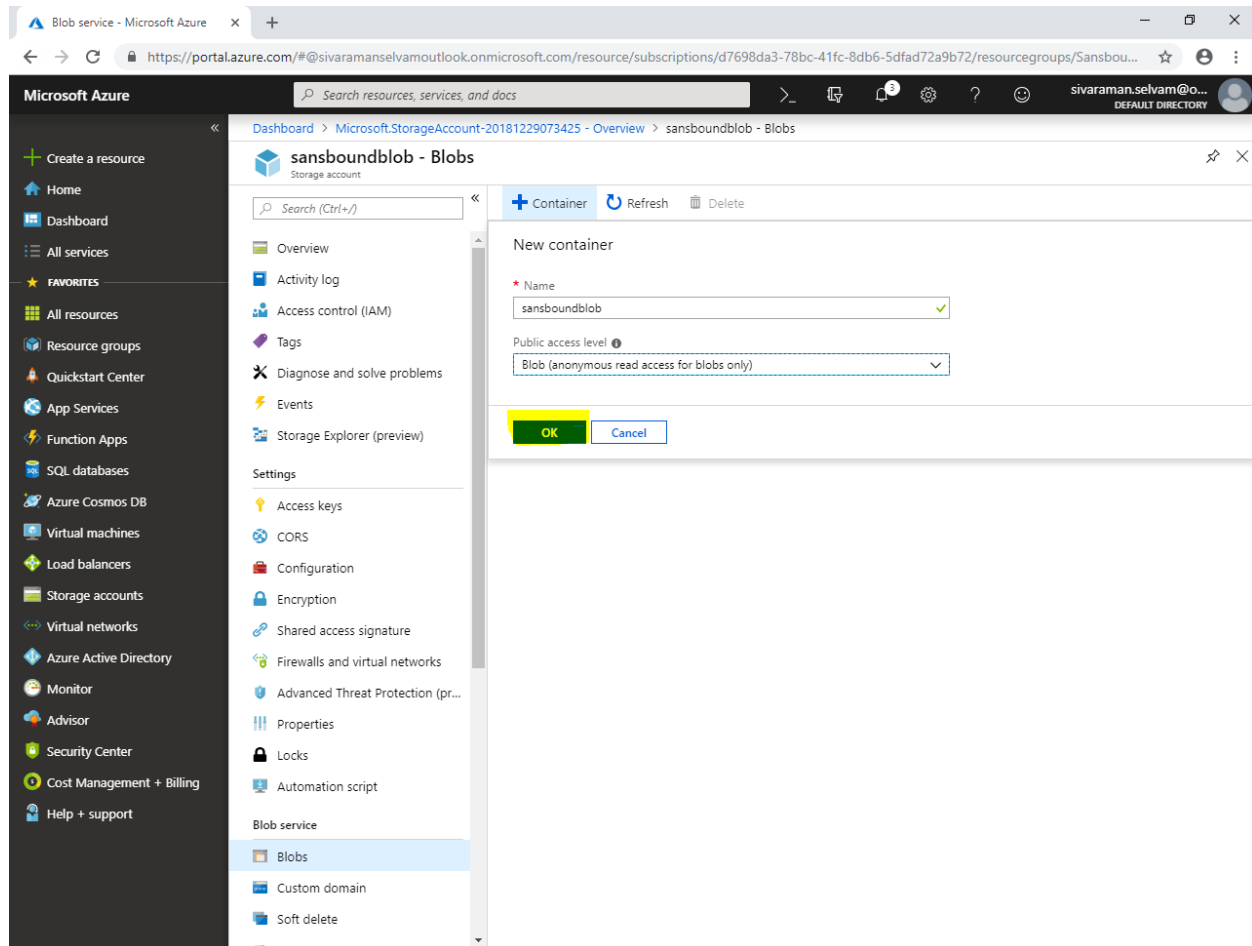
While create container,

Type “Name” as “**sansboundblob**”.

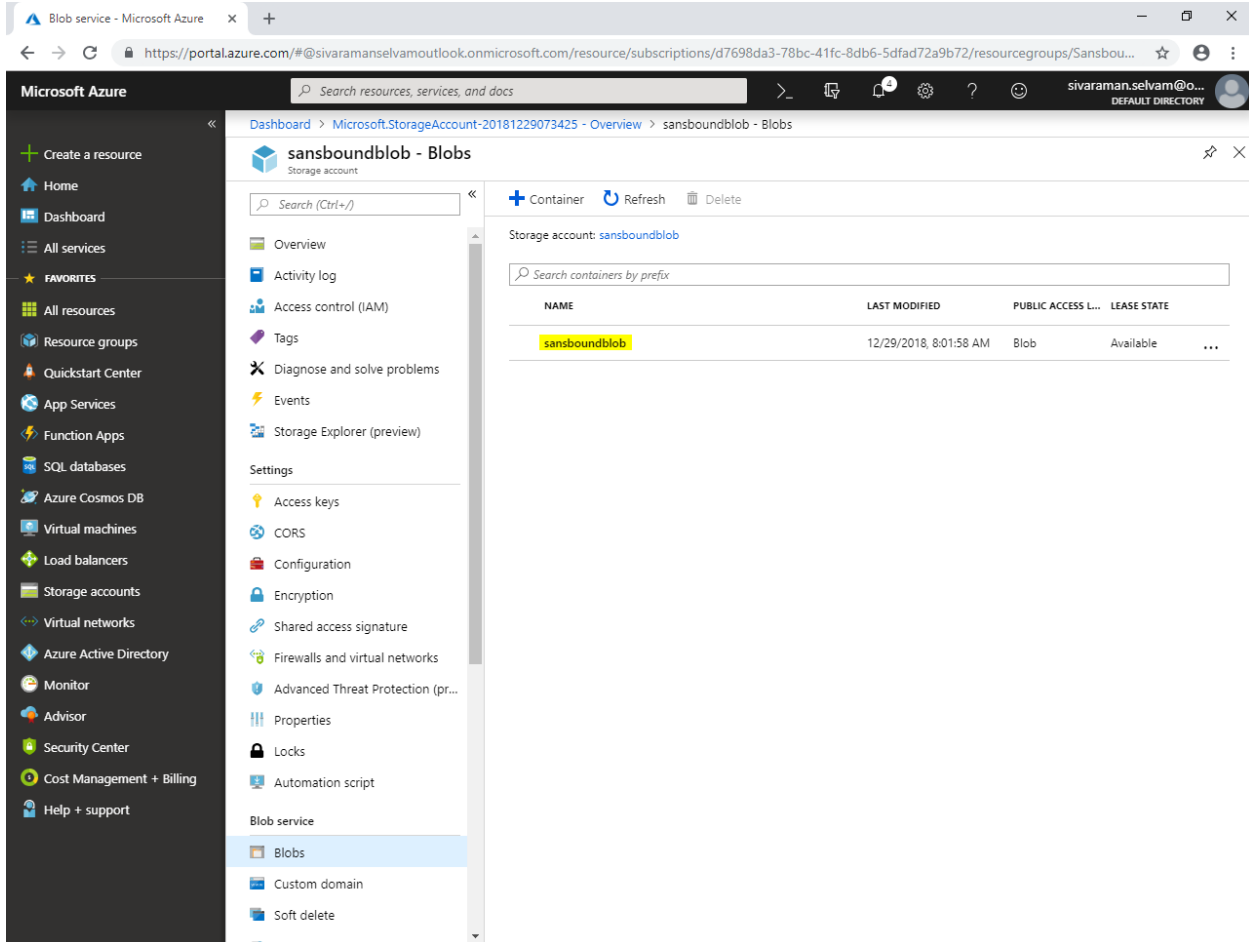
Select “Public access level” as “**Blob**”.



Click **“Ok”**.



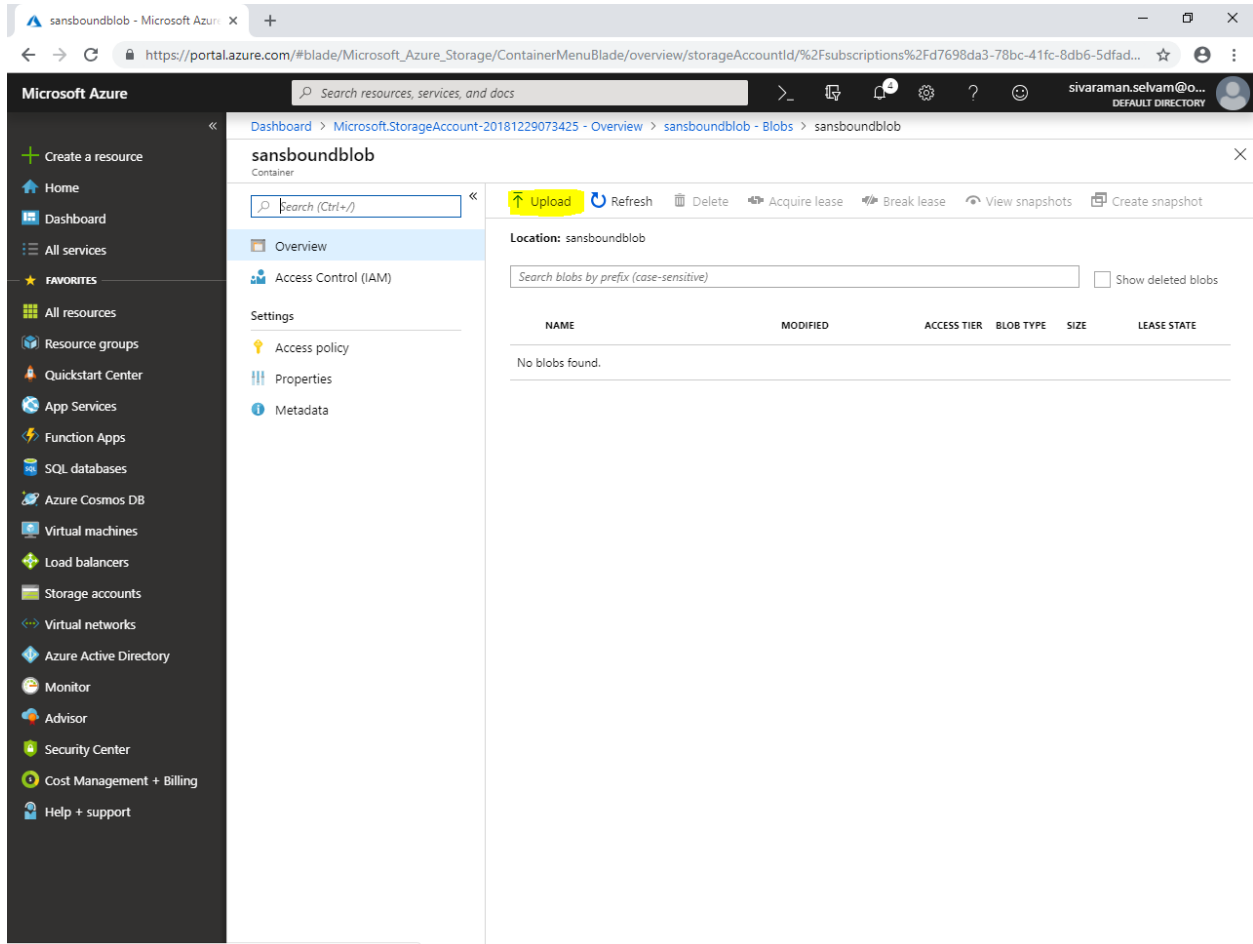
Click **"sansboundblob"**.



The screenshot shows the Microsoft Azure portal interface. The left sidebar contains the navigation menu with categories like 'Create a resource', 'Home', 'Dashboard', 'All services', 'FAVORITES', and various services including 'Storage accounts'. The 'Storage accounts' option is selected, leading to the 'sansboundblob - Blobs' page. The main content area displays the storage account name 'sansboundblob' and a table of blobs. The table has columns for NAME, LAST MODIFIED, PUBLIC ACCESS L..., and LEASE STATE. A single blob named 'sansboundblob' is listed with a last modified date of 12/29/2018, 8:01:58 AM, and a public access level of 'Blob'.

NAME	LAST MODIFIED	PUBLIC ACCESS L...	LEASE STATE
sansboundblob	12/29/2018, 8:01:58 AM	Blob	Available

Click **“Upload”** to upload **“index.html”** file.



The screenshot shows the Microsoft Azure portal interface. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main content area displays the 'sansboundblob' container overview. The 'Upload' button is highlighted in yellow. Below the 'Upload' button, there is a search bar for blobs and a table with columns: NAME, MODIFIED, ACCESS TIER, BLOB TYPE, SIZE, and LEASE STATE. The table currently shows 'No blobs found.'

Microsoft Azure

Search resources, services, and docs

Dashboard > Microsoft.StorageAccount-20181229073425 - Overview > sansboundblob - Blobs > sansboundblob

sansboundblob

Container

Search (Ctrl+/)

Overview

Access Control (IAM)

Settings

Access policy

Properties

Metadata

Upload Refresh Delete Acquire lease Break lease View snapshots Create snapshot

Location: sansboundblob

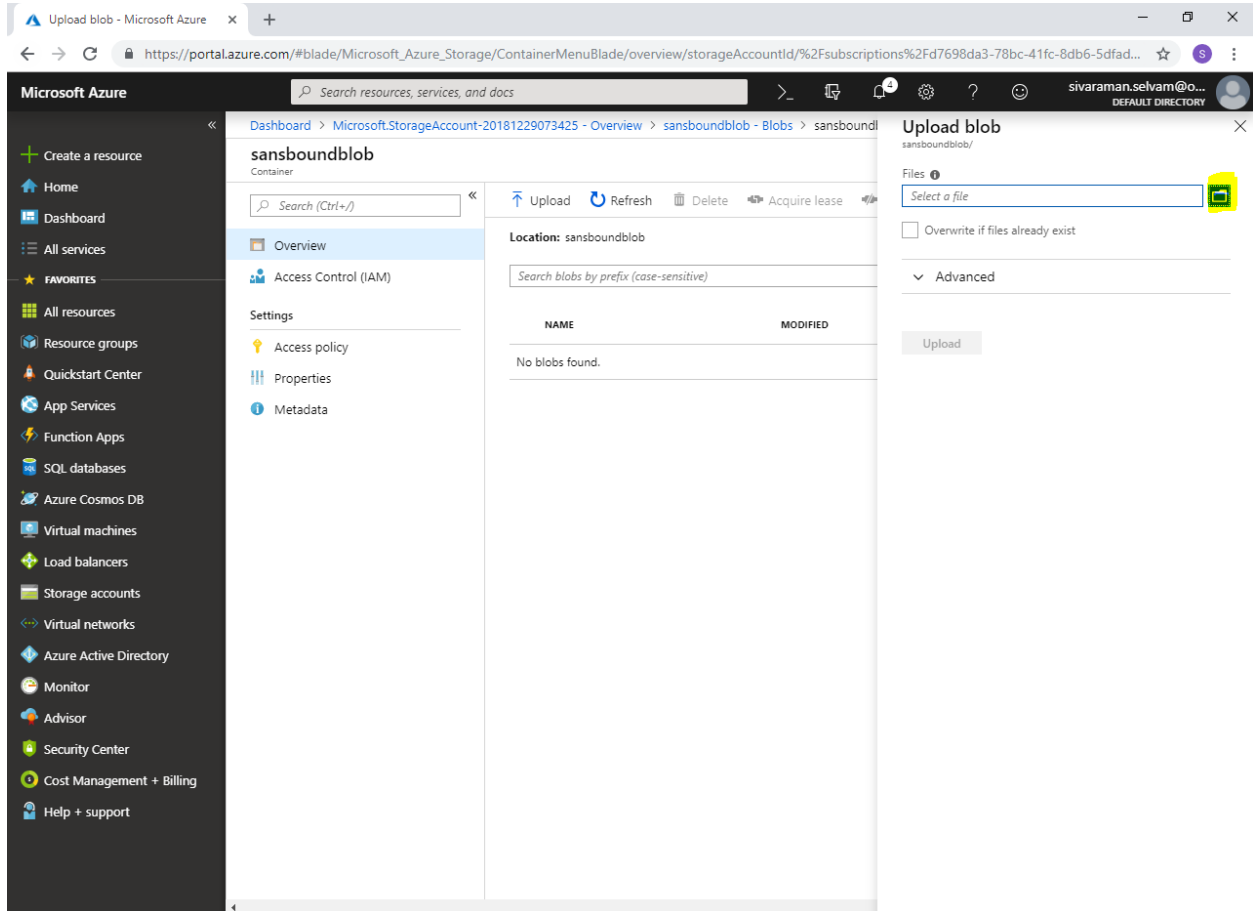
Search blobs by prefix (case-sensitive)

Show deleted blobs

NAME	MODIFIED	ACCESS TIER	BLOB TYPE	SIZE	LEASE STATE
No blobs found.					

In "Upload blob"

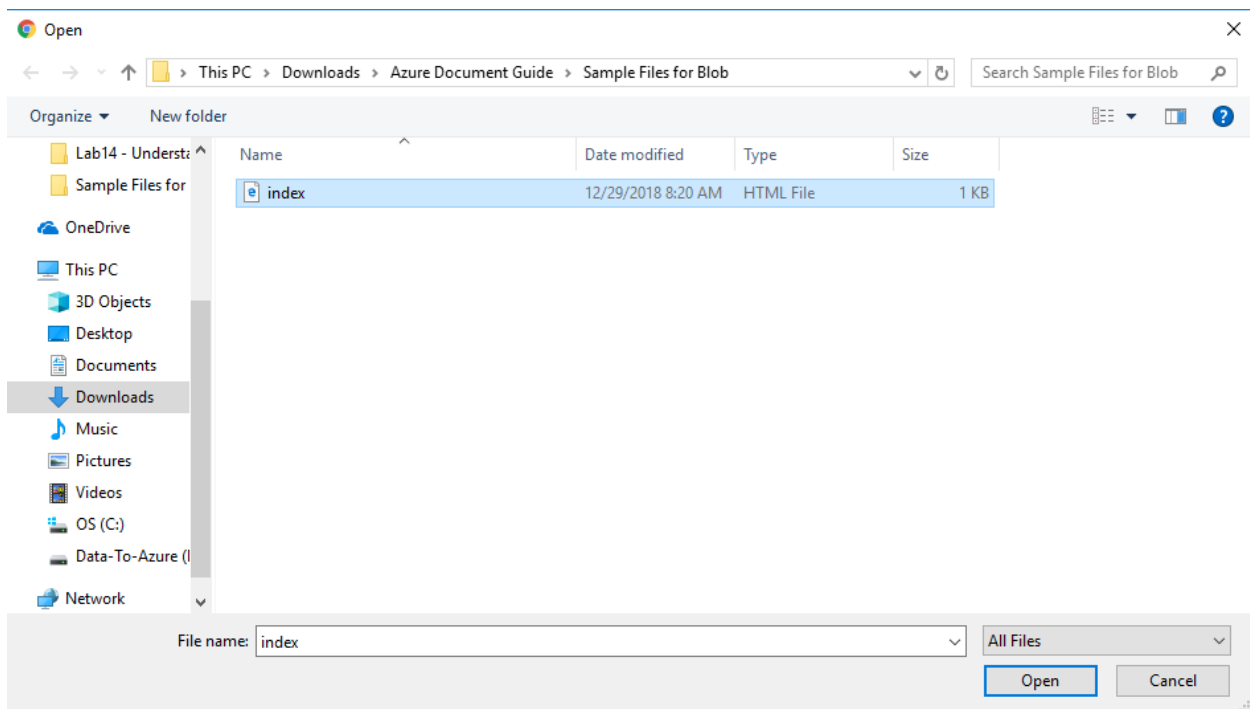
Click "Icon".



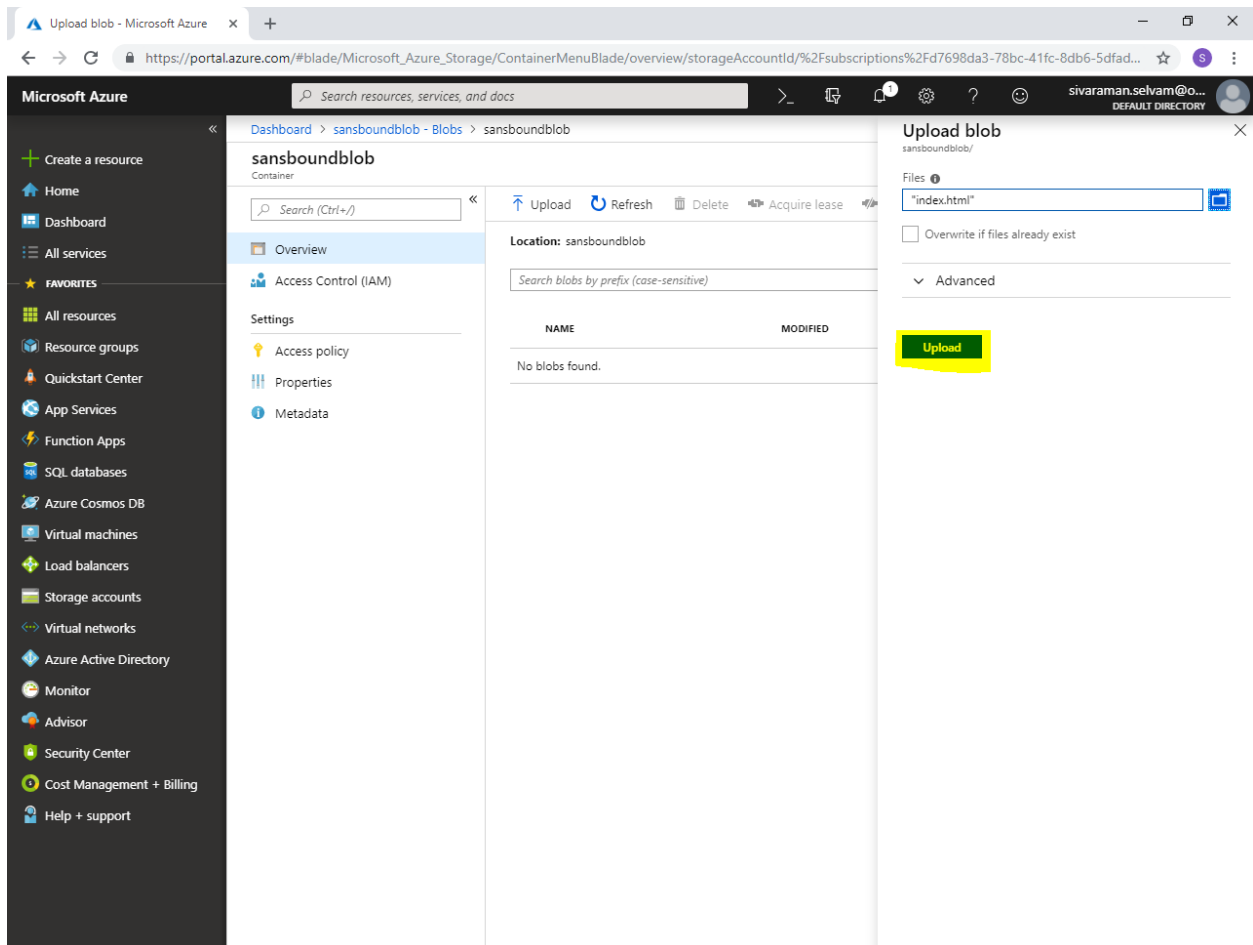
The screenshot shows the Microsoft Azure portal interface. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area displays the 'sansboundblob' container overview. On the right, the 'Upload blob' pane is open, showing a 'Select a file' button, an 'Overwrite if files already exist' checkbox, and an 'Advanced' section. The 'Upload' button is visible at the bottom of the pane.

In your local machine, locate the “index.html” and select “index.html” file.

Click **“Open”**.

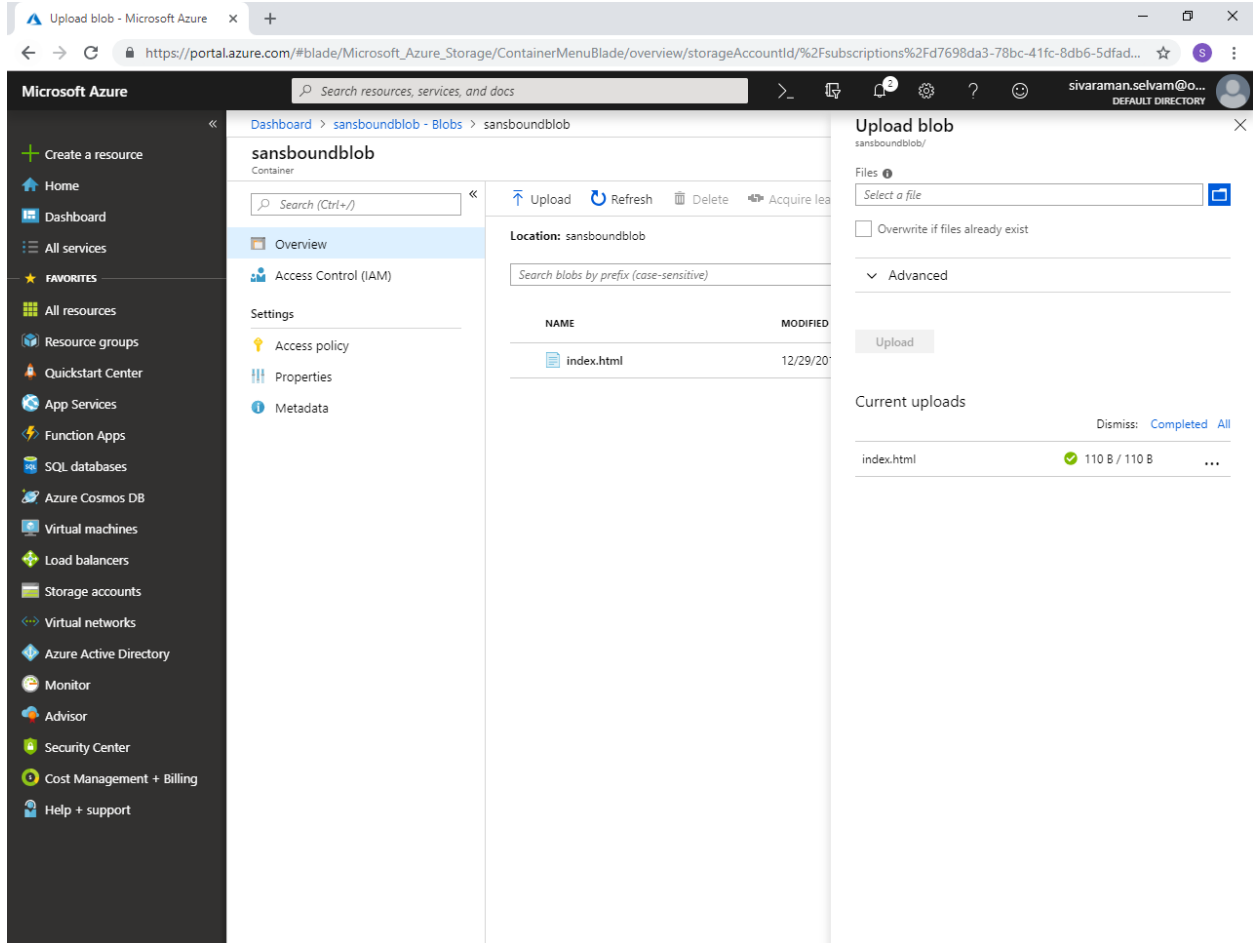


Click **“Upload”**.



The screenshot shows the Microsoft Azure portal interface. On the left is a navigation pane with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area displays the 'sansboundblob' container overview. On the right, the 'Upload blob' dialog box is open, showing a file input field with 'index.html', an 'Overwrite if files already exist' checkbox, and a yellow 'Upload' button.

You have successfully uploaded the **"index.html"** in sansboundblob container.

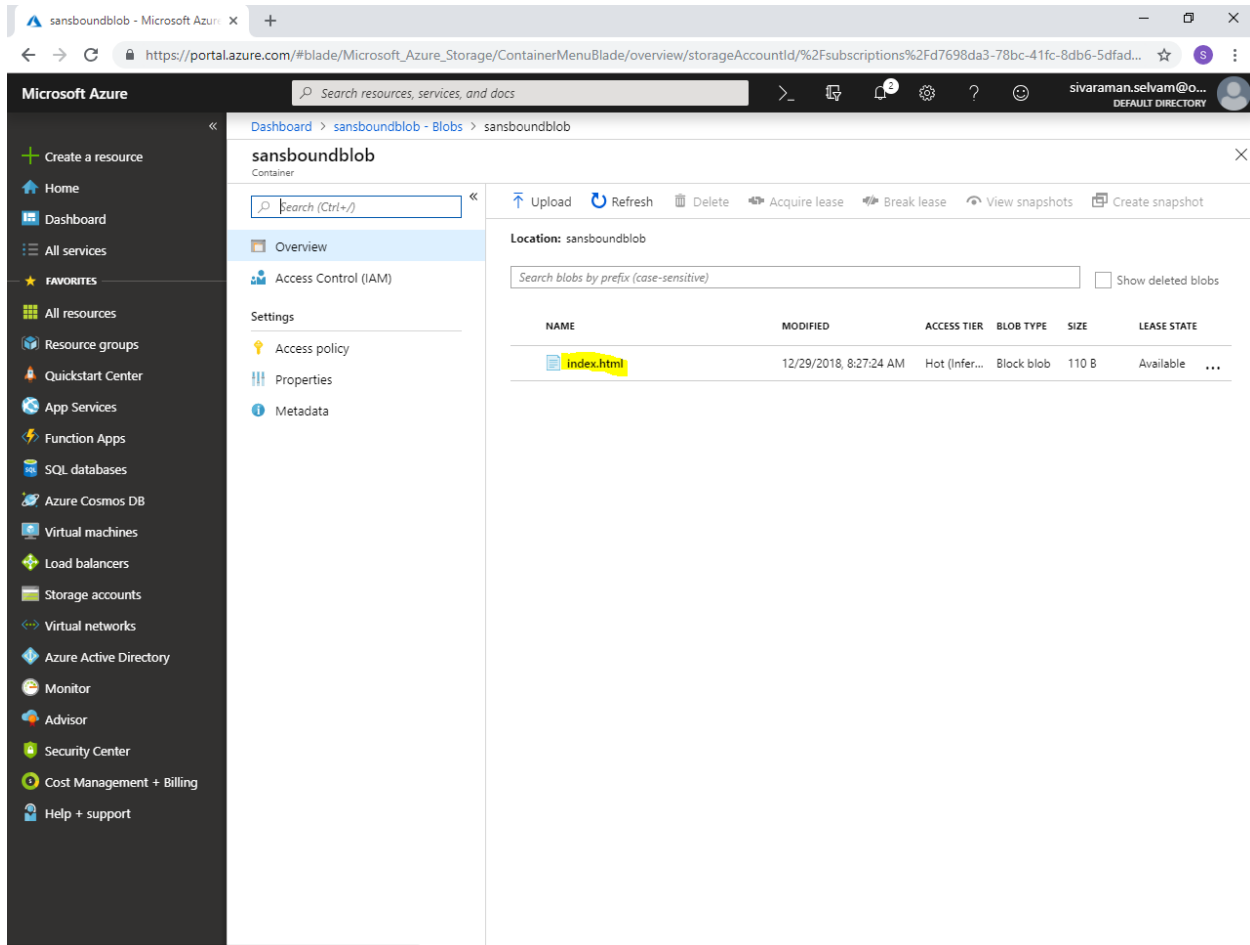


The screenshot displays the Microsoft Azure portal interface. The left sidebar shows the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', and 'All services'. The main content area shows the 'sansboundblob' container overview. A table lists the uploaded files:

NAME	MODIFIED
index.html	12/29/20...

On the right, the 'Upload blob' pane is open, showing the 'Upload' button and the 'Current uploads' section, which indicates that 'index.html' (110 B / 110 B) has been successfully uploaded.

Click **"index.html"**.

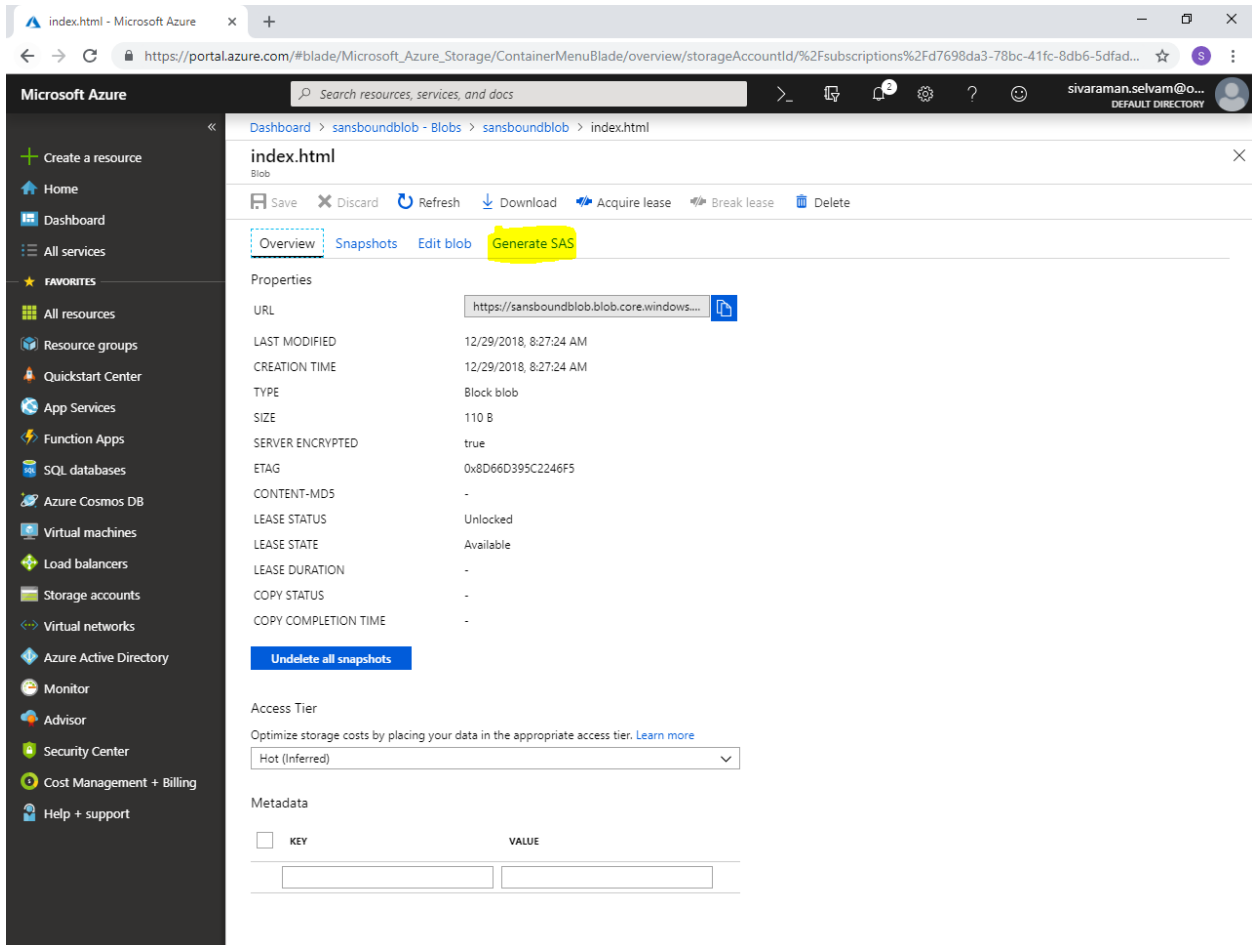


The screenshot shows the Microsoft Azure portal interface. The left sidebar contains navigation options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area displays the 'sansboundblob' container. A search bar is present, and a table lists the blobs. The 'index.html' blob is highlighted.

NAME	MODIFIED	ACCESS TIER	BLOB TYPE	SIZE	LEASE STATE
index.html	12/29/2018, 8:27:24 AM	Hot (Infer...	Block blob	110 B	Available ...

In “Overview”.

Click “Generate SAS”.

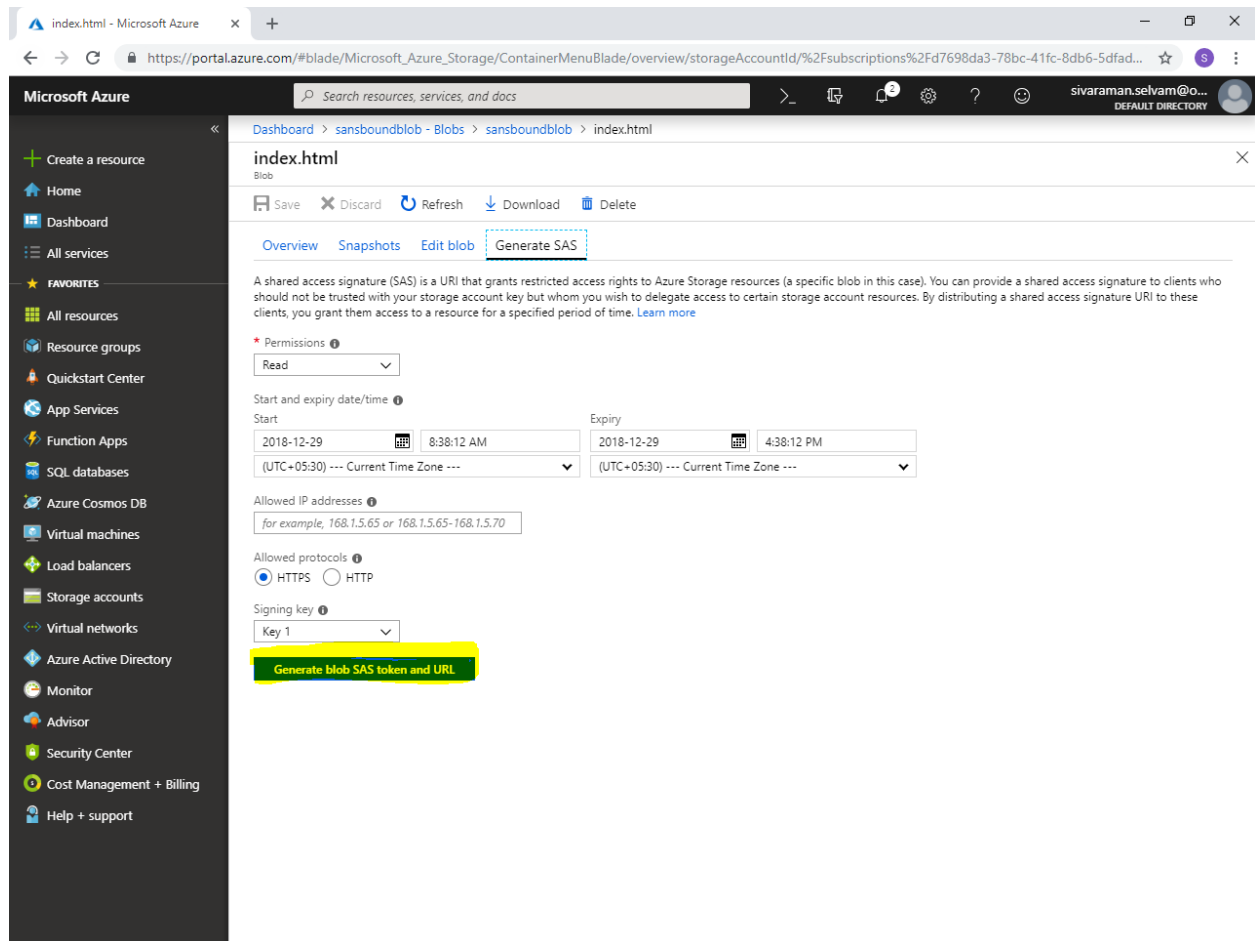


The screenshot shows the Microsoft Azure portal interface. The left sidebar contains navigation options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main content area displays the 'index.html' blob page. At the top, there's a breadcrumb trail: 'Dashboard > sansboundblob - Blobs > sansboundblob > index.html'. Below this, the 'index.html' blob is shown with various actions: 'Save', 'Discard', 'Refresh', 'Download', 'Acquire lease', 'Break lease', and 'Delete'. A tabbed interface at the top of the blob details shows 'Overview' (selected), 'Snapshots', 'Edit blob', and 'Generate SAS' (highlighted in yellow). The 'Properties' section lists details such as URL, LAST MODIFIED, CREATION TIME, TYPE, SIZE, SERVER ENCRYPTED, ETAG, CONTENT-MD5, LEASE STATUS, LEASE STATE, LEASE DURATION, COPY STATUS, and COPY COMPLETION TIME. Below the properties, there's a button 'Undelete all snapshots'. The 'Access Tier' section shows 'Hot (Inferred)' with a dropdown arrow. The 'Metadata' section has a table with 'KEY' and 'VALUE' columns.

KEY	VALUE

In “Generate SAS”.

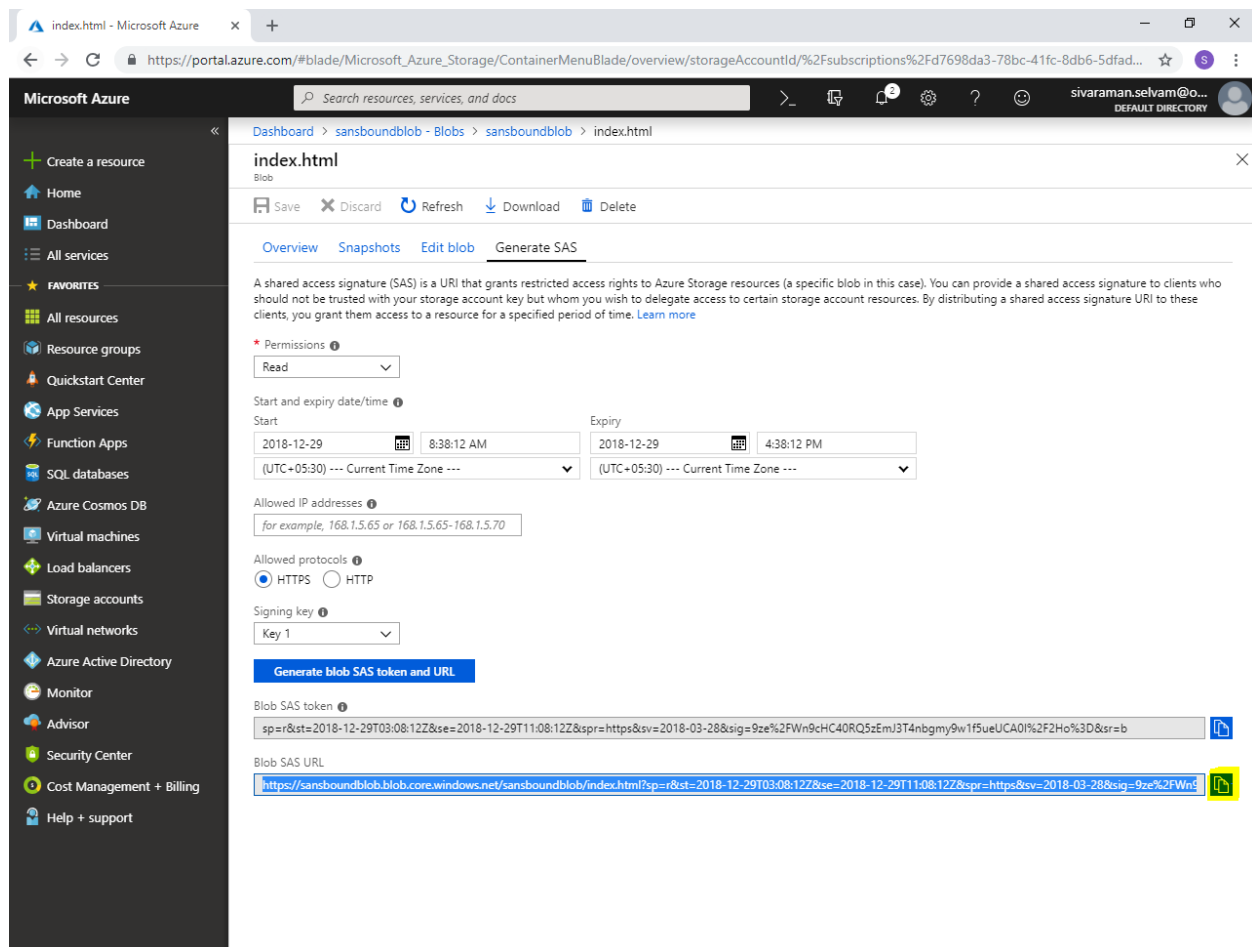
Click “Generate blob SAS token and URL”.



The screenshot shows the Microsoft Azure portal interface. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main content area displays the 'index.html' blob page. The 'Generate SAS' tab is selected, showing a configuration form. The form includes a 'Permissions' dropdown set to 'Read', 'Start and expiry date/time' fields with a start date of 2018-12-29 at 8:38:12 AM and an expiry date of 2018-12-29 at 4:38:12 PM, both in the UTC+05:30 time zone. The 'Allowed IP addresses' field is empty, and the 'Allowed protocols' are set to 'HTTPS'. The 'Signing key' is set to 'Key 1'. A green button labeled 'Generate blob SAS token and URL' is highlighted at the bottom of the form.

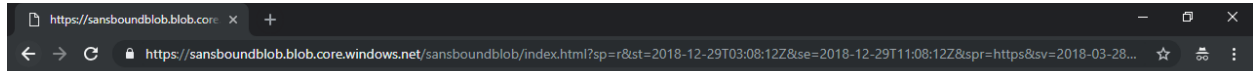
To copy **"Blob SAS URL"**.

Click **"Icon"** to copy **"Blob SAS URL"**.



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 'index.html' blob page. The 'Generate SAS' tab is active, showing a form to generate a Shared Access Signature (SAS). The form includes fields for 'Permissions' (set to 'Read'), 'Start' and 'Expiry' dates and times, 'Allowed IP addresses', 'Allowed protocols' (set to 'HTTPS'), and 'Signing key' (set to 'Key 1'). A blue button labeled 'Generate blob SAS token and URL' is visible. Below the form, the 'Blob SAS token' and 'Blob SAS URL' are displayed. The 'Blob SAS URL' is highlighted with a blue box, and a copy icon is shown next to it.

Paste the “Blob SAS URL” in browser and press “Enter”.



Welcome to Sansbound Azure Blob page

You have got Blob page successfully.