

## Lab8 – Understanding Performance tiers of Storage Disks - Azure

### Disks storage for Azure Windows VMs

Just like any other computer, virtual machines in Azure use disks as a place to store an operating system, applications, and data. All Azure virtual machines have at least two disks – a Windows operating system disk and a temporary disk. The operating system disk is created from an image, and both the operating system disk and the image are virtual hard disks (VHDs) stored in an Azure storage account. Virtual machines also can have one or more data disks, that are also stored as VHDs.

### Disks used by VMs

Let's take a look at how the disks are used by the VMs.

#### Operating system disk

Every virtual machine has one attached operating system disk. It's registered as a SATA drive and labeled as the C: drive by default. This disk has a maximum capacity of 2048 gigabytes (GB).

#### Temporary disk

Each VM contains a temporary disk. The temporary disk provides short-term storage for applications and processes and is intended to only store data such as page or swap files. Data on the temporary disk may be lost during a [maintenance event](#) or when you [redploy a VM](#). During a successful standard reboot of the VM, the data on the temporary drive should persist. However, there are cases where the data may not persist, such as moving to a new host. Accordingly, any data on the temp drive should not be data that is critical to the system.

The temporary disk is labeled as the D: drive by default and it used for storing pagefile.sys. To remap this disk to a different drive letter, see [Change the drive letter of the Windows temporary disk](#). The size of the temporary disk varies, based on the size of the virtual machine. For more information, see [Sizes for Windows virtual machines](#).

For more information on how Azure uses the temporary disk, see [Understanding the temporary drive on Microsoft Azure Virtual Machines](#)

## Data disk

A data disk is a VHD that's attached to a virtual machine to store application data, or other data you need to keep. Data disks are registered as SCSI drives and are labeled with a letter that you choose. Each data disk has a maximum capacity of 4,095 GB, managed disks have a maximum capacity of 32,767 GiB. The size of the virtual machine determines how many data disks you can attach to it and the type of storage you can use to host the disks.

Azure creates an operating system disk when you create a virtual machine from an image. If you use an image that includes data disks, Azure also creates the data disks when it creates the virtual machine. Otherwise, you add data disks after you create the virtual machine.

You can add data disks to a virtual machine at any time, by **attaching** the disk to the virtual machine. You can use a VHD that you've uploaded or copied to your storage account, or use an empty VHD that Azure creates for you. Attaching a data disk associates the VHD file with the VM by placing a 'lease' on the VHD so it can't be deleted from storage while it's still attached.

## About VHDs

The VHDs used in Azure are .vhd files stored as page blobs in a standard or premium storage account in Azure. For details about page blobs, see [Understanding block blobs and page blobs](#). For details about premium storage, see [High-performance premium storage and Azure VMs](#).

Azure supports the fixed disk VHD format. The fixed format lays the logical disk out linearly within the file, so that disk offset X is stored at blob offset X. A small footer at the end of the blob describes the properties of the VHD. Often, the fixed-format wastes space because most disks have large unused ranges in them. However, Azure stores .vhd files in a sparse format, so you receive the benefits of both the fixed and dynamic disks at the same time. For more information, see [Getting started with virtual hard disks](#).

All VHD files in Azure that you want to use as a source to create disks or images are read-only, except the .vhd files uploaded or copied to Azure storage by the user (which can be either read-write or read-only). When you create a disk or image, Azure makes

copies of the source .vhd files. These copies can be read-only or read-and-write, depending on how you use the VHD.

When you create a virtual machine from an image, Azure creates a disk for the virtual machine that is a copy of the source .vhd file. To protect against accidental deletion, Azure places a lease on any source .vhd file that's used to create an image, an operating system disk, or a data disk.

Before you can delete a source .vhd file, you'll need to remove the lease by deleting the disk or image. To delete a .vhd file that is being used by a virtual machine as an operating system disk, you can delete the virtual machine, the operating system disk, and the source .vhd file all at once by deleting the virtual machine and deleting all associated disks. However, deleting a .vhd file that's a source for a data disk requires several steps in a set order. First you detach the disk from the virtual machine, then delete the disk, and then delete the .vhd file.

## **Warning**

If you delete a source .vhd file from storage, or delete your storage account, Microsoft can't recover that data for you.

## **Types of disks**

Azure Disks are designed for 99.999% availability. Azure Disks have consistently delivered enterprise-grade durability, with an industry-leading ZERO% Annualized Failure Rate.

There are three performance tiers for storage that you can choose from when creating your disks -- Premium SSD Disks, Standard SSD, and Standard HDD Storage. Also, there are two types of disks -- unmanaged and managed.

### **Standard HDD disks**

Standard HDD disks are backed by HDDs, and deliver cost-effective storage. Standard HDD storage can be replicated locally in one datacenter, or be geo-redundant with primary and secondary data centers. For more information about storage replication, see [Azure Storage replication](#).

For more information about using Standard HDD disks, see [Standard Storage and Disks](#).

## **Standard SSD disks**

Standard SSD disks are designed to address the same kind of workloads as Standard HDD disks, but offer more consistent performance and reliability than HDD. Standard SSD disks combine elements of Premium SSD disks and Standard HDD disks to form a cost-effective solution best suited for applications like web servers that do not need high IOPS on disks. Where available, Standard SSD disks are the recommended deployment option for most workloads. Standard SSD disks are available as Managed Disks in all regions but are currently only available with the locally redundant storage (LRS) resiliency type.

## **Premium SSD disks**

Premium SSD disks are backed by SSDs, and delivers high-performance, low-latency disk support for VMs running I/O-intensive workloads. Typically you can use Premium SSD disks with sizes that include an "s" in the series name. For example, there is the Dv3-Series and the Dsv3-series, the Dsv3-series can be used with Premium SSD disks. For more information, please see [Premium Storage](#).

## **Unmanaged disks**

Unmanaged disks are the traditional type of disks that have been used by VMs. With these disks, you create your own storage account and specify that storage account when you create the disk. Make sure you don't put too many disks in the same storage account, because you could exceed the [scalability targets](#) of the storage account (20,000 IOPS, for example), resulting in the VMs being throttled. With unmanaged disks, you have to figure out how to maximize the use of one or more storage accounts to get the best performance out of your VMs.

## **Managed disks**

Managed Disks handles the storage account creation/management in the background for you, and ensures that you do not have to worry about the scalability limits of the storage account. You simply specify the disk size and the performance tier (Standard/Premium), and Azure creates and manages the disk for you. As you add disks or scale the VM up and down, you don't have to worry about the storage being used.

You can also manage your custom images in one storage account per Azure region, and use them to create hundreds of VMs in the same subscription. For more information about Managed Disks, see the [Managed Disks Overview](#).

We recommend that you use Azure Managed Disks for new VMs, and that you convert your previous unmanaged disks to managed disks, to take advantage of the many features available in Managed Disks.

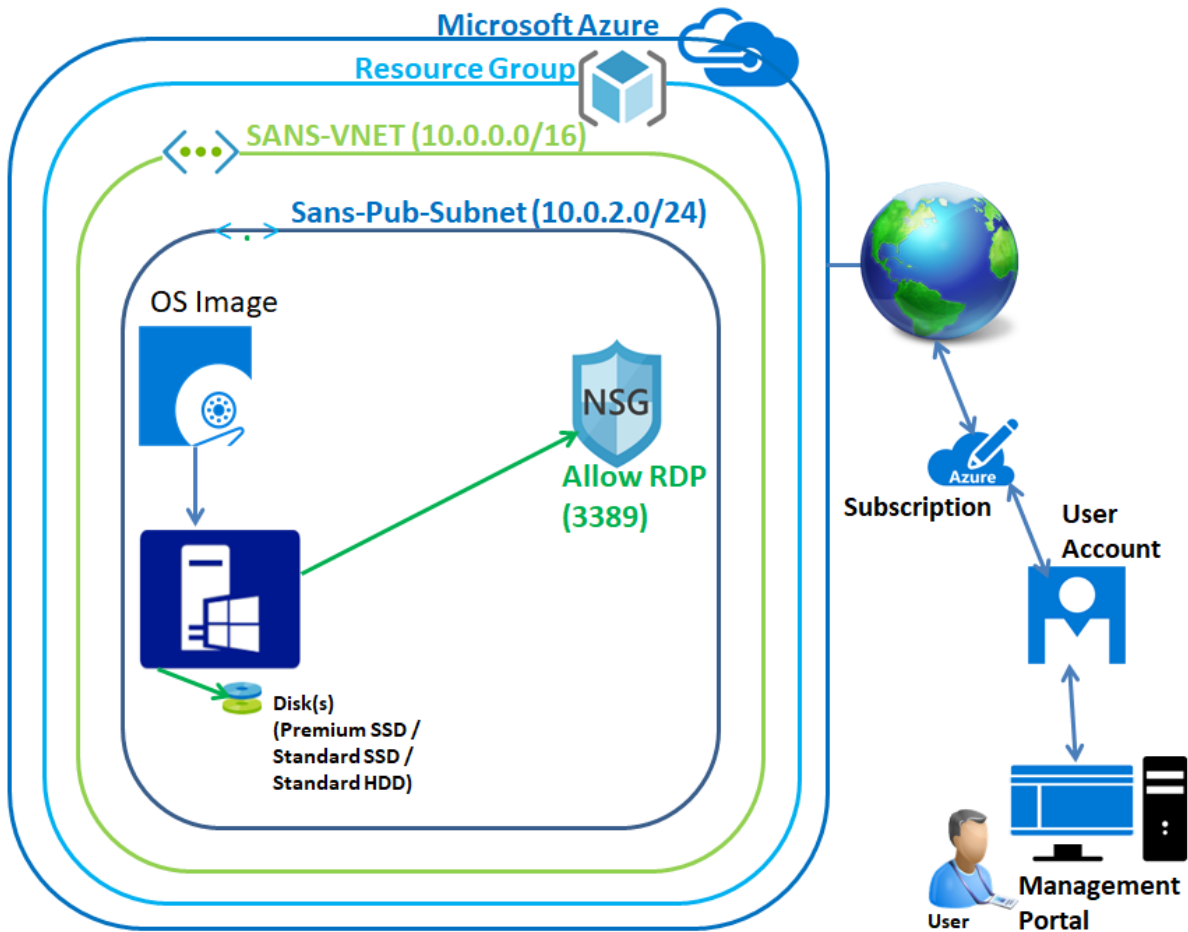
### **Disk comparison**

The following table provides a comparison of Standard HDD, Standard SSD, and Premium SSD for unmanaged and managed disks to help you decide what to use. Sizes denoted with an asterisk are currently in preview.

If you have required more details about storage please go through below link.

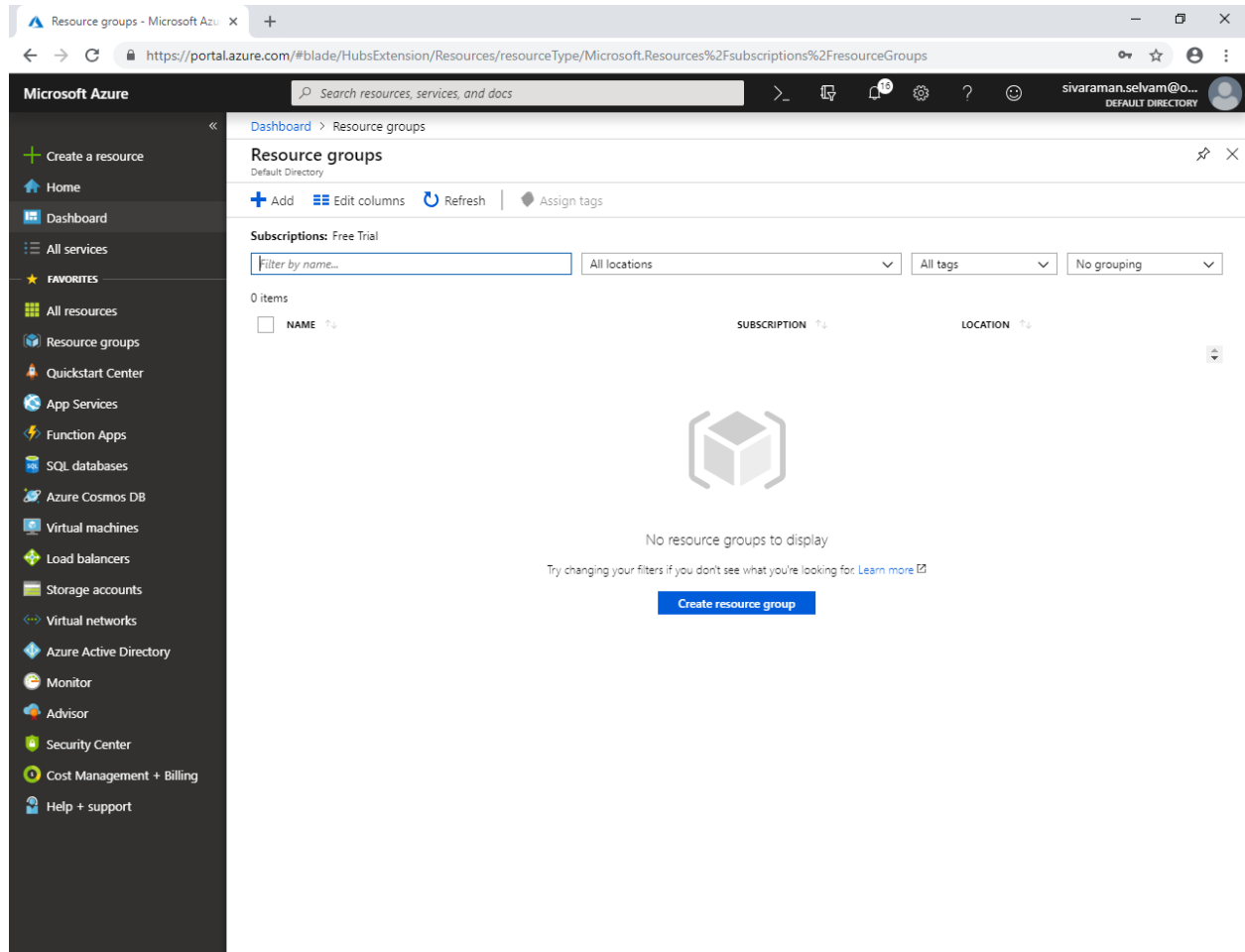
<https://docs.microsoft.com/en-us/azure/virtual-machines/windows/about-disks-and-vhds>

## Topology



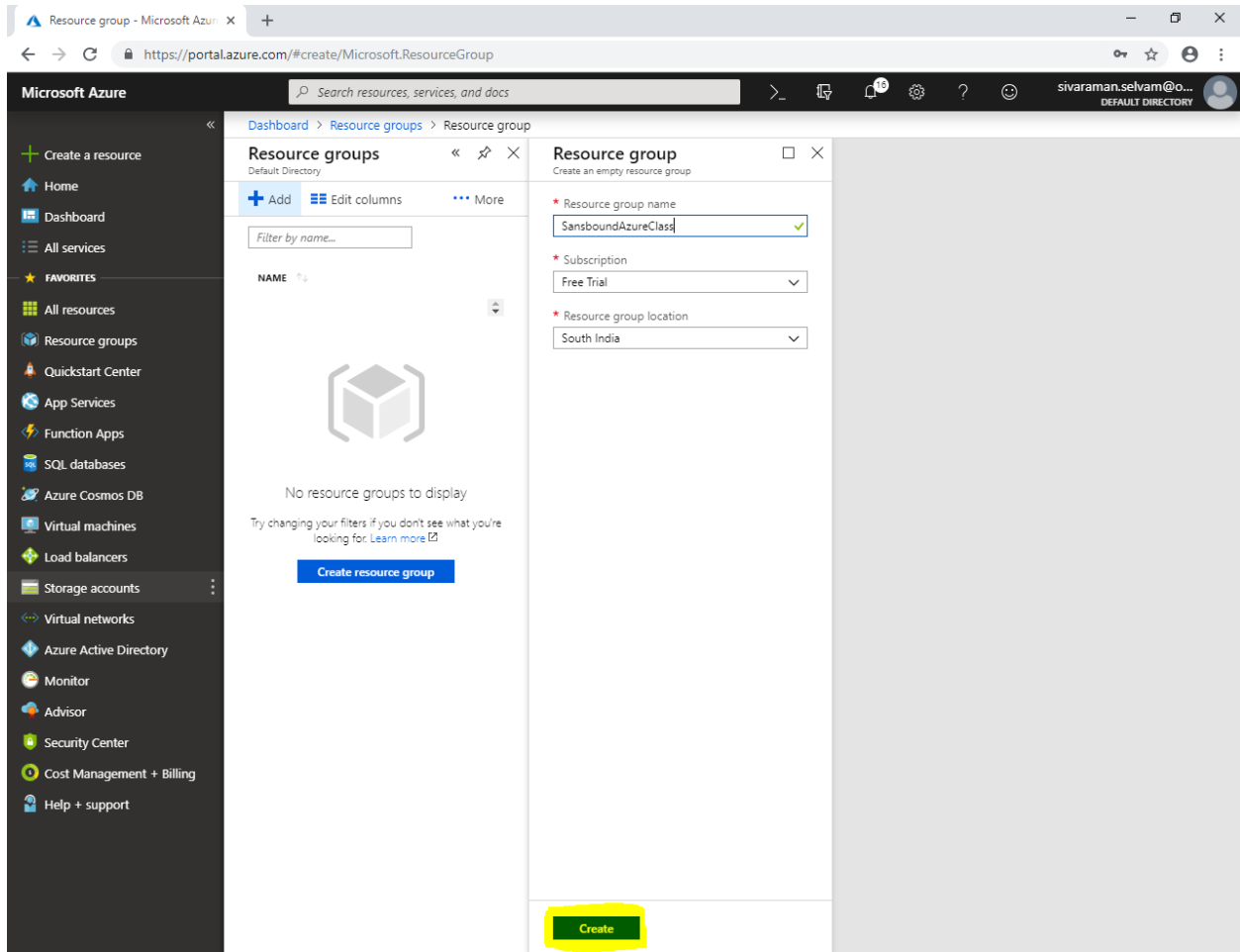
In Azure Portal, click **“Resource Groups”**

Click **“Add”** to create new **“Resource groups”**.



While create new “Resource Group” type the “Resource group name” as “SansboundAzureClass”.

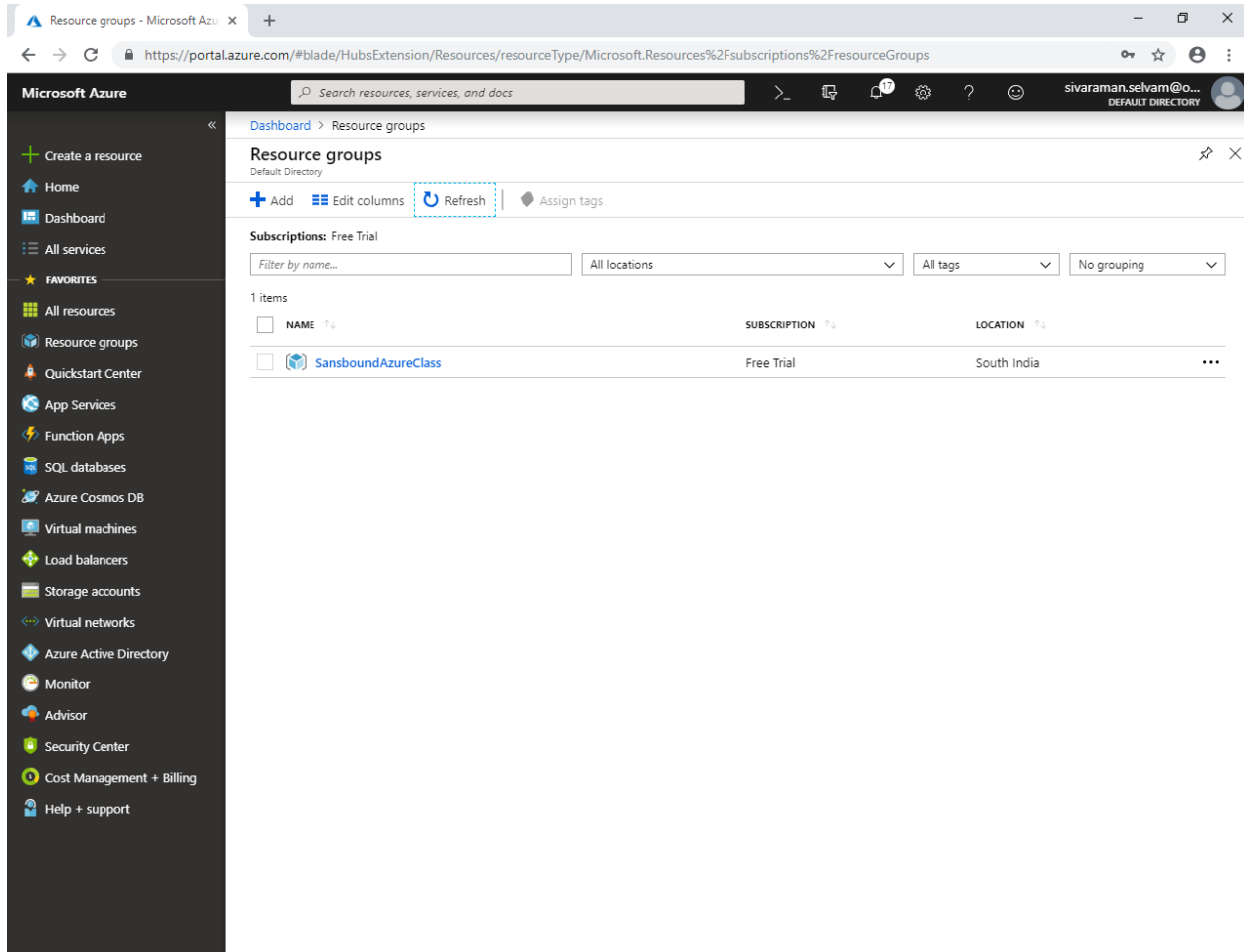
Select “Subscription” and “Resource group location”.



Click “Create”.



In “Resource groups” click “Refresh” to view newly created “Resource Group”.



Resource groups - Microsoft Azure

https://portal.azure.com/#blade/HubsExtension/Resources/resourceType/Microsoft.Resources%2Fsubscriptions%2FresourceGroups

Microsoft Azure

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Dashboard > Resource groups

Resource groups


Default Directory

+ Add Edit columns Refresh Assign tags

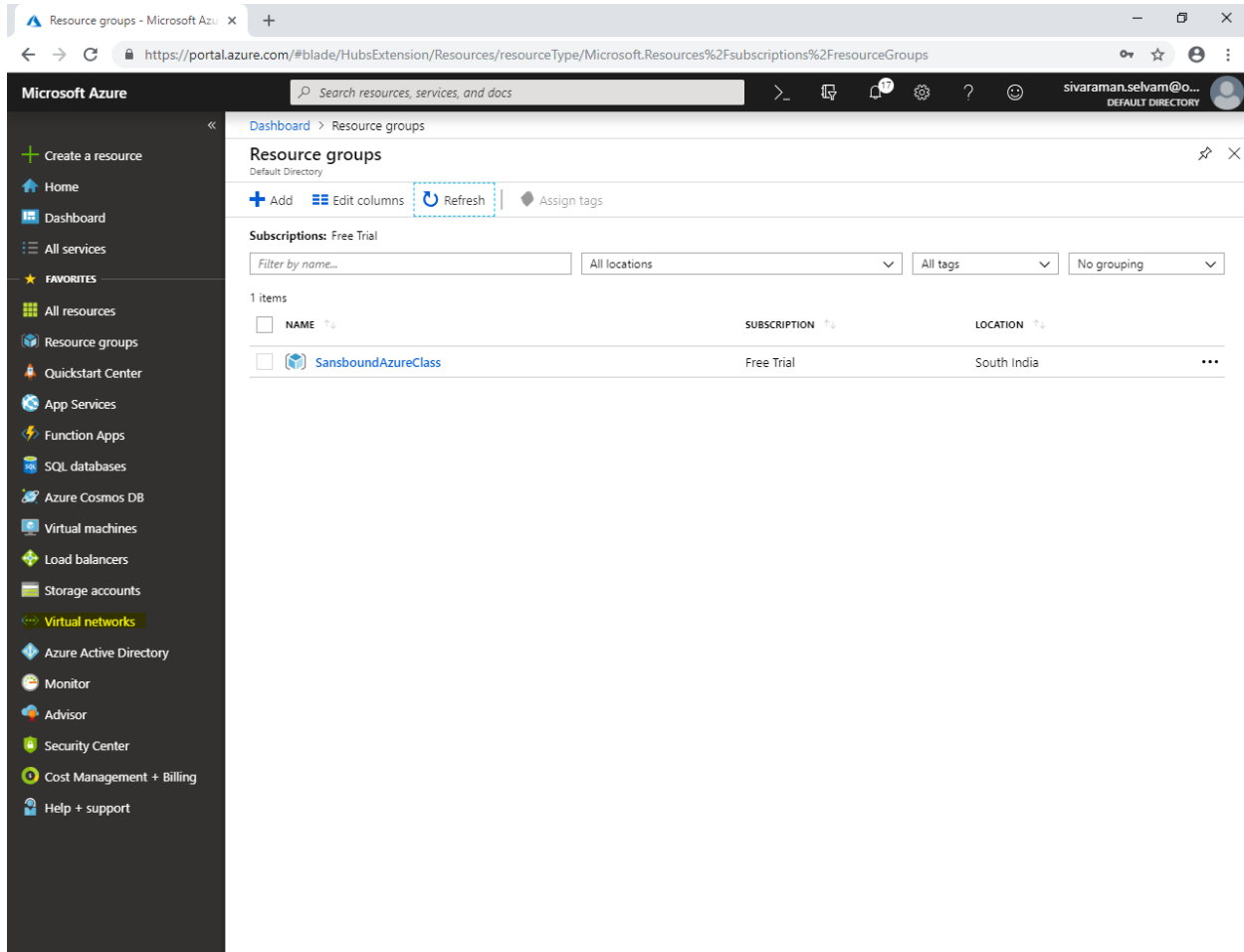
Subscriptions: Free Trial

Filter by name... All locations All tags No grouping

1 items

<input type="checkbox"/>	NAME	SUBSCRIPTION	LOCATION	
<input type="checkbox"/>	 SansboundAzureClass	Free Trial	South India	...

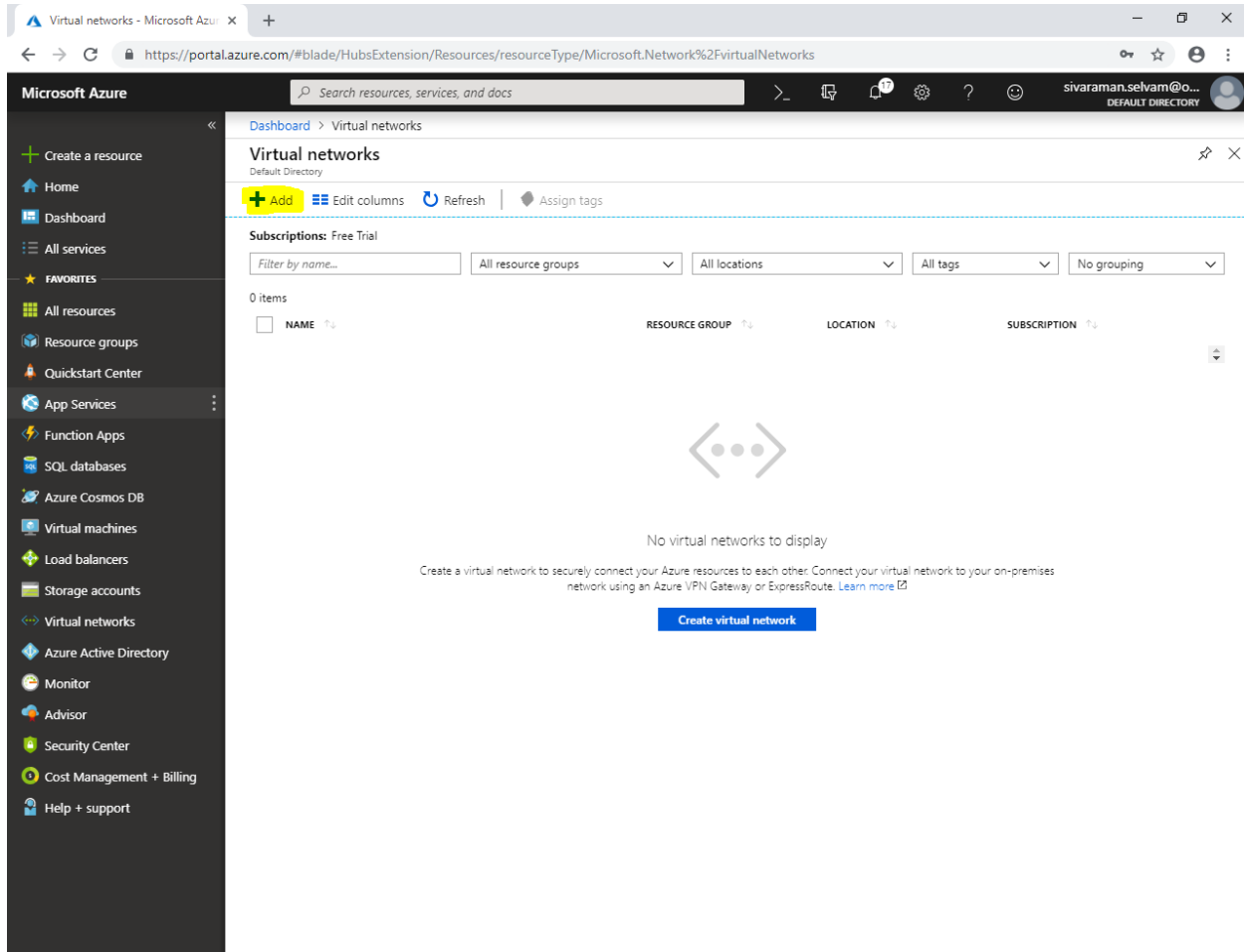
Now I have required to create a new “VNET”, so click “Virtual networks” in left side panel.



The screenshot displays the Microsoft Azure portal interface. The left-hand navigation pane lists various services, with 'Virtual networks' highlighted in yellow. The main pane shows the 'Resource groups' page. At the top, there are buttons for 'Add', 'Edit columns', 'Refresh' (which is highlighted with a dashed blue box), and 'Assign tags'. Below these, there are filters for 'Subscriptions: Free Trial', 'All locations', 'All tags', and 'No grouping'. A table lists the resource groups, showing one item: 'SansboundAzureClass' under the 'Free Trial' subscription and 'South India' location. The table has columns for 'NAME', 'SUBSCRIPTION', and 'LOCATION'.

NAME	SUBSCRIPTION	LOCATION
SansboundAzureClass	Free Trial	South India

Click **"Add"**.



The screenshot shows the Microsoft Azure portal interface. The left sidebar contains navigation options like 'Create a resource', 'Home', 'Dashboard', 'All services', and a 'FAVORITES' section with various services. The main content area is titled 'Virtual networks' and includes a search bar, a '+ Add' button (highlighted in yellow), and filters for 'Subscriptions: Free Trial'. Below the filters, it states '0 items' and shows a table with columns for NAME, RESOURCE GROUP, LOCATION, and SUBSCRIPTION. A message indicates 'No virtual networks to display' and provides a link to 'Create a virtual network'.

While creating “Virtual network”

Type “Virtual network name” as “SANS-VNET”.

Type “Address space” as “10.0.0.0/16”.

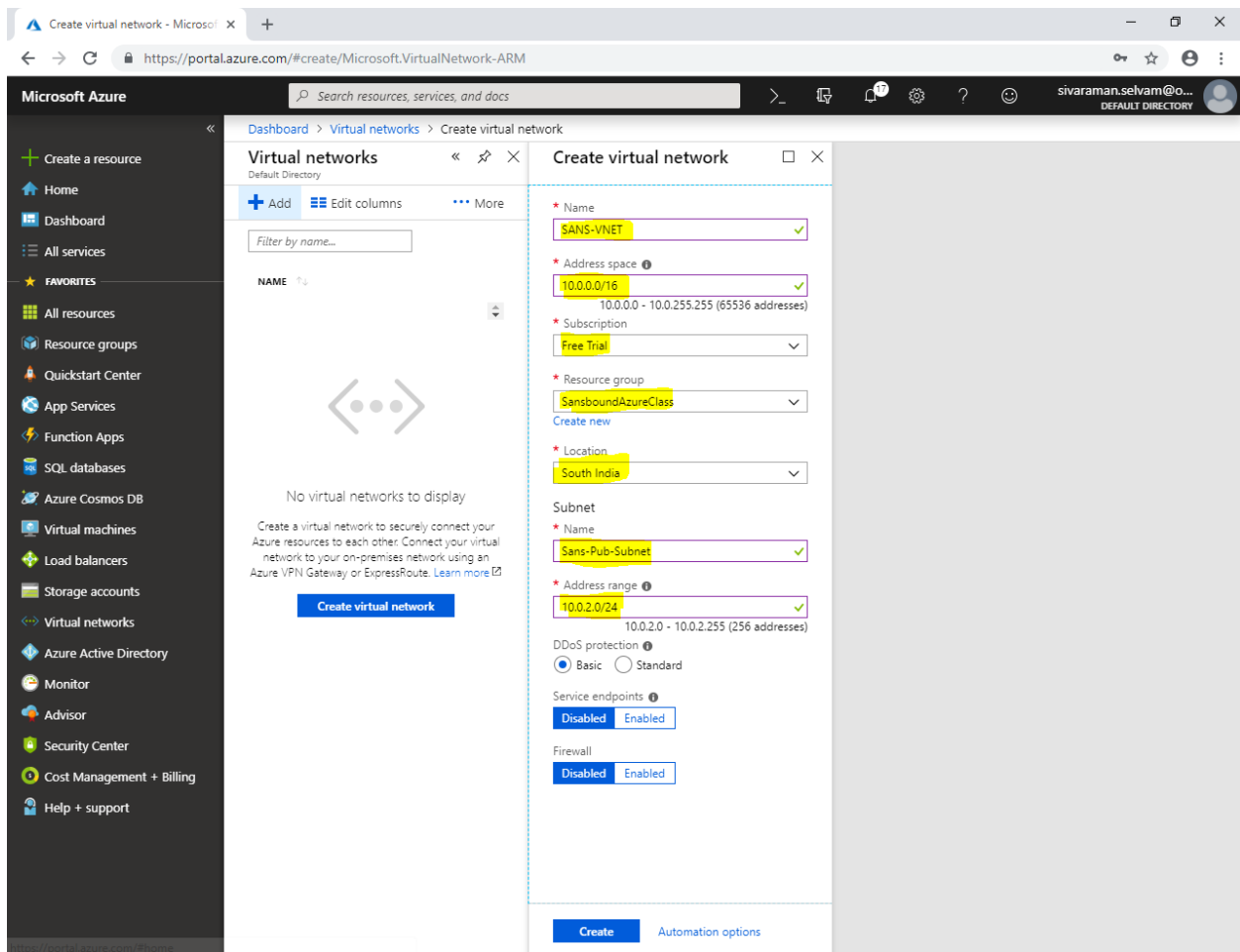
Subscription as “Free Trial”.

Select “Resource group” as “SansboundAzureClass”.

Location “South India”.

Subnet “Sans-Pub-Subnet”.

Type “Address range” for the subnet as “10.0.2.0/24”.

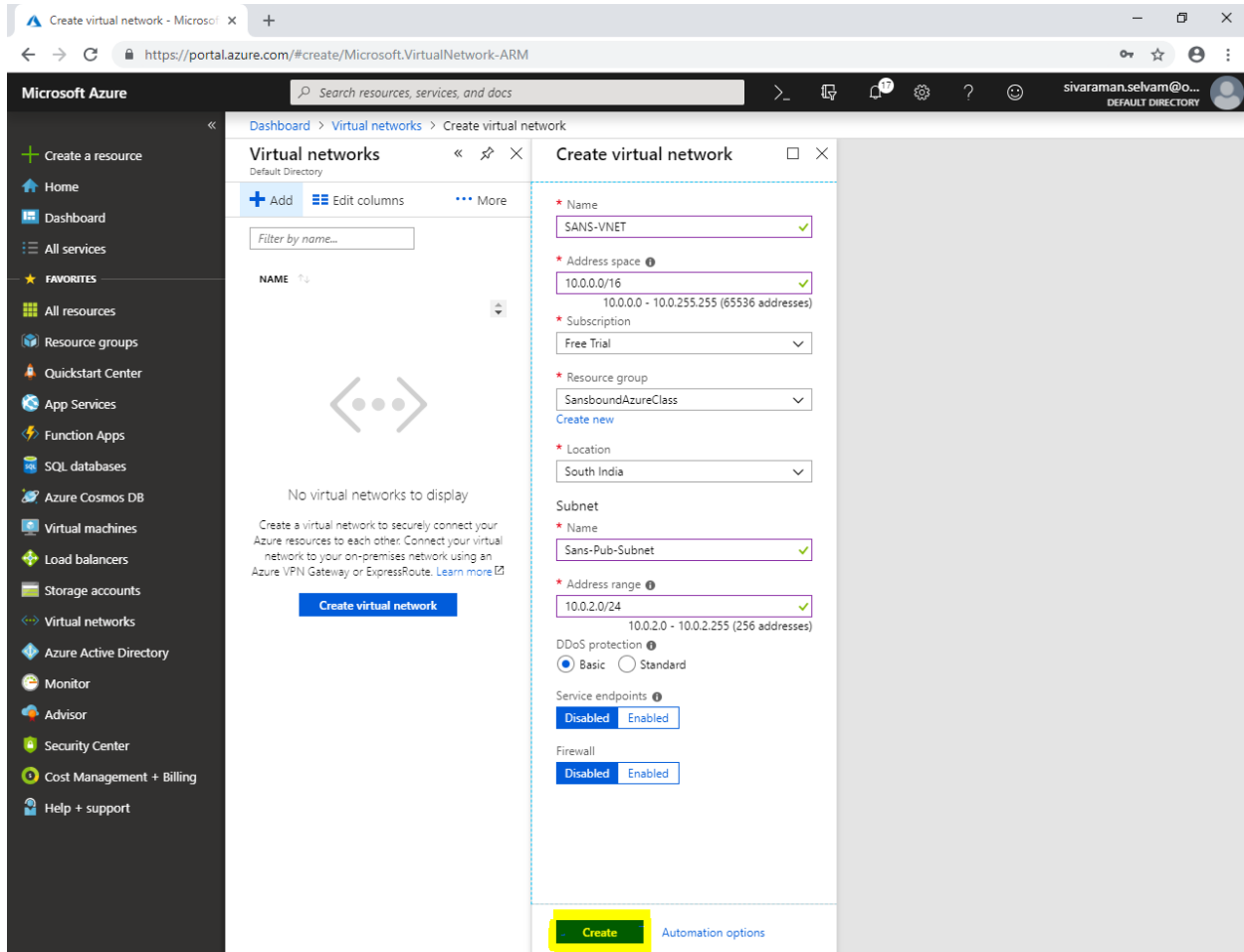


The screenshot displays the Microsoft Azure portal interface for creating a virtual network. The left sidebar shows the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', and various services. The main area is titled 'Virtual networks' and shows a list of existing networks (currently empty). The 'Create virtual network' form is open on the right, with the following fields filled:

- Name: SANS-VNET
- Address space: 10.0.0.0/16
- Subscription: Free Trial
- Resource group: SansboundAzureClass
- Location: South India
- Subnet Name: Sans-Pub-Subnet
- Subnet Address range: 10.0.2.0/24
- DDoS protection: Basic
- Service endpoints: Disabled
- Firewall: Disabled

The 'Create' button is located at the bottom right of the form.

Click **“Create”**.



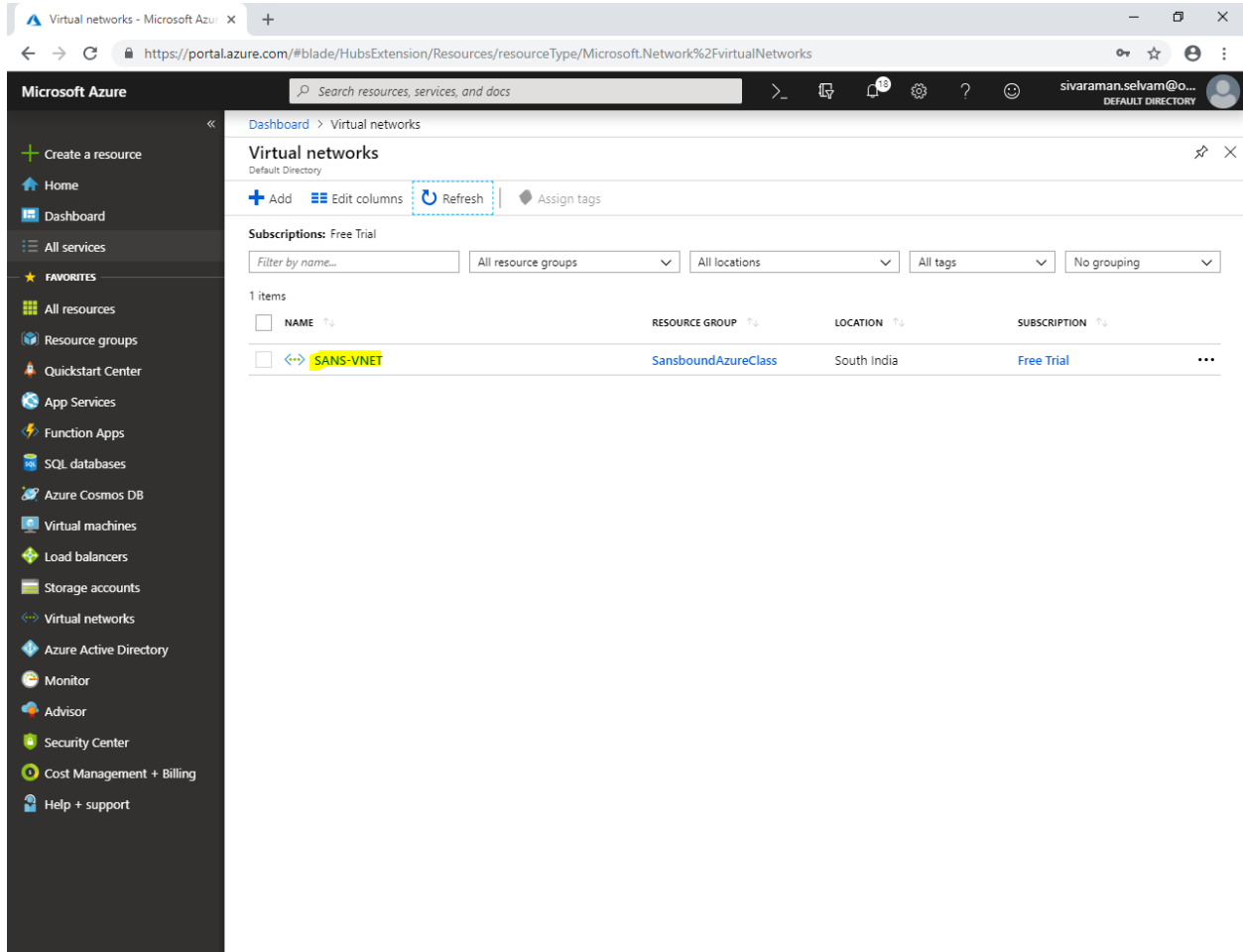
The screenshot shows the Microsoft Azure portal interface for creating a virtual network. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area is titled 'Virtual networks' and shows a list of virtual networks (currently empty) with a 'Create virtual network' button. The right pane displays the 'Create virtual network' form with the following fields and values:

- Name: SANS-VNET
- Address space: 10.0.0.0/16 (10.0.0.0 - 10.0.255.255 (65536 addresses))
- Subscription: Free Trial
- Resource group: SansboundAzureClass
- Location: South India
- Subnet: Sans-Pub-Subnet
- Address range: 10.0.2.0/24 (10.0.2.0 - 10.0.2.255 (256 addresses))
- DDoS protection: Basic
- Service endpoints: Disabled
- Firewall: Disabled

The 'Create' button is highlighted in yellow at the bottom of the form.

In “Virtual networks”

Click on “SANS-VNET”.

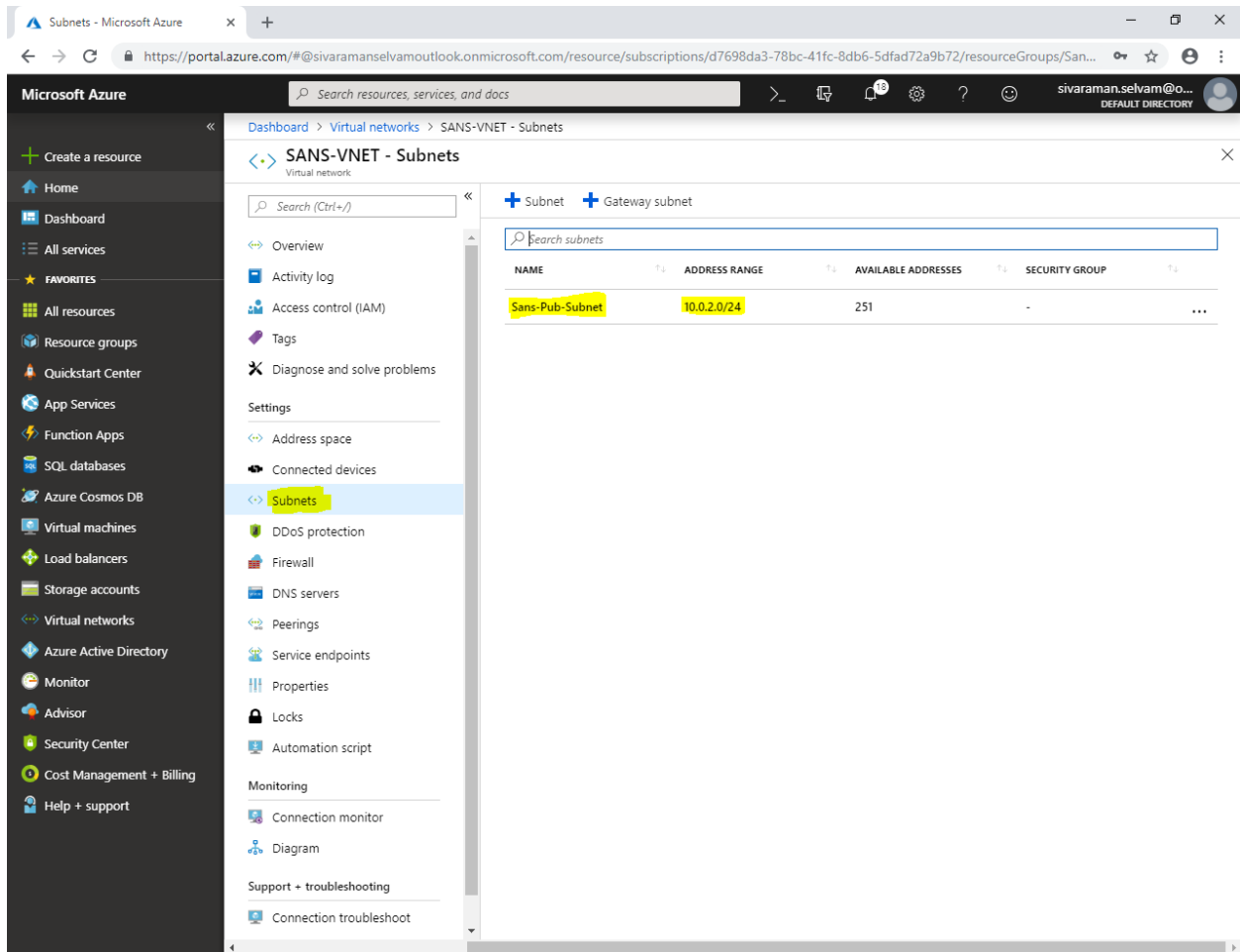


The screenshot shows the Microsoft Azure portal interface. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main content area is titled 'Virtual networks' and shows a table of virtual networks. The table has columns for NAME, RESOURCE GROUP, LOCATION, and SUBSCRIPTION. One item is listed: SANS-VNET, located in the SansboundAzureClass resource group in South India, under the Free Trial subscription.

NAME	RESOURCE GROUP	LOCATION	SUBSCRIPTION
SANS-VNET	SansboundAzureClass	South India	Free Trial

## In “Subnets”

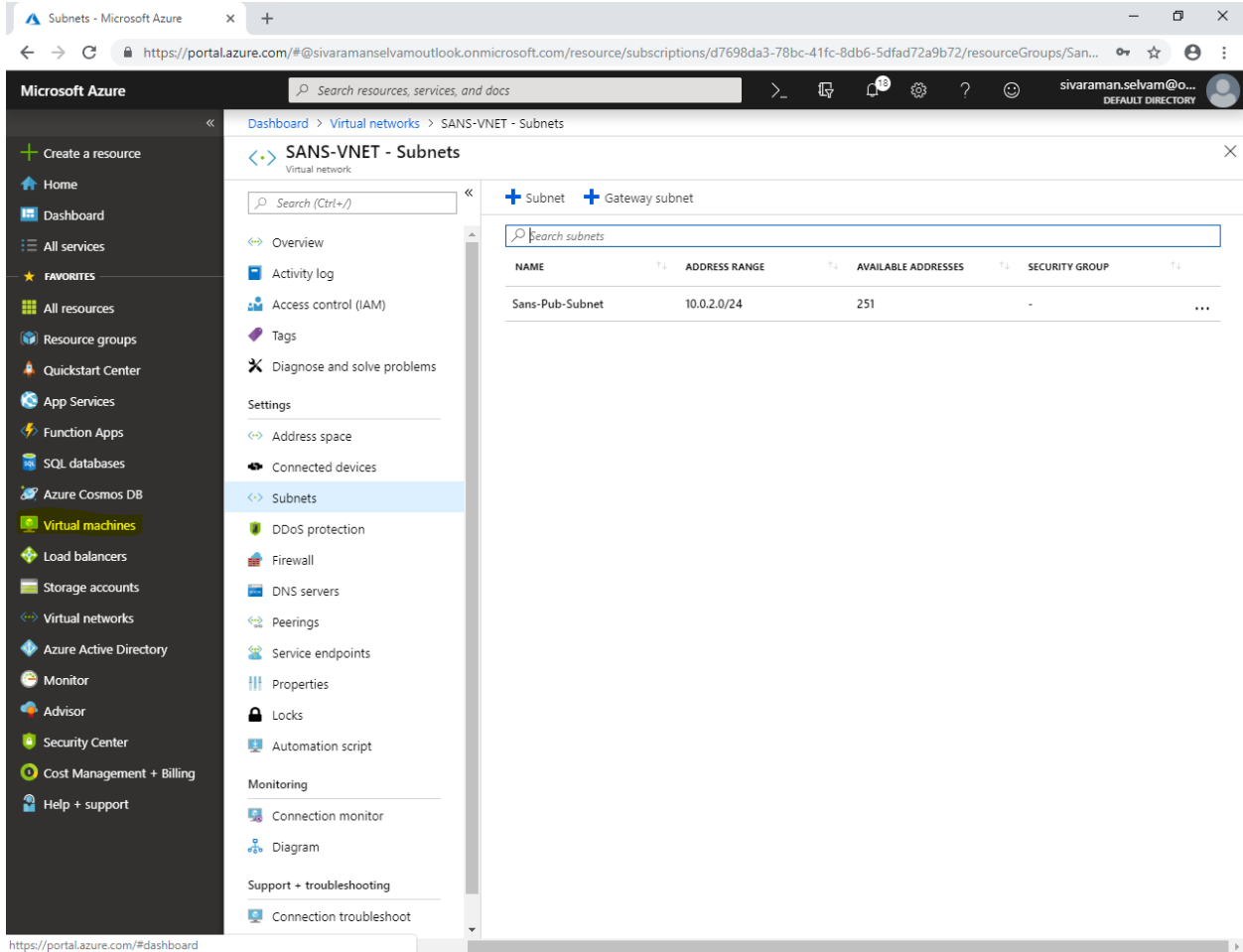
You are able to see the Subnet name as **“Sans-Pub-Subnet”** and address range for the Subnet is **10.0.2.0/24**.



The screenshot shows the Microsoft Azure portal interface. The left sidebar contains the navigation menu with options like 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main content area is titled 'SANS-VNET - Subnets' and shows a table of subnets. The table has columns for NAME, ADDRESS RANGE, AVAILABLE ADDRESSES, and SECURITY GROUP. One subnet is listed: 'Sans-Pub-Subnet' with address range '10.0.2.0/24' and 251 available addresses.

NAME	ADDRESS RANGE	AVAILABLE ADDRESSES	SECURITY GROUP
Sans-Pub-Subnet	10.0.2.0/24	251	-

In Dashboard, click on **“Virtual machines”**.



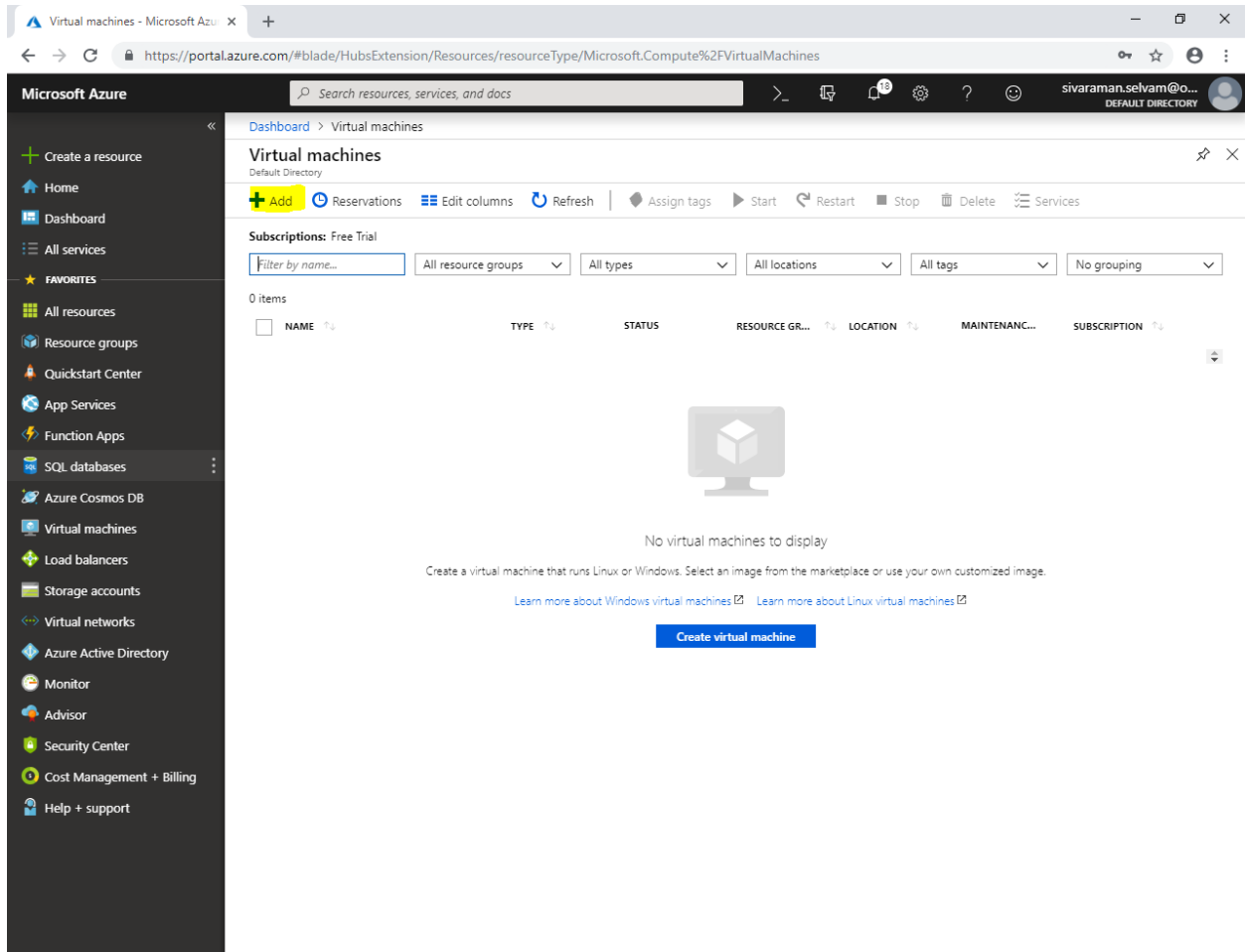
The screenshot shows the Microsoft Azure portal interface. The left sidebar contains the navigation menu with categories like "Create a resource", "Home", "Dashboard", "All services", "FAVORITES", and "Virtual machines". The "Virtual machines" option is highlighted. The main content area displays the "SANS-VNET - Subnets" page. The breadcrumb trail is "Dashboard > Virtual networks > SANS-VNET - Subnets". The page title is "SANS-VNET - Subnets" with a sub-label "Virtual network". Below the title is a search bar "Search (Ctrl+F)". The left sidebar of the page lists various options: Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings, Address space, Connected devices, Subnets (highlighted), DDoS protection, Firewall, DNS servers, Peerings, Service endpoints, Properties, Locks, Automation script, Monitoring, Connection monitor, Diagram, Support + troubleshooting, and Connection troubleshoot. The right pane shows a table of subnets with columns: NAME, ADDRESS RANGE, AVAILABLE ADDRESSES, and SECURITY GROUP. The table contains one entry: "Sans-Pub-Subnet" with address range "10.0.2.0/24" and 251 available addresses. The security group is listed as "-".

NAME	ADDRESS RANGE	AVAILABLE ADDRESSES	SECURITY GROUP
Sans-Pub-Subnet	10.0.2.0/24	251	-



## In “Virtual machines”

Click “Add” to create a new virtual machine.



Virtual machines - Microsoft Azure

Search resources, services, and docs

Dashboard > Virtual machines

### Virtual machines

Default Directory

+ Add Reservations Edit columns Refresh Assign tags Start Restart Stop Delete Services

Subscriptions: Free Trial

Filter by name... All resource groups All types All locations All tags No grouping

0 items

NAME	TYPE	STATUS	RESOURCE GR...	LOCATION	MAINTENANC...	SUBSCRIPTION
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No virtual machines to display

Create a virtual machine that runs Linux or Windows. Select an image from the marketplace or use your own customized image.

[Learn more about Windows virtual machines](#) [Learn more about Linux virtual machines](#)

Create virtual machine

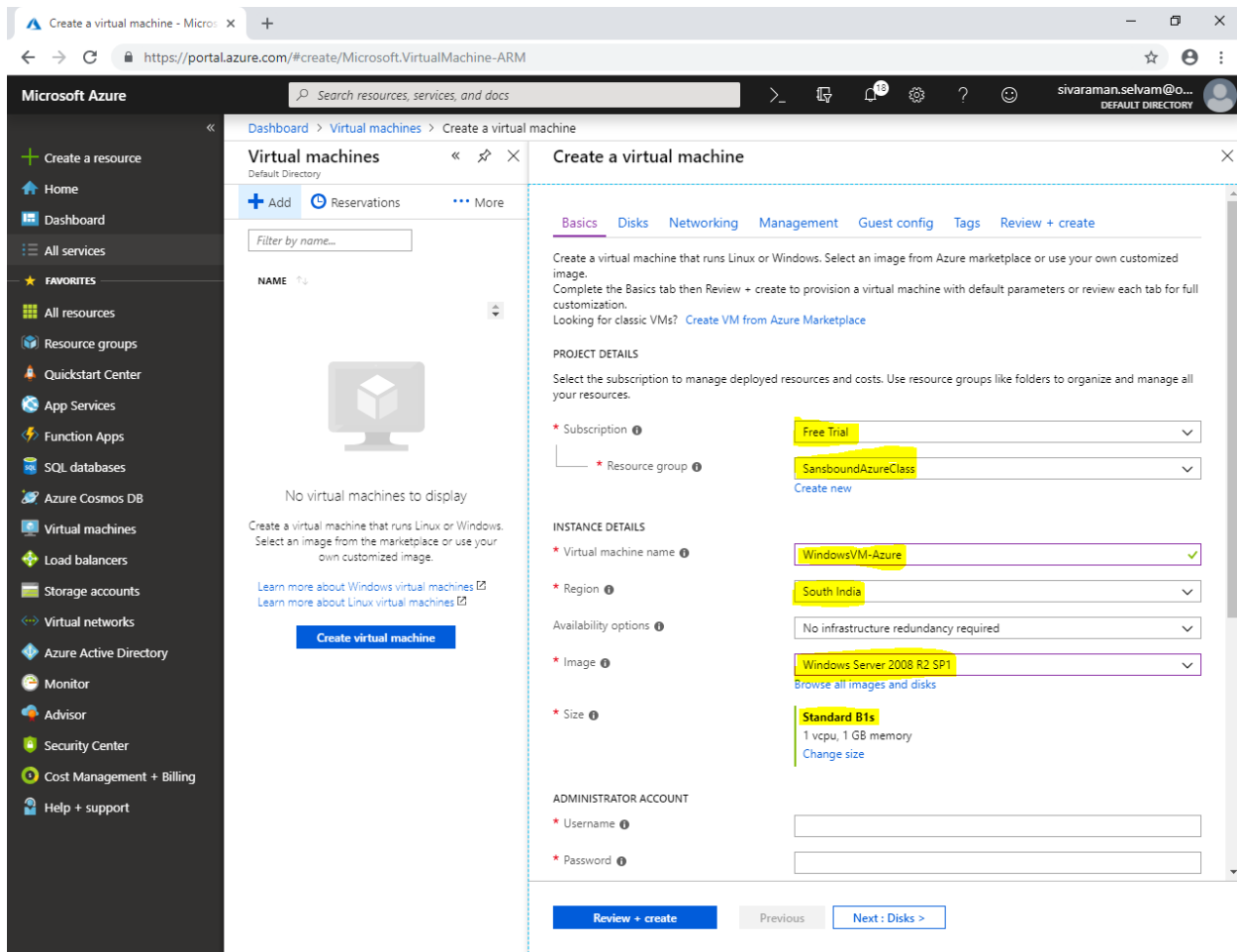
While creating “Virtual machine”,

Type “Virtual machine name” as “WindowsVM-Azure”.

Select “Region” as “South India”.

Select “Image” as “Windows Server 2008 R2 SP1”.

Change “VM Size” as “Standard B1s”.



Microsoft Azure

Create a virtual machine - Micros

https://portal.azure.com/#create/Microsoft.VirtualMachine-ARM

Virtual machines


Create a virtual machine


Basics Disks Networking Management Guest config Tags Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. Looking for classic VMs? [Create VM from Azure Marketplace](#)


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 [Create new](#)


INSTANCE DETAILS

\* Virtual machine name  WindowsVM-Azure


\* Region  South India


Availability options  No infrastructure redundancy required

\* Image  Windows Server 2008 R2 SP1 [Browse all images and disks](#)

\* Size  Standard B1s  
1 vcpu, 1 GB memory [Change size](#)

ADMINISTRATOR ACCOUNT

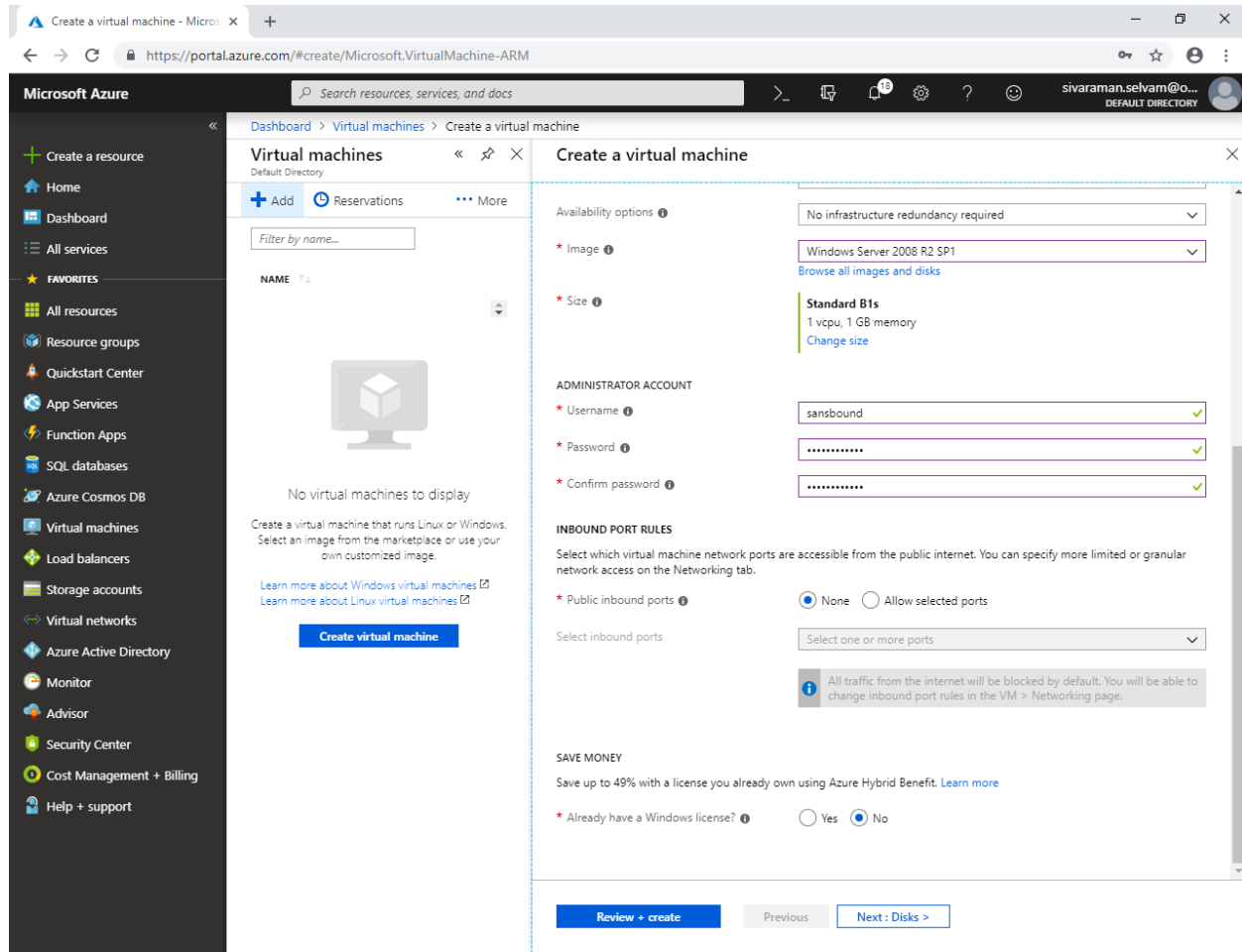
\* Username 

\* Password 

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

Click **“Administrator Account”**.

Type **“Username”** as sansbound and password as per your wish.



Microsoft Azure

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Dashboard > Virtual machines > Create a virtual machine

Virtual machines

Default Directory

+ Add Reservations More

Filter by name...

NAME

No virtual machines to display

Create a virtual machine that runs Linux or Windows. Select an image from the marketplace or use your own customized image.

[Learn more about Windows virtual machines](#)

[Learn more about Linux virtual machines](#)

Create virtual machine

Availability options

No infrastructure redundancy required

\* Image

Windows Server 2008 R2 SP1

[Browse all images and disks](#)

\* Size

Standard B1s

1 vcpu, 1 GB memory

[Change size](#)

ADMINISTRATOR ACCOUNT

\* Username

sansbound

\* Password

\*\*\*\*\*

\* Confirm password

\*\*\*\*\*

INBOUND PORT RULES

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

\* Public inbound ports

☒ None ☐ Allow selected ports

Select inbound ports

Select one or more ports

All traffic from the internet will be blocked by default. You will be able to change inbound port rules in the VM > Networking page.

SAVE MONEY

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\* Already have a Windows license?

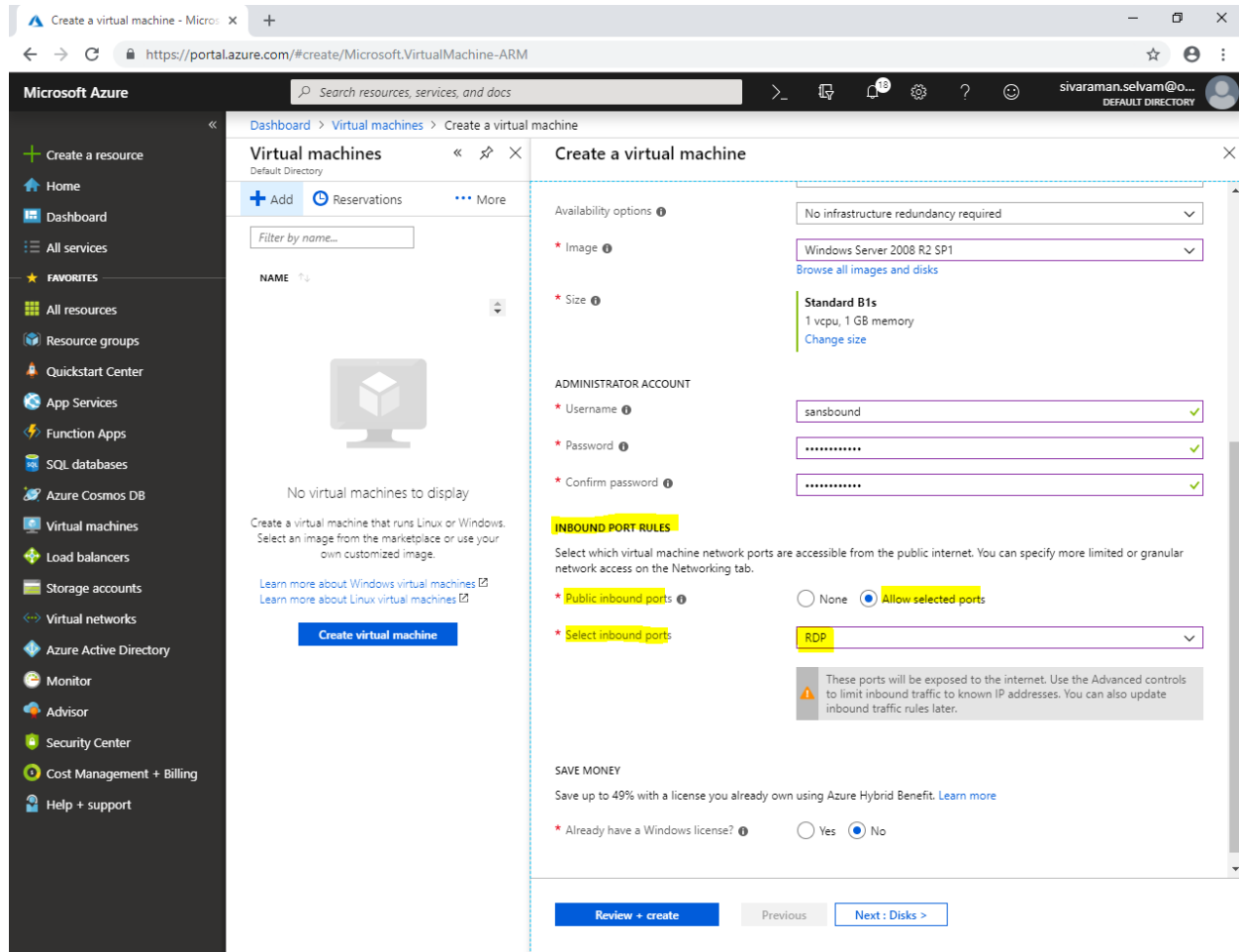
☐ Yes ☒ No

Review + create Previous Next: Disks >

## In “Inbound Port Rules”

Click “Public inbound ports” as “Allow selected ports”.

Select “Select inbound ports” as “RDP”.



The screenshot shows the Azure portal interface for creating a virtual machine. The left sidebar contains navigation links for various Azure services. The main content area is titled 'Create a virtual machine' and includes sections for 'Availability options', 'Image', 'Size', 'ADMINISTRATOR ACCOUNT', and 'INBOUND PORT RULES'. The 'INBOUND PORT RULES' section is highlighted, showing the 'Public inbound ports' set to 'Allow selected ports' and 'Select inbound ports' set to 'RDP'. A warning message states: 'These ports will be exposed to the internet. Use the Advanced controls to limit inbound traffic to known IP addresses. You can also update inbound traffic rules later.'

Microsoft Azure

Search resources, services, and docs

Dashboard > Virtual machines > Create a virtual machine

Virtual machines

Filter by name...

NAME

No virtual machines to display

Create a virtual machine that runs Linux or Windows. Select an image from the marketplace or use your own customized image.

Learn more about Windows virtual machines

Learn more about Linux virtual machines

Create virtual machine

Availability options

No infrastructure redundancy required

\* Image

Windows Server 2008 R2 SP1

Browse all images and disks

\* Size

Standard B1s

1 vcpu, 1 GB memory

Change size

ADMINISTRATOR ACCOUNT

\* Username

sansbound

\* Password

\*\*\*\*\*

\* Confirm password

\*\*\*\*\*

INBOUND PORT RULES

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

\* Public inbound ports

☐ None ☒ Allow selected ports

\* Select inbound ports

RDP

These ports will be exposed to the internet. Use the Advanced controls to limit inbound traffic to known IP addresses. You can also update inbound traffic rules later.

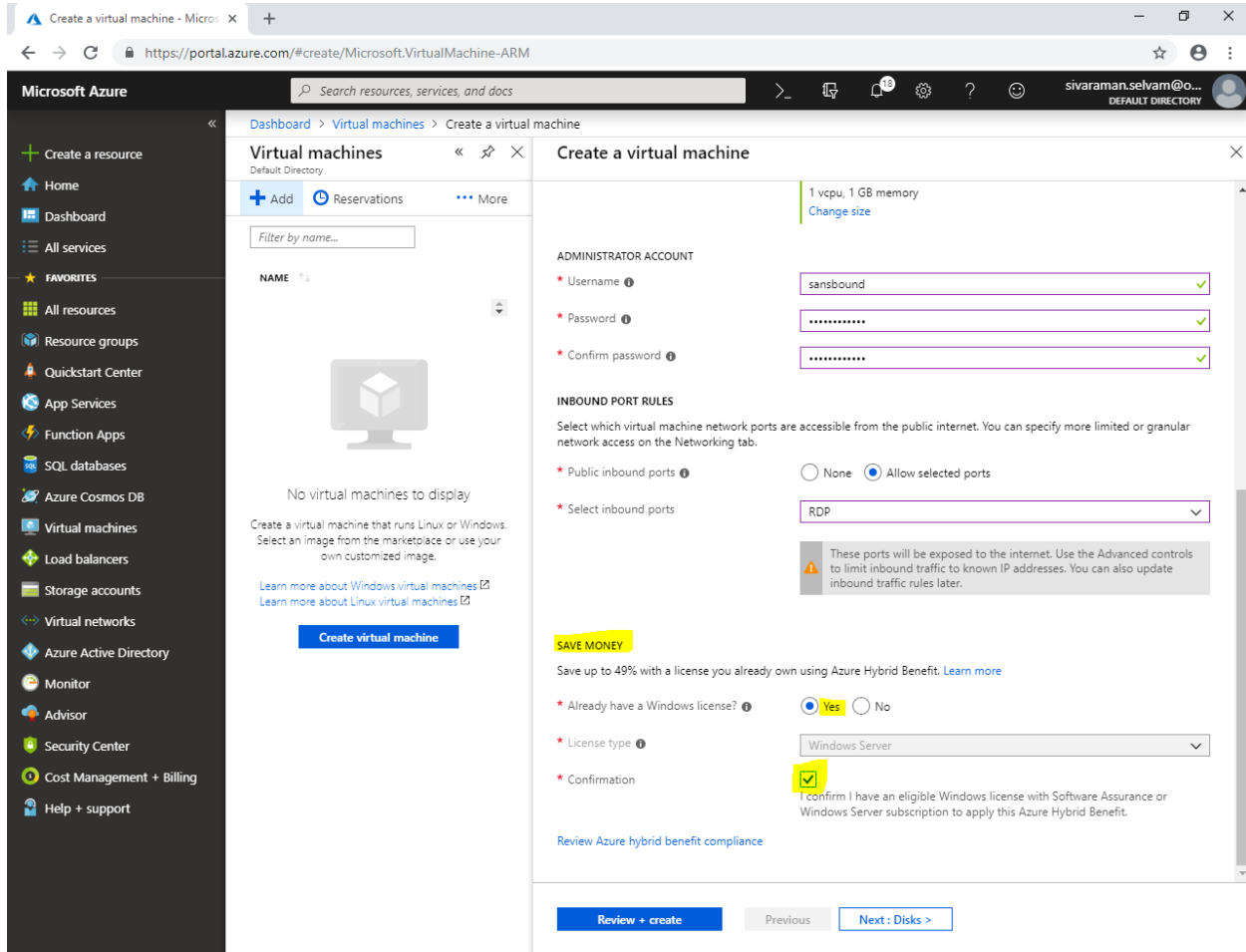
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\* Already have a Windows license?

☐ Yes ☒ No

Review + create Previous Next : Disks >

In **"Save Money"**Click **"Yes"** for **"Already have a Windows license"**.Click **"Confirmation"** check box.

Microsoft Azure

Search resources, services, and docs

Dashboard > Virtual machines > Create a virtual machine

Virtual machines

Filter by name...

No virtual machines to display

Create a virtual machine that runs Linux or Windows. Select an image from the marketplace or use your own customized image.

Learn more about Windows virtual machines

Learn more about Linux virtual machines

Create virtual machine

1 vcpu, 1 GB memory

Change size

ADMINISTRATOR ACCOUNT

\* Username

\* Password

\* Confirm password

INBOUND PORT RULES

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

\* Public inbound ports ☐ None ☒ Allow selected ports

\* Select inbound ports

These ports will be exposed to the internet. Use the Advanced controls to limit inbound traffic to known IP addresses. You can also update inbound traffic rules later.

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\* Already have a Windows license? ☒ Yes ☐ No

\* License type

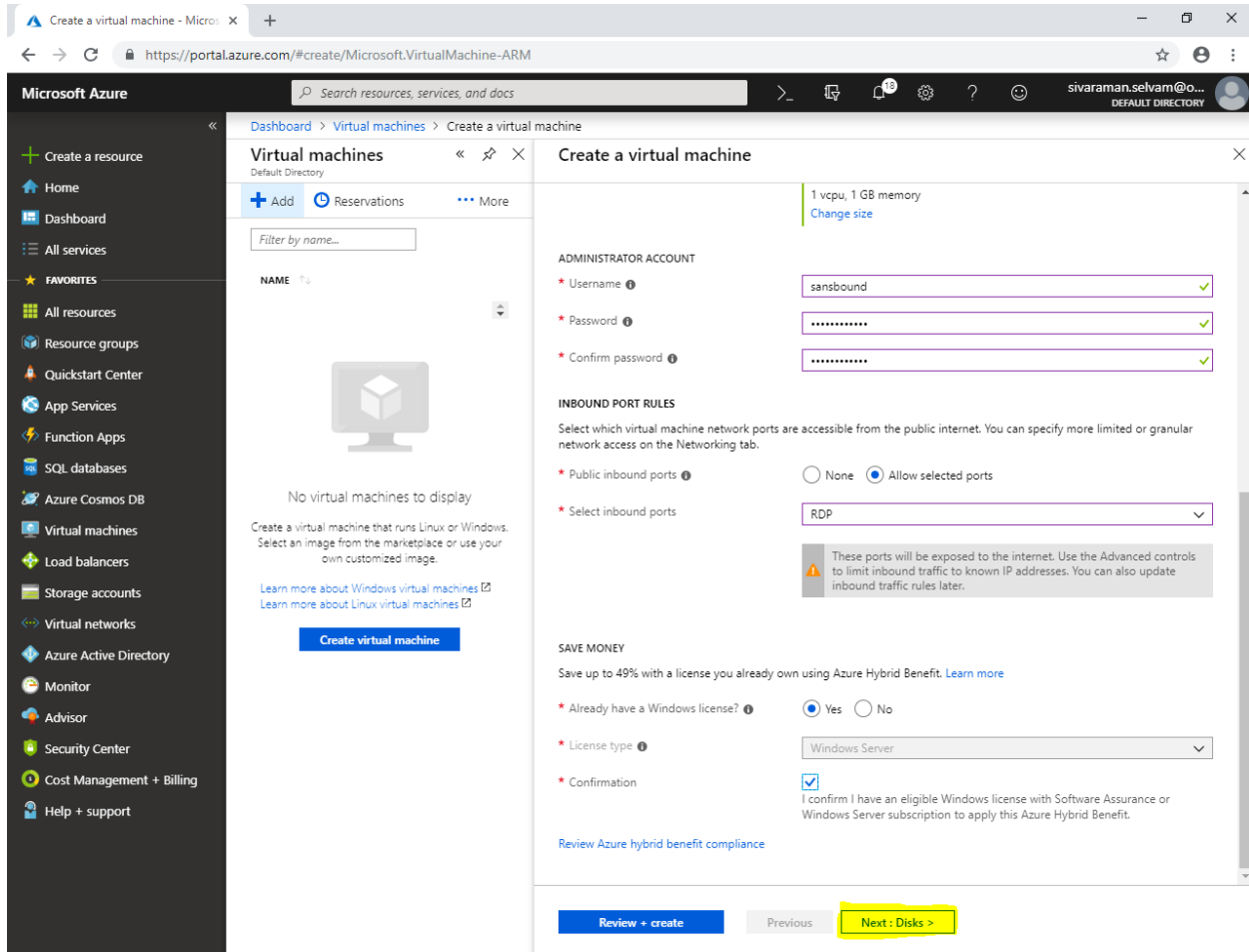
\* Confirmation ☒

I confirm I have an eligible Windows license with Software Assurance or Windows Server subscription to apply this Azure Hybrid Benefit.

[Review Azure hybrid benefit compliance](#)

Review + create Previous Next : Disks >

Click **“Next : Disks >”**.



Microsoft Azure

Dashboard > Virtual machines > Create a virtual machine

**Virtual machines**

+ Add Reservations More

Filter by name...

NAME

No virtual machines to display

Create a virtual machine that runs Linux or Windows. Select an image from the marketplace or use your own customized image.

[Learn more about Windows virtual machines](#)

[Learn more about Linux virtual machines](#)

[Create virtual machine](#)

**Create a virtual machine**

1 vcpu, 1 GB memory  
[Change size](#)

**ADMINISTRATOR ACCOUNT**

\* Username

\* Password

\* Confirm password

**INBOUND PORT RULES**

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

\* Public inbound ports ☐ None ☒ Allow selected ports

\* Select inbound ports

These ports will be exposed to the internet. Use the Advanced controls to limit inbound traffic to known IP addresses. You can also update inbound traffic rules later.

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\* Already have a Windows license? ☒ Yes ☐ No

\* License type

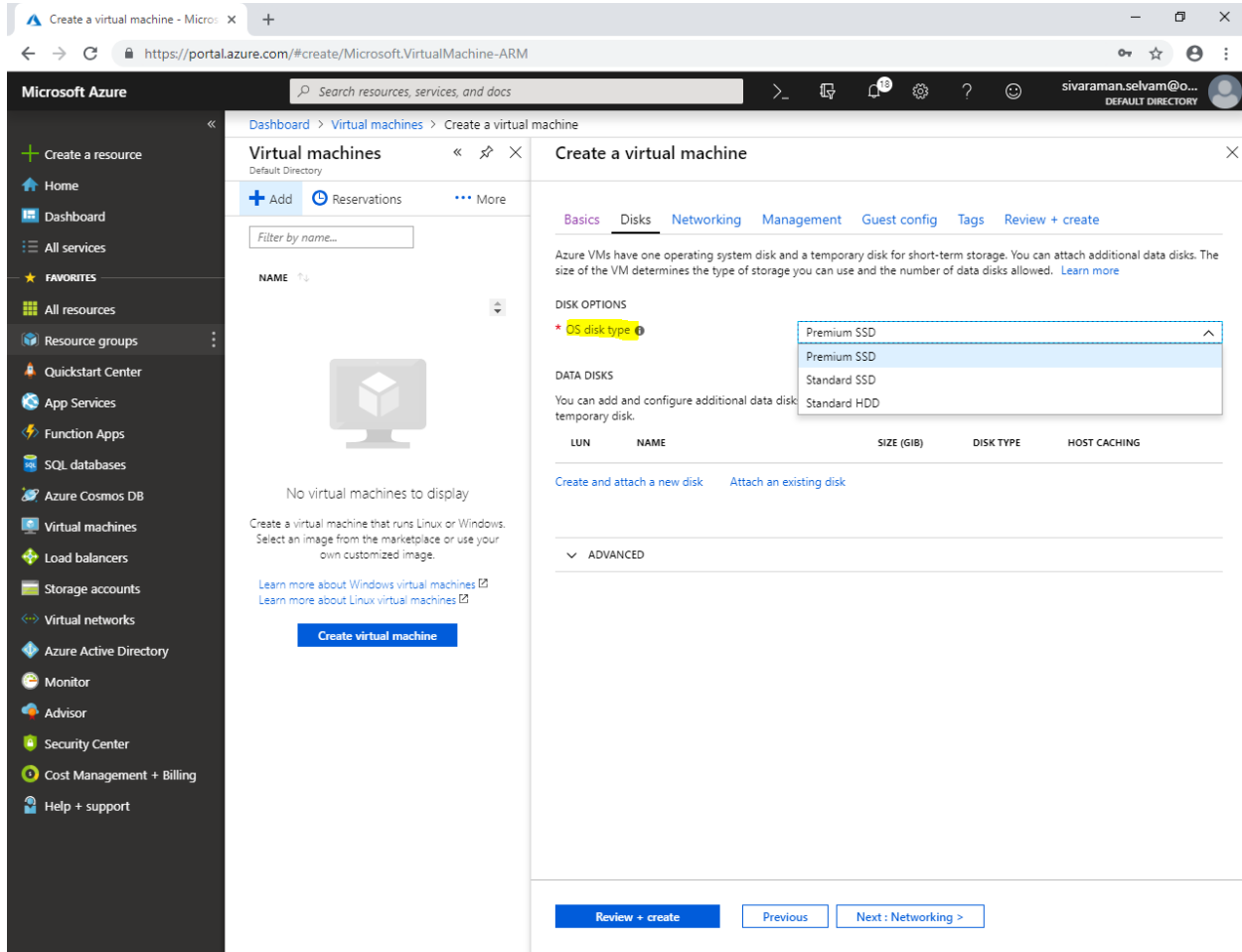
\* Confirmation ☒  
I confirm I have an eligible Windows license with Software Assurance or Windows Server subscription to apply this Azure Hybrid Benefit.

[Review Azure hybrid benefit compliance](#)

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

## In “Disks”

By default “Premium SSD” as OS disk type to get high performance.



The screenshot shows the Microsoft Azure portal interface for creating a virtual machine. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', 'FAVORITES', '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 area is titled 'Create a virtual machine' and has tabs for 'Basics', 'Disks', 'Networking', 'Management', 'Guest config', 'Tags', and 'Review + create'. The 'Disks' tab is active, showing 'DISK OPTIONS' with a dropdown for 'OS disk type' set to 'Premium SSD'. Below this, the 'DATA DISKS' section is visible, showing a table with columns: LUN, NAME, SIZE (GiB), DISK TYPE, and HOST CACHING. The table is currently empty. At the bottom, there are buttons for 'Review + create', 'Previous', and 'Next : Networking >'. The 'Create virtual machine' button is also visible in the 'Basics' tab area.

If you have selected OS disk type as “**Standard SSD**”, it clearly says that VM size supports premium disks. It recommended Premium SSD for high IOPS. And “Standard SSD” will not qualify for the 99.9% connectivity SLA. Compare Premium SSD disk performance will be slow.

**DISK OPTIONS**

\* OS disk type ⓘ

Standard SSD

The selected VM size supports premium disks. We recommend Premium SSD for high IOPS workloads. Virtual machines with Premium SSD disks qualify for the 99.9% connectivity SLA.

If you have selected OS disk type as “**Standard HDD**”, it clearly says that VM size supports premium disks. It recommended Premium SSD for high IOPS. And “Standard HDD” will not qualify for the 99.9% connectivity SLA. Compare Premium SSD and Standard HDD disk performance will be slow. It’s similar like as magnetic hard disk.

**DISK OPTIONS**

\* OS disk type ⓘ

Standard HDD

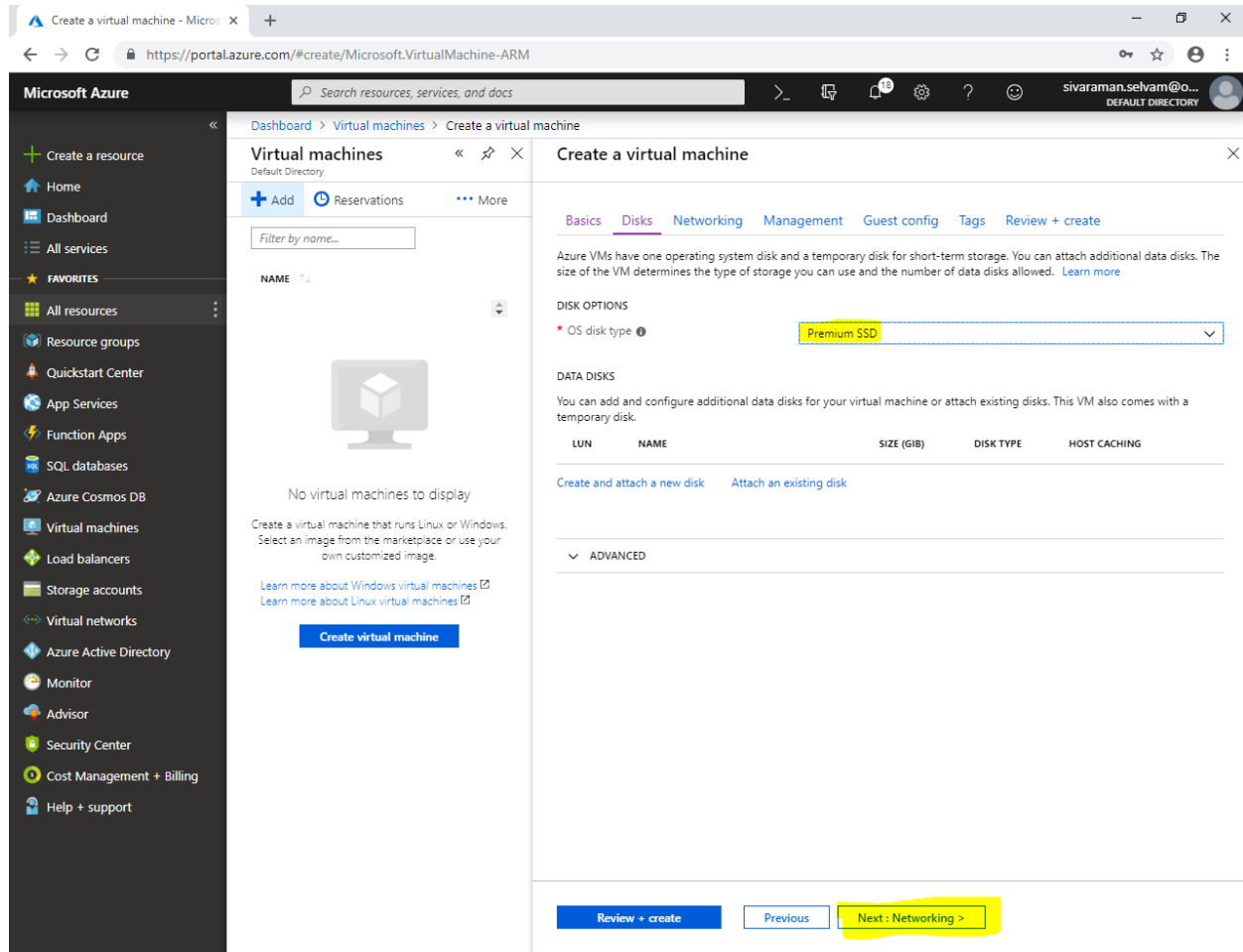
The selected VM size supports premium disks. We recommend Premium SSD for high IOPS workloads. Virtual machines with Premium SSD disks qualify for the 99.9% connectivity SLA.



In “Disks”,

In “Disk options” select OS disk type as “Premium SSD”.

Click “Next : Networking >”.

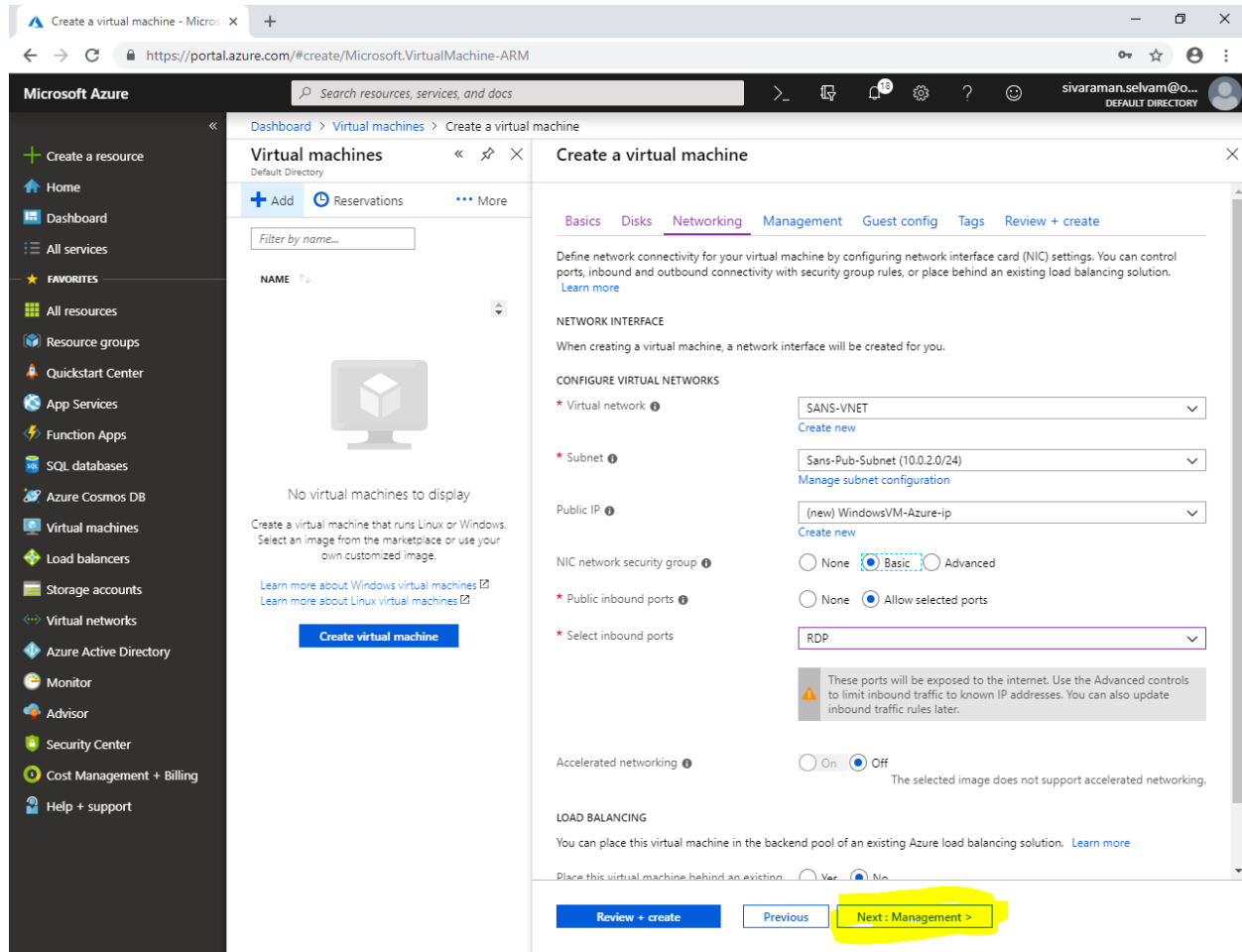


The screenshot shows the Microsoft Azure portal interface for creating a virtual machine. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area is titled 'Virtual machines' and shows a 'Create a virtual machine' wizard. The 'Disks' tab is selected, and the 'OS disk type' is set to 'Premium SSD'. The 'DATA DISKS' section is also visible, showing a table with columns for LUN, NAME, SIZE (GiB), DISK TYPE, and HOST CACHING. At the bottom, the 'Next : Networking >' button is highlighted.

LUN	NAME	SIZE (GiB)	DISK TYPE	HOST CACHING
-----	------	------------	-----------	--------------

In “Networking”,

Click “Next : Management >”.



The screenshot shows the Microsoft Azure portal interface for creating a virtual machine. The left sidebar contains navigation links such as 'Create a resource', 'Home', 'Dashboard', 'All services', and various resource categories. The main content area is titled 'Create a virtual machine' and is divided into two panes. The left pane shows a list of virtual machines with a 'No virtual machines to display' message. The right pane shows the 'Networking' configuration step, which includes settings for the network interface, virtual network, subnet, public IP, and network security group. The 'Next : Management >' button is highlighted in yellow at the bottom of the right pane.

Microsoft Azure

Search resources, services, and docs

Dashboard > Virtual machines > Create a virtual machine

Virtual machines

Default Directory

+ Add Reservations More

Filter by name...

NAME

No virtual machines to display

Create a virtual machine that runs Linux or Windows. Select an image from the marketplace or use your own customized image.

Learn more about Windows virtual machines

Learn more about Linux virtual machines

Create virtual machine

Create a virtual machine

Basics Disks Networking Management Guest config Tags Review + create

Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution. [Learn more](#)

NETWORK INTERFACE

When creating a virtual machine, a network interface will be created for you.

CONFIGURE VIRTUAL NETWORKS

\* Virtual network SANS-VNET [Create new](#)

\* Subnet Sans-Pub-Subnet (10.0.2.0/24) [Manage subnet configuration](#)

Public IP (new) WindowsVM-Azure-ip [Create new](#)

NIC network security group ☐ None ☒ Basic ☐ Advanced

\* Public inbound ports ☐ None ☒ Allow selected ports

\* Select inbound ports RDP

These ports will be exposed to the internet. Use the Advanced controls to limit inbound traffic to known IP addresses. You can also update inbound traffic rules later.

Accelerated networking ☐ On ☒ Off

The selected image does not support accelerated networking.

LOAD BALANCING

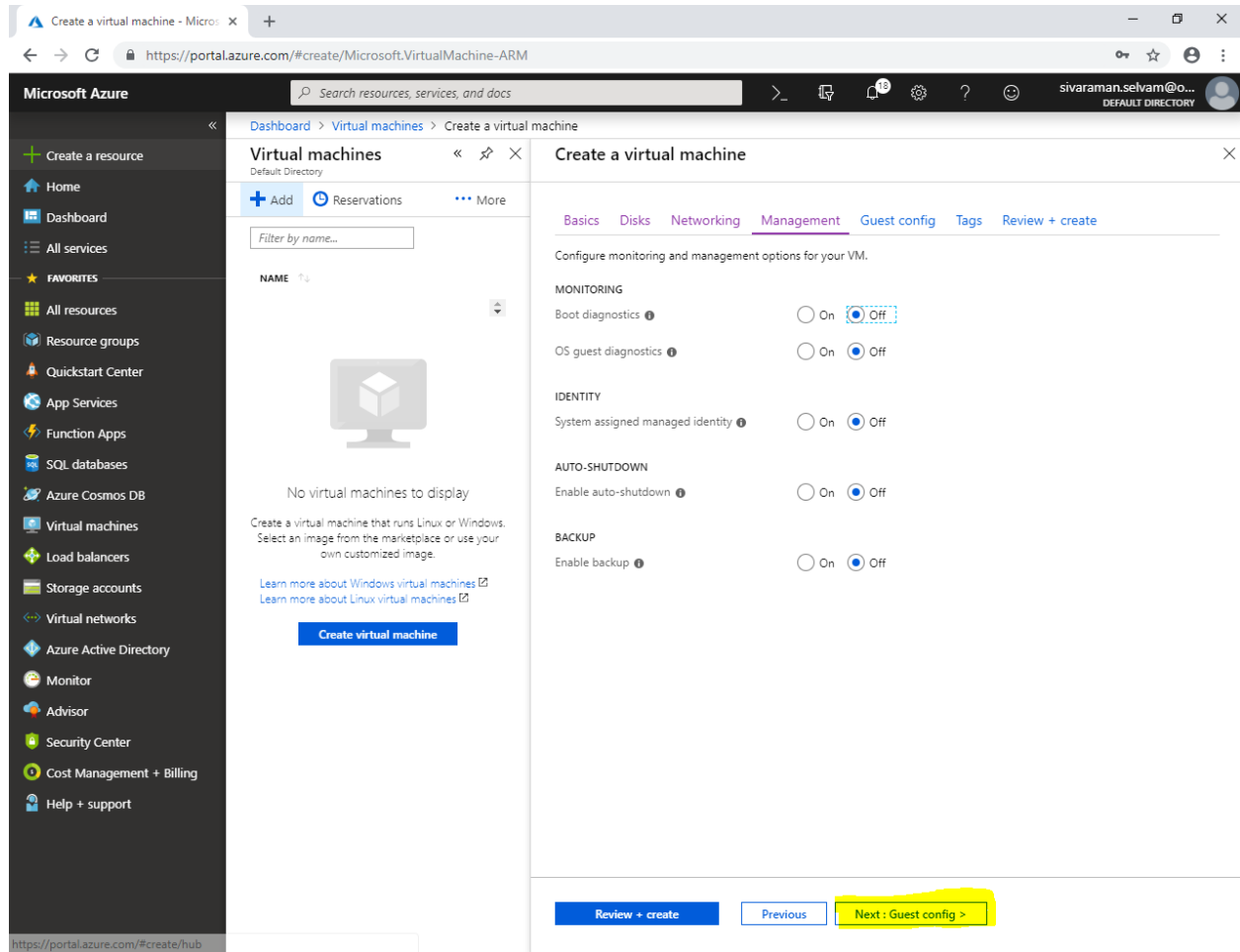
You can place this virtual machine in the backend pool of an existing Azure load balancing solution. [Learn more](#)

Place this virtual machine behind an existing load balancing solution. ☐ Yes ☒ No

Review + create Previous Next : Management >

In “Management”,

Click “Next : Guest config >”.



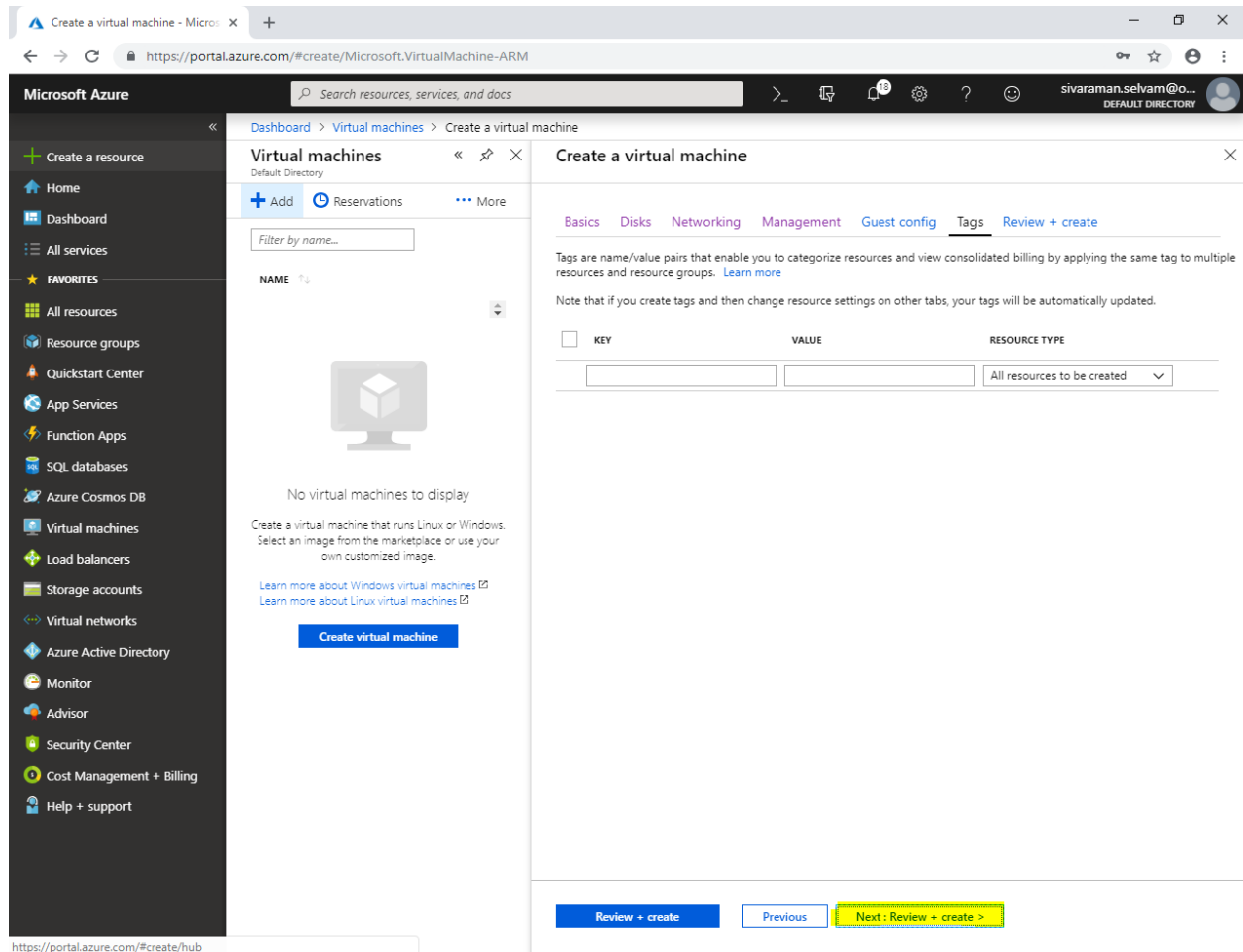
The screenshot shows the Microsoft Azure portal interface for creating a virtual machine. The left sidebar contains navigation links such as 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area is titled 'Virtual machines' and shows a list of virtual machines (currently empty). The right pane displays the 'Create a virtual machine' wizard with tabs for 'Basics', 'Disks', 'Networking', 'Management', 'Guest config', 'Tags', and 'Review + create'. The 'Management' tab is active, showing options for 'MONITORING', 'IDENTITY', 'AUTO-SHUTDOWN', and 'BACKUP'. At the bottom of the wizard, three buttons are visible: 'Review + create', 'Previous', and 'Next : Guest config >'. The 'Next : Guest config >' button is highlighted in yellow.

In “Guest config”,

Click “Next : Tags >”.

The screenshot shows the Microsoft Azure portal interface. On the left is a navigation sidebar with various service categories. The main area is titled 'Create a virtual machine' and contains several tabs: Basics, Disks, Networking, Management, Guest config (selected), Tags, Review + create, and Extensions. The 'Guest config' tab displays information about cloud-init and extensions. At the bottom of the wizard, there are three buttons: 'Review + create', 'Previous', and 'Next : Tags >'. The 'Next : Tags >' button is highlighted with a yellow rectangular box.

Click **“Next : Review + create”**.



The screenshot shows the Azure portal interface for creating a virtual machine. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area is titled 'Virtual machines' and shows a list of existing VMs (currently empty). The right pane displays the 'Create a virtual machine' wizard, specifically the 'Review + create' step. This step includes a summary of the configuration and a 'Review + create' button at the bottom right, which is highlighted in yellow.

Microsoft Azure

Search resources, services, and docs

Dashboard > Virtual machines > Create a virtual machine

Virtual machines

+ Add Reservations More

Filter by name...

NAME

No virtual machines to display

Create a virtual machine that runs Linux or Windows. Select an image from the marketplace or use your own customized image.

[Learn more about Windows virtual machines](#)

[Learn more about Linux virtual machines](#)

Create virtual machine

Create a virtual machine

Basics Disks Networking Management Guest config Tags Review + create

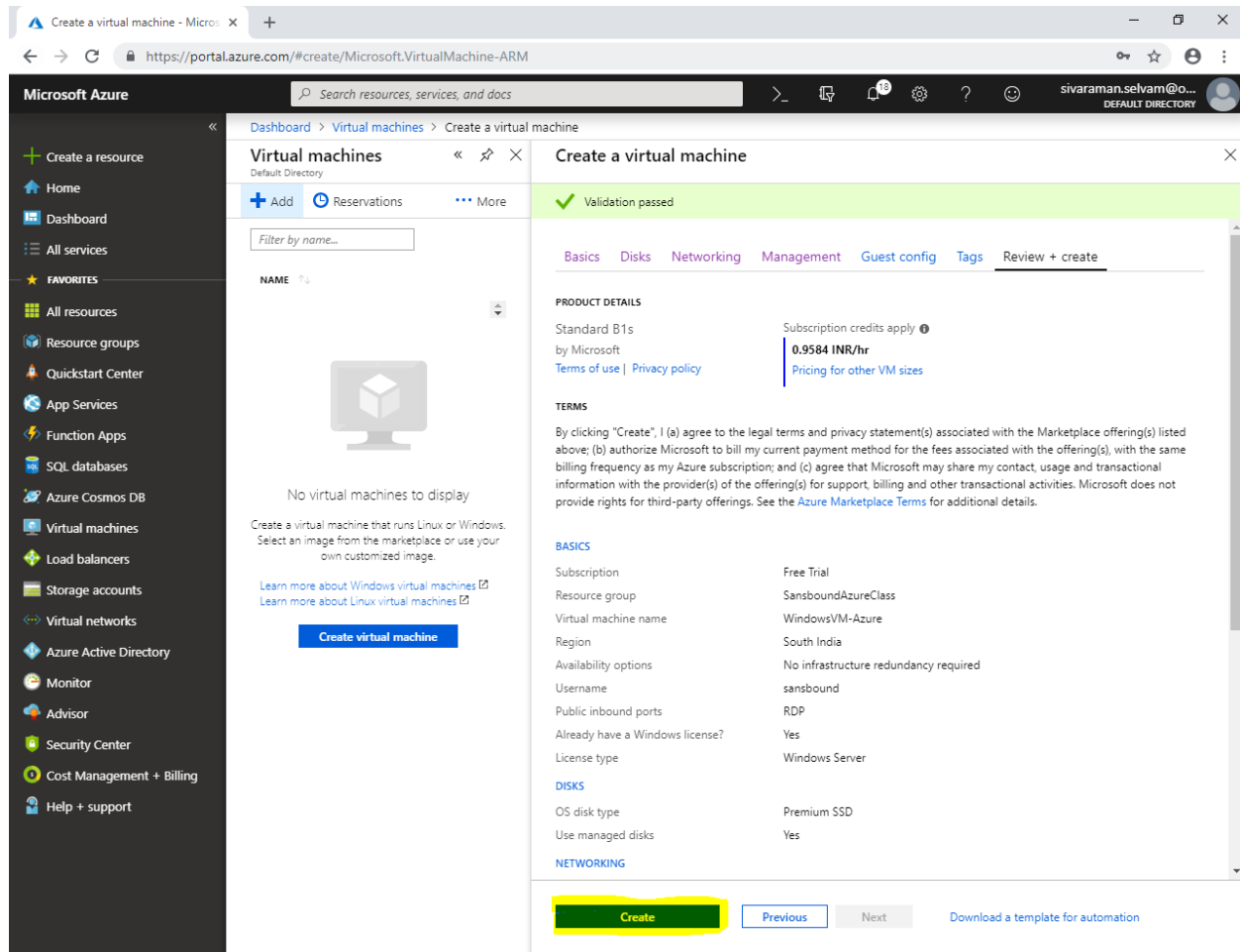
Tags are name/value pairs that enable you to categorize resources and view consolidated billing by applying the same tag to multiple resources and resource groups. [Learn more](#)

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

KEY	VALUE	RESOURCE TYPE
		All resources to be created

Review + create Previous Next: Review + create >

Click **“Create”**.



The screenshot shows the Azure portal interface for creating a virtual machine. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main area is titled 'Virtual machines' and 'Create a virtual machine'. A green banner at the top indicates 'Validation passed'. The 'Basics' tab is active, displaying the following configuration details:

PRODUCT DETAILS	
Standard B1s	Subscription credits apply
by Microsoft	0.9584 INR/hr
<a href="#">Terms of use</a>   <a href="#">Privacy policy</a>	<a href="#">Pricing for other VM sizes</a>

**TERMS**

By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the [Azure Marketplace Terms](#) for additional details.

BASICS	
Subscription	Free Trial
Resource group	SansboundAzureClass
Virtual machine name	WindowsVM-Azure
Region	South India
Availability options	No infrastructure redundancy required
Username	sansbound
Public inbound ports	RDP
Already have a Windows license?	Yes
License type	Windows Server

DISKS	
OS disk type	Premium SSD
Use managed disks	Yes

NETWORKING	
------------	--

At the bottom, there are three buttons: 'Create' (highlighted in yellow), 'Previous', and 'Next'. A link 'Download a template for automation' is also present.

Click on **“Go to resource”**.

Microsoft Azure

Search resources, services, and docs

Dashboard > CreateVm-MicrosoftWindowsServer.WindowsServer-200-20181225152701 - Overview

CreateVm-MicrosoftWindowsServer.WindowsServer-200-20181225152701 - Overview

Deployment

Search (Ctrl+/)

Overview

Inputs

Outputs

Template

✓ Your deployment is complete

[Go to resource](#)

Deployment name: CreateVm-MicrosoftWindowsServer.WindowsServer-200-20181225152701  
Subscription: [Free Trial](#)  
Resource group: [SansboundAzureClass](#)

DEPLOYMENT DETAILS [\(Download\)](#)  
Start time: 12/25/2018, 3:55:54 PM  
Duration: 6 minutes 33 seconds  
Correlation ID: 91644d95-37b1-4379-af29-40a35d7a2687

RESOURCE	TYPE	STATUS	OPERATION DET...
✓ WindowsVM-Azure	Microsoft.Compu...	OK	<a href="#">Operation details</a>
✓ windowsvm-azure8	Microsoft.Networ...	Created	<a href="#">Operation details</a>
✓ WindowsVM-Azure	Microsoft.Networ...	OK	<a href="#">Operation details</a>
✓ WindowsVM-Azure	Microsoft.Networ...	OK	<a href="#">Operation details</a>

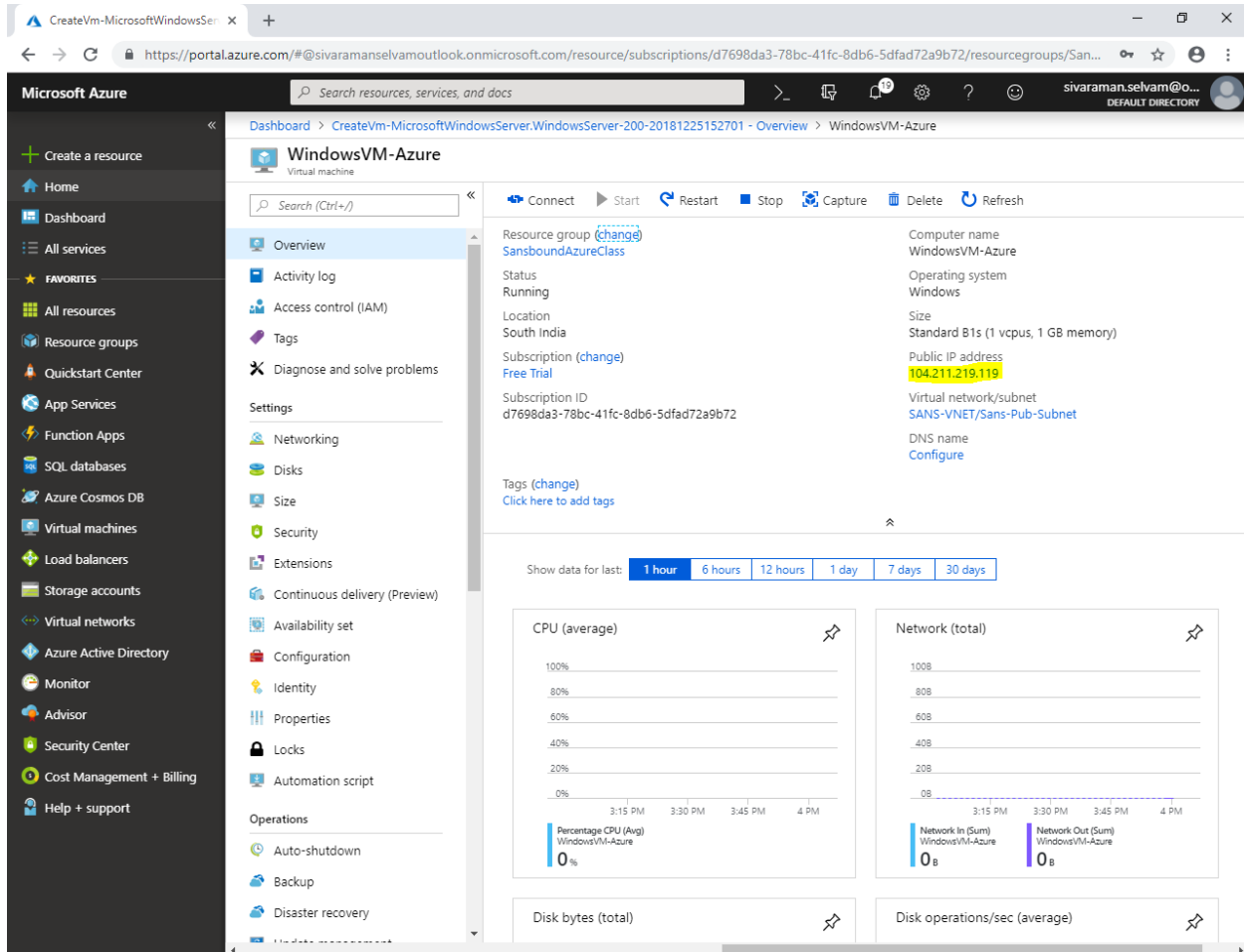
Additional Resources

- [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](#)

Kindly note the public IP address we will access the server by using RDP by using this Public IP Address.



The screenshot displays the Microsoft Azure portal interface. The left sidebar contains navigation options such as 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The main content area shows the 'Overview' tab for a virtual machine named 'WindowsVM-Azure'. Key details include:

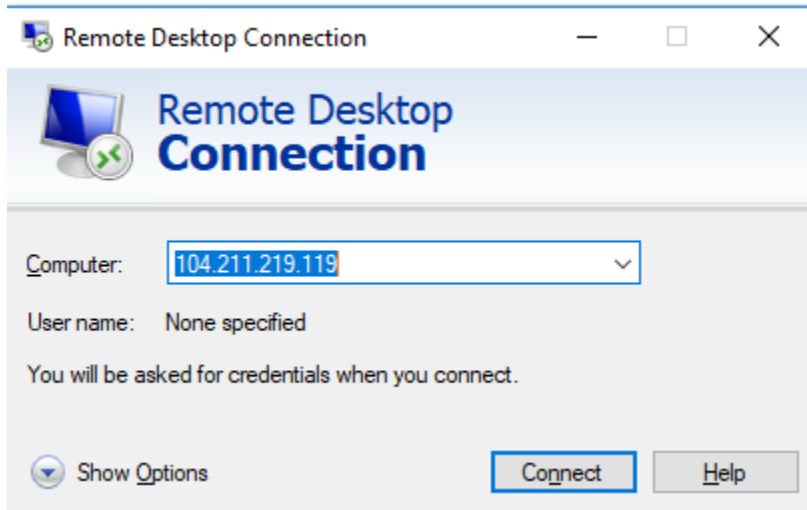
- Resource group:** [SansboundAzureClass](#)
- Status:** Running
- Location:** South India
- Subscription:** [Free Trial](#)
- Subscription ID:** d7698da3-78bc-41fc-8db6-5dfad72a9b72
- Computer name:** WindowsVM-Azure
- Operating system:** Windows
- Size:** Standard B1s (1 vcpu, 1 GB memory)
- Public IP address:** 104.211.219.119
- Virtual network/subnet:** SANS-VNET/Sans-Pub-Subnet
- DNS name:** [Configure](#)

Below the overview, there are performance metrics for the last 1 hour:

- CPU (average):** A line graph showing 0% usage.
- Network (total):** A line graph showing 0B for both Network In (Sum) and Network Out (Sum).
- Disk bytes (total):** A line graph showing 0B.
- Disk operations/sec (average):** A line graph showing 0 operations/sec.

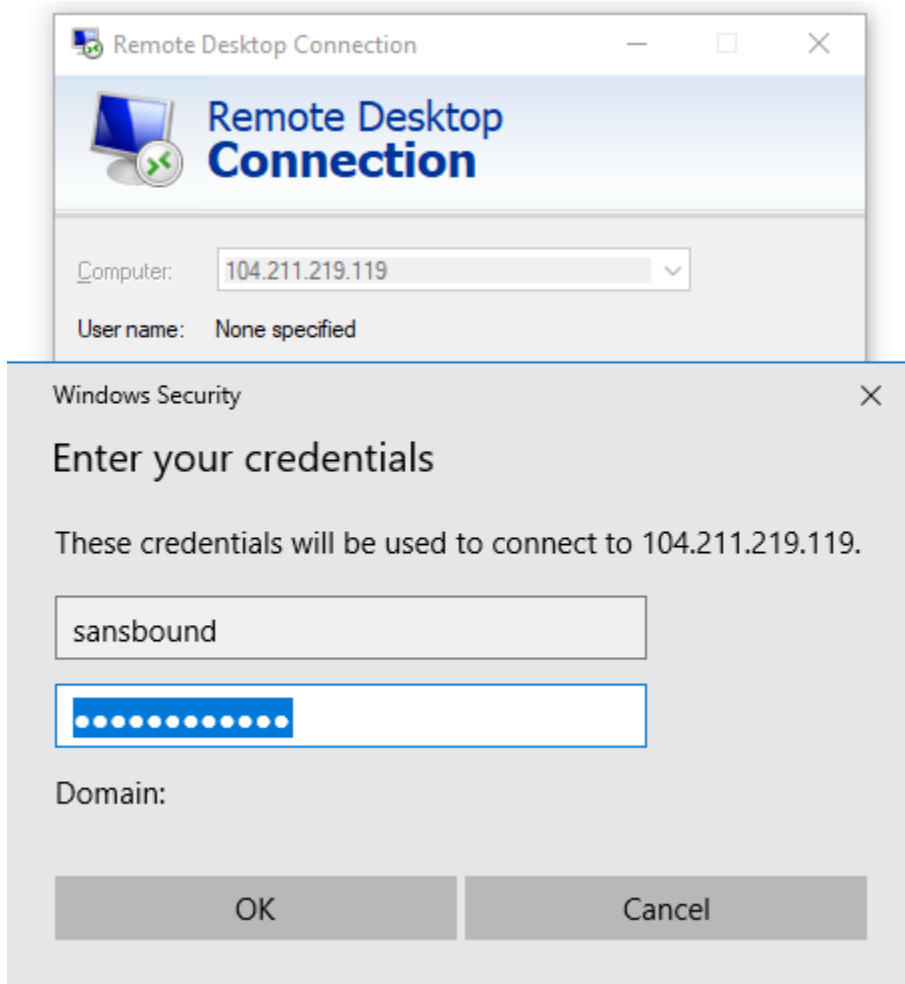


Type “mstsc” in Run box.



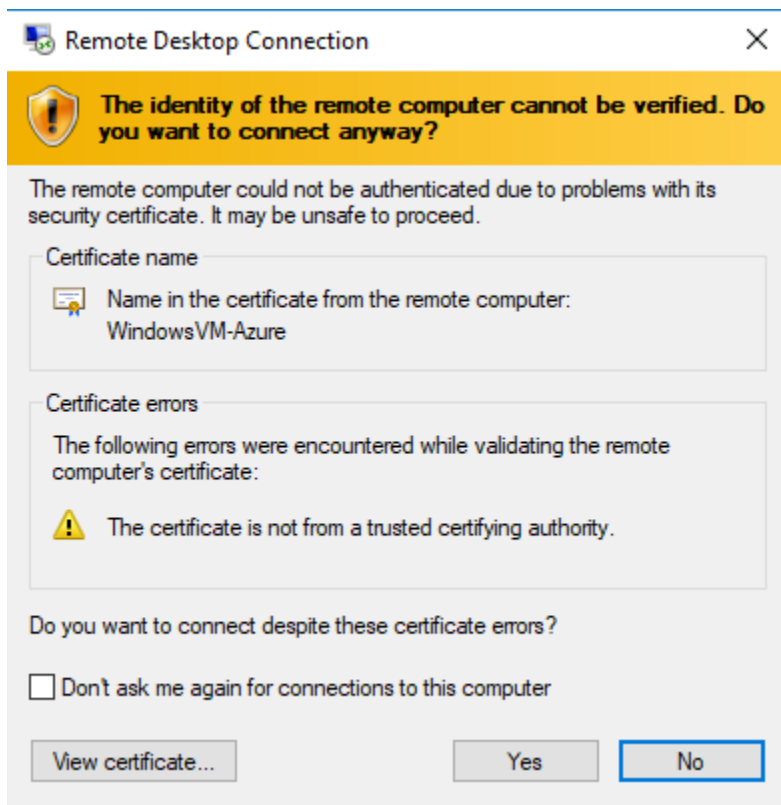
Click **“Connect”**.

Type **“Username”** and **“password”** for the Windows 2008 R2 Server virtual machine.



Click **“Ok”**.

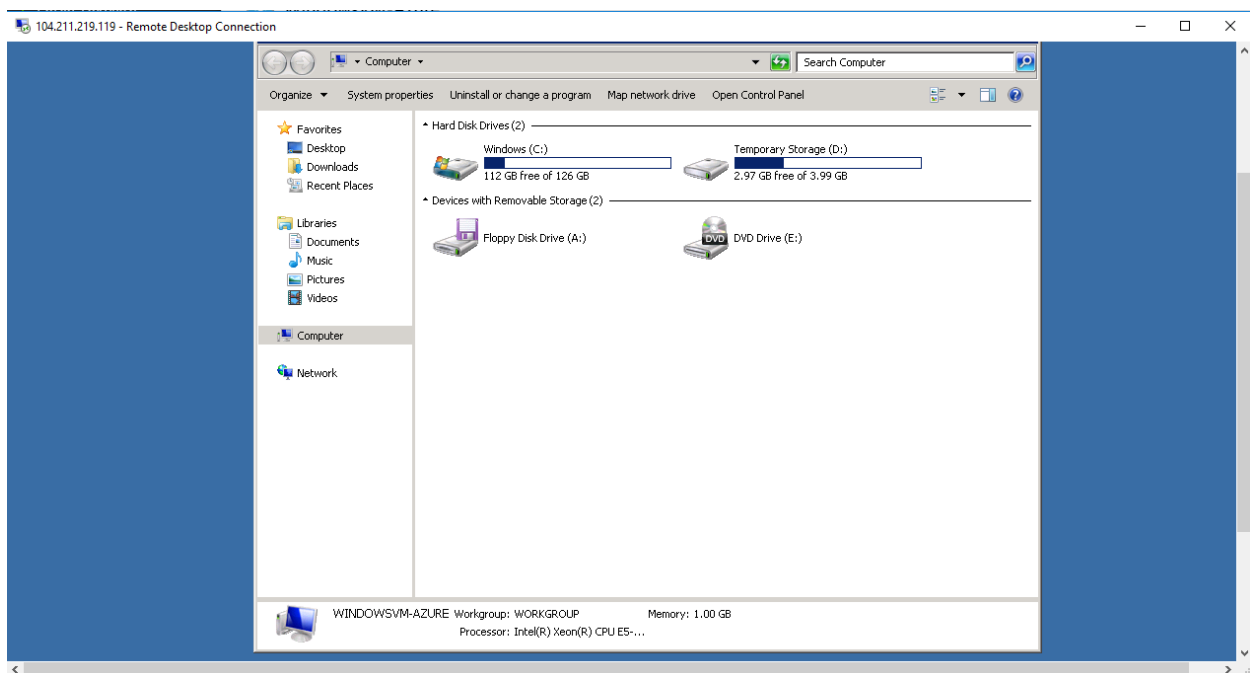
Click **"Yes"**.



In “Windows Server 2008 R2” virtual machine,

You are able to see the **C drive space as “126 GB”**.

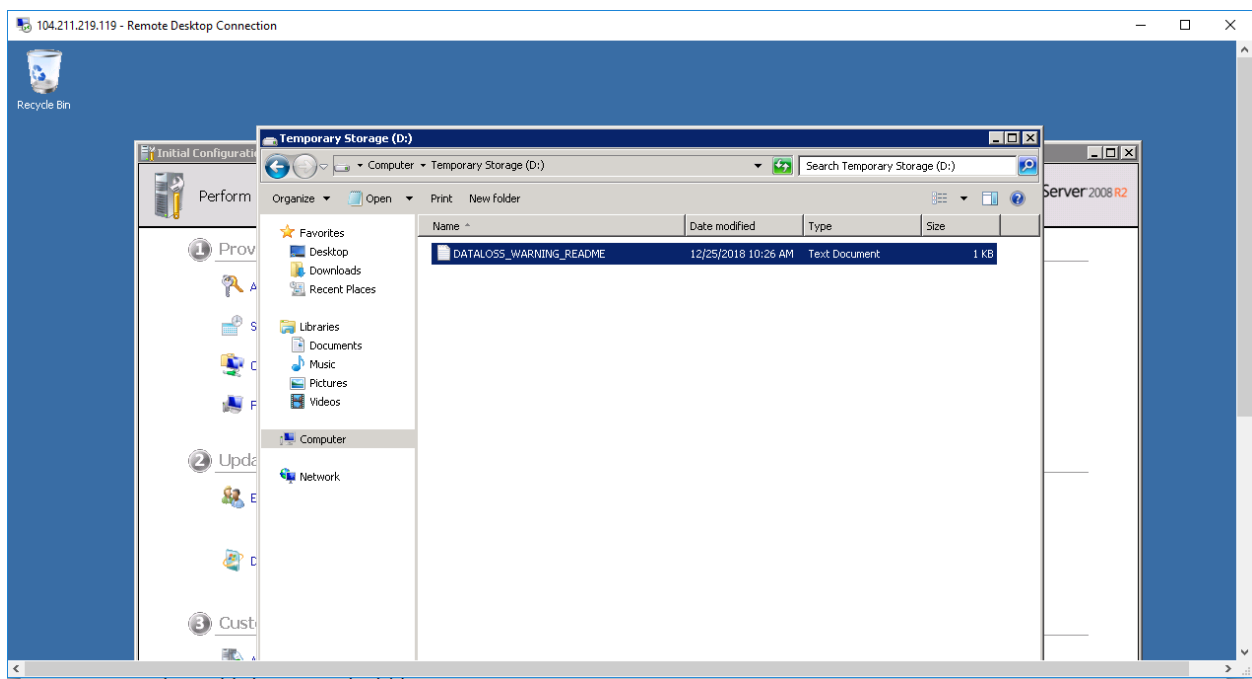
Also you are able to see another drive letter named **“D” (Temporary Storage)**.



Click **"D" drive (Temporary storage):**

I can able to see one text file.

Open the text file.



**It says that, do not store any data on this Temporary disk.**

