

# CREATING A 'CUSTOM' VIRTUAL MACHINE (VM)



DS 203  
2024 – S1

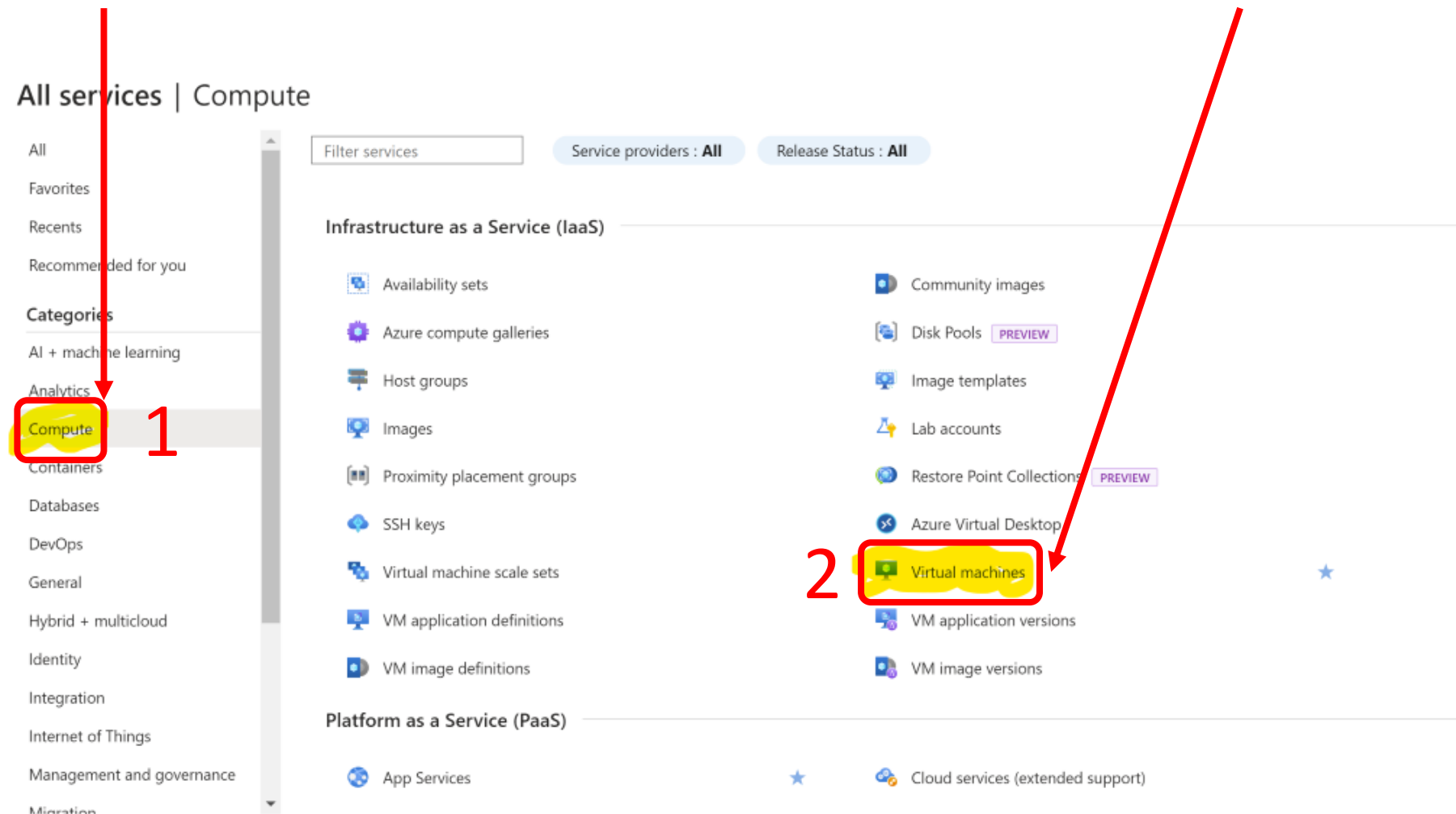
- In the previous step you acquired **Azure Educational Credits**
- The next step involves creating a custom Virtual Machine (VM) using an existing 'disk image', with DS203 specific tools pre-installed
  - A disk-image has been created and shared. It will be used.
  - This disk image is based on UBUNTU (Linux) and the following software have been pre-installed: MySQL server, Jupyter Notebook, and SPARK
- Follow all the subsequently outlined steps very carefully!

## In case of difficulties ...

- Log your issues in the Moodle Forum **Queries and Discussions** and a member of the TA team will respond and guide you.

# Creating a VM...

- Let's create our Virtual Machine.
- Click this link: <https://portal.azure.com/#allservices/category/All>. You will see page shown in image below.
- Click on "Compute" as highlighted in the image and you should see "Virtual Machine". **Click on it.**



# Creating a VM ...

- On this page, you will see a dashboard of your VMs (which you don't have yet.)
- Click on the **"Create"** button
- Choose **"Azure virtual machine"**

[Home](#) >

## Virtual machines

Indian Institute of Technology Bombay (iitbacin.onmicrosoft.com)



Create



Switch to classic



Reservations



Manage



**Azure virtual machine**

Create a virtual machine hosted by Azure



**Azure virtual machine with preset configuration**

Create a virtual machine with presets based on your workloads

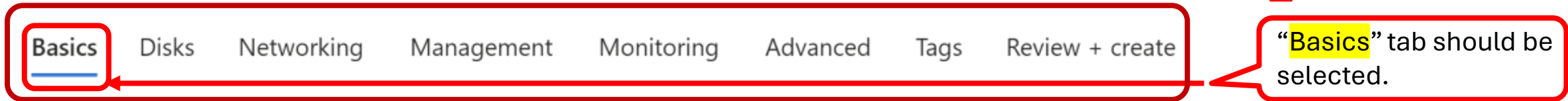


**More VMs and related solutions**

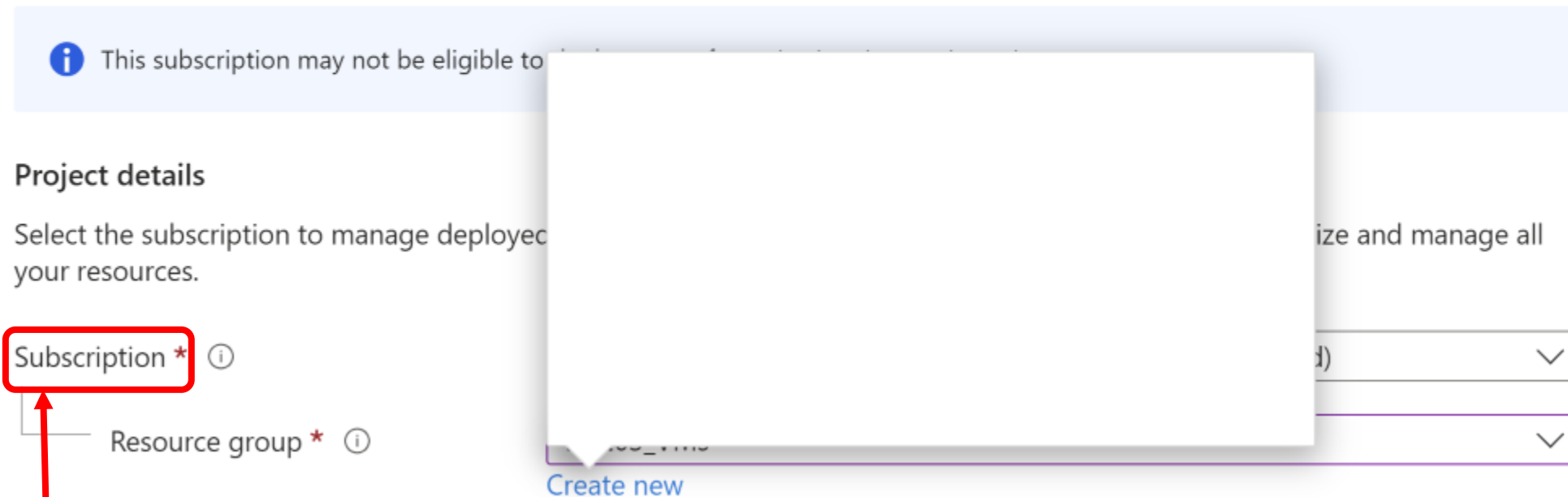
Discover and deploy full workloads and Azure products for your business needs

# Basics tab

- You should see a screen with the "Basics", "Disks", "Networking",... and more tabs.



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. [Learn more](#)



2

Keep "Subscription" to its default value

# Basics tab: Create a resource group

**Basics**   Disks   Networking   Management   Monitoring   Advanced   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. [Learn more](#)

**Project details**

Select the subscription to manage deployed your resources.

Subscription \* ⓘ

Resource group \* ⓘ

[Create new](#)

A resource group is a container that holds related resources for an Azure solution.

Name \*

DS203\_VM ✓

OK Cancel

**1** Click on "Create new" to create a new "Resource group".  
Be sure to select 'Australia East' region, whenever there is an option

**2** Name your Resource Group as "DS203\_VM", Then click "Ok"

# Basics tab: Browse images

[Home](#) > [Virtual machines](#) >

## Create a virtual machine ...



Help me create a low cost VM

Help me create a VM optimized for high availability

Help me choose the ri

### Instance details

Virtual machine name \* ⓘ

DS203-vm



Region \* ⓘ

(Asia Pacific) Australia East



Availability options ⓘ

No infrastructure redundancy required



Security type ⓘ

Standard



Image \* ⓘ



[See all images](#) | [Configure VM generation](#)



This image is compatible with additional security features. [Click here to swap to the Trusted launch security type.](#)

VM architecture ⓘ



Arm64



x64

1  
Set these 4 entries as values in this image.

2

3  
Click on "See all images"  
You will see window as in next slide.



# Basics tab: Selecting the image

- After clicking “See all images”, You will see following page.
- Click on “Shared Images”

[Home](#) > [Virtual machines](#) > [Create a virtual machine](#) >

## Select an image ...

Other Items

My Images

Shared Images

Community Images

Direct Shared Images  
(PREVIEW)

## Other Items | Shared Images

Publisher : All

Azure Compute Gallery : All

Image Name

↑↓

Subscription

↑↓

Publisher

ds203\_vm\_image\_definition

Azure for Students (fcbd8fde-32bb-43fc-b8a4-3e02a... VK

2

We have shared a VM Image with you all. You should be able to see that VM Image here, Select it. (Make sure, the publisher of the image is “VK” If you don’t see a VM Image here, post a query)

P.S. You might see some other images here too, (incase, someone has shared it with you). You can ignore those as we are not concerned with those Images.

# Basics tab: VM Image selected

- After selecting a VM Image, You will be redirected back to creating VM page.
- Your final values for given entries should look like the image below

[Home](#) > [Virtual machines](#) >

## Create a virtual machine ...



Help me create a low cost VM

Help me create a VM optimized for high availability

Help me choose the

### Instance details

Virtual machine name \* ⓘ

DS203-vm



Region \* ⓘ

(Asia Pacific) Australia East



Availability options ⓘ

No infrastructure redundancy required



Security type ⓘ

Standard



Image \* ⓘ



DS203\_Aus\_East\_Compute\_Gallery/ds203\_vm\_image\_definition/latest - x64



[See all images](#) | [Configure VM generation](#)

VM architecture ⓘ

☐ Arm64

☒ x64



Arm64 is not supported with the selected image.

# Basics tab: Choosing RAM

- Now, We will select our RAM size.
- WARNING:** Selecting other RAM could cost you more, so make sure you follow steps carefully

Run with Azure Spot discount ⓘ

☐

Size \* ⓘ

1

See all sizes

Enable Hibernation (preview) ⓘ

☐

ⓘ To enable Hibernation, you must register your subscription. [Learn more](#) ↗

[Home](#) > [Virtual machines](#) > [Create a virtual machine](#) >

Select a VM size ...

vCPUs : **All**

RAM (GiB) : **All**

Display cost : **Monthly**

[Add filter](#)

Showing 695 VM sizes.

Subscription: Azure for Students

Region: Australia East

Current size: Standard\_B2s

Image: DS203\_Aus\_East\_Compute\_Gallery/ds203\_vm\_image\_definition/latest

[Learn more about VM sizes](#) ↗

Group by series

▼

VM Size ↑↓	Type ↑↓	vCPUs ↑↓	RAM (GiB) ↑↓	Data disks ↑↓	Max IOPS ↑↓	Local storage (GiB) ↑↓	Premium disk ↑↓	Cost/month ↑↓
Most used by Azure users ↗								
The most used sizes by users in Azure								
DS1_v2 ↗	General purpose	1	3.5	4	3200	7 (SCSI)	Supported	₹5,101.50
D2s_v3 ↗	General purpose	2	8	4	3200	16 (SCSI)	Supported	₹7,591.51
D2as_v4 ↗	General purpose	2	8	4	3200	16 (SCSI)	Supported	₹7,287.85
B2s ↗	General purpose	2	4	4	1280	8 (SCSI)	Supported	₹3,206.66
B1s ↗ (free services eligible) ⓘ	General purpose	1	1	2	320	4 (SCSI)	Supported	₹801.66
B2ms ↗	General purpose	2	8	4	1920	16 (SCSI)	Supported	₹6,437.60
B1ls ↗	General purpose	1	0.5	2	320	4 (SCSI)	Supported	₹400.83
DS2_v2 ↗	General purpose	2	7	8	6400	14 (SCSI)	Supported	₹10,203.00
D4s_v3 ↗	General purpose	4	16	8	6400	32 (SCSI)	Supported	₹15,183.03
DS3_v2 ↗	General purpose	4	14	16	12800	28 (SCSI)	Supported	₹20,405.99
D-Series v4								
The 4th generation D family sizes for your general purpose needs								

3

Select

Prices presented are estimates in INR that include only Azure infrastructure costs and any discounts from the subscription and location. The prices don't include any applicable software costs. Final charges will appear in your local currency in cost analysis and billing views. [View Azure pricing calculator](#). ↗

[Give feedback](#)

- Click on “See all sizes”
- You will be redirected to a page where you will see all the RAM options.
- Choose “B2s” RAM. In case you don't see this option, choose any 4GB ram with 2 vcpu which costs approximately ₹3200.
- Then click “Select”

# Basics tab: SSH configuration

## Administrator account

Authentication type ⓘ

☒ SSH public key

1

☐ Password

**i** Azure now automatically generates an SSH key pair for you and allows you to store it for future use. It is a fast, simple, and secure way to connect to your virtual machine.

Username \* ⓘ

ds203

2

SSH public key source

Use existing public key



3  
Click on **dropdown icon**.  
Select **"Use existing public key"** option

SSH public key \* ⓘ

ssh-rsa

AAAAB3NzaC1yc2EAAAADAQABAAQBAgQDMSMvEBdrgFR4laDLMY7i7YJewF6  
KV/4VziGORxULNMyhtUlo5FXPFxbKjgGNU+HCvQ4c97r04nnb8zUGG/+aNQa

**i** Learn more about creating and using SSH keys in Azure [↗](#)

4  
TODO: Copy and  
Paste the contents  
of the text file  
***ds203-azure-vm1-  
public-key.txt***

# Basics tab: SSH ports

## 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

1

Select inbound ports \*

SSH (22)

2



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

Review + create

< Previous

Next : Disks >

3

Click on “Next: Disks >”  
Beware, Don’t click “Review + create”

# Disks tab: Choosing disk

- Now, You will be redirected to “Disk Creation” tab.
- Let’s configure our Disk
- We need to change just 2 settings here, As shown in Image below

Warning: Selecting other option for disk type can cost you more, Please make sure you select the right option

Basics **Disks** Networking Management Monitoring Advanced Tags Review + create

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more](#)

## VM disk encryption

Azure disk storage encryption automatically encrypts your data stored on Azure managed disks (OS and data disks) at rest by default when persisting it to the cloud.

Encryption at host

☐

Encryption at host is not registered for the selected subscription. [Learn more about enabling this feature](#)

## OS disk

OS disk size

Image default (30 GiB)

OS disk type \*

Standard HDD (locally-redundant storage)

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.

Delete with VM

☒

Using Dropdown menu select “Standard HDD” option

1

2

Tick “Delete with VM” checkbox

# Disks tab

- Now, You will be redirected to Networking Tab.

Key management ⓘ

Platform-managed key



Enable Ultra Disk compatibility ⓘ

☐

## Data disks for ds203VM

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN

Name

Size (GiB)

Disk type

Host caching

Delete with VM ⓘ

[Create and attach a new disk](#)

[Attach an existing disk](#)

▼ Advanced

Review + create

< Previous

Next : Networking >

Keep other settings to default values  
Now, Click on “Next: Networking >”

1

# Networking tab: Create a virtual network

- We will create our new Virtual Network, follow along !!

Click "Create new", You will see this window

1

2

3

Keep other settings to default values

Set "Name" value to "DS203-VM-vnet"  
Keep other settings to default. Click Ok

The screenshot shows the 'Create a virtual machine' page in the Azure portal. The 'Networking' tab is selected. A modal window titled 'Create virtual network' is open. The modal contains the following information:

- Name:** DS203-VM-vnet
- Address space:** The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).
- Subnets:** The subnet's address range in CIDR notation. It must be contained by the address space of the virtual network.

The modal also includes a table for address ranges and a table for subnets.

Address range *	Addresses	Overlap
<input type="checkbox"/> 10.0.0.0/16	10.0.0.0 - 10.0.255.255 (65536 addresses)	None
<input type="checkbox"/> (0 Addresses)	(0 Addresses)	None

Subnet name	Address range	Addresses
<input type="checkbox"/> default	10.0.0.0/24	10.0.0.0 - 10.0.255 (256 addresses)
<input type="checkbox"/> (0 Addresses)	(0 Addresses)	(0 Addresses)



# Network Tab (Cont.)

Select inbound ports \* SSH (22)

**⚠ This will allow all IP addresses to access your virtual machine.** This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

1 ☒ Delete public IP and NIC when VM is deleted ⓘ

Enable accelerated networking ⓘ ☐ The selected VM size 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](#) ↗

Load balancing options ⓘ

- ☒ None
- ☐ Azure load balancer  
Supports all TCP/UDP network traffic, port-forwarding, and outbound flows.
- ☐ Application gateway  
Web traffic load balancer for HTTP/HTTPS with URL-based routing, SSL termination, session persistence, and web application firewall.

Review + create < Previous 2 Next : Management >

Tick “Delete public IP...” checkbox,  
Keep other setting to default values.

Click on “Next: Management >”

# Management tab (Cont.): Auto Shutdown

Warning: Make sure to Enable auto-shutdown. VM just kept on will also cost you credits !!

## Azure AD

Login with Azure AD ⓘ



⚠ This image does not support Login with Azure AD.

## Auto-shutdown

Enable auto-shutdown ⓘ



Shutdown time ⓘ

2

2:00:00 AM

Time zone ⓘ

(UTC) Coordinated Universal Time

Notification before shutdown ⓘ



Email \* ⓘ

3

your\_email@iitb.ac.in

## Guest OS updates

Patch orchestration options ⓘ

Image default



Some patch orchestration options are not available for this image. [Learn more](#)

4

Review + create

< Previous

Next : Monitoring >

Tick “Enable auto-shutdown”.  
And set the “Shutdown time”  
as shown in the image, or  
whatever time of the night you  
are sure to be asleep!

Type your IITB email address,  
And click on  
“Next: Monitoring >”

# Almost there !

- Keep the next three tabs "Monitoring", "Advanced" and "Tags" as default.  
When you click "Next: Review + create", azure will run a validation on your VM and it should pass.  
Click on "Create" and your VM should be created/deployed.

# IMPORTANT \*\* IMPORTANT \*\* IMPORTANT

- Once you are through with your work on / with the VM, be sure to **STOP** it to pause the Billing for this resource! Go to this link: [Virtual machines](#)

The screenshot shows the Microsoft Azure portal interface for a virtual machine named 'ds203-VM'. The top navigation bar includes the 'Microsoft Azure' logo and a search bar. The left sidebar contains a navigation menu with options like 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'Connect', 'Networking', and 'Settings'. The main content area displays the VM's 'Essentials' and 'Properties' tabs. The 'Essentials' tab shows key information: Resource group (DS203), Status (Running), Location (East US (Zone 1)), Subscription (Azure for Students), and Availability zone (1). The 'Properties' tab is also visible, showing details like Computer name (VM3), Operating system (Linux (ubuntu 20.04)), Image publisher (VinayK), and Image offer (Course). A red circle highlights the 'Stop' button in the top action bar, with a red arrow pointing to it from the word 'STOP' in the text above.

Property	Value
Resource group	DS203
Status	Running
Location	East US (Zone 1)
Subscription	Azure for Students
Subscription ID	
Availability zone	1
Tags	Add tags
Operating system	Linux (ubuntu 20.04)
Size	Standard B2s (2 vcpus, 4 GiB memory)
Public IP address	x.y.z.w
Virtual network/subnet	DS203-VM1-vnet/default
DNS name	Not configured
Health state	-

Property	Value
Computer name	VM3
Operating system	Linux (ubuntu 20.04)
Image publisher	VinayK
Image offer	Course

Property	Value
Public IP address	x.y.z.w
Public IP address (IPv6)	-
Private IP address	10.0.0.5
Private IP address (IPv6)	-

# The next steps ...

- Now that the virtual machine has been created ... and started
- You need some applications to connect to the VM for various purposes:
  - A terminal : to manage the VM
  - A file transfer program to move files to / from the VM
  - A MySQL client to work with the MySQL server running on the server
  - A 'network tunnel' to be able to access Jupyter Notebook
    - These topics are covered in the slide decks that follow ...