

Introduction to Cloud Computing

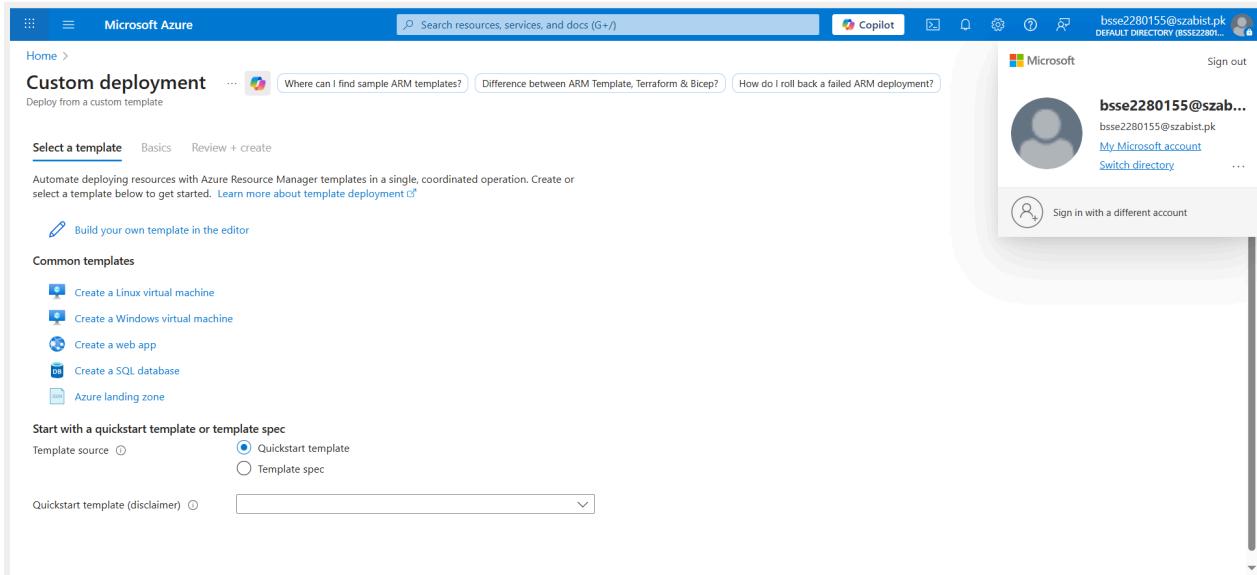
LAB 11

Name: Muhammad Yahya

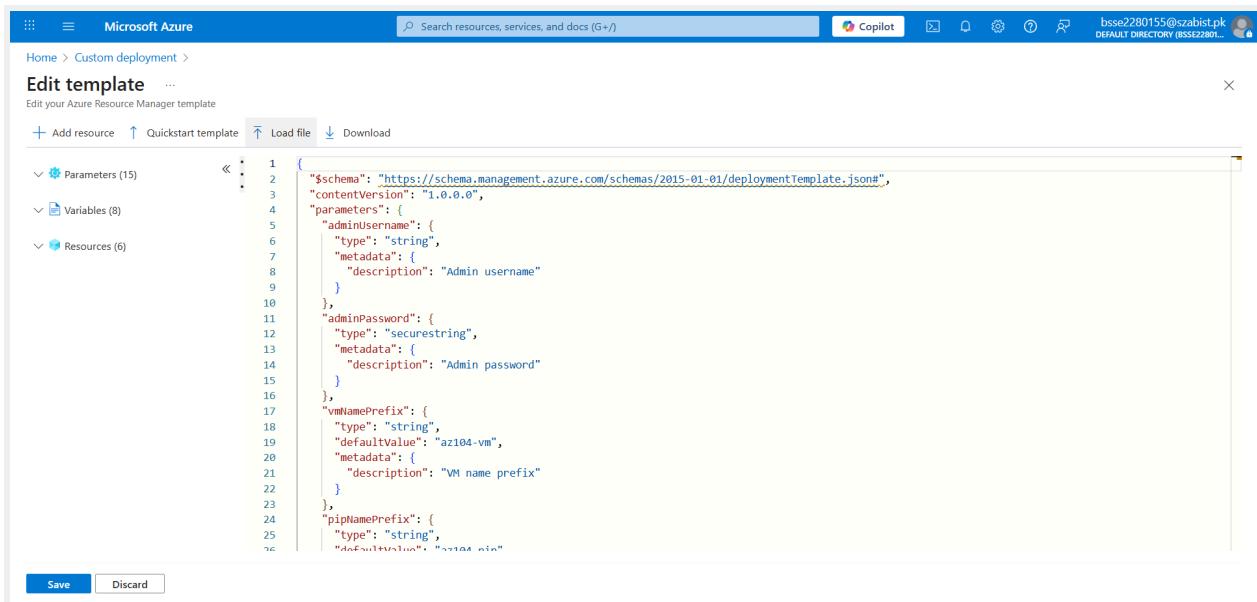
ID: 2280155

BS-SE 7B

Task 1: Use a template to provision an infrastructure



The screenshot shows the Microsoft Azure Custom Deployment interface. At the top, there's a navigation bar with 'Microsoft Azure' and a search bar. Below it, the main title is 'Custom deployment'. A sub-section titled 'Select a template' is active, showing options like 'Create a Linux virtual machine', 'Create a Windows virtual machine', 'Create a web app', 'Create a SQL database', and 'Azure landing zone'. Below these, there's a section for 'Common templates'. Under 'Start with a quickstart template or template spec', the 'Template source' dropdown is set to 'Quickstart template'. A 'Quickstart template (disclaimer)' dropdown is also present. On the right side, a sidebar displays the user's profile (bsse2280155@szabist.pk) and other account options.



The screenshot shows the 'Edit template' interface. It features a JSON code editor on the right and a tree view of resources on the left. The tree view includes 'Parameters (15)', 'Variables (8)', and 'Resources (6)'. The JSON code in the editor is as follows:

```
1  {
2   "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
3   "contentVersion": "1.0.0.0",
4   "parameters": {
5     "adminUsername": {
6       "type": "string",
7       "metadata": {
8         "description": "Admin username"
9       }
10    },
11    "adminPassword": {
12      "type": "securestring",
13      "metadata": {
14        "description": "Admin password"
15      }
16    },
17    "vmNamePrefix": {
18      "type": "string",
19      "defaultValue": "az104-vm",
20      "metadata": {
21        "description": "VM name prefix"
22      }
23    },
24    "pipNamePrefix": {
25      "type": "string",
26      "defaultValue": "az104-pip"
27    }
28  }
```

At the bottom, there are 'Save' and 'Discard' buttons.

Microsoft Azure | Microsoft.Template-20260111133433 | Overview

Deployment

Search | Delete | Cancel | Redeploy | Download | Refresh

Your deployment is complete

Deployment name : Microsoft.Template-20260111133433
Subscription : Azure for Students
Resource group : az104-rg11

Start time : 1/11/2026, 1:34:55 PM
Correlation ID : 7b384d16-3b45-4554-b314-3b023f3bb548

Deployment succeeded
Deployment "Microsoft.Template-20260111133433" to resource group "az104-rg11" was successful.

Pin to dashboard | Go to resource group

Overview | Inputs | Outputs | Template

Deployment details | Next steps | Go to resource group

Give feedback | Tell us about your experience with deployment

Add or remove resources by selecting **Create + Child items**

Microsoft Azure | Microsoft.Template-20260111133433 | Overview

az104-rg11 | Resource group

Search | Create | Manage view | Delete resource group | Refresh | Export to CSV | Open query | Assign tags | Move | Delete | Group by none | JSON View

Overview | Activity log | Access control (IAM) | Tags | Resource visualizer | Events | Settings | Cost Management | Monitoring | Automation | Help

Essentials

Resources | Recommendations

Filter for any field... Type equals all Location equals all Add filter

Name	Type	Location
az104-nic0	Network Interface	Central India
az104-nsq01	Network security group	Central India
az104-pip0	Public IP address	Central India
az104-vm0	Virtual machine	Central India
az104-vm0_disk1_76d6e77f10a040e5a2746911dda048db	Disk	Central India
az104-vnet	Virtual network	Central India
az10411s7m3kgfpb6y4m	Storage account	Central India

Showing 1 - 7 of 7. Display count: auto | Give feedback

- In the portal, search for and select **Monitor**.

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

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DEFAULT DIRECTORY (BSSE2280...)

Home > Monitor | Overview

Summarize these Monitor services in a table Catch me up on my alerts Run an anomaly investigation into my resource

The Log Analytics agents, used by VM Insights, won't be supported as of August 31, 2024. Plan to migrate to VM Insights on Azure Monitor agent prior to this date. →

Overview Tutorials

Insights

Use curated monitoring views for specific Azure resources. [View all insights](#)

 Application insights Monitor your app's availability, performance, errors, and usage. View More	 Container Insights Gain visibility into the performance and health of your controllers, nodes, and containers. View More	 VM Insights Monitor the health, performance, and dependencies of your VMs and VM scale sets. View More	 Network Insights View the health and metrics for all deployed network resources. View More
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Detection, triage, and diagnosis

Visualize, analyze, and respond to monitoring data and events. [Learn more about monitoring](#)

 Metrics Create charts to monitor and investigate the usage and performance of your Azure resources. View More	 Alerts Get notified and respond using alerts and actions. View More	 Logs Analyze and diagnose issues with log queries. View More	 Workbooks View, create and share interactive reports. View More
 Dashboards with Grafana (preview) Add to favorites	 Change Analysis Add to favorites	 Diagnostic Settings Add to favorites	 Azure Monitor SCOM managed instance Add to favorites

Add or remove favorites by pressing **ctrl+L+Shift+F**

The screenshot shows the Microsoft Azure Monitor Virtual Machines dashboard. The left sidebar lists navigation items: Home, Monitor, Overview, Activity log, Alerts, Issues (preview), Metrics, Logs, Change Analysis, Service health, Workbooks, Dashboards with Grafana, Insights, Applications, Virtual Machines (selected), Storage accounts, Containers, Networks, and Azure Cosmos DB. The main content area has a search bar and a feedback button. It displays a 'Get started' section with tabs for Overview, Performance, and Map. A filter bar includes 'Subscription: Azure for Students', 'Resource group: All resource groups', 'Type: All types', and 'Location: All locations'. A note says 'Onboarding now supports OpenTelemetry metrics. If you enable only OpenTelemetry metrics, your VM will still collect data but will not appear as "Monitored" in this view.' Below this, a table lists monitored resources: 'az104-rg1' (1 of 1) and 'az104-vm0' (Not enabled, with an 'Enable' button). A tooltip for 'az104-vm0' indicates 'Relicensing Techniques Slides (Protected View) - PowerPoint (Product Activation failed)'.

Microsoft Azure

Home > Monitor | Virtual Machines >

Configure monitor | az104-vm0

Capabilities Review + enable

Infrastructure monitoring

Collect health and performance data from the operating system running on your virtual machine for improved troubleshooting, alerts, and visualizations.

Customize infrastructure monitoring

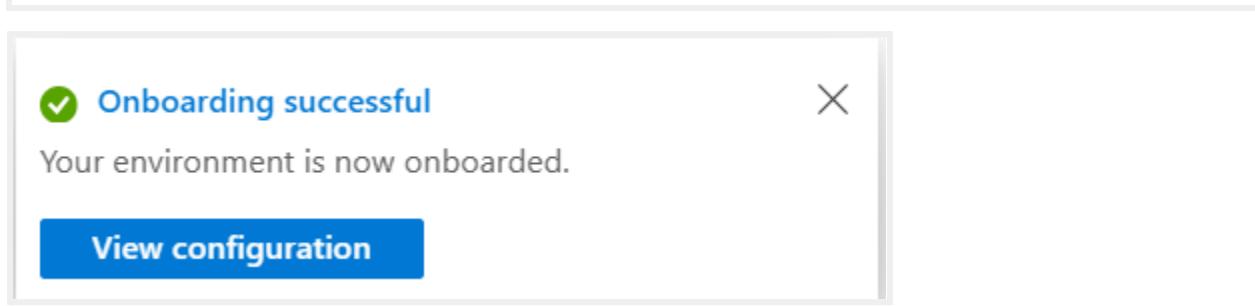
Enable detailed metrics [Preview] OpenTelemetry metrics [See metrics](#) At no additional cost

Azure Monitor workspace: (New) defaultazuremonitorworkspace-cid

[Classic] Log-based metrics Log Analytics workspace: defaultworkspace-db878fc-8781-42d0-a1d-55de3d976446-cin

Refactoring_Techniques_Slides (Protected View) -
PowerPoint (Product Activation Failed)

Next Review + enable Give feedback



Task 2: Create an alert

Microsoft Azure

Home > Monitor | Alerts >

Create an alert rule

Scope Condition Actions Details Tags Review + create

Create an alert rule to identify and address issues when important conditions are found in your monitoring data. [Learn more](#)

Scope level Subscription Select scope

Resource Hierarchy

No resource selected yet

Select a resource

Browse Recent

Resource types All resource types Locations All locations

Search to filter items...

Resource	Resource type	Location
<input checked="" type="checkbox"/> az104-rg11	Subscription	-
<input type="checkbox"/> DefaultResourceGroup-CID	Resource group	-

Metric and Log signals might not be available if the scope includes multiple resources.

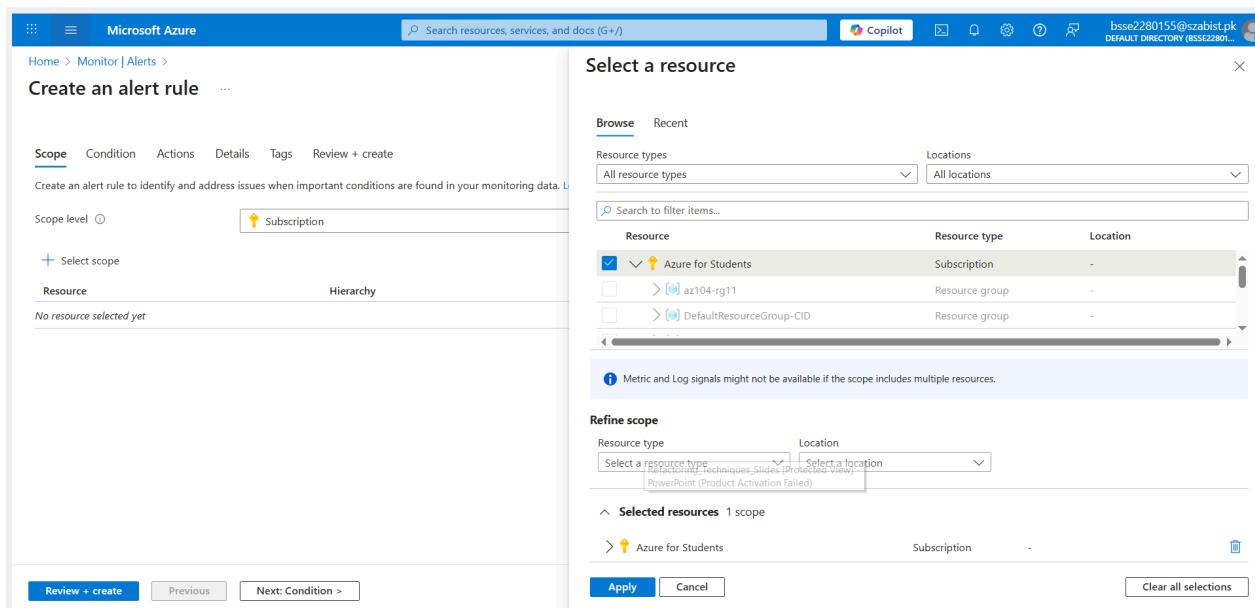
Refine scope

Resource type Select a resource type Location Select a location

Selected resources 1 scope

az104-rg11 Subscription

Apply Cancel Clear all selections



Microsoft Azure

Search resources, services, and docs (G+)

Copilot

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DEFAULT DIRECTORY (BSSE22801...)

Home > Monitor | Alerts >

Create an alert rule

Scope Condition Actions Details Tags Review + create

Configure when the alert rule should trigger by selecting a signal and defining its logic.

Signal name *

Select a signal [See all signals](#)

Signal type : All Signal source : All

Signal name Signal source

Activity log

Signal name	Signal source
Delete Virtual Hub proxy (Virtual Hub Proxy)	Administrative
Delete Virtual Machine (Virtual Machines)	Administrative
Delete Virtual Machine and Virtual Machine scale sets in a Azure Fleet resource (File...)	Administrative
Delete Virtual Machine Associated Network Security Group (Virtual Machine Associa...)	Administrative
Delete Virtual Machine diagnostic run command (Virtual Machine Diagnostic RunCo...)	Administrative
Delete Virtual Machine Extension (Virtual Machine Extensions)	Administrative
Delete Virtual Machine Image (Virtual Machine Image)	Administrative
Delete Virtual Machine in a Virtual Machine Scale Set (Virtual Machine in Scale Set)	Administrative
PowerPoint (Product Activation Failed)	
Delete virtual machine pools. (Virtual Machine Pools)	Administrative
Delete Virtual Machine run command (Virtual Machine RunCommands)	Administrative

Review + create Previous Next: Actions > Apply Cancel

activityLogHistoryBarSeries

-

View events in Azure Monitor - Activity Log

Alert logic

Event Level [\(i\)](#) Status [\(i\)](#) Event initiated by [\(i\)](#)

All selected All selected * (All services and users) Add event initiator

Condition preview

Whenever the Activity Log has an event with Category='Administrative', Signal name='Delete Virtual Machine (Virtual Machines)'

Review + create Previous Next: Actions >

Task 3: Configure action group notifications

The screenshot shows the Microsoft Azure portal interface. On the left, the main pane displays the 'Create an alert rule' page with the 'Actions' tab selected. The right pane is a modal window titled 'Select action groups' with the instruction 'Select up to five action groups to attach to this rule.' It includes a 'Create action group' button and a search bar. A table lists existing action groups, with one entry highlighted: 'Refactoring_Techniques_Slides [Protected View] - PowerPoint (Product Activation Failed)'. At the bottom of the modal are 'Review + create', 'Previous', 'Next: Details >', and 'Select' buttons.

The screenshot shows the Microsoft Azure portal interface. The main pane displays the 'Create action group' page under the 'Basics' tab. It includes sections for 'Project details' (Subscription: Azure for Students, Resource group: az104-rg1), 'Region' (Global), and 'Instance details' (Action group name: Alert the operations team, Display name: AlertOpsTeam). The display name field has a note: 'The display name is limited to 12 characters'. Navigation buttons at the bottom include 'Review + create', 'Previous', and 'Next: Notifications >'.

Create an alert rule

Scope Condition Actions **Details** Tags Review + create

Project details
Select the subscription and resource group in which to save the alert rule.

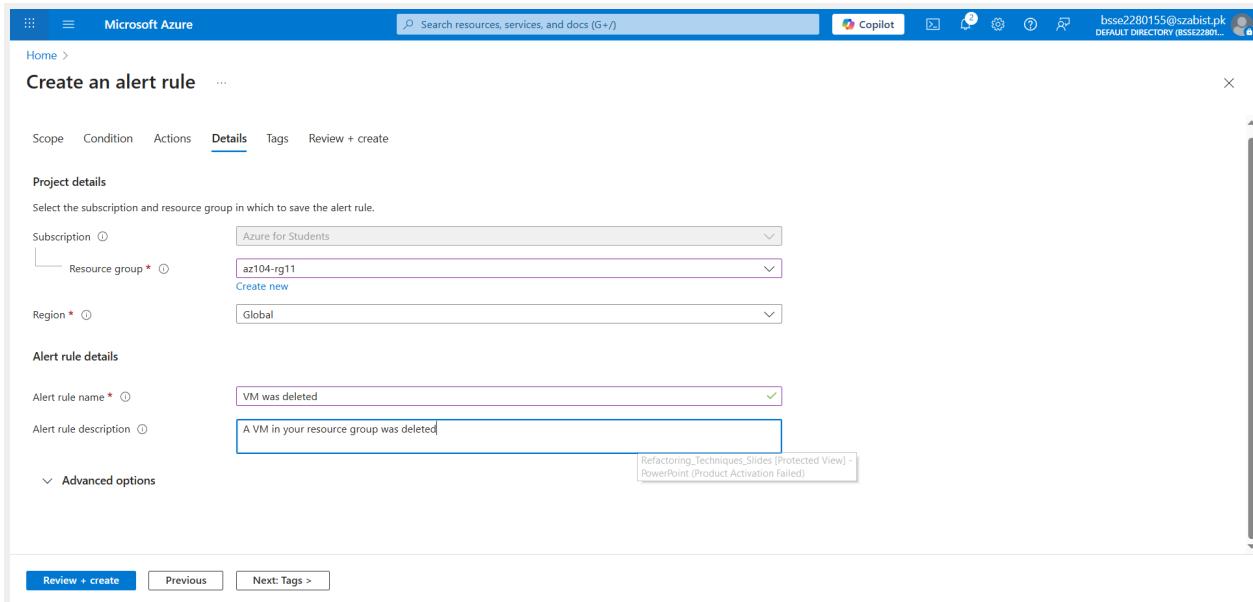
Subscription: Azure for Students
Resource group *: az104-rg11
Region: Global

Alert rule details

Alert rule name *: VM was deleted
Alert rule description: A VM in your resource group was deleted

Advanced options

Review + create Previous Next: Tags >



Alert rule created

Alert rule VM was deleted successfully created. It might take a few minutes for changes to be shown.

a few seconds ago

Task 4: Trigger an alert and confirm it is working

Delete az104-vm0

This action will permanently delete the virtual machine and is irreversible even if delete operation fails.

Resource to be deleted: az104-vm0 **Resource type**: Virtual machine

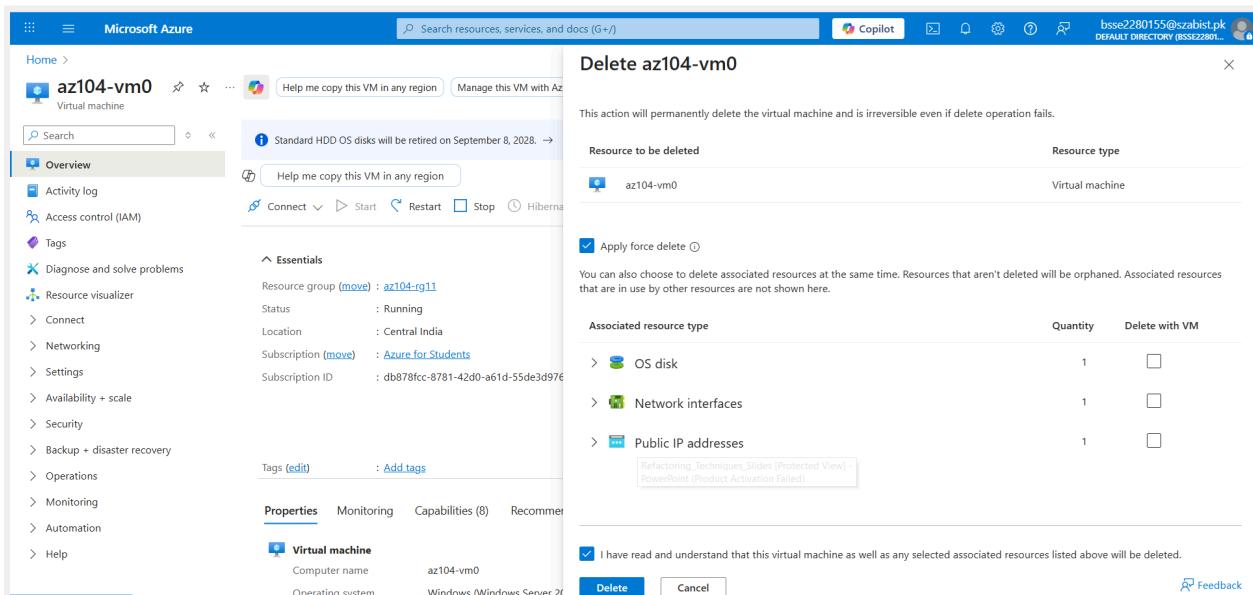
Apply force delete

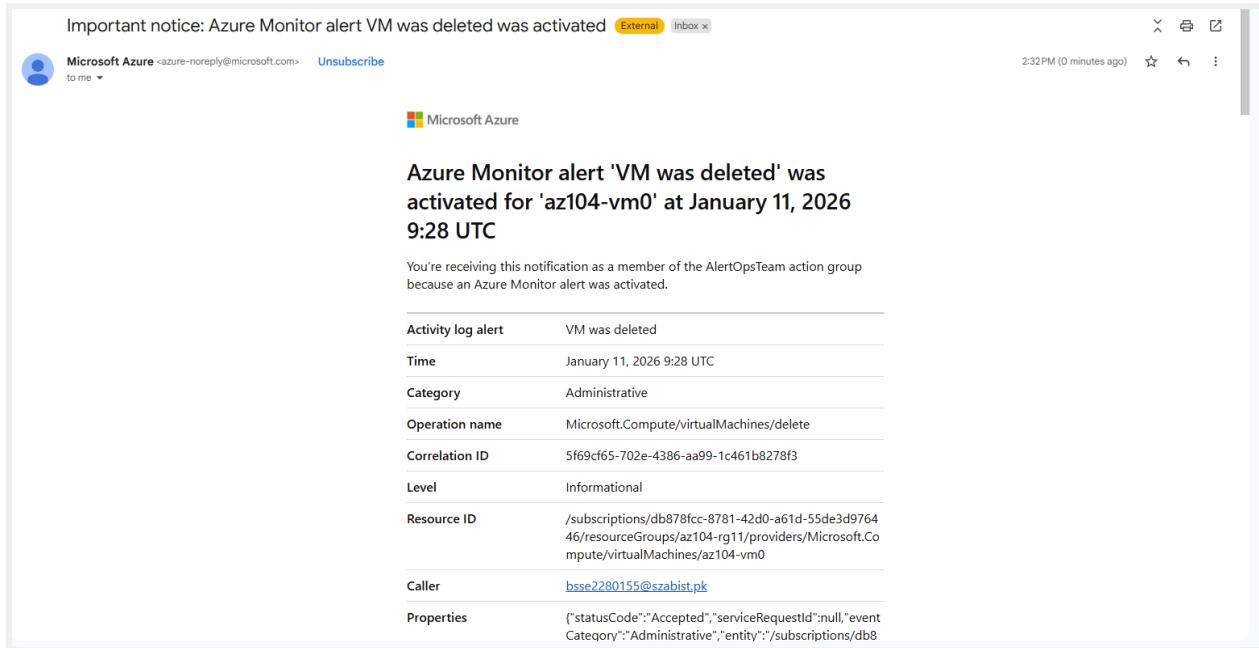
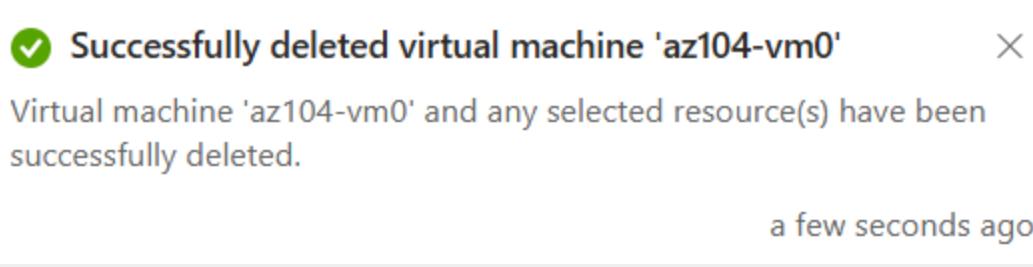
You can also choose to delete associated resources at the same time. Resources that aren't deleted will be orphaned. Associated resources that are in use by other resources are not shown here.

Associated resource type	Quantity	Delete with VM
OS disk	1	<input type="checkbox"/>
Network interfaces	1	<input type="checkbox"/>
Public IP addresses	1	<input type="checkbox"/>

I have read and understand that this virtual machine as well as any selected associated resources listed above will be deleted.

Delete **Cancel** **Feedback**





A screenshot of the Microsoft Azure Monitor Alerts interface. On the left, there's a sidebar with links like Home, Monitor, Overview, Activity log, and Alerts (which is currently selected). The main area shows a summary of alerts: Total alerts (3), Critical (0), Error (0), and Warning (0). A table lists three alerts, all of which are "VM was deleted" and have a severity of "4 - Verbose".
On the right, a detailed view of one of these alerts is shown. The title is "VM was deleted". The "General details" section includes:

- Severity: 4 - Verbose
- Fired time: 1/11/2026, 2:32 PM
- Affected resource: az104-vm0
- Monitor service: ActivityLog Administrative
- Alert condition: Fired (highlighted)
- User response: New (button)

The alert status is "Investigate (review)" with a blue water drop icon.

The "Why did this alert fire?" section contains the event details:

- The following event occurred: Microsoft.Compute/virtualMachines/delete
- Event level: Informational
- Category: Administrative
- Initiated by: bsse2280155@szabist.pk

Task 5: Configure an alert processing rule

The screenshot shows the Microsoft Azure portal interface for creating an alert processing rule. The top navigation bar includes 'Copilot', a search bar, and user information. The main title is 'Create an alert processing rule'. The left sidebar has tabs: Scope, Rule settings, Scheduling, Details, Tags, and Review + create. The 'Scope' tab is selected. A note below says: 'Use alert processing rules to decide what happens when an alert is triggered, like suppressing notifications or applying actions.' Below this is a 'Scope' section with a 'Select scope' button. To the right is a 'Select a scope' modal window. The modal has a 'Browse' tab, a 'Resource types' dropdown set to 'All resource types', and a search bar. It lists resources under 'Scope': 'Azure for Students' (Subscription), followed by several Resource groups: 'az104-rg11', 'DefaultResourceGroup-CID', 'DefaultResourceGroup-CIN', 'DefaultResourceGroup-EA', 'DefaultResourceGroup-EUS', 'MA_defaultazuremonitorworkspace-cid_centralindia...', and 'NetworkWatcherRG'. At the bottom of the modal, it shows 'Selected scopes 1 scope: Azure for Students' and buttons for 'Apply', 'Cancel', and 'Clear all selections'.

The screenshot shows the Microsoft Azure portal interface for creating an alert processing rule. The top navigation bar includes 'Copilot', a search bar, and user information. The main title is 'Create an alert processing rule'. The left sidebar has tabs: Scope, Rule settings, Scheduling, Details, Tags, and Review + create. The 'Rule settings' tab is selected. A 'Rule type *' section contains two options: 'Suppress notifications' (selected) and 'Apply action group'. Below each option is a brief description. A note at the bottom right indicates a file named 'Refactoring_Techniques_Slides [Protected View].PowerPoint (Product Activation Failed)' is attached. At the bottom of the page, there are 'Review + create', 'Previous', and 'Next: Scheduling >' buttons.

Microsoft Azure

Search resources, services, and docs (G+/)

Copilot

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Home > Monitor | Alerts > Alert processing rules >

Create an alert processing rule

Scope Rule settings **Scheduling** Details Tags Review + create

Define when you'd like to apply this rule.

Apply the rule

Always
 At a specific time
 Recurring

Start 10:00 PM

End 7:00 AM

Time zone

Preview From 08/01/2026 at 10:00 pm to 09/01/2026 at 7:00 am (UTC+05:00 Islamabad, Karachi)

Review + create **Previous** **Next: Details >**

Microsoft Azure

Search resources, services, and docs (G+/)

Copilot

bsse2280155@szabist.pk

DEFAULT DIRECTORY (BSSE2280155@szabist.pk)

Home > Monitor | Alerts > Alert processing rules >

Create an alert processing rule

Scope Rule settings Scheduling **Details** Tags Review + create

Select the subscription and resource group in which to save the alert processing rule.

Project details

Subscription

Resource group *

Alert processing rule details

Rule name *

Description

Enable rule upon creation

Refactoring_Techniques_Slides [Protected View] -
PowerPoint (Product Activation Failed)

Review + create **Previous** **Next: Tags >**

Microsoft Azure

Search resources, services, and docs (G+/)

Copilot

bsse2280155@szabist.pk

DEFAULT DIRECTORY (BSSE2280155@szabist.pk)

Home > Monitor | Alerts >

Alert processing rules

+ Create Columns Refresh Open query | Delete Enable Disable

Search Subscription : **Azure for Students** Resource group : all Target scope : all Status : Enabled Rule type : all Add tag filter

Name ↑	Scope	Filter	Rule type ↑	Scheduling	Status ↑↓
<input type="checkbox"/> Planned Maintenance	Azure for Students		Suppression	At a specific time	<input checked="" type="checkbox"/> Enabled

Task 6: Use Azure Monitor log queries

The screenshot shows two separate instances of the Microsoft Azure Monitor Logs interface.

Top Instance:

- Left Sidebar:** Home > Monitor, with the Logs icon selected.
- Top Bar:** Microsoft Azure, Search resources, services, and docs (G+), Copilot, Save, Share, Queries hub.
- Central Area:** A chart titled "User Query" showing the count of logs for the computer "az104-vm0". The query is displayed as: `Computer | count_ > az104-vm0 22`.

Bottom Instance:

- Left Sidebar:** Home > Monitor, with the Logs icon selected.
- Top Bar:** Microsoft Azure, Search resources, services, and docs (G+), Copilot, Save, Share, Queries hub.
- Central Area:** A chart titled "Run" showing the utilization percentage over time. The query is displayed as: `1 InsightsMetrics
2 where TimeGenerated > ago(1h)
3 where Name == "UtilizationPercentage"
4 summarize avg(Val) by bin(TimeGenerated, 5m), Computer //split up by computer
5 render timechart`. The chart shows a blue line representing the average utilization percentage for the computer "az104-vm0" from 9:05 AM to 9:25 AM.