

Introduction to Cloud Computing

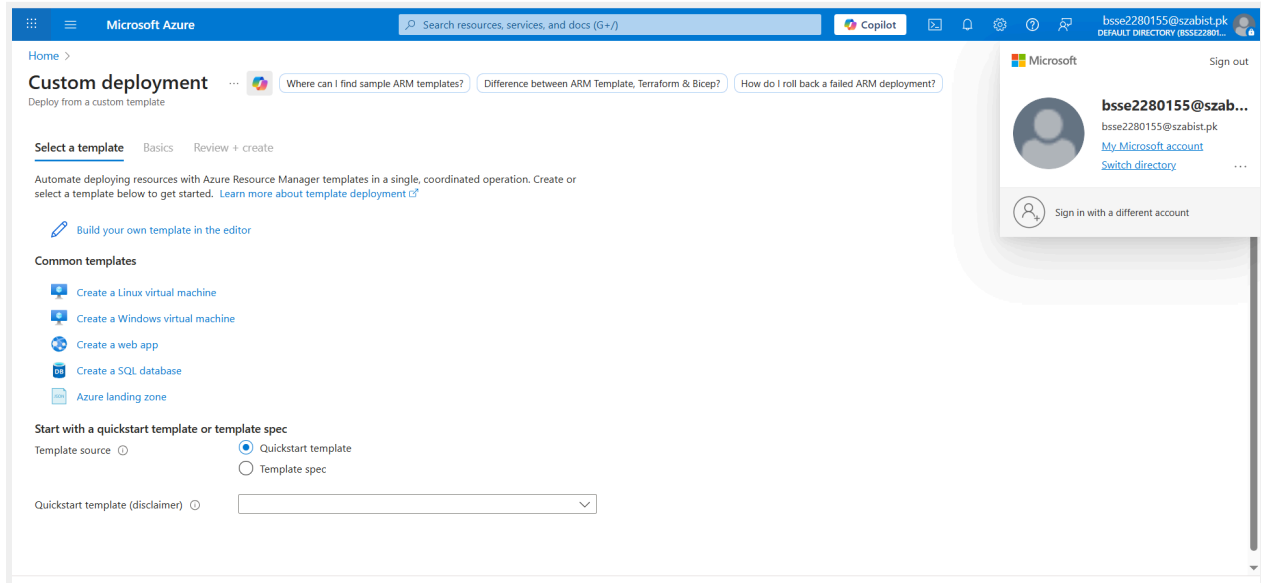
LAB 11

Name: Muhammad Yahya

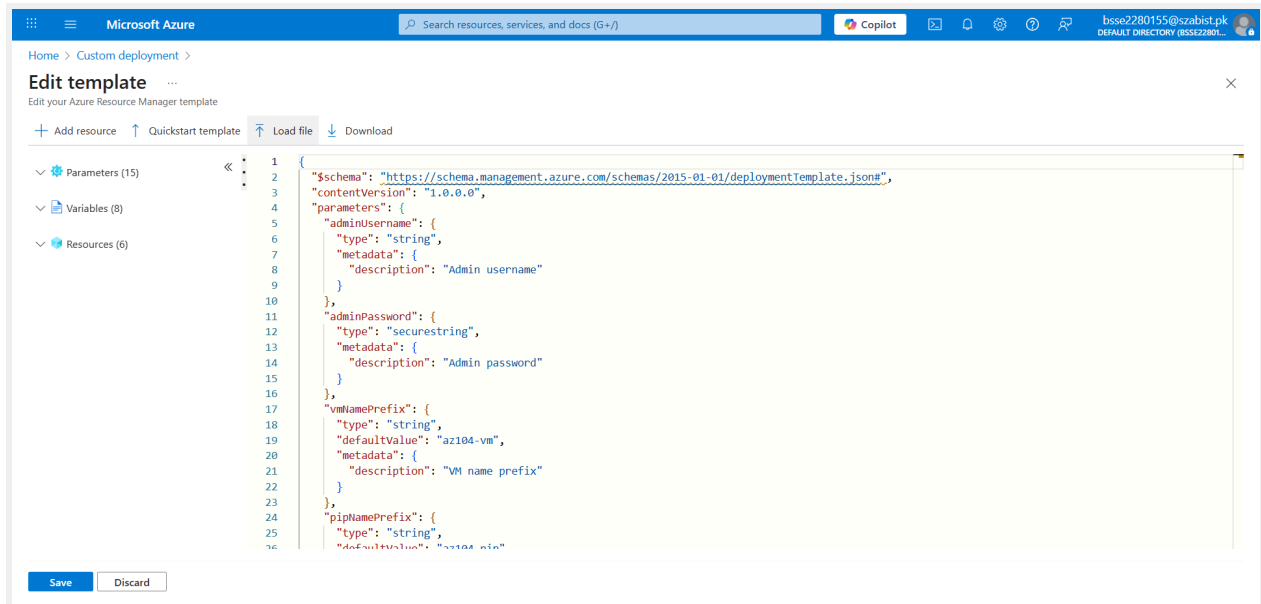
ID: 2280155

BS-SE 7B

Task 1: Use a template to provision an infrastructure



The screenshot shows the Microsoft Azure portal's 'Custom deployment' page. The page title is 'Custom deployment' with a subtitle 'Deploy from a custom template'. There are three tabs: 'Select a template', 'Basics', and 'Review + create'. The 'Select a template' tab is active. Below the tabs, there is a section 'Common templates' with links to 'Create a Linux virtual machine', 'Create a Windows virtual machine', 'Create a web app', 'Create a SQL database', and 'Azure landing zone'. Below this is a section 'Start with a quickstart template or template spec' with two radio buttons: 'Quickstart template' (selected) and 'Template spec'. There is also a 'Quickstart template (disclaimer)' dropdown menu. On the right side, there is a user profile card for 'bsse2280155@szabist.pk' with a 'Sign out' button and a 'Sign in with a different account' button.



The screenshot shows the Microsoft Azure portal's 'Edit template' page. The page title is 'Edit template' with a subtitle 'Edit your Azure Resource Manager template'. There are three tabs: 'Add resource', 'Quickstart template', and 'Load file'. The 'Load file' tab is active. Below the tabs, there is a list of resources: 'Parameters (15)', 'Variables (8)', and 'Resources (6)'. The main area shows a JSON template with the following content:

```
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"
```

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

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

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DEFAULT DIRECTORY (BSSE22801...

Home > Microsoft.Template-20260111133433 | Overview

Deployment

Search

Delete Cancel Redeploy Download Refresh

Overview

Inputs

Outputs

Template

✓ 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 details

Next steps

Go to resource group

Give feedback

Tell us about your experience with deployment

Deployment succeeded

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

Pin to dashbo... Go to resource gr...

Cost management

Get notified to stay within your budget and prevent unexpected charges on your bill.
Set up cost alerts >

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Secure your apps and infrastructure
Go to Microsoft Defender for Cloud >

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Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.
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Add no reserved branches for repository C++1 + C++2 + C++3

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Home > 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

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-nsg01	Network security group	Central India
az104-pip0	Public IP address	Central India
az104-vm0	Virtual machine	Central India
az104-vm0_disk1_76d6e77f10a040e5a2746911dda848db	Disk	Central India
az104-vnet	Virtual network	Central India
az10411s7m3kgf6b6y4m	Storage account	Central India

Showing 1 - 7 of 7. Display count: auto

Give feedback

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

The screenshot shows the Microsoft Azure Monitor Overview page. The top navigation bar includes the Microsoft Azure logo, a search bar, and the Copilot icon. The left sidebar contains a list of navigation options: Overview (selected), Activity log, Alerts, Issues (preview), Metrics, Logs, Change Analysis, Service health, Workbooks, Dashboards with Grafana, Insights, Managed Services, Settings, and Support + Troubleshooting. The main content area is titled 'Monitor | Overview' and features a search bar, a 'Summarize these Monitor services in a table' button, a 'Catch me up on my alerts' button, and a 'Run an anomaly investigation into my resource' button. Below this, there is a notification about Log Analytics agents. The 'Insights' section displays four tiles: Application insights, Container Insights, VM Insights, and Network Insights. The 'Detection, triage, and diagnosis' section displays four tiles: Metrics, Alerts, Logs, and Workbooks. At the bottom, there are tiles for Dashboards with Grafana (preview), Change Analysis, Diagnostic Settings, and Azure Monitor SCOM managed instances.

The screenshot shows the Microsoft Azure Monitor Virtual Machines page. The top navigation bar is the same as the previous screenshot. The left sidebar is also the same, but the 'Virtual Machines' option is selected. The main content area is titled 'Monitor | Virtual Machines' and features a search bar, a 'Refresh' button, and a 'Provide Feedback' button. Below this, there are tabs for 'Get started', 'Overview' (selected), 'Performance', and 'Map'. A filter bar shows 'Filter by name...', 'Subscription: Azure for Students', 'Resource group: All resource groups', 'Type: All types', and 'Location: All locations'. A 'Group by' dropdown is set to 'Subscription, Resource group'. A notification about OpenTelemetry metrics is displayed. Below this, there is a table with columns 'Name', 'Monitor Coverage', and 'Workspace'. The table lists three items: 'Azure for Students' (1 of 1), 'az104-rg11' (1 of 1), and 'az104-vm0' (Not enabled). The 'az104-vm0' item has an 'Enable' button next to it. A tooltip for 'az104-vm0' shows a list of items: 'Refactoring_Techniques_Slides (Protected View)', 'PowerPoint (Product Activation Failed)', and 'PowerPoint (Product Activation Failed)'.

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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

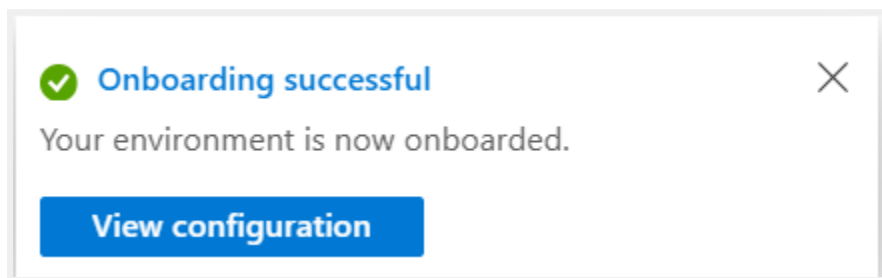
Log Analytics workspace: defaultworkspace-db878fcc-8781-42d0-a61d-55de3d976446-cin

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

Next

Review + enable

Give Feedback



Task 2: Create an alert

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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.

Scope level

Subscription

+ Select scope

Resource

Hierarchy

No resource selected yet

Review + create

Previous

Next: Condition >

Select a resource

×

Browse

Recent

Resource types

Locations

All resource types

All locations

Search to filter items...

Resource

Resource type

Location

☒ Azure for Students

Subscription

-

☐ az104-rg11

Resource group

-

☐ DefaultResourceGroup-CID

Resource group

-

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

Refine scope

Resource type

Location

Select a resource type

Select a location

Selected resources 1 scope

Azure for Students

Subscription

-

Apply

Cancel

Clear all selections

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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](#)

Review + create

Previous

Next: Actions >

Select a signal

Signal type: AllSignal source: All

Signal name	Signal source
Activity log	
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 (Fle...	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
Delete virtual machine pools. (Virtual Machine Pools)	Administrative
Delete Virtual Machine run command (Virtual Machine RunCommands)	Administrative

Apply

Cancel

activityLogHistoryBarSeries

View events in Azure Monitor - Activity Log

Alert logic

Event Level ⓘ

All selected

Status ⓘ

All selected

Event initiated by ⓘ

* (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

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DEFAULT DIRECTORY (BSSE22801...

Home >

Create an alert rule ...

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

An action group is a set of actions that can be applied to an alert rule. [Learn more](#)

Select actions

☐ Use quick actions (preview)
Select one or more of the quick actions.

☒ Use action groups
Add an existing action group or create a new one.

☐ None

Action groups

Action group name

Contains a

No action group selected yet

Select action groups

Review + create Previous Next: Details >

Select action groups

Select up to five action groups to attach to this rule.

+ Create action group

Subscription

Azure for Students

Search

Action group name

Resource group

Contains actions

Location

No results to display

Select

Microsoft Azure

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

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DEFAULT DIRECTORY (BSSE22801...

Home > Create an alert rule >

Create action group ...

Basics Notifications Actions Tags Review + create

An action group invokes a defined set of notifications and actions when an alert is triggered. [Learn more](#)

Project details

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription

Azure for Students

Resource group *

az104-rg11

Create new

Region *

Global

Instance details

Action group name *

Alert the operations team

Display name *

AlertOpsTeam

The display name is limited to 12 characters

Review + create Previous Next: Notifications >

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DEFAULT DIRECTORY (BSSE22801...

Home >

Create an alert rule

ScopeConditionActionsDetailsTagsReview + create

Project details

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

Subscription ⓘAzure for Students

Resource group * ⓘaz104-rg11
Create new

Region * ⓘGlobal

Alert rule details

Alert rule name * ⓘVM was deleted

Alert rule description ⓘA VM in your resource group was deleted

Advanced options

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

Review + createPreviousNext: 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

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Home >

az104-vm0

Virtual machine

Help me copy this VM in any region

Manage this VM with Az

Standard HDD OS disks will be retired on September 8, 2028. →

Help me copy this VM in any region

ConnectStartRestartStopHibernate

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Resource visualizer

Connect

Networking

Settings

Availability + scale

Security

Backup + disaster recovery

Operations

Monitoring

Automation

Help

Essentials

Resource group (move): az104-rg11

Status: Running

Location: Central India

Subscription (move): Azure for Students

Subscription ID: db878fcc-8781-42d0-a61d-55de3d976

Tags (edit): Add tags

PropertiesMonitoringCapabilities (8)Recommendations

Virtual machine

Computer name: az104-vm0

Operating system: Windows (Windows Server 2019)

Delete az104-vm0

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

Resource to be deletedResource type

az104-vm0Virtual 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 typeQuantityDelete with VM

OS disk1

Network interfaces1

Public IP addresses1

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

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

DeleteCancel


Feedback

✓ Successfully deleted virtual machine 'az104-vm0' ✕

Virtual machine 'az104-vm0' and any selected resource(s) have been successfully deleted.

a few seconds ago

Important notice: Azure Monitor alert VM was deleted was activated External Inbox x

 Microsoft Azure <azure-noreply@microsoft.com> [Unsubscribe](#)
to me ▾

2:32 PM (0 minutes ago) ☆ ↶ ⋮

 Microsoft Azure

Azure Monitor alert 'VM was deleted' was activated for 'az104-vm0' at January 11, 2026 9:28 UTC

You're receiving this notification as a member of the AlertOpsTeam action group because an Azure Monitor alert was activated.

Activity log alert	VM was deleted
Time	January 11, 2026 9:28 UTC
Category	Administrative
Operation name	Microsoft.Compute/virtualMachines/delete
Correlation ID	5f69cf65-702e-4386-aa99-1c461b8278f3
Level	Informational
Resource ID	/subscriptions/db878fcc-8781-42d0-a61d-55de3d976446/resourceGroups/az104-rg11/providers/Microsoft.Compute/virtualMachines/az104-vm0
Caller	bsse2280155@szabist.pk
Properties	<code>{"statusCode":"Accepted","serviceRequestId":null,"eventCategory":"Administrative","entity":"/subscriptions/db8</code>

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DEFAULT DIRECTORY (BSSE2280155@SZABIST.PK)

Home > Monitor

Monitor | Alerts

Which alerts require my immediate attention Help me set

Search View as timeline (preview) + Create Alert rule

Overview Activity log

Alerts

Issues (preview) Metrics Logs Change Analysis Service health Workbooks Dashboards with Grafana Insights Managed Services Settings Support + Troubleshooting

Total alerts 3 Critical 0 Error 0 Warning 0

Subscription: db878fcc-8781-42d0-a61d-55de3d976446

Name ↑↓	Severity ↑↓
<input type="checkbox"/> VM was deleted	4 - Verbose
<input type="checkbox"/> VM was deleted	4 - Verbose
<input type="checkbox"/> VM was deleted	4 - Verbose

VM was deleted

Activity log alert details

Copy link Go to alert rule Investigate (preview)

Summary History

General details

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

The target resource az104-vm0 has been moved or deleted.

Why did this alert fire?

The following event occurred: Microsoft.Compute/virtualMachines/delete

Event level	Category	Initiated by
Informational	Administrative	bsse2280155@szabist.pk

Additional details

Showing 1 - 3 of 3 results.

Task 5: Configure an alert processing rule

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DEFAULT DIRECTORY (BSS622801...

Home > Monitor | Alerts > Alert processing rules >

Create an alert processing rule ...

Scope

Rule settings

Scheduling

Details

Tags

Review + create

Use alert processing rules to decide what happens when an alert is triggered, like suppressing notifications or applying an action group.

[Learn more](#)

Scope

This rule will apply to alerts that are triggered on the resources you select.

+ Select scope

Resource

Hierarchy

No resource selected yet

Filter

Filters

Operator

Value

Review + create

Previous

Next: Rule settings >

Select a scope

Browse

Resource types

All resource types

Search to filter items...

Scope	Resource type	Location
<input checked="" type="checkbox"/> Azure for Students	Subscription	-
<input type="checkbox"/> az104-rg11	Resource group	-
<input type="checkbox"/> DefaultResourceGroup-CID	Resource group	-
<input type="checkbox"/> DefaultResourceGroup-CIN	Resource group	-
<input type="checkbox"/> DefaultResourceGroup-EA	Resource group	-
<input type="checkbox"/> DefaultResourceGroup-EUS	Resource group	-
<input type="checkbox"/> MA_defaultazuremonitorworkspace-cid_centralindi...	Resource group	-
<input type="checkbox"/> NetworkWatcherRG	Resource group	-

Selected scopes

1 scope

> Azure for Students

Subscription

-

Clear all selections

Apply

Cancel

Microsoft Azure

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

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bss62280155@szabist.pk
DEFAULT DIRECTORY (BSS622801...

Home > Monitor | Alerts > Alert processing rules >

Create an alert processing rule ...

Scope

Rule settings

Scheduling

Details

Tags

Review + create

Rule type *

☒ Suppress notifications
The alert will still fire, but the action groups won't be invoked so you won't receive any notifications when it fires.

☐ Apply action group
An action group invokes a defined set of notifications and actions when an alert is triggered.

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

Review + create

Previous

Next: Scheduling >

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

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DEFAULT DIRECTORY (BSSE22801...

Home > Monitor | Alerts > Alert processing rules >

Create an alert processing rule ...

ScopeRule settingsSchedulingDetailsTagsReview + create

Define when you'd like to apply this rule.

Apply the rule

☐ Always

☒ At a specific time

☐ Recurring

Start01/08/202610:00 PM

End01/09/20267:00 AM

Time zone(UTC+05:00) Islamabad, Karachi

PreviewFrom 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 >

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DEFAULT DIRECTORY (BSSE22801...

Home > Monitor | Alerts > Alert processing rules >

Create an alert processing rule ...

ScopeRule settingsSchedulingDetailsTagsReview + create

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

Project details

Subscription

Azure for Students

Resource group

az104-rg11

Create new

Alert processing rule details

Rule name

Planned Maintenance

Description

Suppress notifications during planned maintenance

Enable rule upon creation

☒

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

Review + create

Previous

Next: Tags >

Microsoft Azure

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DEFAULT DIRECTORY (BSSE22801...

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 the Microsoft Azure Monitor Logs interface. The left sidebar contains navigation options: Overview, Activity log, Alerts, Issues (preview), Metrics, Logs (selected), and Change Analysis. The main area displays a query titled "New Query 1*". The query is a simple table query with the following structure:

Computer	count
az104-vm0	22

The interface includes a search bar, a "Time range" dropdown set to "Set in query", and a "Show: 1000 results" button. The "Results" tab is active, showing the table data.

The screenshot shows the Microsoft Azure Monitor Logs interface with a KQL query and its corresponding time-series chart. The query is as follows:

```
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 displays the average utilization percentage over time for the computer "az104-vm0". The x-axis represents "TimeGenerated [UTC]" from 9:05 AM to 9:25 AM. The y-axis represents "Avg(Val)" from 0.125 to 0.2. The chart shows a blue line with data points at 5-minute intervals.

TimeGenerated [UTC]	Avg(Val)
9:05 AM	0.185
9:10 AM	0.145
9:15 AM	0.175
9:20 AM	0.170
9:25 AM	0.145

The interface includes a search bar, a "Time range" dropdown set to "Set in query", and a "Show: 1000 results" button. The "Chart" tab is active, showing the time-series plot. The query is displayed in the "KQL mode" editor.