

Lab 11

CST8912\_011

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Submitted to :

Prof. Tanishq Bansal

## **Lab Report Format**

### **Title**

Azure Cloud Monitoring and Metrics Lab

### **Introduction or Purpose**

Cloud Monitoring helps manage and track resources in a cloud environment by collecting metrics, events, and metadata. It automatically detects resources and offers visualization tools. In this lab, you'll install the Cloud Monitoring agent, create an uptime check, set up an alert policy, and visualize CPU metrics for a Compute Engine instance.

### **Steps covered in the lab**

- Create an uptime check for your resources (storage account and virtual machine) in Canada Central region.
- Define an alert policy for specific events.
- Create a chart to show CPU metrics for your instance on the Cloud Monitoring dashboard.
- Use log queries to interact with data.
- Create an Azure Data Factory in Canada Central region.
- Create an Azure Log Analytics workspace in the same region.
- Configure Diagnostic settings for Azure Data Factory.
- Create and review a Log Solution for Azure Data Factory.
- Set up Monitor Alerts for Azure Data Factory.
- Delete all resources after the demo.

### **Results**

Create Resources in Canada Central

Microsoft Azure

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

Copilot

degu0055@algonquinli...  
ALGONQUIN COLLEGE (ALGONQ...

Home >

lab11  
Resource group

Search

CreateManage viewDelete resource groupRefreshExport to CSVOpen queryAssign tagsMoveDeleteExport templateOpen in mobile

Overview

Activity logAccess control (IAM)TagsResource visualizerEventsSettingsDeploymentsSecurityDeployment stacksPoliciesPropertiesLocksCost ManagementMonitoringAutomationExport templateHelpSupport + Troubleshooting

Essentials

Subscription (move) : Azure for StudentsDeployments : No deployments  
Subscription ID : cdb9bdf3-e7ee-43e9-8f6c-ba7327868df1Location : Canada Central  
Tags (edit) : Add tags

ResourcesRecommendations

Filter for any field...Type equals allLocation equals allAdd filter

Showing 0 to 0 of 0 records. Show hidden types

No groupingList view

No resources match your filters  
Try changing or clearing your filters.  
Create resourcesClear filters  
Learn more

Give feedback

Microsoft Azure

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

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ALGONQUIN COLLEGE (ALGONQ...

Home > salab11march082025\_1741486908825 | Overview >

salab11march082025  
Storage account

Search

UploadOpen in ExplorerDeleteMoveRefreshOpen in mobileCLI / PSCU / PSFeedback

Overview

Activity logTagsDiagnose and solve problemsAccess Control (IAM)Data migrationEventsStorage browserStorage MoverPartner solutionsResource visualizerData storageContainersFile sharesQueuesTablesSecurity + networkingNetworkingFront Door and CDNAccess keysShared access signatureEncryptionMicrosoft Defender for Cloud

Essentials

Resource group (move) : lab11Performance : Standard  
Location : canadacentralReplication : Read-access geo-redundant storage (RA-GRS)  
Primary/Secondary Location : Primary: Canada Central, Secondary: Canada EastAccount kind : StorageV2 (general purpose v2)  
Subscription (move) : Azure for StudentsProvisioning state : Succeeded  
Subscription ID : cdb9bdf3-e7ee-43e9-8f6c-ba7327868df1Created : 3/8/2025, 9:21:54 PM  
Disk state : Primary: Available, Secondary: Available  
Tags (edit) : Add tags

PropertiesMonitoringCapabilities (7)Recommendations (0)TutorialsTools + SDKs

Blob service

Hierarchical namespace : Disabled  
Default access tier : Hot  
Blob anonymous access : Disabled  
Blob soft delete : Enabled (7 days)  
Container soft delete : Enabled (7 days)  
Versioning : Disabled  
Change feed : Disabled  
NFS v3 : Disabled  
Allow cross-tenant replication : Disabled  
Storage tasks assignments : None

File service

Large file share : Enabled  
Identity-based access : Not configured  
Default share-level permissions : Disabled

Security

Require secure transfer for REST API operations : Enabled  
Storage account key access : Enabled  
Minimum TLS version : Version 1.2  
Infrastructure encryption : Disabled

Networking

Allow access from : All networks  
Private endpoint connections : 0  
Network routing : Microsoft network routing  
Access for trusted Microsoft services : Yes  
Endpoint type : Standard

Microsoft Azure

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

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ALGONQUIN COLLEGE (ALGONQ...

Home > CreateVm-canonical.ubuntu-24.04-its-server-20250308212407 | Overview >

lab11VM  
Virtual machine

Search

Help me copy this VM in any region

Overview

- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Resource visualizer
- Connect
- Networking
- Settings
- Availability + scale
- Security
- Backup + disaster recovery
- Operations
- Monitoring
  - Insights
  - Alerts
  - Metrics
  - Diagnostic settings
  - Logs
  - Workbooks
- Automation
  - Tasks
  - Export template

Connect Start Restart Stop Hibernate Capture Delete Refresh Open in mobile Feedback CLI / PS

Essentials

Resource group (move) : lab11

Status : Running

Location : Canada Central (Zone 1)

Subscription (move) : Azure for Students

Subscription ID : cdb9bdf3-e7ee-43e9-8f6c-ba7327868df1

Availability zone : 1

Operating system : Linux (ubuntu 24.04)

Size : Standard B1s (1 vcpu, 1 GiB memory)

Public IP address : 4.206.212.224

Virtual network/subnet : lab11VM-vnet/default

DNS name : Not configured

Health state : -

Time created : 3/9/2025, 2:25 AM UTC

Tags (edit) : Add tags

JSON View

Properties Monitoring Capabilities (7) Recommendations Tutorials

Virtual machine

Computer name	lab11VM
Operating system	Linux (ubuntu 24.04)
VM generation	V2
VM architecture	x64
Agent status	Ready
Agent version	2.12.0.2
Hibernation	Disabled
Host group	-
Host	-
Proximity placement group	-
Colocation status	N/A
Capacity reservation group	-

Networking

Public IP address	4.206.212.224 ( Network interface lab11vm392_x1 )
Public IP address (IPv6)	-
Private IP address	10.0.0.4
Private IP address (IPv6)	-
Virtual network/subnet	lab11VM-vnet/default
DNS name	Configure

Size

Size	Standard B1s
vCPUs	1
RAM	1 GiB

Create an Alert

Microsoft Azure

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Home > Monitor

Monitor | Alerts

View as timeline (preview) | Create | Alert rules | Action groups | Alert processing rules | Prometheus rule groups | Change user response | Actions | Refresh

Search

Alert rule | Action group | Alert rule | Alert processing rule

Time range: Past 24 hours | Alert condition: Fired | Severity: all | Add filter

Total alerts: 0 | Critical: 0 | Error: 0 | Warning: 0 | Informational: 0 | Verbose: 0

No grouping

Name | Severity | Affected resource | Alert condition | User response | Fire time

!

No alerts found

Try changing your search or choose a different scope level if you don't see what you're looking for.

Clear filters

Microsoft Azure

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

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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. [Learn more](#)

+ Select scope

Resource | Hierarchy

No resource selected yet

Review + create | Previous | Next: Condition >

Select a resource

Browse | Recent

Subscription | Resource types | Locations

All subscriptions | All resource types | All locations

Search to filter items...

Resource	Resource type	Location
> AVD-Prod	Subscription	-
> Azure for Students	Subscription	-

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

Refine scope

Resource type | Location

Virtual machines | Canada Central

Selected resources 1 scope

> Azure for Students | Subscription | -



Apply | Cancel | Clear all selections

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 \*  Chart CPU usage trends 

[See all signals](#)

Define the logic for triggering an alert. Use the chart to view trends in the data. [Learn more](#)

The query to run on this resource's logs. The results returned by this query are used to populate the alert definition below.

Search query \*

```
// To create an alert for this query, click '+ New alert rule'
Perf
| where CounterName == "% Processor Time"
| where ObjectName == "Processor"
| summarize avg(CounterValue) by bin(TimeGenerated, 15min), Computer, _ResourceId // bin is used to set the time grain to 15 minutes
| render timechart
// Perf table stores performance counters for Windows and Linux computers
// Counters are specified using ObjectName (performance object), InstanceName and CounterName
```

[View result and edit query in Logs](#)

### Measurement

Select how to summarize the results. We try to detect summarized data from the query results automatically.

Measure  avg\_CounterValue 

Aggregation type  Average 


Aggregation granularity  5 minutes 




### Split by dimensions

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

Home > Monitor | Alerts >

## Create an alert rule

Use dimensions to monitor specific time series and provide context to the fired alert. Dimensions can be either number or string columns. If you select more than one dimension value, each time series that results from the combination will trigger its own alert and will be charged separately. 

Dimension name	Operator	Dimension values	Include all future values
Select dimension 	= 	0 selected  <a href="#">Add custom value</a>	<input type="checkbox"/>

### Alert logic

Operator  Greater than 

Threshold value \*  80 


Frequency of evaluation \*  5 minutes 

 Estimated monthly cost **Variable (USD)**

### Advanced options

#### Preview

Select time series  Select time series 

Time range  Over the last 30 minutes 

80

60

40

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

Home > Monitor | Alerts >

## 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 actions
High CPU Alert Group	1 Email, 1 SMS message
<a href="#">Manage action groups</a>	

Review + create

Previous

Next: Details >

Text Message • SMS  
Today 9:46 PM

All done. You're in HighCPUALert group. Reply 'STOP' to stop all, 'Disable HighCPUALert' to stop grp, 'HELP' for info. Msg&amp;data rates apply.

Home > Monitor

## Monitor | Alerts

Search View as timeline (preview) + Create Alert rules Action groups Alert processing rules Prometheus rule groups Change user response Actions Refresh

Overview

Activity log

**Alerts**

Metrics

Logs

Change Analysis

Service health

Workbooks

Investigator (preview)

Insights

Applications

Virtual Machines

Storage accounts

Containers

Networks

Azure Cosmos DB

Key Vaults

Azure Cache for Redis

Azure Data Explorer

Clusters

Log Analytics

workspaces

Azure Local

Service Bus (preview)

Search

Subscription: 2 selected

Time range: Past 24 hours

Alert condition: Fired

Severity: all

Add filter

Total alerts Critical Error Warning Informational Verbose

0 0 0 0 0 0

No grouping

Name Severity Affected resource Alert condition User response Fire time



### No alerts found

Try changing your search or choose a different scope level if you don't see what you're looking for.

Clear filters

**Alert rule created**  
Successfully created alert rule High CPU Alert. It might take a few minutes for changes to be shown.

Microsoft Azure

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

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Home > Monitor | Alerts >

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 \* ⓘ

lab11

Create new

Region \*

Global

Instance details

Action group name \* ⓘ

Storage Alert

Display name \* ⓘ

StorageAlert

The display name is limited to 12 characters

Review + create

Previous

Next: Notifications >

Microsoft Azure

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

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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. [Learn more](#)

+ Select scope

Resource

Hierarchy

No resource selected yet

Select a resource

×

Browse

Recent

Subscription

All subscriptions

Resource types

All resource types

Locations

All locations

Search to filter items...

Resource

Resource type

Location

☐ > AVD-Prod

Subscription

-

☒ > Azure for Students

Subscription

-

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

Refine scope

Resource type

Storage accounts

Location

Canada Central

^ Selected resources 1 scope

✓ > Azure for Students

Subscription

-

lab11

Resource group

-

Apply

Cancel

Clear all selections

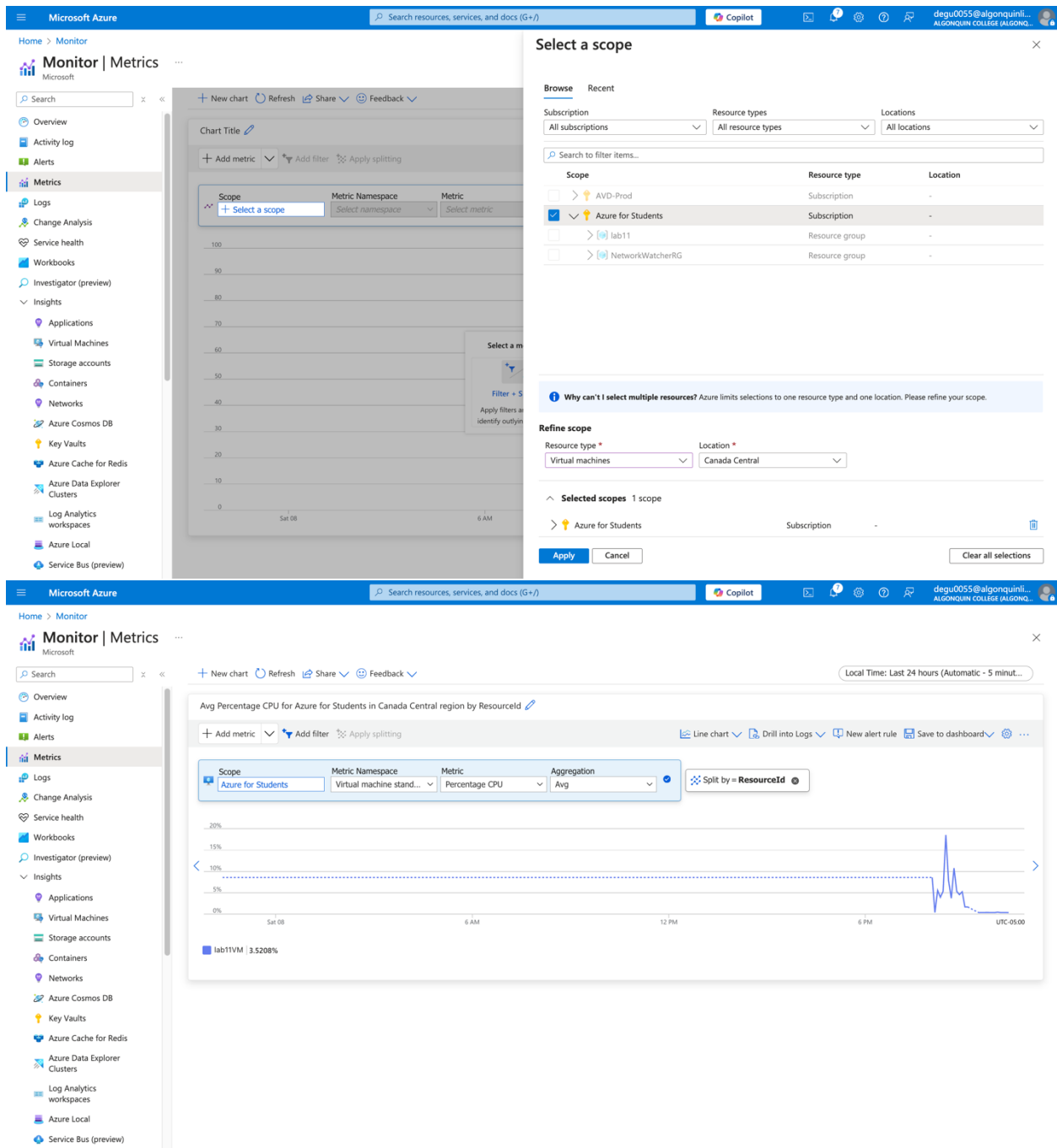
Review + create

Previous

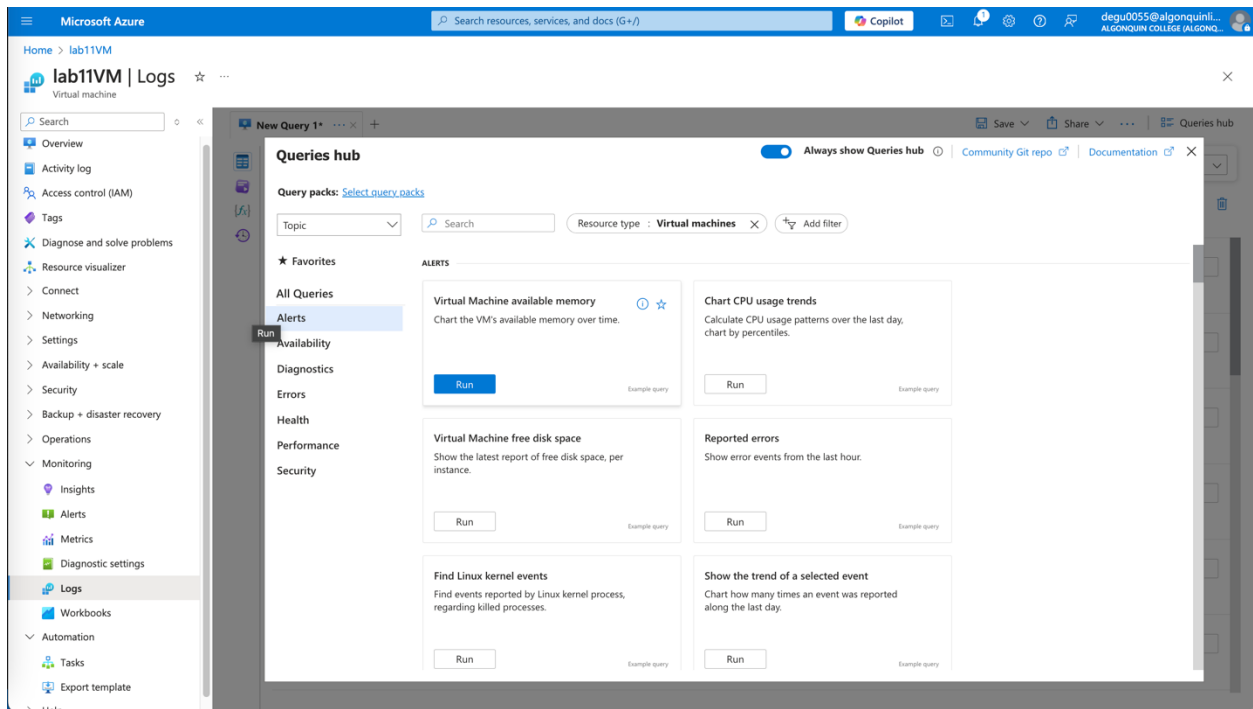
Next: Condition >

Create a Chart for CPU Metrics in Cloud Monitoring

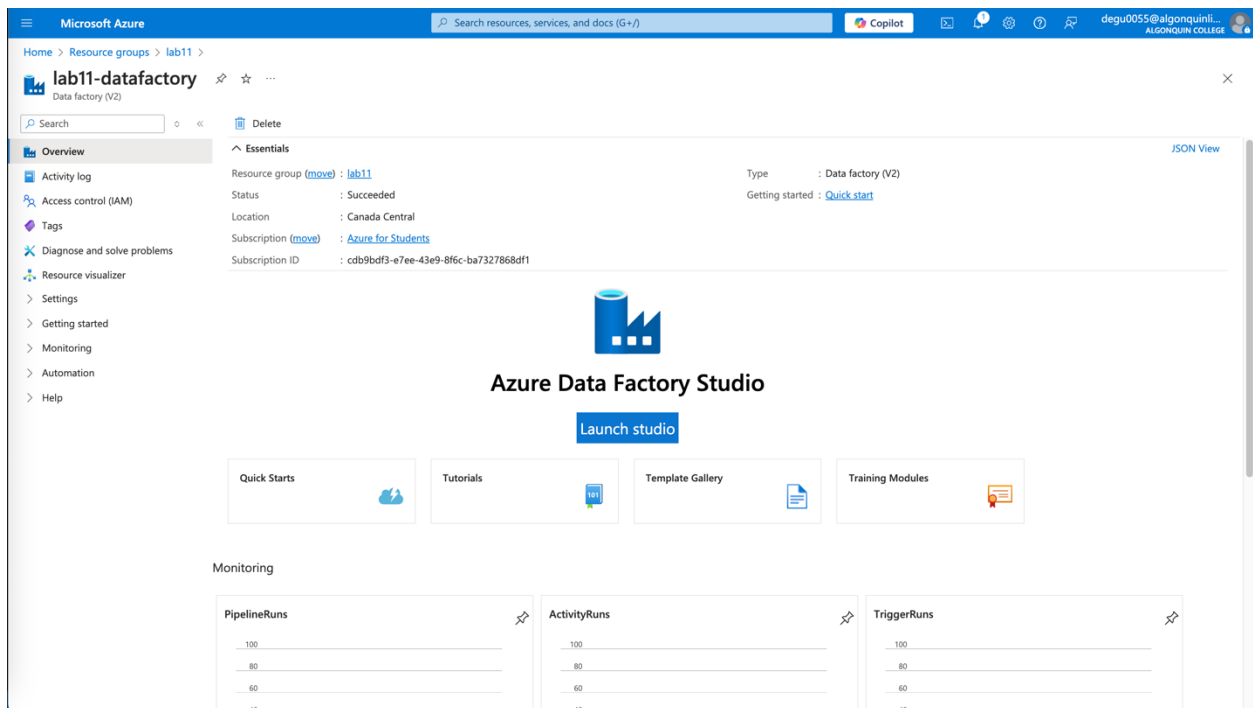




Use Log Queries to Interact with Data



Create azure data factory in Canada central region



Create Azure Log Analytics workspace in same region as other resources

The screenshot displays the Microsoft Azure portal interface for a Log Analytics workspace named 'loganalytics'. The left-hand navigation pane includes links to Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Logs, Resource visualizer, Settings, Classic, Monitoring, Automation, and Help. The main content area features a top navigation bar with a search bar and a 'Delete' button. Below this, a message states that Log Analytics agents (MMAOMS) will no longer be supported from August 31, 2024, and users are advised to migrate to the Azure Monitor Agent. The 'Essentials' section provides key details: Resource group (lab11), Status (Active), Location (Canada Central), Subscription (Azure for Students), Subscription ID (cdb9bdf3-e7ee-43e9-8f6c-ba7327868df1), Tags (Add tags), Workspace Name (loganalytics), Workspace ID (ffa06a80-cbb3-4a11-86c4-20585080d1a0), Pricing tier (Pay-as-you-go), Access control mode (Use resource or workspace permissions), and Operational issues (OK). The 'Get Started' section offers three steps: 1. Connect a data source, 2. Configure monitoring solutions, and 3. Monitor workspace health. A 'Useful links' section provides documentation and community resources. At the bottom, a 'Maximize your Log Analytics experience' section highlights features like Search and analyze logs, Manage alert rules, Manage usage and costs, and Create and Share Workbooks.

## Configure Diagnostic settings for Azure Data Factory

The screenshot shows the Microsoft Azure portal interface for the 'lab11-datafactory' resource. The left-hand navigation pane includes links to Activity log, Access control (IAM), Tags, Diagnose and solve problems, Resource visualizer, Settings, Networking, Managed identities, Properties, Locks, Getting started, Quick start, Monitoring, Alerts, Metrics, Diagnostic settings, Logs, Automation, CLI / PS, Tasks, Help, Resource health, and Support + Troubleshooting. The main content area features a top navigation bar with a search bar, a 'Refresh' button, and a 'Feedback' button. Below this, a message states that diagnostic settings are used to configure streaming export of platform logs and metrics for a resource to the destination of your choice. The 'Diagnostic settings' section displays a table with columns for Name, Storage account, Event hub, Log Analytics workspace, Partner solution, and Edit setting. The table currently shows 'No diagnostic settings defined' and a link to '+ Add diagnostic setting'. Below the table, a message states that clicking 'Add Diagnostic setting' will configure the collection of the following data:

- Pipeline activity runs log
- Pipeline runs log
- Trigger runs log
- Sandbox Pipeline runs log
- Sandbox Activity runs log
- SSIS package event messages
- SSIS package executable statistics
- SSIS package event message context
- SSIS package execution component phases
- SSIS package execution data statistics
- SSIS integration runtime logs
- Airflow task execution logs
- Airflow worker logs
- Airflow dag processing logs
- Airflow scheduler logs
- Airflow web logs
- AllMetrics

## Create and review a Log Solution for the Azure Data Factory

## Setup Monitor Alerts for Azure Data Factory

## Setup Monitor Alerts for Azure Data Factory

Microsoft Azure

Search resources, services, and docs (G+)

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ALGONQUIN COLLEGE

Home > Monitor

Monitor | Alerts

View as timeline (preview) | Create | Alert rules | Action groups | Alert processing rules | Prometheus rule groups | Change user response | Actions | Refresh

Search

Alert rule

Alert processing rule

Subscription: 2 selected | Time range: Past 24 hours | Alert condition: Fired | Severity: all | Add filter

Total alerts: 0 | Critical: 0 | Error: 0 | Warning: 0 | Informational: 0 | Verbose: 0

No grouping

Name ↑↓	Severity ↑↓	Affected resource ↑↓	Alert condition ↑↓	User response ↑↓	Fire time ↑↓
---------	-------------	----------------------	--------------------	------------------	--------------

!

No alerts found

Try changing your search or choose a different scope level if you don't see what you're looking for.

Clear filters

Overview

Activity log

Alerts

Metrics

Logs

Change Analysis

Service health

Workbooks

Investigator (preview)

Insights

Applications

Virtual Machines

Storage accounts

Containers

Networks

Azure Cosmos DB

Key Vaults

Azure Cache for Redis

Azure Data Explorer Clusters

Log Analytics workspaces

Azure Local

Service Bus (preview)

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

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ALGONQUIN COLLEGE

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](#)

+ Select scope

Resource	Hierarchy
No resource selected yet	

Review + create

Previous

Next: Condition >

Select a resource

Browse | Recent

Subscription: All subscriptions | Resource types: All resource types | Locations: All locations

Search to filter items...

Resource	Resource type	Location
<input type="checkbox"/> > AVD-Prod	Subscription	-
<input type="checkbox"/> > Azure for Students	Subscription	-
<input type="checkbox"/> > DefaultResourceGroup-EUS	Resource group	-
<input type="checkbox"/> > lab11	Resource group	-
<input type="checkbox"/> endpoint	Data collection endpoint	Canada Central
<input type="checkbox"/> High CPU Alert	Log alert rule	Canada Central
<input type="checkbox"/> High CPU Alert Group	Action group	Global
<input checked="" type="checkbox"/> lab11-datafactory	Data factory (V2)	Canada Central
<input type="checkbox"/> lab11VM	Virtual machine	Canada Central
<input type="checkbox"/> lab11VM-ip	Public IP address	Canada Central
<input type="checkbox"/> lab11VM-nsg	Network security group	Canada Central
<input type="checkbox"/> lab11VM-vnet	Virtual network	Canada Central
<input type="checkbox"/> lab11vm392_z1	Network interface	Canada Central
<input type="checkbox"/> lab11VM_disk1_650147f6ebd047b93bea730...	Disk	Canada Central
<input type="checkbox"/> lab11VM_key	SSH key	Canada Central

Selected resources 1 data factory (V2)

lab11-datafactory | Data factory (V2) | Canada Central

Apply

Cancel

Clear all selections

Microsoft Azure

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

Copilot

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ALGONQUIN COLLEGE

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 \* ⓘ

Airflow Integration Runtime Cpu Usage

See all signals

Alert logic

Threshold type ⓘ

Static

Dynamic

Aggregation type ⓘ

Average

Value is ⓘ

Greater than

Threshold \* ⓘ

80

Split by dimensions

Use dimensions to monitor specific time series and provide context to the fired alert. [About monitoring multiple time series](#)

Dimension name	Operator	Dimension values	Include all future values
Select dimension	=	0 selected	<input type="checkbox"/>
Add custom value			

When to evaluate

Check every ⓘ

1 minute

Lookback period ⓘ

5 minutes

Review + create

Previous

Next: Actions >

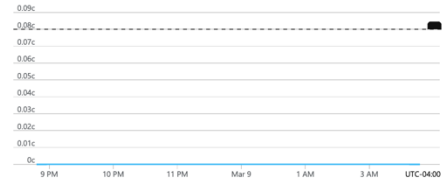
Preview

\$0.10 USD/month

Whenever the average Airflow Integration Runtime Cpu Usage is greater than 80

Preview time range : Over the last 6 hours

Time series : Aggregate



Airflow Integration Runtime Cpu Usage (Avg), lab11-datafactory |--

Microsoft Azure

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

Copilot

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ALGONQUIN COLLEGE

Home > Monitor | Alerts >

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 actions
High CPU Alert Group	1 Email, 1 SMS message

Manage action groups

Review + create

Previous

Next: Details >

Microsoft Azure

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

Copilot

degu0055@algonquinli... ALGONQUIN COLLEGE

Home > Monitor | Alerts >

### 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 \* lab11 [Create new](#)

**Alert rule details**

Severity \* 3 - Informational

Alert rule name \* Alert CPU usage

Alert rule description Alert CPU usage

Advanced options

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

After demo delete all the resources created in the lab

Microsoft Azure

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

Copilot

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Home > Resource groups >

### Resource groups

Algonquin College

+ Create Manage view

Filter for any field...

Name

- DefaultResourceGroup-EUS
- lab11
- NetworkWatcherRG

**lab11** Resource group

Overview

- Activity log
- Access control (IAM)
- Tags
- Resource visualizer
- Events
- Settings
  - Deployments
  - Security
  - Deployment stacks
  - Policies
  - Properties
  - Locks
- Cost Management
  - Cost analysis
  - Cost alerts (preview)
  - Budgets
- Advisor recommendations
- Monitoring
  - Insights (preview)
  - Alerts
  - Metrics
  - Diagnostic settings

Essentials

Subscription (move): Azure for Students Deployments: 7 Succeeded

Subscription ID: cdb9bdf3-e7ee-43e9-8f6c-ba7327868df1 Location: Canada Central

Tags (edit): Add tags

Resources Recommendations

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

Showing 1 to 23 of 23 records. Show hidden types

No grouping List view

Name	Type	Location
Alert CPU usage	Metric alert rule	Global
CPUPerformance	Action group	Global
endpoint	Data collection endpoint	Canada Central
High CPU Alert	Log search alert rule	Canada Central
High CPU Alert Group	Action group	Global
lab11-datafactory	Data factory (V2)	Canada Central
lab11VM	Virtual machine	Canada Central
lab11VM-ip	Public IP address	Canada Central
lab11VM-nsg	Network security group	Canada Central

< Previous Page 1 of 1 Next >

Give feedback

Deleting resource group lab11

Deleting resource group lab11