

Lab Report: CST8912 Graded Lab Activity #11

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Course: CST8912_011

Title

Monitoring and Alert Setup for Azure Cloud Resources

Introduction or Purpose

The purpose of this lab was to explore cloud monitoring and alerting capabilities in Microsoft Azure. The main objective was to create and configure resources in Azure, including a virtual machine, storage account, and Azure Data Factory, all in the Canada Central region. The lab focused on setting up monitoring tools such as uptime checks, alert policies, CPU metric charts, and log queries using Azure Monitor and Log Analytics. Additionally, diagnostic settings and alerts were configured for Azure Data Factory to ensure proper monitoring of its activities. This lab aimed to demonstrate the ability to manage and monitor cloud resources effectively, ensuring timely notifications for critical events like resource downtime or activity failures.

Steps Covered in the Lab

Step 1: Create Virtual Machine and Storage Account

- Logged into the Azure portal and created a resource group named "Lab11Group".
- Created a virtual machine named "Lab11VM" in the Canada Central region with the lowest memory option (B1s size) and a Windows Server 2019 image.
- Created a storage account named "lab11storage123" in the same region with standard performance and locally-redundant storage (LRS).

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

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Connect

Start

Restart

Stop

Hibernate

Capture

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Refresh

Open in mobile

Feedback

CLI / PS

Essentials

Resource group (move)
Lab11Group

Status
Running

Location
Canada Central (Zone 1)

Subscription (move)
Azure for Students

Subscription ID
913a8401-361d-4f42-8d7d-e2ff44f75da2

Availability zone
1

Tags (edit)
Add tags

Operating system
Windows (Windows Server 2019 Datacenter)

Size
Standard B1s (1 vcpu, 1 GiB memory)

Public IP address
4.172.206.236

Virtual network/subnet
Lab11VM-vnet/default

DNS name
Not configured

Health state
-

Time created
4/2/2025, 8:14 PM UTC

JSON View

Properties

Monitoring

Capabilities (8)

Recommendations

Tutorials

Virtual machine

Computer name
Lab11VM

Operating system
Windows (Windows Server 2019 Datacenter)

VM generation
V2

VM architecture
x64

Networking

Public IP address
4.172.206.236 (Network interface
lab11vm221_z1)

Public IP address (IPv6)
-

Private IP address
10.0.0.4

lab11storage123

Storage account

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Upload

Open in Explorer

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Access Control (IAM)

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Storage browser

Storage Mover

Partner solutions

Resource visualizer

Data storage

Containers

File shares

Queues

Tables

Security + networking

Data management

Settings

Monitoring

Essentials

Resource group (...)
Lab11Group

Location
canadacentral

Subscription (move)
Azure for Students

Subscription ID
913a8401-361d-4f42-8d7d-e2ff44f75da2

Disk state
Available

Performance
Standard

Replication
Locally-redundant storage (LRS)

Account kind
StorageV2 (general purpose v2)

Provisioning state
Succeeded

Created
2025/4/2 16:19:43

Tags (edit)
Add tags

JSON View

Properties

Monitoring

Capabilities (7)

Recommendations (0)

Tutorials

Tools + SDKs

Blob service

Hierarchical namespace
Disabled

Default access tier
Hot

Blob anonymous access
Disabled

Security


Require secure transfer for REST API operations
Enabled

Storage account key access
Enabled

Minimum TLS version
Version 1.2

Step 2: Create an Uptime Check

- Navigated to "Monitor" > "Alerts" in the Azure portal.
- Created a new alert rule for "Lab11VM", selecting the "Availability" condition with a threshold of 0 to detect downtime.
- Named the alert rule "VMUptimeCheck" and saved it.



VMUptimeCheck

Metric alert rule

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Resource group [\(move\)](#)

[Lab11Group](#)

Location [\(move\)](#)

Global

Subscription [\(move\)](#)

[Azure for Students](#)

Subscription ID

913a8401-361d-4f42-8d7d-e2ff44f75da2

Tags [\(edit\)](#)

[Add tags](#)

Severity

3 - Informational

Description

Alert when VM is down

JSON View

Scope

Resource

lab11vm

Hierarchy

Azure for Students > lab11group

Conditions

Name	Time series monitored ⓘ	Estimated monthly cost ⓘ
VmAvailabilityMetric < 0	1	\$0.10

VMUptimeCheck

Metric alert rule

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EditDisableDuplicateDeleteRefresh

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Global

Subscription (move)

Azure for Students

Subscription ID

913a8401-361d-4f42-8d7d-e2ff44f75da2

Tags (edit)

Add tags

Severity

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Description

Alert when VM is down

JSON View

Scope

Resource

lab11vm

Hierarchy

Azure for Students > lab11group

Conditions

Name	Time series monitored ⓘ	Estimated monthly cost ⓘ
VmAvailabilityMetric < 0	1	\$0.10

Step 3: Define an Alert Policy

- Created another alert rule for "Lab11VM" to monitor CPU usage.
- Selected the "Percentage CPU" signal, set the condition to "Greater than 80%", and named the alert "HighCPUAlert".
- Reused the "VMUptimeCheck" action group for notifications.

Home > Monitor | Alerts > Alert rules >

HighCPUALert

Metric alert rule

Search

Edit Disable Duplicate Delete Refresh

Overview

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- Access control (IAM)
- Tags
- Diagnose and solve problems
- History
- Resource visualizer
- Settings
- Alert rule configuration
- Automation
- Help

Essentials [JSON View](#)

Resource group (...): [Lab11Group](#)

Location ([move](#)): Global

Subscription ([move](#)): [Azure for Students](#)

Subscription ID: 913a8401-361d-4f42-8d7d-e2ff44f75da2

Severity: 3 - Informational

Description: -

Tags ([edit](#)): [Add tags](#)

Scope

Resource [lab11vm](#)

Hierarchy: Azure for ... > [lab11group](#)

Conditions

Name	Time series monitored	Estimated monthly cost
Percentage CP...	1	\$0.10

Alert rules

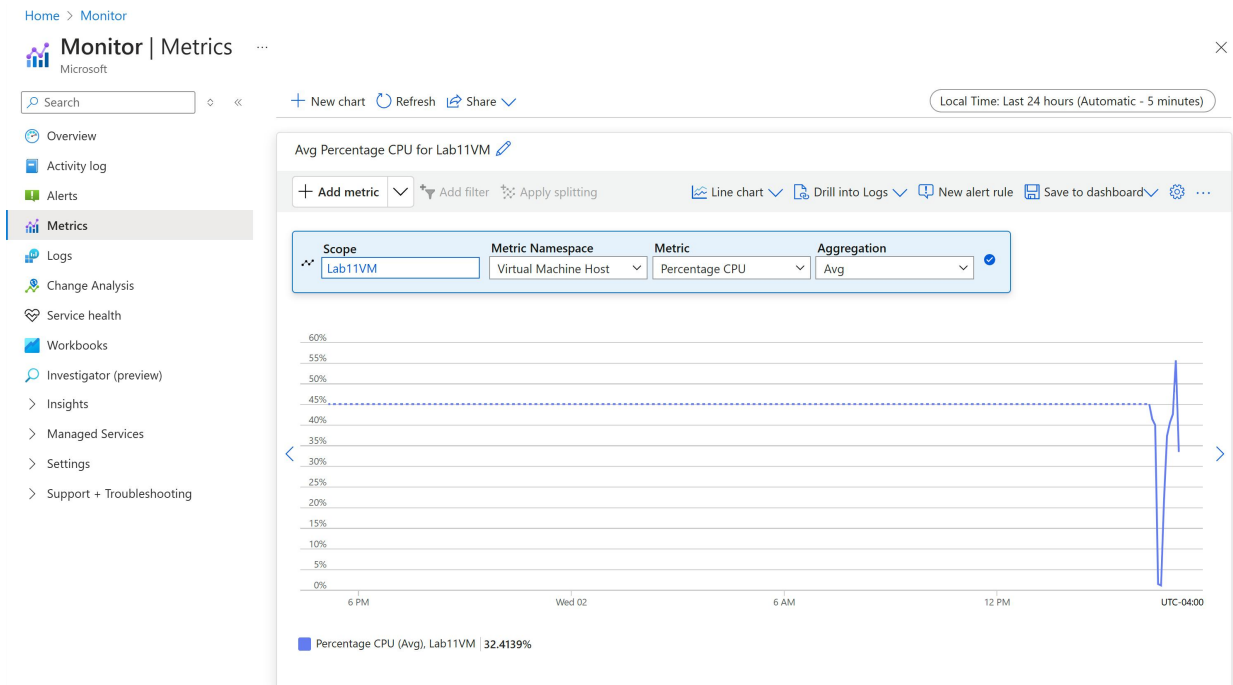
+ Create Columns Refresh Export to CSV Open query Delete Enable Disable

Search Subscription: 2 selected Target scope: all Target resource type: all Signal type: all Add tag filter More (2) No grouping

Name	Condition	Severity	Target scope	Target resource type	Signal type	Status
<input type="checkbox"/> HighCPUALert	Percentage CPU > 80	3 - Informational	Lab11VM	Virtual machine	Metrics	Enabled
<input type="checkbox"/> VMUptimeCheck	VmAvailabilityMetric < 0	3 - Informational	Lab11VM	Virtual machine	Metrics	Enabled

Step 4: Create a CPU Metrics Chart

- In "Monitor" > "Metrics", selected "Lab11VM" and added a chart for "Percentage CPU" with an average aggregation over the last 24 hours.



Step 5: Use Log Queries to Interact with Data

- In "Monitor" > "Logs", selected "Lab11VM" and ran the query: `Perf | where ObjectName == "Processor" and CounterName == "% Processor Time" | summarize avg(CounterValue) by bin(TimeGenerated, 1h)` to view CPU usage data.

Home > Monitor

Monitor | Logs

Microsoft

Search

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Investigator (preview)
Insights
Managed Services
Settings
Support + Troubleshooting

New Query 1 New Query 2* + Save Share Queries hub

Heartbeat Time range: Last 24 hours Show: 1000 results Add Simple mode

Results Chart

TimeGenerated [UTC]	SourceComputerId	ComputerIP	Computer	Category	OSType
4/2/2025, 9:18:42.952 PM	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows
TenantId: a97d7620-95f3-4395-b254-1a42b9929efc					
SourceSystem: OpsManager					
TimeGenerated [UTC]: 2025-04-02T21:18:42.9528554Z					
IMG: 00000000-0000-0000-0000-000000000001					
ManagementGroupName: AOI-a97d7620-95f3-4395-b254-1a42b9929efc					
SourceComputerId: d139bbe7-2e1c-4997-877a-966fac0a9b7b					
ComputerIP: 4.172.206.236					
Computer: Lab11VM					
Category: Azure Monitor Agent					
OSType: Windows					
OSName: Windows Server 2019 Datacenter					
OSMajorVersion: 10					
OSMinorVersion: 0					
Version: 1.34.0.0					
SCAgentChannel: Direct					
RemotelPLongitude: -79.38					

Home > Monitor

Monitor | Logs

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New Query 1 New Query 2*

Save Share Queries hu

Heartbeat Time range: Last 24 hours Show: 1000 results Add Simple mode

TimeGenerated [UTC]	SourceComputerId	ComputerIP	Computer	Category	OSType
> 4/2/2025, 9:27:43.244 P...	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows
> 4/2/2025, 9:26:43.238 P...	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows
> 4/2/2025, 9:25:43.232 P...	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows
> 4/2/2025, 9:24:43.221 P...	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows
> 4/2/2025, 9:23:43.216 P...	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows
> 4/2/2025, 9:22:43.210 P...	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows
> 4/2/2025, 9:21:43.194 P...	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows
> 4/2/2025, 9:20:43.187 P...	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows
> 4/2/2025, 9:19:42.963 P...	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows
> 4/2/2025, 9:18:42.952 P...	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows
> 4/2/2025, 9:17:42.947 P...	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows
> 4/2/2025, 9:16:42.936 P...	d139bbe7-2e1c-4997-877a-966fac0a9b7b	4.172.206.236	Lab11VM	Azure Monitor Agent	Windows

Step 6: Create Azure Data Factory

- Created an Azure Data Factory named "Lab11DataFactory" in the Canada Central region under the "Lab11Group" resource group.

Home > Microsoft.DataFactory-20250402172930 | Overview

Lab11Group

Resource group

Search

Create Manage view Delete resource group Refresh Export to CSV Open query Assign tags Move Delete

Overview
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Essentials

Subscription (move): [Azure for Students](#) Deployments: 5 Succeeded
Subscription ID: 913a8401-361d-4f42-8d7d-e2ff44f75da2 Location: Canada Central
Tags (edit): [Add tags](#)

Resources Recommendations

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

Showing 1 to 11 of 11 records. Show hidden types No grouping List view

Name	Type	Location
HighCPULAlert	Metric alert rule	Global
Lab11DataFactory	Data factory (V2)	Canada Central
lab11storage123	Storage account	Canada Central
Lab11VM	Virtual machine	Canada Central
Lab11VM-ip	Public IP address	Canada Central
Lab11VM-nsg	Network security group	Canada Central
Lab11VM-vnet	Virtual network	Canada Central
lab11vm221_z1	Network interface	Canada Central

< Previous Page 1 of 1 Next >

Give feedback

Step 7: Create Azure Log Analytics Workspace

- Created a Log Analytics workspace named "Lab11LogAnalytics" in the Canada Central region under the same resource group.

Home >

Lab11LogAnalytics

Log Analytics workspace

Search ⌵ << 🗑️ Delete

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Essentials JSON View

Resource group (move)	: lab11group
Status	: Active
Location	: Canada Central
Subscription (move)	: Azure for Students
Subscription ID	: 913a8401-361d-4f42-8d7d-e2ff...
Workspace Name	: Lab11LogAnalytics
Workspace ID	: 3de13951-b513-40af-a922-e4b...
Pricing tier	: Pay-as-you-go
Access control mode	: Use resource or workspace per...
Operational issues	: ✅ OK
Tags (edit)	: Add tags

[Get Started](#) Recommendations

Get started with Log Analytics

Log Analytics collects data from a variety of sources and uses a powerful query language to give you insights into the operation of your applications and resources.

Step 8: Configure Diagnostic Settings for Azure Data Factory

- In "Lab11DataFactory", added a diagnostic setting named "DFDiagnostics", enabling "AllMetrics" and "AllLogs", and sent the data to "Lab11LogAnalytics".

Step 9: Create and Review a Log Solution for Azure Data Factory

- In "Lab11LogAnalytics" > "Logs", ran the query: `ADFPipelineRun | summarize count() by PipelineName` to check pipeline run data (result was empty as no pipelines were run).

Home > Lab11LogAnalytics

Lab11LogAnalytics | Logs

Log Analytics workspace

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New Query 1*

Run Time range: Last 24 hours Show: 1000 results KQL mode

```
1 ADFPipelineRun
2 | summarize count() by PipelineName
```

Results Chart

No results found from the last 24 hours
Try [selecting another time range](#)

Step 10: Setup Monitor Alerts for Azure Data Factory

- Created an alert rule named "DFAAlert" for "Lab11DataFactory", using the "Failed activity runs metrics" signal with a threshold of 1, and reused the "VMUptimeCheck" action group.

Home > Monitor | Alerts > Alert rules >

Alert rules

Create Columns

Search

Name

DFAAlert

HighCPULAlert

VMUptimeCheck

Showing 1 - 3 of 3 results.

Give feedback

DFAAlert

Metric alert rule

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Edit Disable Duplicate Delete Refresh

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Essentials

Resource group [\(move\)](#)

[lab11Group](#)

Location [\(move\)](#)

Global

Subscription [\(move\)](#)

[Azure for Students](#)

Subscription ID

913a8401-361d-4f42-8d7d-e2ff44f75da2

Tags [\(edit\)](#)

[Add tags](#)

Severity

3 - Informational

Description

-

JSON View

Scope

Resource

lab11datafactory

Hierarchy

Azure for Students > lab11group

Conditions

Name	Time series monitored	Estimated monthly cost
ActivityFailedRuns > 1	1	\$0.10

Step 11: Delete All Resources

- Deleted the "Lab11Group" resource group, which removed all created resources.

Recent

Manage view

Refresh

Export to CSV

Clear

Assign tags

Group by none

Filter for any field...

Subscription equals all

Resource Group equals all

Type equals all

Location equals all

Add filter

<input type="checkbox"/>	Name ↑	Type	Location	Resource Group	Subscription	Last accessed
<input type="checkbox"/>	Azure for Students	...	Subscription		Azure for Students	2个月前
<input type="checkbox"/>	AVD-Prod	...	Subscription		AVD-Prod	2个月前

Showing 1 - 2 of 2. Display count:

auto

Give feedback