

Lab 10

CST8912_011

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Submitted to :

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Introduction & Purpose

Introduction:

When you build a cloud infrastructure, you might have anywhere from a small to many resources. Checking the needed parameters for each resource that you have into your cloud environment could become hard. That's where monitoring can help you organize and handle the metrics and checks for your resources. Cloud Monitoring is a Cloud service that collects metrics, events, and metadata from your Cloud environment. Cloud Monitoring automatically detects all the resources that you are running into your cloud infrastructure and provides you rich visualization tools to work with. By using Cloud Monitoring, you can create dashboards with metrics that you need, create checks on critical resources, and create alerts triggered when certain events happen. In this lab, you will work in a cloud environment where you will find an existent Compute Engine instance to work with. You will install the Cloud Monitoring agent and then start practicing with Cloud Monitoring. You will create an uptime check and an alert policy triggered when the uptime check fails. You will also create a chart with the CPU metrics of your Compute Engine instance.

Purpose:

Upon completion of this lab, you will be able to create resources for azure:

1. Create an uptime check for your resources (storage account and a virtual machine with lowest memory option) created in Canada central region
2. Define an alert policy that will advise you when certain events happen.
3. Handle the Cloud Monitoring dashboard to create a chart that will show you the CPU metrics of the instance
4. Use log queries to interact with data
5. Create azure data factory in Canada central region
6. Create Azure Log Analytics workspace in same region as other resources
7. Configure Diagnostic settings for Azure Data Factory
8. Create and review a Log Solution for the Azure Data Factory
9. Setup Monitor Alerts for Azure Data Factory
10. After demo delete all the resources created in the lab

Steps covered in the lab

Step 1: Create a Resource Group, a Storage Account and a Virtual Machine:

1. Create a Resource Group

The screenshot shows the 'Create a resource group' page in the Microsoft Azure portal. The page has a blue header with the Microsoft Azure logo, a search bar, and a Copilot button. The breadcrumb trail is 'Home > Resource groups >'. The title is 'Create a resource group' with a close button. There are three tabs: 'Basics' (selected), 'Tags', and 'Review + create'. A description of a resource group is provided. The form fields are: 'Subscription *' (Azure for Students), 'Resource group name *' (CST8912-lab11), and 'Region *' ((Canada) Canada Central). At the bottom, there are buttons for 'Previous', 'Next', and 'Review + create'.

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

Home > Resource groups >

Create a resource group

Basics Tags Review + create

Resource group - A container that holds related resources for an Azure solution. The resource group can include all the resources for the solution, or only those resources that you want to manage as a group. You decide how you want to allocate resources to resource groups based on what makes the most sense for your organization. [Learn more](#)

Subscription * Azure for Students

Resource group name * CST8912-lab11

Region * (Canada) Canada Central

Previous Next Review + create

2. Create a Storage Account

The screenshot shows the 'Create a storage account' page in the Microsoft Azure portal. The page has a blue header with the Microsoft Azure logo, a search bar, and a Copilot button. The breadcrumb trail is 'Home > Resource groups > CST8912-lab11 > Marketplace >'. The title is 'Create a storage account' with a close button. The page includes a description of storage accounts. The form fields are: 'Subscription *' (Azure for Students), 'Resource group *' (CST8912-lab11), 'Instance details' section with 'Storage account name *' (labstorageacc11), 'Region *' ((Canada) Canada Central), 'Primary service' (Azure Blob Storage or Azure Data Lake Storage Gen 2), 'Performance *' (Standard: Recommended for most scenarios (general-purpose v2 account)), and 'Redundancy *' (Locally-redundant storage (LRS)). At the bottom, there are buttons for 'Previous', 'Next', and 'Review + create', along with a 'Give feedback' link.

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

Home > Resource groups > CST8912-lab11 > Marketplace >

Create a storage account

and manage your storage account together with other resources.

Subscription * Azure for Students

Resource group * CST8912-lab11 [Create new](#)

Instance details

Storage account name * labstorageacc11

Region * (Canada) Canada Central [Deploy to an Azure Extended Zone](#)

Primary service Azure Blob Storage or Azure Data Lake Storage Gen 2

Performance * ☒ Standard: Recommended for most scenarios (general-purpose v2 account) ☐ Premium: Recommended for scenarios that require low latency.

Redundancy * Locally-redundant storage (LRS)

Previous Next Review + create [Give feedback](#)

3. Create a Virtual Machine

Microsoft Azure

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

Copilot

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 right VM size for my workload

Project details

Select the 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 *

CST8912-lab11

Create new

Instance details

Virtual machine name *

lab11vm

Region *

(Canada) Canada Central

Availability options

No infrastructure redundancy required

Security type

Trusted launch virtual machines

Configure security features

Trusted launch virtual machine is required when using 1P Gallery images.

< Previous

Next : Disks >

Review + create

Give feedback

Microsoft Azure

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

Copilot

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 right VM size for my workload

Run with Azure Spot discount

Size *

Standard_B2s - 2 vcpus, 4 GiB memory (\$39.71/month)

See all sizes

Enable Hibernation

Hibernate is not supported by the size that you have selected. Choose a size that is compatible with Hibernation to enable this feature. Learn more

Administrator account

Username *

yuntiandu

Password *

Confirm password *

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.

< Previous

Next : Disks >

Review + create

Give feedback

Step 2: Define an Alert Policy for Virtual Machine, when CPU usage is above 80%, this alert will trigger.

Microsoft Azure

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

Copilot

Home > Monitor

Monitor | Alerts

Microsoft

Search

View as timeline (preview)

Create

Alert rules

Overview

Activity log

Alerts

Metrics

Logs

Change Analysis

Service health

Workbooks

Investigator (preview)

Insights

Managed Services

Settings

Support + Troubleshooting

Search

Alert rule

Action group

Alert processing rule

More (4)

Total alerts

Critical

Error

Warning

Informational

Verbose

0

0

0

0

0

0

No grouping

Name

Severity

Affected resource

No alerts found

Try changing your search or choose a

Select a resource

Browse

Recent

Subscription

Resource types

Locations

All subscriptions

All resource types

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"/> > CST8912-lab11	Resource group	-
<input checked="" 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

Selected resources

1 virtual machine

lab11vm

Virtual machine

Canada Central

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 * ⓘ  Percentage CPU ⓘ [See all signals](#)

Alert logic

i We have set the condition configuration automatically based on popular settings for this metric. Please review and make changes as needed.

Threshold type ⓘ ☒ Static ☐ Dynamic

Aggregation type ⓘ Average ▼

Value is ⓘ Greater than ▼

Threshold * ⓘ 80 %

When to evaluate

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

Create action group

Home > Monitor | Alerts > 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 * ⓘ CST8912-lab11 ▼ [Create new](#)

Region * Global ▼

Instance details

Action group name * ⓘ lab11ACG ✓

Display name * ⓘ lab11ACG ✓

The display name is limited to 12 characters

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

Microsoft Azure

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

Copilot

Home > Monitor | Alerts

Email/SMS message/Push/Voice

Add or edit Email/SMS message/Push/Voice action

Create action group

Basics

Notifications

Choose how to get notified

Notification type ⓘ

Email/SMS message/Push/Voice

☒ Email

Email ⓘ

☐ SMS (Carrier charges may apply)

Country code

Phone number

☐ Azure mobile app notification

Azure account email ⓘ

☐ Voice

Country code

Phone number

Enable the common alert schema. [Learn more](#)

☐ Yes ☒ No

OK

Review + create

Microsoft Azure

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

Copilot

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
lab11ACG	1 Email

Manage action groups

Review + create

Previous

Next: Details >

Microsoft Azure

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

Copilot

Home > Monitor | Alerts >

Create an alert rule

The following fields require attention: Alert rule name

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 *

CST8912-lab11

Create new

Alert rule details

Severity *

3 - Informational

Alert rule name *

cpu80alert

Alert rule description

cpu usage above 80%

Review + create

Previous

Next: Tags >

Step 3: Create a Cloud Monitoring Dashboard

Enable Insights for Virtual Machine

Microsoft Azure

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

Copilot

Dashboard > lab11vm

lab11vm | Insights

Virtual machine

Search

Resource Group Monitoring

Azure Monitor

Connect

Networking

Settings

Availability + scale

Security

Backup + disaster recovery

Operations

Monitoring

Insights

Alerts

Metrics

Diagnostic settings

Logs

Workbooks

Automation

Help

The map data set collected with Azure Monitor for VMs is intended to be infrastructure data about the resources being deployed and monitored. For details on data collected please [click here](#).

Enable

Having difficulties enabling Azure Monitors for VM? [Troubleshoot](#)

Have more questions?
[Learn more about virtual machine monitoring](#)
[What is VM Insights?](#)
[Learn more about pricing](#)
[Support Matrix](#)
[FAQ](#)
[Update Azure Agent](#)

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

Monitoring configuration

VM Insights now supports data collection using the Azure Monitor Agent and data collection rules.

Subscription *

Azure for Students

Data collection rule ⓘ

(new) MSVM-DefaultWorkspace-22f60889-0ad3-47d4-9d41-7d026e7ff990-E...

Create New

MSVM-DefaultWorkspace-22f60889-0ad3-47d4-9d41-7d026e7ff990-EUS

Guest performance

Enabled

Processes and dependencies (Map)

Disabled

Log Analytics workspace

DefaultWorkspace-22f60889-0ad3-47d4-9d41-7d026e7ff990-EUS

This will also enable System Assigned Managed Identity, in addition to existing User Assigned identities (if any).
Note: Unless specified in the request, the machine will default to using System Assigned Identity. [Learn More](#)

Currently, only resources in certain regions are supported. [Learn More](#)

15

Configure

Cancel

Set Metrics under VM Monitoring and save to dashboard.

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

Dashboard > lab11vm

lab11vm | Metrics

☆ ...

Virtual machine

Search

Resource instances

Connect

Networking

Settings

Availability + scale

Security

Backup + disaster recovery

Operations

Monitoring

Insights

Alerts

Metrics

Diagnostic settings

Logs

Workbooks

Automation

Help

+ New chart

Refresh

Share

Feedback

Local Time: Last 24 hours (Automatic - 15 minut...

Avg Percentage CPU for lab11vm

+ Add metric

Line chart

Drill into Logs

Add filter

New alert rule

Apply splitting

Save to dashboard

Scope

lab11vm

Metric Namespace

Virtual Machine Host

Metric

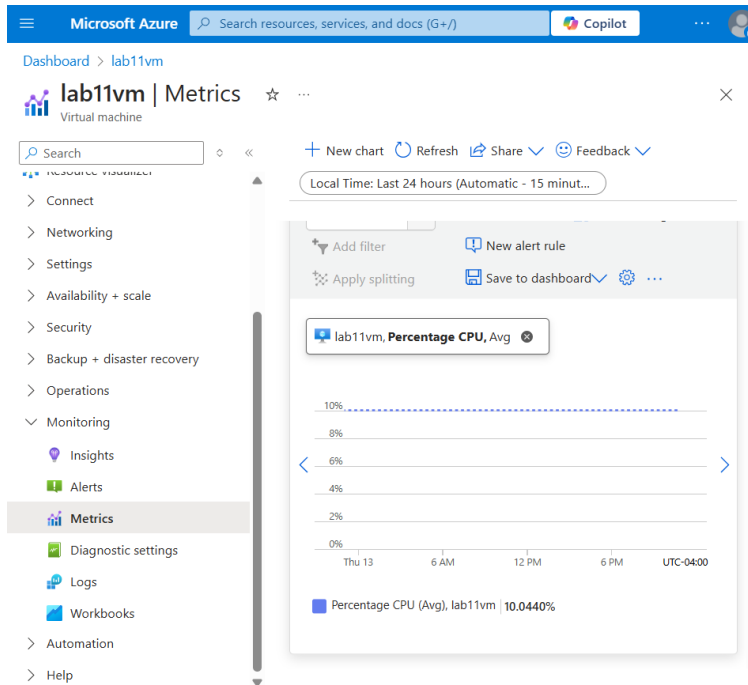
Percentage CPU

Aggregation

Avg

10%

0%



Step 4: Use Log Queries to Interact with Data

Configure Diagnostic settings for VM

Microsoft Azure | Search resources, services, and docs (G+/J) | Copilot

Home > lab11vm

lab11vm | Diagnostic settings

Virtual machine

Search

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

Azure Monitoring collects host-level metrics - like CPU utilization, disk and network usage - for all virtual machines without any additional software. For more insight into this virtual machine, you can collect guest-level metrics, logs, and other diagnostic data using the Azure Diagnostics agent. You can also send diagnostic data to other services like Application Insights. [Learn more](#)

To get started now, choose a storage account below where diagnostic data will be sent and then click the button labeled 'Enable guest-level diagnostics'.

In portal, the storage account must be in the same region as the virtual machine. Your VM is located in 'canadacentral'.

Diagnostics storage account *

labstorageacc11

Enable guest-level monitoring

[Give feedback](#)

Microsoft Azure Search resources, services, and docs (G+/J) Copilot

Home > lab11vm

lab11vm | Diagnostic settings

Virtual machine

Search

- Connect
- Networking
- Settings
- Availability + scale
- Security
- Backup + disaster recovery
- Operations
- Monitoring
 - Insights
 - Alerts
 - Metrics
 - Diagnostic settings**
 - Logs
 - Workbooks
- Automation
- Help

Azure Diagnostics Agent Settings

Configure the settings for the diagnostics agent itself. [Learn more](#)

Storage account *

Disk quota (MB): *

Collect Infrastructure Logs ☒

Log level: *

Remove Azure Diagnostics agent

If diagnostic data isn't being collected or you're having trouble viewing it in the portal, reinstalling the agent might help. This removes the agent, but doesn't delete the diagnostic data already collected.

[Apply](#) [Discard changes](#) [Give feedback](#)

Home > lab11vm

lab11vm | Diagnostic settings

Virtual machine

Search

- Connect
- Networking
- Settings
- Availability + scale
- Security
- Backup + disaster recovery
- Operations
- Monitoring
 - Insights
 - Alerts
 - Metrics
 - Diagnostic settings**
 - Logs
 - Workbooks
- Automation
- Help

Windows Performance Counter provides a consistent interface for monitoring system performance, such as CPU, memory, and disk usage. Software developers can use these counters to monitor the resource usage of their applications.

+ Select basic counter

Counter specifier

\Process(_Total)\Thread...

\Process(_Total)\Handle...

\System\System Up Time

\System\Context Switches/sec

\System\Processor Queue Length

[Apply](#) [Discard](#)

- ☒ CPU (10)
- ☒ Disk (18)
- ☒ Memory (10)
- ☒ Network (8)
- ☐ ASP.NET (140)
- ☐ SQL Server (12)

Use log query to Count heartbeats

Home > lab11vm

lab11vm | Logs

Search

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

Queries hub

Always show Queries hub

Query packs: [Select query packs](#)

Topic

Search

Resource type: Virtual machines

Add filter

★ Favorites

All Queries

Alerts

Availability

Diagnostics

Errors

Health

Performance

Security

Count heartbeats

Count all computers heartbeats from the last hour.

Example query

Run

Run

Last heartbeat of each co...

Show the last heartbeat sent by each computer.

Example query

Run

Shut down Virtual Machines

Virtual Machines successfully shut down in the last 10 minutes.

Example query

Run

Home > lab11vm

lab11vm | Logs

Search

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

New Query...

New Query...

User Query

Time range: Set in query

Simple mode

Show: 1000 results

Add

Results

Chart

Computer	count_
lab11vm	59
Computer	lab11vm
count_	59

1s 33ms

Display time (UTC+00:00)

Query details

1 - 1 of 1

Step 5: Create an Azure Data Factory

Microsoft Azure

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

Copilot

Home > Data factories >

Create Data Factory ...

BasicsGit configurationNetworkingAdvancedTagsReview + create

One-click to create data factory with sample pipeline and datasets. [Try it](#)

Project details

Select the 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 * ⓘCST8912-lab11

Create new

Instance details

Name * ⓘDFIab11

Region * ⓘCanada Central

Version * ⓘV2

PreviousNextReview + create

Give feedback

Step 6: Create an Azure Log Analytics Workspace

Microsoft Azure

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

Copilot

Home > Log Analytics workspaces >

Create Log Analytics workspace ...

A Log Analytics workspace is the basic management unit of Azure Monitor Logs. There are specific considerations you should take when creating a new Log Analytics workspace. [Learn more](#)

With Azure Monitor Logs you can easily store, retain, and query data collected from your monitored resources in Azure and other environments for valuable insights. A Log Analytics workspace is the logical storage unit where your log data is collected and stored.

Project details

Select the 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 * ⓘCST8912-lab11

Create new

Instance details

Name * ⓘLAW11

Region * ⓘCanada Central

Review + CreatePreviousNext : Tags >

Step 7: Configure Diagnostic Settings for Azure Data Factory

Microsoft Azure Search resources, services, and docs (G+/) Copilot

Home > DFlab11 | Diagnostic settings >

Diagnostic setting

Save Discard Delete Feedback

A diagnostic setting specifies a list of categories of platform logs and/or metrics that you want to collect from a resource, and one or more destinations that you would stream them to. Normal usage charges for the destination will occur. [Learn more about the different log categories and contents of those logs](#) [JSON View](#)

Diagnostic setting name diagnostic1

Logs

Category groups ⓘ

☒ allLogs

Categories

- ☒ Pipeline activity runs log
- ☒ Pipeline runs log
- ☒ Trigger runs log
- ☒ Sandbox Pipeline runs log
- ☒ Sandbox Activity runs log
- ☒ SSIS package event

Destination details

☒ Send to Log Analytics workspace

Subscription
Azure for Students

Log Analytics workspace
DefaultWorkspace-22f60889-0ad3-47d4-9d41-7...

Destination table ⓘ
Azure diagnostics Resource specific

☒ Archive to a storage account

Showing all storage accounts including classic storage accounts

Location

Home > Recent > CST8912-lab11 > DFlab11

DFlab11 | Diagnostic settings

Data factory (V2)

Search Refresh Feedback

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Resource visualizer
- Settings
- Getting started
- Monitoring
 - Alerts
 - Metrics
 - Diagnostic settings**
 - Logs
- Automation
- Help

Diagnostic settings

Name	Storage account	Event hub	L
diagnostic1	labstorageacc11	-	

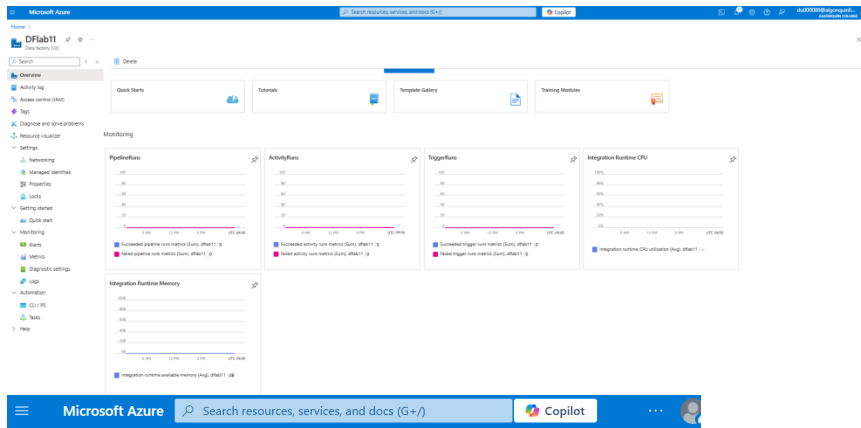
[+ Add diagnostic setting](#)

Click 'Add Diagnostic setting' above to 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

Step 8: Create and Review a Log Solution for Azure Data Factory

After step 8, we could see charts in the Overview section. We could also add Metrics related to Data Factory under Monitor and add the charts to Dashboard.



Select a scope

Browse Recent

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

Search to filter items...		
Scope	Resource type	Location
<input type="checkbox"/> Azure for Students	Subscription	-
<input type="checkbox"/> CST8912-lab11	Resource group	-
<input checked="" type="checkbox"/> DFlab11	Data factory (V2)	Canada Central
<input type="checkbox"/> lab11vm	Virtual machine	Canada Central

Why can't I select multiple resources? Data factory (V2) resources have not enabled multi-selection with metrics. You can let the Data factory (V2) team know this capability is important and upvote this request.

Upvote

Selected scopes 1 data factory (V2)

DFlab11

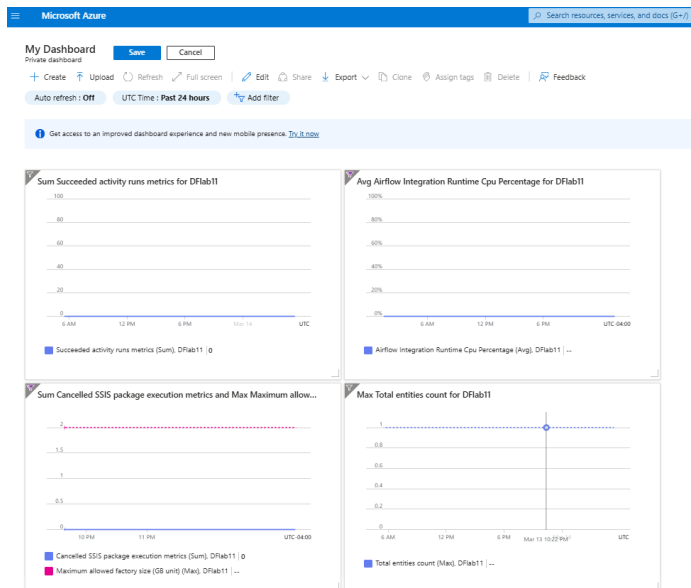
Data factory (V2)

Canada Central

Apply

Cancel

Clear all selections



Step 9: Setup Monitor Alerts for Azure Data Factory

Home > DFlab11

DFlab11 | Alerts

Data factory (V2)

Search View as timeline (preview) Create Alert rules Action groups

- Overview
- 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

Set up alert rules on this resource

Get notified when important monitoring events happen on your resource.

Create alert rule

Home > DFlab11 | 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 * [See all signals](#)

Alert logic

Threshold type ☒ Static ☐ Dynamic

Aggregation type

Value is

Unit

Threshold *

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
<input type="text" value="Select dimension"/>	<input type="text" value="="/>	<input type="text" value="0 selected"/> Add custom value	<input type="checkbox"/>

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

Home > DFlab11 | Alerts >

Create an alert rule

Add custom value

When to evaluate

Check every

Lookback period

Preview \$0.10 USD/month

Whenever the total Failed pipeline runs metrics is greater than 0

Preview time range: **Over the last 6 hours** Time series: **Aggregate**

Failed pipeline runs metrics (Sum, dflab11) 0

+ Add condition

15

Review + create Previous Next: Actions >

Home > DFlab11 | Alerts >

Create an alert rule

The following fields require attention: Alert rule name

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

Project details

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

Subscription

Resource group [Create new](#)

Alert rule details

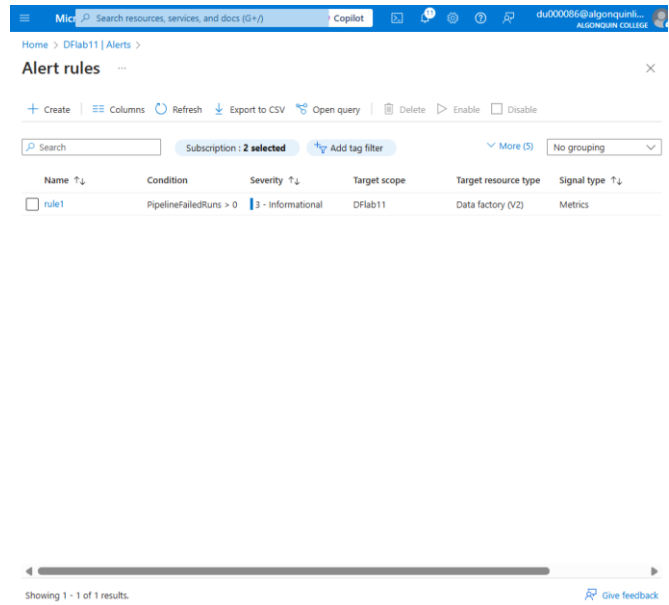
Severity

Alert rule name

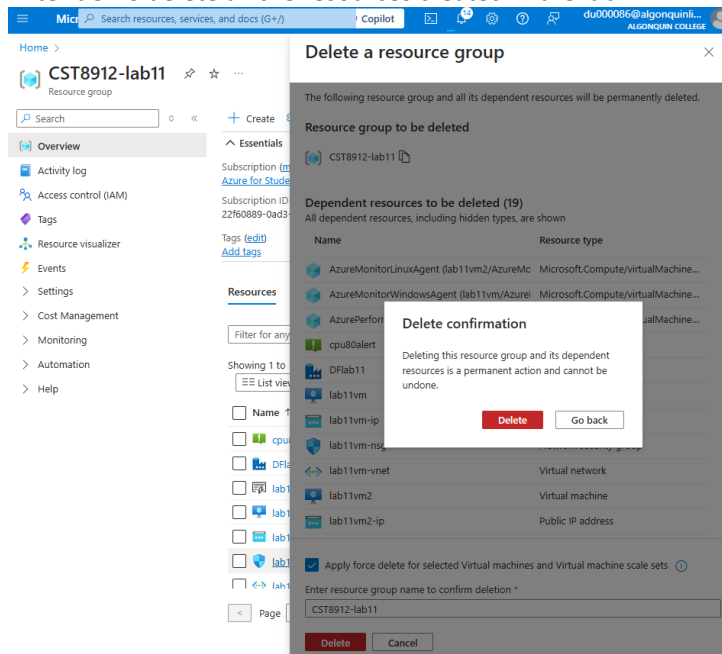
Alert rule description

Advanced options

Review + create Previous Next: Tags >



Step 10: After demo delete all the resources created in the lab



References

None.