

# **Monitor the Performance of Virtual Machines by using Azure Monitor VM Insights**

## **Exercise - Set up a Log Analytics workspace and Azure Monitor VM Insights**

### **Objectives:**

- Deploy monitoring for workloads on virtual machines.
- Set up a log analytics workspace, onboard virtual machines to Azure Monitor VM Insights
- Build log queries by using Kusto Query Language.

In this unit, we will:

1. Create a Log Analytics workspace.
2. Configure the Log Analytics workspace permissions model for the environment you're supporting.
3. Create two virtual machines and onboard both to Azure Monitor VM Insights.

# Creating a Log Analytics workspace

[Home](#) > [Log Analytics workspaces](#) >

## Create Log Analytics workspace ...

**Basics**   Tags   Review + Create

**i** 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 \* ⓘ

Concierge Subscription



Resource group \* ⓘ

learn-7df27ab4-6a90-4303-85d6-1ebbdda17587

[Create new](#)

### Instance details

Name \* ⓘ

ASH12345

Region \* ⓘ

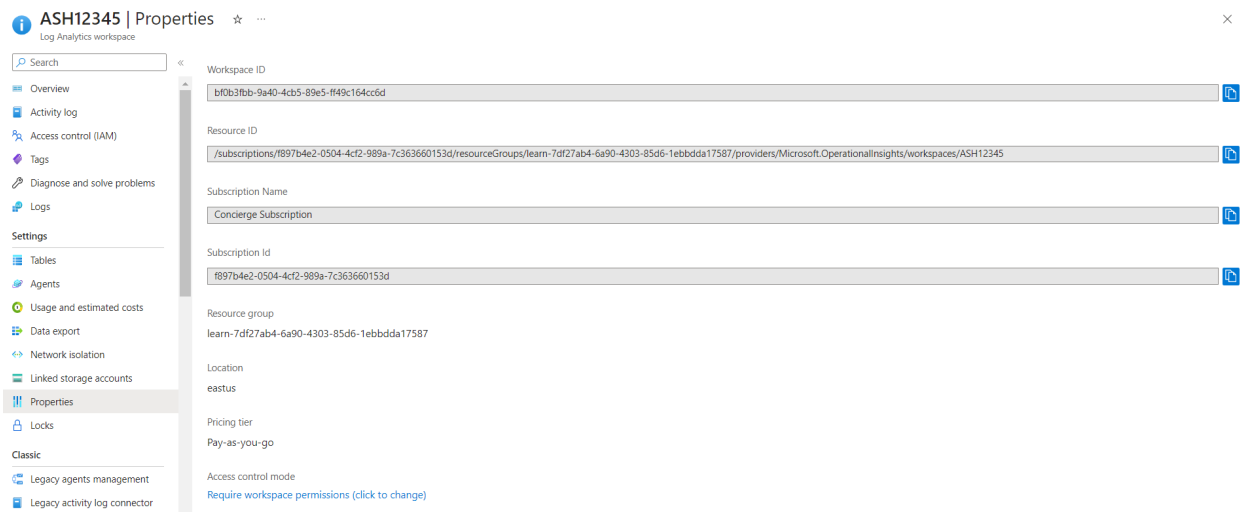
East US

**Review + Create**

« Previous

Next : Tags >

Look for the access control mode, and select Use resource or workspace permissions. This setting changes the access mode to use the resource-context.



## Creating the virtual machines

### - Creating the first virtual machine:

Run this command in Azure Cloud Shell:

```
az vm create \
--resource-group learn-7df27ab4-6a90-4303-85d6-1ebbdda17587 \
--location westus \
--name SampleVM1 \
--image UbuntuLTS \
--admin-username azureuser \
--generate-ssh-keys \
--verbose
```

```
andrijana_sh [ ~ ]$ az vm create \
--resource-group learn-7df27ab4-6a90-4303-85d6-1ebbdda17587 \
--location westus \
--name SampleVM1 \
--image UbuntuLTS \
--admin-username azureuser \
--generate-ssh-keys \
--verbose
SSH key files '/home/andrijana_sh/.ssh/id_rsa' and '/home/andrijana_sh/.ssh/id_rsa.pub' have been generated under ~/.ssh to allow SSH access to the VM. If using machines without permanent storage, back up your keys to a safe location.
Ignite (November) 2023 onwards "az vm/vmss create" command will deploy Gen2-Trusted Launch VM by default. To know more about the default change and Trusted Launch, please visit https://aka.ms/TLaD
It is recommended to use parameter "--public-ip-sku Standard" to create new VM with Standard public IP. Please note that the default public IP used for VM creation will be changed from Basic to Standard in the future.
Consider using the "Ubuntu2204" alias. On April 30, 2023, the image deployed by the "UbuntuLTS" alias reaches its end of life. The "UbuntuLTS" will be removed with the breaking change release of Fall 2023.
{
  "fqdns": "",
  "id": "/subscriptions/f897b4e2-0504-4cf2-989a-7c363660153d/resourceGroups/learn-7df27ab4-6a90-4303-85d6-1ebbdda17587/providers/Microsoft.Compute/virtualMachines/SampleVM1",
  "location": "westus",
  "macAddress": "08-00-3A-32-00-88",
  "powerState": "VM running",
  "privateIpAddress": "10.0.0.4",
  "publicIpAddress": "20.245.122.0",
  "resourceGroup": "learn-7df27ab4-6a90-4303-85d6-1ebbdda17587",
  "zones": ""
}
```

## - Creating the second virtual machine:

az vm create \

--resource-group learn-7df27ab4-6a90-4303-85d6-1ebbdda17587 \

--location westus \

--name SampleVM2 \

--image UbuntuLTS \

--admin-username azureuser \

--generate-ssh-keys \

--verbose

```
andrijana_sh [ ~ ]$ az vm create \
--resource-group learn-7df27ab4-6a90-4303-85d6-1ebbdda17587 \
--location westus \
--name SampleVM2 \
--image UbuntuLTS \
--admin-username azureuser \
--generate-ssh-keys \
--verbose
Use existing SSH public key file: /home/andrijana_sh/.ssh/id_rsa.pub
ignite (November) 2023 onwards "az vm/vmss create" command will deploy Gen2-Trusted Launch VM by default. To know more about the default change and Trusted Launch, please visit https://aka.ms/TLaB
It is recommended to use parameter "--public-ip-sku Standard" to create new VM with Standard public IP. Please note that the default public IP used for VM creation will be changed from Basic to Standard in the future.
Consider using the "Ubuntu2204" alias. On April 30, 2023, the image deployed by the "UbuntuLTS" alias reaches its end of life. The "UbuntuLTS" will be removed with the breaking change release of Fall 2023.
{
  "fqdns": "",
  "id": "/subscriptions/f897b4e2-0504-4cf2-989a-7c363660153d/resourceGroups/learn-7df27ab4-6a90-4303-85d6-1ebbdda17587/providers/Microsoft.Compute/virtualMachines/SampleVM2",
  "location": "westus",
  "macAddress": "00-22-48-0A-1A-1E",
  "powerState": "VM running",
  "privateIpAddress": "10.0.0.5",
  "publicIpAddress": "104.210.54.74",
  "resourceGroup": "learn-7df27ab4-6a90-4303-85d6-1ebbdda17587",
  "zones": ""
}
```

## Onboard virtual machines to Azure Monitor VM Insights

Here are the created virtual machines that we will use as samples for this task:

Virtual machines									
Microsoft Learn Sandbox									
+ Create ▾ Switch to classic ⌚ Reservations ▾ ⚙️ Manage view ▾ ↺ Refresh ⬇️ Export to CSV 📄 Open query   🏷️ Assign tags ▶️ Start 🔄 Restart ☐ Stop 🗑️ Delete 📋 Services ▾ 🔧 Maintenance ▾									
Filter for any field... Subscription equals all Type equals all Resource group equals all Location equals all Add filter									
Showing 1 to 2 of 2 records. No grouping List view									
<input type="checkbox"/> Name ↑	Type ↑	Subscription ↑	Resource group ↑	Location ↑	Status ↑	Operating system ↑	Size ↑	Public IP address ↑	Disks ↑
<input type="checkbox"/> SampleVM1	Virtual machine	Concierge Subscription	learn-7df27ab4-6a90-...	West US	Running	Linux	Standard_DS1_v2	20.245.122.0	1
<input type="checkbox"/> SampleVM2	Virtual machine	Concierge Subscription	learn-7df27ab4-6a90-...	West US	Running	Linux	Standard_DS1_v2	104.210.54.74	1



# SampleVM1 | Insights

Virtual machine



Inventory



Change tracking



Automanage



Configuration management  
(Preview)



Policies



Run command

## Monitoring



Insights



Alerts



Metrics



Diagnostic settings



Logs



Connection monitor (classic)

Enable

We configure the monitoring by selecting the log analytics workspace we created in the beginning:

MICROSOFT LEARN SANDBOX

Monitoring configuration

Virtual machine Insights now supports data collection using the Azure Monitor agent. Configuring using the Azure Monitor Agent is currently in preview mode.

Enable insights using

☐ Azure Monitor agent (Recommended)

☒ Log Analytics agent

Subscription \*

Concierge Subscription

Log Analytics workspaces

ASH12345

We do the same for the second virtual machine.

SampleVM2 | Insights

Virtual machine

Search

Inventory

Change tracking

Automanage

Configuration management (Preview)

Policies

Run command

Monitoring

Insights

Alerts

Metrics

Diagnostics settings

Logs

Connection monitor (classic)

Workbooks

Automation

Tasks (preview)

Export template

Resource Group Monitoring

Azure Monitor

Get started

With an Azure virtual machine

You will be billed based on the amount of data collected.

Monitoring configuration

Virtual machine Insights now supports data collection using the Azure Monitor agent. Configuring using the Azure Monitor Agent is currently in preview mode.

Enable insights using

☐ Azure Monitor agent (Recommended)

☒ Log Analytics agent

Subscription \*

Concierge Subscription

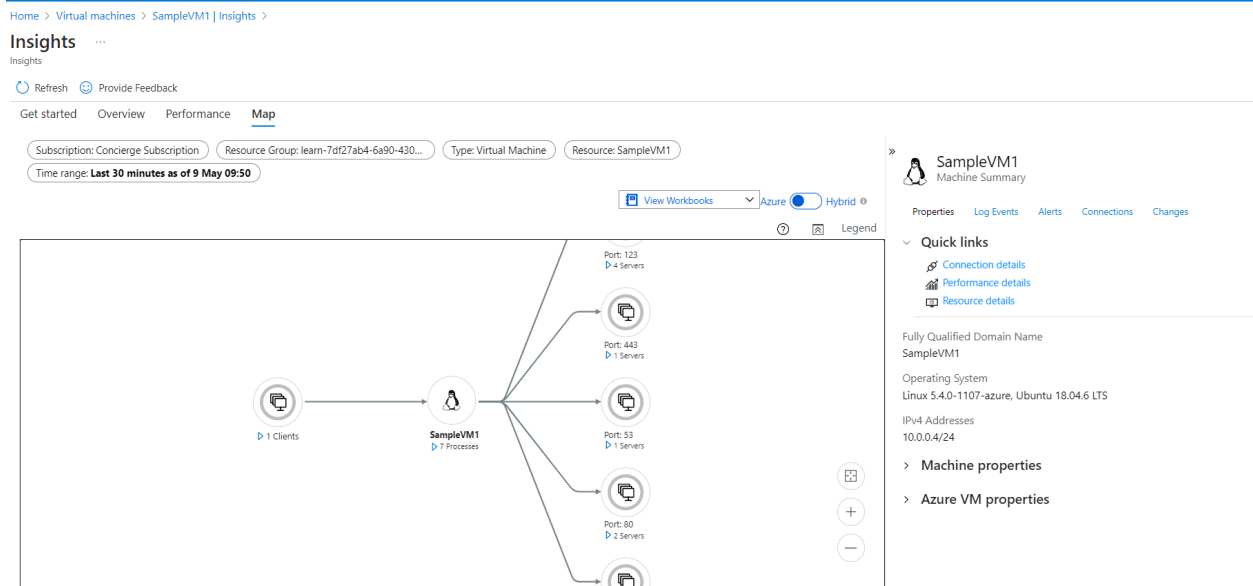
Log Analytics workspaces

ASH12345

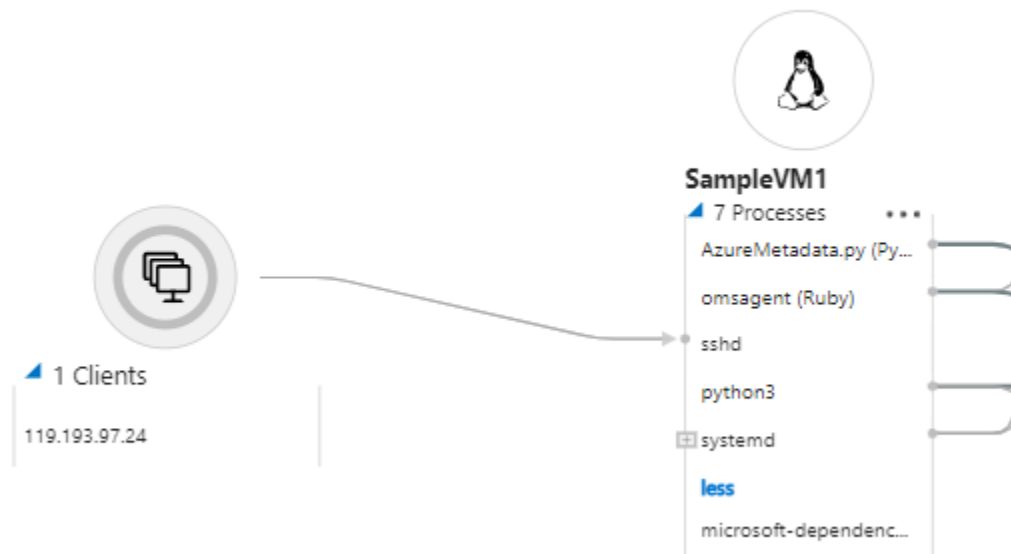
Configure

Cancel

## We get the monitoring results:



We can review clients, processes, ports, etc.




This is the **Performance Tab**:

Explore the different graphs for:

- Logical Disk Performance
- CPU Utilization
- Available Memory
- Logical Disk IOPS
- Logical Disk MB/s
- Logical Disk Latency (ms)
- Max Logical Disk Used %
- Bytes Sent Rate
- Bytes Received Rate

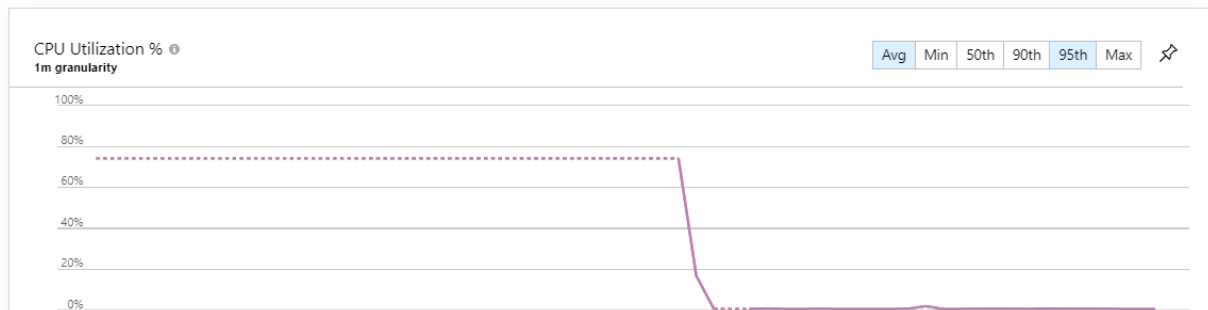
Get started Performance Map

Time range: **Last hour as of 9 May 10:10**

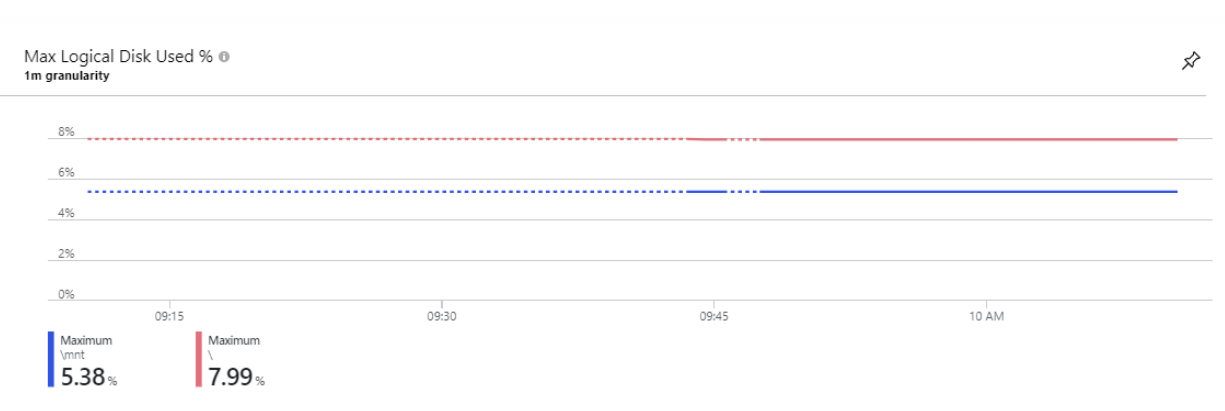
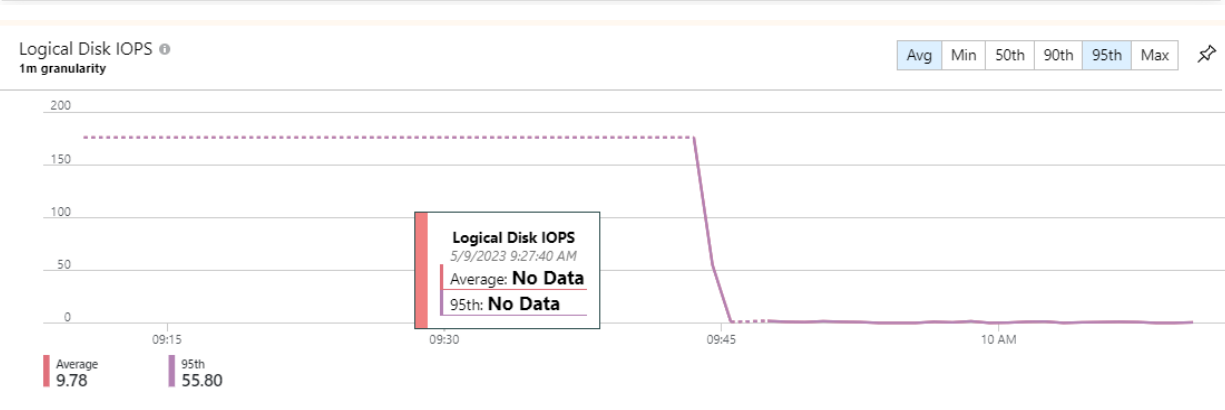
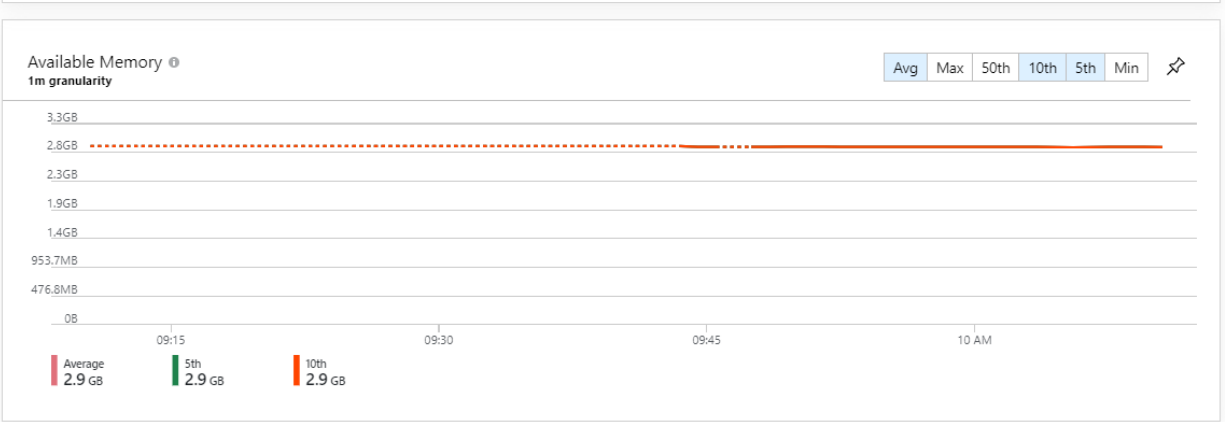
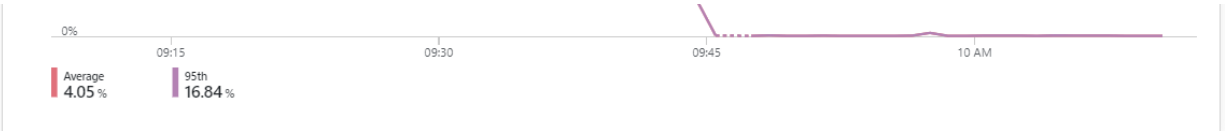
[View Workbooks](#) 

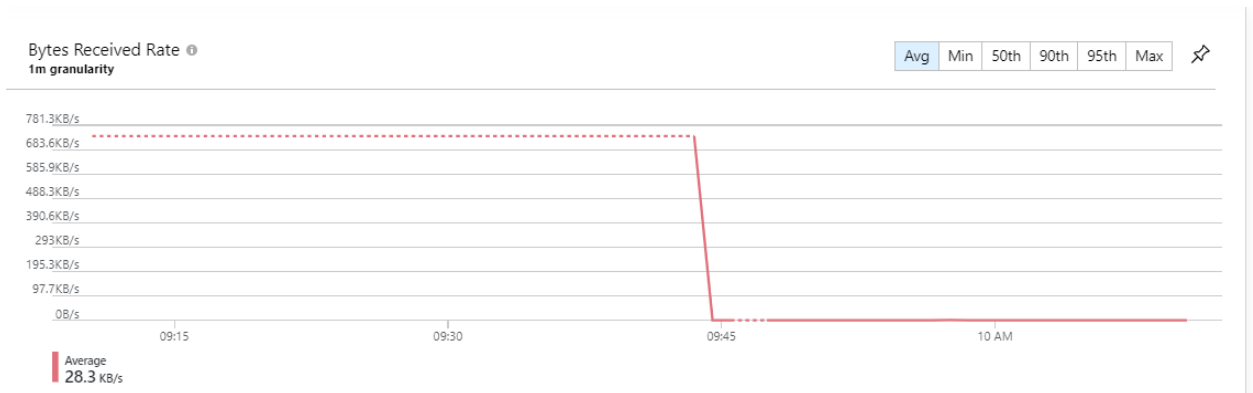
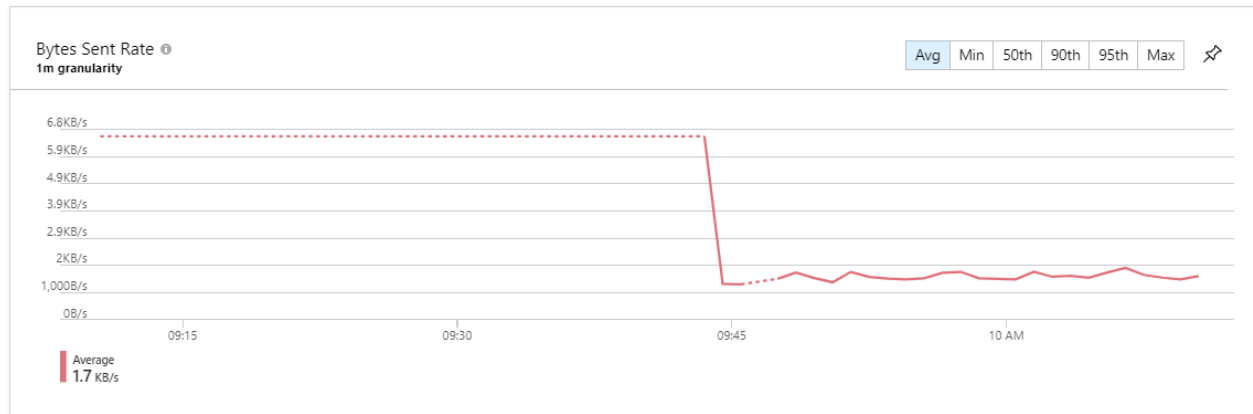
#### Logical Disk Performance

DISK	CURRENT SIZE (GB)	CURRENT USED (%)	P95 IOPs READ	P95 IOPs WRITE	P95 IOPs TOTAL	P95 MB/s READ	P95 MB/s WRITE	P95 MB/s TOTAL
/	28.89	8%	33.21	4.88	55.8	0.72	0.52	2.23
/mnt	6.79	5%	0	0	0	0	0	0
Total	35.69	7%	33.21	4.88	55.8	0.72	0.52	2.23

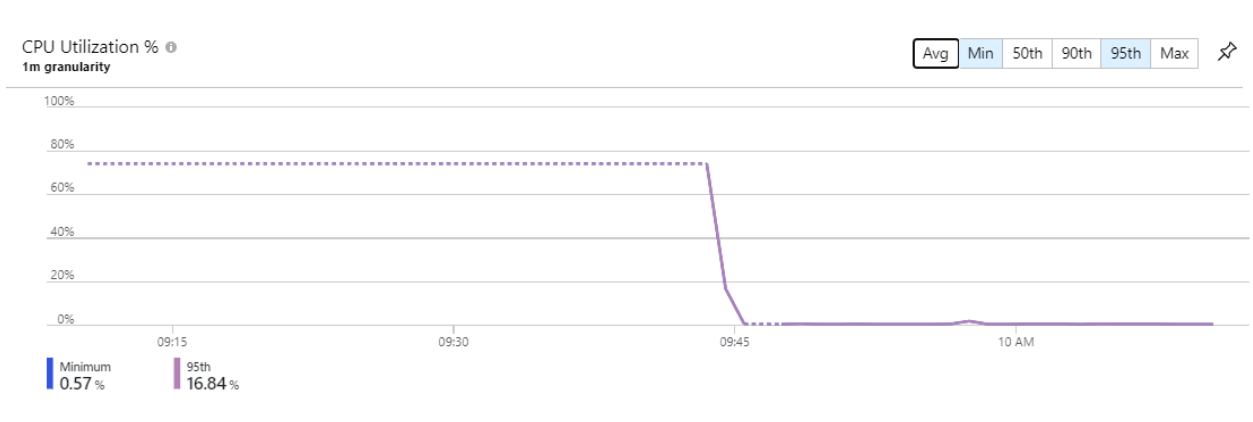




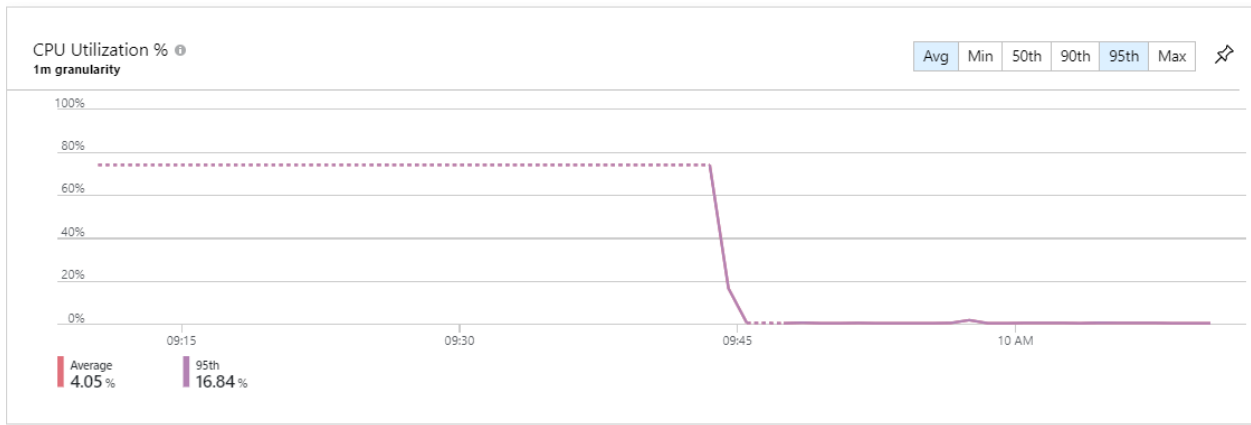




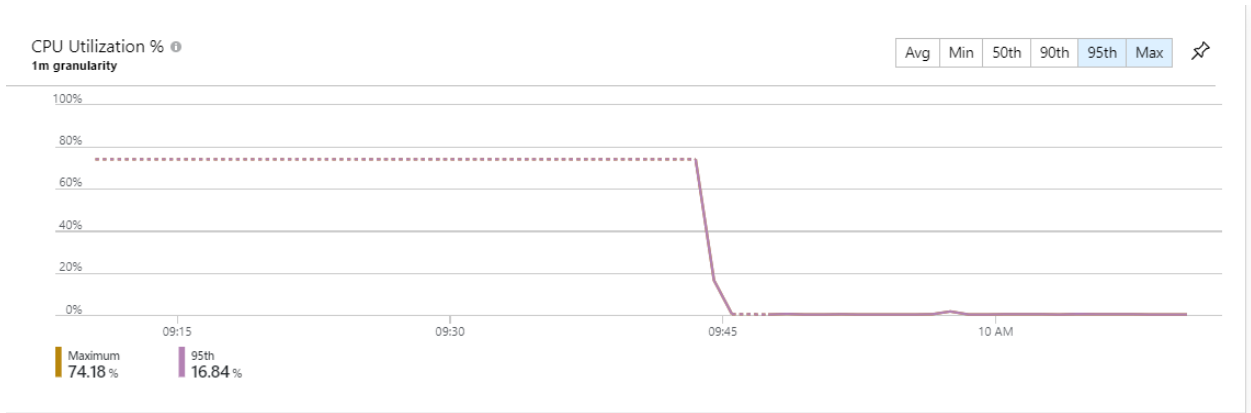
## Data from Min CPU utilization



Data for Avg CPU utilization



Data for Max CPU utilization



Sample VM1 Insights

Home > SampleVM1

SampleVM1 | Insights

Virtual machine

Search

Resource Group Monitoring Azure Monitor Run Diagnostics Refresh Monitoring configuration Provide Feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Networking

Connect

Disks

Size

Microsoft Defender for Cloud

Advisor recommendations

Extensions + applications

Availability + scaling

Configuration

Identity

Properties

Locks

Get started Performance Map

Time range: Last 30 minutes as of 9 May 10:07

3 Clients

SampleVM1 10 Processes

Port: 443 9 Servers

Port: 123 5 Servers

Port: 53 1 Servers

Port: 80 2 Servers

SampleVM1 Machine Summary

Properties Log Events Alerts Connections Changes

Quick links

Connection details

Fully Qualified Domain Name  
SampleVM1

Operating System  
Linux 5.4.0-1107-azure, Ubuntu 18.04.6 LTS

IPv4 Addresses  
10.0.0.4/24

Health

Machine properties


Azure VM properties

## Log Events:

▼

end

»

 **SampleVM1**  
Machine Log Events

[Properties](#) [Log Events](#) [Alerts](#) [Connections](#) [Changes](#)

Select an event type to open in Log Analytics

EVENT TYPE	COUNT
Heartbeat	24
InsightsMetrics	576
ServiceMapComputer_CL	1
ServiceMapProcess_CL	10
VMBoundPort	72
VMComputer	1
VMConnection	227
VMProcess	10

## InsightMetrics log:

Home > SampleVM1 | Insights >

Logs ASH12345

New Query 1\* x +

ASH12345 Select scope > Run Time range: Last 30 minutes Save Share + New alert rule Export Pin to Format query

2 | where Computer == 'SampleVM1'

Tables Queries Functions ... <<

Search

Filter Group by: Solution

Collapse all

Favorites

You can add favorites by clicking on the star icon

- Azure Monitor for VMs
- AzureResources
- LogManagement
- Custom Logs

Results Chart

TimeGenerated [UTC]	Computer	Origin	Namespace	Name	Val	Tags	AgentId
> 5/9/2023, 7:43:48.021 AM	SampleVM1	vm.azm.ms/map	Computer	Heartbeat	1	("vm.azm.ms/processId":"p-f1e1e2d5654c1483e3b52bda2...	5cf5427e-99b1-4d9b-a912-387a0c55...
> 5/9/2023, 7:44:47.925 AM	SampleVM1	vm.azm.ms/map	Computer	Heartbeat	1	("vm.azm.ms/processId":"p-f1e1e2d5654c1483e3b52bda2...	5cf5427e-99b1-4d9b-a912-387a0c55...
> 5/9/2023, 7:45:48.085 AM	SampleVM1	vm.azm.ms/map	Computer	Heartbeat	1	("vm.azm.ms/processId":"p-f1e1e2d5654c1483e3b52bda2...	5cf5427e-99b1-4d9b-a912-387a0c55...
> 5/9/2023, 7:46:47.989 AM	SampleVM1	vm.azm.ms/map	Computer	Heartbeat	1	("vm.azm.ms/processId":"p-f1e1e2d5654c1483e3b52bda2...	5cf5427e-99b1-4d9b-a912-387a0c55...
> 5/9/2023, 7:47:05.000 AM	SampleVM1	vm.azm.ms	LogicalDisk	BytesPerSecond	0	("vm.azm.ms/mountId":"/mnt")	5cf5427e-99b1-4d9b-a912-387a0c55...
> 5/9/2023, 7:47:05.000 AM	SampleVM1	vm.azm.ms	LogicalDisk	ReadsPerSecond	0	("vm.azm.ms/mountId":"/mnt")	5cf5427e-99b1-4d9b-a912-387a0c55...
> 5/9/2023, 7:47:05.000 AM	SampleVM1	vm.azm.ms	LogicalDisk	WritesPerSecond	0	("vm.azm.ms/mountId":"/mnt")	5cf5427e-99b1-4d9b-a912-387a0c55...
> 5/9/2023, 7:47:05.000 AM	SampleVM1	vm.azm.ms	LogicalDisk	TransfersPerSecond	2.49970178557698	("vm.azm.ms/mountId":"/mnt")	5cf5427e-99b1-4d9b-a912-387a0c55...
> 5/9/2023, 7:47:05.000 AM	SampleVM1	vm.azm.ms	LogicalDisk	TransfersPerSecond	0	("vm.azm.ms/mountId":"/mnt")	5cf5427e-99b1-4d9b-a912-387a0c55...
> 5/9/2023, 7:47:05.000 AM	SampleVM1	vm.azm.ms	LogicalDisk	ReadBytesPerSecond	0	("vm.azm.ms/mountId":"/mnt")	5cf5427e-99b1-4d9b-a912-387a0c55...

- The logs section of a Log Analytics workspace opens with a prepopulated query showing the data being collected.

## Virtual Machine 2 Insights:

SampleVM2 | Insights ☆ ...

Virtual machine

Search

Resource Group Monitoring Azure Monitor Run Diagnostics Refresh Monitoring configuration Provide Feedback

The virtual machine is currently using Log Analytics agent. Azure Monitor Agent is now available. →

Get started Performance Map

DISK	CURRENT SIZE (GB)	CURRENT USED (%)	P95 IOPS READ	P95 IOPS WRITE	P95 IOPS TOTAL	P95 MB/s READ	P95 MB/s WRITE	P95 MB/s TOTAL
/	28.89	8%	0.02	3.38	3.38	0	0.02	0.02
/mnt	6.79	5%	0	0	0	0	0	0
Total	35.69	7%	0.02	3.38	3.38	0	0.02	0.02

CPU Utilization % @ 1m granularity

Avg Min 50th 90th 95th Max

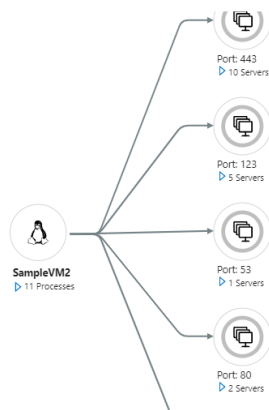
Available Memory @ 1m granularity

Avg Max 50th 10th 5th Min

Average 0.76 % 1.77 %

Average 2.9 GB 2.9 GB 2.9 GB

Time range: Last 30 minutes as of 9 May 10:21



View Workbooks

Legend

**SampleVM2**  
Machine Summary[Properties](#) [Log Events](#) [Alerts](#) [Connections](#) [Changes](#)

## Quick links

[Connection details](#)

Fully Qualified Domain Name

SampleVM2

Operating System

Linux 5.4.0-1107-azure, Ubuntu 18.04.6 LTS

IPv4 Addresses

10.0.0.5/24

## &gt; Health

## &gt; Machine properties

## &gt; Azure VM properties



d

**SampleVM2**  
Machine Log Events[Properties](#)[Log Events](#)[Alerts](#)[Connections](#)[Changes](#)

Select an event type to open in Log Analytics

EVENT TYPE	COUNT
Heartbeat	30
InsightsMetrics	719
ServiceMapProcess_CL	4
VMBoundPort	87
VMConnection	265
VMProcess	6

# Displaying the results as a chart:

