#### Exercise 1

# Lab 11 - Implement Monitoring Student lab manual

### Lab scenario

You need to evaluate Azure functionality that would provide insight into performance and configuration of Azure resources, focusing in particular on Azure virtual machines. To accomplish this, you intend to examine the capabilities of Azure Monitor, including Log Analytics.

# Objectives

In this lab, you will:

- Task 1: Provision the lab environment
- Task 2: Create and configure an Azure Log Analytics workspace and Azure Automation-based solutions
- Task 3: Review default monitoring settings of Azure virtual machines
- Task 4: Configure Azure virtual machine diagnostic settings
- Task 5: Review Azure Monitor functionality
- Task 6: Review Azure Log Analytics functionality

## Estimated timing: 45 minutes

## Instructions

#### **Exercise 1**

#### Task 1: Provision the lab environment

In this task, you will deploy a virtual machine that will be used to test monitoring scenarios.

- 1. Sign in to the Azure portal.
- 2. In the Azure portal, open the Azure Cloud Shell by clicking on the icon in the top right of the Azure Portal.
- 3. If prompted to select either **Bash** or **PowerShell**, select **PowerShell**.
  - Note: If this is the first time you are starting Cloud Shell and you are presented with the You have no storage mounted message, select the subscription you are using in this lab, and click Create storage.
- 4. In the toolbar of the Cloud Shell pane, click the Upload/Download files icon, in the drop-down menu, click Upload and upload the files \Allfiles\Labs\11\az104-11-vm-template.json and \Allfiles\Labs\11\az104-11-vm-parameters.json into the Cloud Shell home directory.
- 5. From the Cloud Shell pane, run the following to create the resource group that will be hosting the virtual machines (replace the [Azure\_region] placeholder with the name of an Azure region where you intend to deploy Azure virtual machines):

Į	Note: Make sure to choose one of the regions listed as Log Analytics Workspace Region in the referen	
	Workspace mappings documentation	



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```
$location = '[Azure_region]'

$rgName = 'az104-11-rg0'

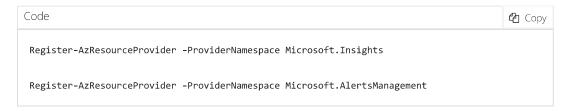
New-AzResourceGroup -Name $rgName -Location $location
```

6. From the Cloud Shell pane, run the following to create the first virtual network and deploy a virtual machine into it by using the template and parameter files you uploaded:



#### Task 2: Register the Microsoft.Insights and Microsoft.AlertsManagement resource providers.

1. From the Cloud Shell pane, run the following to register the Microsoft.Insights and Microsoft.AlertsManagement resource providers.



2. Minimize Cloud Shell pane (but do not close it).

#### Task 3: Create and configure an Azure Log Analytics workspace and Azure Automation-based solutions

In this task, you will create and configure an Azure Log Analytics workspace and Azure Automation-based solutions

- 1. In the Azure portal, search for and select **Log Analytics workspaces** and, on the **Log Analytics workspaces** blade, click **+ Add**.
- On the Basics tab of the Create Log Analytics workspace blade, the following settings, click Review +
   Create and then click Create:

Settings	Value
Subscription	the name of the Azure subscription you are using in this lab
Resource group	the name of a new resource group az104-11-rg1
Log Analytics Workspace	any unique name
Region	the name of the Azure region into which you deployed the virtual machine in the previous task

Note: Make sure that you specify the same region into which you deployed virtual machines in the previous task.

Note: Wait for the deployment to complete. The deployment should take about 1 minute.

3. In the Azure portal, search for and select **Automation Accounts**, and on the **Automation Accounts** blade, click + **Add**.

4. On the Add Automation Account blade, specify the following settings, and click Create:

Settings	Value
Name	any unique name
Subscription	the name of the Azure subscription you are using in this lab
Resource group	az104-11-rg1
Location	the name of the Azure region determined based on <u>Workspace mappings</u> documentation
Create Azure Run As account	Yes

**Note**: Make sure that you specify the Azure region based on the <u>Workspace mappings documentation</u>

Note: Wait for the deployment to complete. The deployment might take about 3 minutes.

- On the Add Automation Account blade, click Refresh and then click the entry representing your newly created Automation account.
- 6. On the Automation account blade, in the Configuration Management section, click Inventory.
- 7. In the **Inventory** pane, in the **Log Analytics workspace** drop-down list, select the Log Analytics workspace you created earlier in this task and click **Enable**.

Note: Wait for the installation of the corresponding Log Analytics solution to complete. This might take about 3 minutes.

Note: This automatically installs the **Change tracking** solution as well.

8. On the Automation account blade, in the **Update Management** section, click **Update management** and click **Enable**.

Note: Wait for the installation to complete. This might take about 5 minutes.

#### Task 4: Review default monitoring settings of Azure virtual machines

In this task, you will review default monitoring settings of Azure virtual machines

- 1. In the Azure portal, search for and select **Virtual machines**, and on the **Virtual machines** blade, click az104-11-vm0.
- 2. On the az104-11-vm0 blade, in the Monitoring section, click Metrics.

On the \*\*az104- Metrics\*\* blade, on the default chart, note that the only available **Metrics Namespace** is 3. 11-vm0 **Virtual Machine Host**.

	Note: This is expected, since no guest-level diagnostic settings have been configured yet. You do have, however, the option of enabling guest memory metrics directly from the Metrics Namespace drop down-list. You will enable it later in this exercise.			
4.	In the <b>Metric</b> drop-down list, review the list of available metrics.			
	Note: The list includes a range of CPU, disk, and network-related metrics that can be collected from the virtual machine host, without having access into guest-level metrics.			
	n the <b>Metric</b> drop-down list, select <b>Percentage CPU</b> , in the <b>Aggregation</b> drop-down list, select <b>Avg</b> , and eview the resulting chart.			
k 5	Configure Azure virtual machine diagnostic settings			
his	ask, you will configure Azure virtual machine diagnostic settings.			
1. (	n the az104-11-vm0 blade, in the Monitoring section, click Diagnostic settings.			
2.	On the <b>Overview</b> tab of the **az104-11-vm0 Diagnostic settings** blade, click <b>Enable guest-level monitoring</b> .			
	Note: Wait for the operation to take effect. This might take about 3 minutes.			
3.	Switch to the <b>Performance counters</b> tab of the **az104- Diagnostic settings** blade and review the available counters.			
	Note: By default, CPU, memory, disk, and network counters are enabled. You can switch to the <b>Custom</b> view for more detailed listing.			
4.	Switch to the <b>Logs</b> tab of the **az104- Diagnostic settings** blade and review the available event log collection options.			
	Note: By default, log collection includes critical, error, and warning entries from the Application Log and System log, as well as Audit failure entries from the Security log. Here as well you can switch to the <b>Custom</b> view for more detailed configuration settings.			
5. (	n the az104-11-vm0 blade, in the Monitoring section, click Logs and then click Enable.			
	n the <b>az104-11-vm0 - Logs</b> blade, ensure that the Log Analytics workspace you created earlier in this la selected in the <b>Choose a Log Analytics Workspace</b> drop-down list and click <b>Enable</b> .			
	Note: Do not wait for the operation to complete but instead proceed to the next step. The operation might take about 5 minutes.			
7.	On the **az104-11-vm0 Logs** blade, in the <b>Monitoring</b> section, click <b>Metrics</b> .			
8.	On the Metrics** blade, on the default chart, note that at this point, the <b>Metrics Namespace</b> drop-down list, in addition to the <b>Virtual Machine Host</b> entry includes also the <b>Guest (classic)</b> entry.  11-vm0			

- 9. In the Metrics Namespace drop-down list, select the Guest (classic) entry.
- 10. In the **Metric** drop-down list, review the list of available metrics.

Note: The list includes additional guest-level metrics not available when relying on the host-level monitoring only.

11. In the **Metric** drop-down list, select **Memory\Available Bytes**, in the **Aggregation** drop-down list, select **Max**, and review the resulting chart.

#### Task 6: Review Azure Monitor functionality

- 1. In the Azure portal, search for and select **Monitor** and, on the \*\*Monitor Overview\*\* blade, click **Metrics**.
- On the Select a scope blade, on the Browse tab, navigate to the az104-11-rg0 resource group, expand it, select the checkbox next to the az104-11-vm0 virtual machine entry within that resource group, and click Apply.

Note: This gives you the same view and options as those available from the az104-11-vm0 - Metrics blade.

- 3. In the **Metric** drop-down list, select **Percentage CPU**, in the **Aggregation** drop-down list, select **Avg**, and review the resulting chart.
- 4. On the \*\*Monitor Metrics\*\* blade, on the Avg Percentage CPU for az104-11-vm0 pane, click New alert rule.

Note: Creating an alert rule from Metrics is not supported for metrics from the Guest (classic) metric namespace. This can be accomplished by using Azure Resource Manager templates, as described in the document Send Guest OS metrics to the Azure Monitor metric store using a Resource Manager template for a Windows virtual machine

- 5. On the **Create alert rule** blade, in the **Condition** section, click the existing condition entry.
- 6. On the **Configure signal logic** blade, in the list of signals, in the **Alert logic** section, specify the following settings (leave others with their default values) and click **Done**:

Settings	Value
Threshold	Static
Operator	Greater than
Aggregation type	Average
Threshold value	2
Aggregation granularity (Period)	1 minute
Frequency of evaluation	Every 1 Minute

- 7. On the Create alert rule blade, in the Action group section, click Add action groups and then click the + Create action group button.
- 8. On the **Basics** tab of the **Create action group** blade, specify the following settings (leave others with their default values) and select **Next: Notifications** >:

Settings	Value
Subscription	the name of the Azure subscription you are using in this lab
Resource group	az104-11-rg1
Action group name	az104-11-ag1

Settings	Value
Display name	az104-11-ag1

- 9. On the **Notifications** tab of the **Create action group** blade, in the **Notification type** drop-down list, select **Email/SMS/Push/Voice**.
- 10. On the Email/SMS/Push/Voice blade, select the Email checkbox, type your email address in the Email textbox, leave others with their default values, click OK, back on the Notifications tab of the Create action group blade, in the Name text box, type admin email and select Next: Actions >:
- 11. On the **Actions** tab of the **Create action group** blade, review items available in the **Action type** dropdown list without making any changes and select **Review + create**.
- 12. On the Review + create tab of the Create action group blade, select Create.
- 13. Back on the **Create alert rule** blade, in the **Alert rule details** section, specify the following settings (leave others with their default values):

Settings	Value
Alert rule name	CPU Percentage above the test threshold
Description	CPU Percentage above the test threshold
Severity	Sev 3
Enable rule upon creation	Yes

14. Click Create alert rule.

created alert rule.

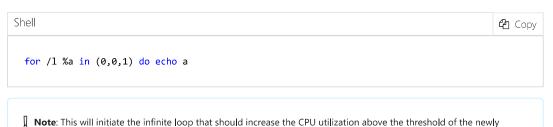
Note: It can take up to 10 minutes for a metric alert rule to become active.

- 15. In the Azure portal, search for and select **Virtual machines**, and on the **Virtual machines** blade, click az104-11-vm0.
- 16. On the az104-11-vm0 blade, click Connect, in the drop-down menu, click RDP, on the Connect with RDP blade, click Download RDP File and follow the prompts to start the Remote Desktop session.

**Note**: This step refers to connecting via Remote Desktop from a Windows computer. On a Mac, you can use Remote Desktop Client from the Mac App Store and on Linux computers you can use an open source RDP client software.

**Note**: You can ignore any warning prompts when connecting to the target virtual machines.

- 17. When prompted, sign in by using the **Student** username and **Pa55w.rd1234** password.
- 18. Within the Remote Desktop session, click **Start**, expand the **Windows System** folder, and click **Command Prompt**.
- 19. From the Command Prompt, run the following to trigger increased CPU utilization on the **az104-11-vm0**Azure VM:



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- 20. Leave the Remote Desktop session open and switch back to the browser window displaying the Azure portal on your lab computer.
- 21. In the Azure portal, navigate back to the **Monitor** blade and click **Alerts**.
- 22. Note the number of **Sev 3** alerts and then click the **Sev 3** row.

Note: You might need to wait for a few minutes and click Refresh.

23. On the All Alerts blade, review generated alerts.

#### Task 7: Review Azure Log Analytics functionality

1. In the Azure portal, navigate back to the Monitor blade, click Logs.

Note: You might need to click **Get Started** if this is the first time you access Log Analytics.

- If necessary, click Select scope, on the Select a scope blade, select the Recent tab, select a104-11-vm0, and click Apply.
- 3. In the query window, paste the following query, click Run, and review the resulting chart:

```
Shell

// Virtual Machine available memory

// Chart the VM's available memory over the last hour.

InsightsMetrics
| where TimeGenerated > ago(1h)
| where Name == "AvailableMB"
| project TimeGenerated, Name, Val
| render timechart
```

- 4. Click **Queries** in the toolbar, on the **Queries** pane, locate the **Track VM availability** tile, click the **Run** command button in the tile, and review the results.
- 5. On the **New Query 1** tab, select the **Tables** header, and review the list of tables in the **Virtual machines** section.

Note: The names of several tables correspond to the solutions you installed earlier in this lab.

- 6. Hover the mouse over the **VMComputer** entry and click the **Preview data** icon.
- 7. If any data is available, in the **Update** pane, click **See in query editor**.

**Note**: You might need to wait a few minutes before the update data becomes available.

#### Clean up resources

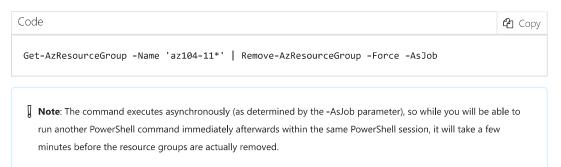
Note: Remember to remove any newly created Azure resources that you no longer use. Removing unused resources ensures you will not see unexpected charges.

- 1. In the Azure portal, open the **PowerShell** session within the **Cloud Shell** pane.
- 2. List all resource groups created throughout the labs of this module by running the following command:

Code Copy

Get-AzResourceGroup -Name 'az104-11\*'

3. Delete all resource groups you created throughout the labs of this module by running the following command:



#### Review

In this lab, you have:

- Provisioned the lab environment
- Created and configured an Azure Log Analytics workspace and Azure Automation-based solutions
- Reviewed default monitoring settings of Azure virtual machines
- Configured Azure virtual machine diagnostic settings
- Reviewed Azure Monitor functionality
- Reviewed Azure Log Analytics functionality