Provisioning for Azure
Cost Optimization & Monitoring Project
Project Starter Template

STEP 0: Problem Background

Company "X" is an engineering company that has offices in both the US East & West Coast. They currently host all their data and applications in a single East coast data center and are constantly worried about both cost and resiliency. Below is how their current servers are configured.

Server(s):	**Purpose:** Windows/Linux Server **Environment:** Physical Servers **Operating System:** Windows **Operating System License:** DataCenter **Servers:** 10 **Procs per server:** 2 **Core(s) per proc:** 8 Cores **RAM:** 256 GB **Optimize By:** CPU **GPU:** None **Usage:** These are the servers where all your engineering workloads happen. Currently they all are being leveraged at regular capacity.
Server(s):	**Purpose:** Web App **Environment:** Physical Servers **Operating System:** Windows

	Operating System License: DataCenter **Servers:** 3 **Procs per server:** 1 **Core(s) per proc:** 8 Cores **RAM:** 64 GB **Optimize By:** CPU **GPU:** None **Usage:** These are the web app servers for your company. Currently they all are being leveraged at regular capacity.
Server(s):	**Source:** Database Server **Database:** Microsoft SQL Server **License:** Enterprise **Environment:** Physical Servers **Operating System:** Windows **Operating System License:** Datacenter **Servers:** 3 **Procs per server:** 1 **Cores per proc:** 16 Cores **RAM:** 64 GB **Optimize By:** CPU **Usage:** These three servers are running Microsoft SQL Server and provide the database for your engineering company. It is critical that they are always running. **Destination** Service: SQL Database Purchase Model: vCore Service Tier: Business Critical Instance Cores: 2 SQL Server Storage: 5

	SQL Server backup: 0
Storage	**Purpose:** Storage **Type:** Local Disk / SAN **Disk Type:** HDD **Capacity:** 1 TB **Back-Up:** None currently **Archive:** None
Networking	Amount of network bandwidth you currently consume in your on-premises environment: 1 GB

STEP 1: Assessing the On-Premises Environment & Generating Total Cost of Ownership (TCO) Report

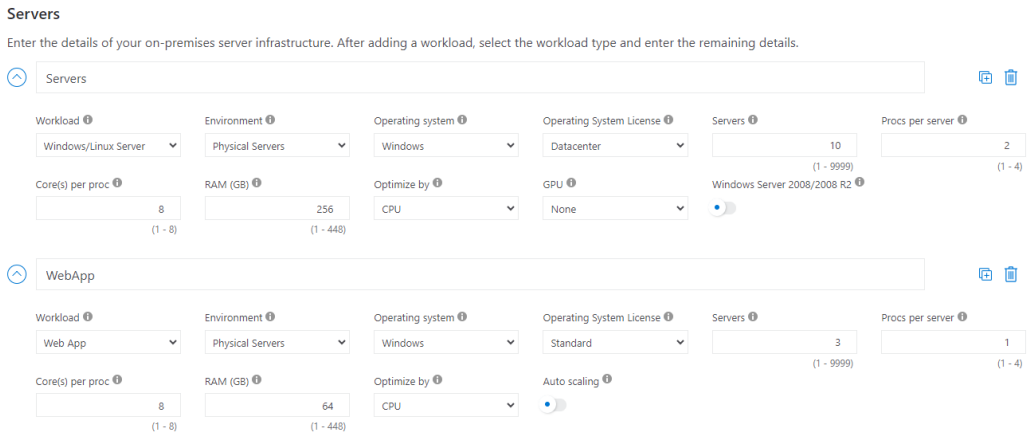
Purpose: To identify the Azure services needed to ensure Company "X"'s business continuity in the cloud.

Current Environment/ Background Make a list of all current on-premises servers and services.	There are 10 Windows VM's which are used for engineering purposes. There are 3 web apps servers which host the front end of the company. There are 3 database servers. There is a storage which is also used to store data.
Matching Azure Services Match the list of on-premises servers and services to the corresponding Azure ones.	1. There are 10 Windows VM's = Azure Virtual Machines (VMs). It provides the ability to create and manages virtual machines in the cloud, provides replicate VM function, scale resources up or down as needed. 2. There are 3 web apps servers = Azure App Service. Azure App Service: Azure App Service is a fully managed platform for building, deploying, and scaling web apps. It supports multiple programming languages and frameworks, making it suitable for hosting the front end of the company's web apps. 3. There are 3 database servers = Azure SQL Database. Azure SQL Database is a managed relational database service that provides a highly available and scalable platform for hosting databases. It offers features like automatic backups, high availability, and built-in security. Migration DB is the useful function.

4. There is a storage = Azure Storage Account. It provides different storage options, such as Blob storage, File storage, and Queue storage, to store and retrieve data.

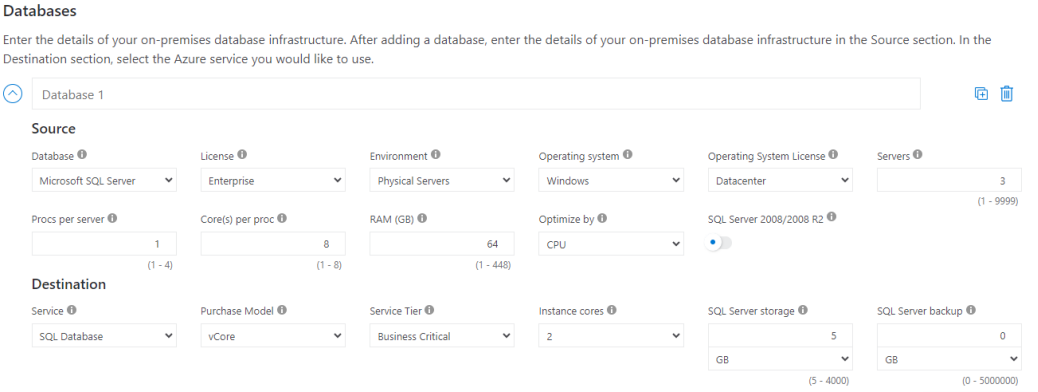
Screenshot 1

Submit the screenshot for each of the above configurations from Azure TCO. VM and Web Apps Server screenshot should be submitted here.



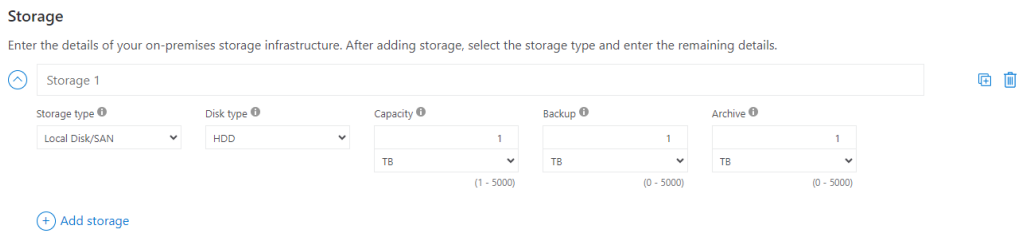
Screenshot 2

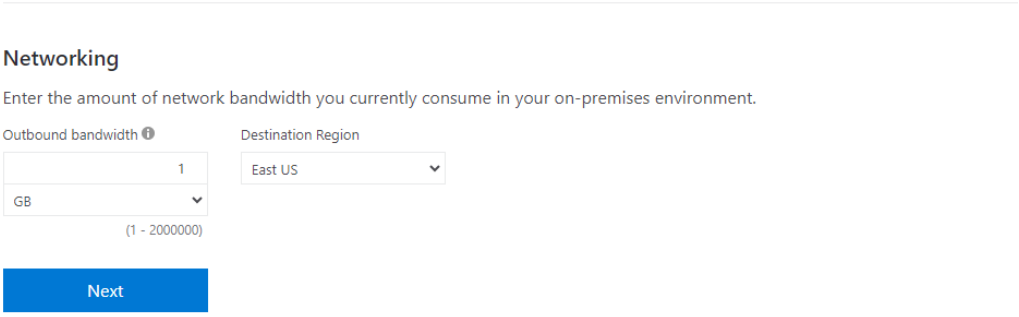
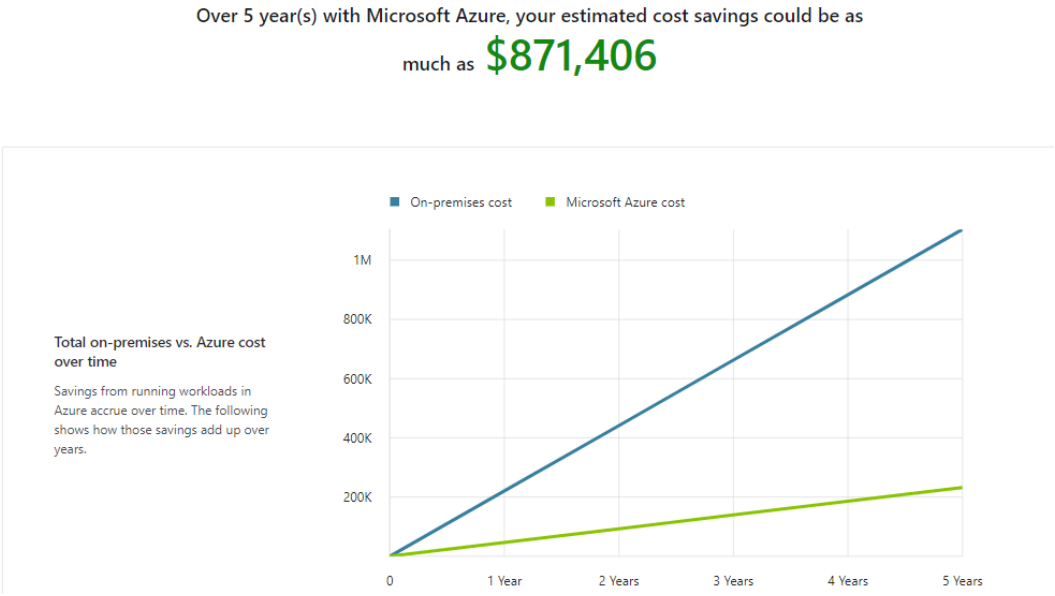
Submit the screenshot for each of the above configurations from Azure TCO. Database screenshot should be submitted here.



Screenshot 3

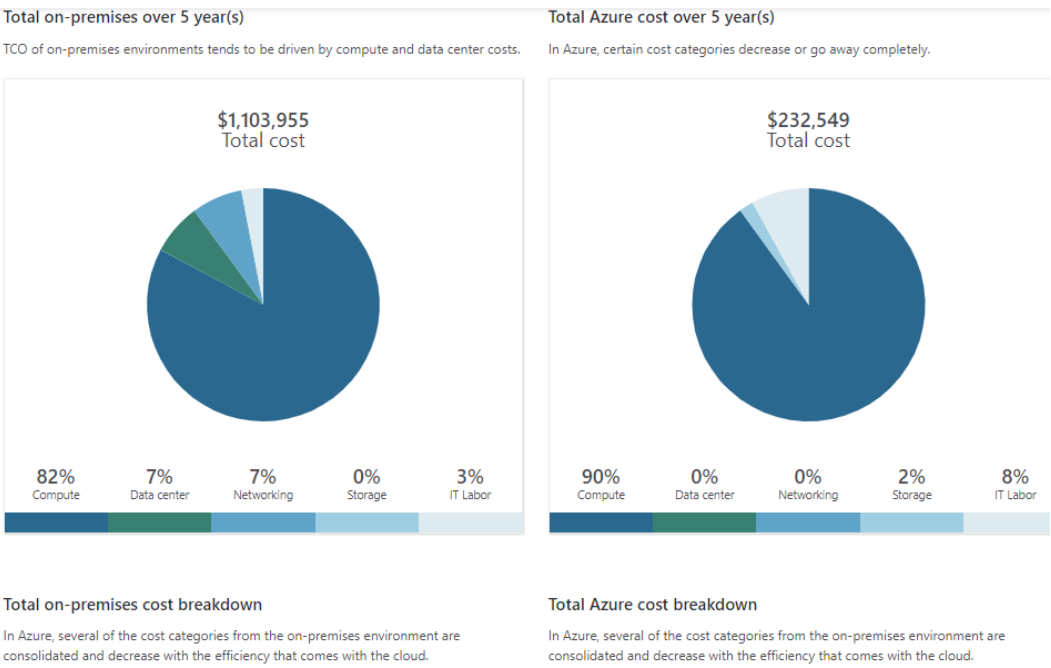
Submit the screenshot for each of the above configurations from Azure TCO. Storage configuration



screenshot should be submitted here.	
Screenshot 4 Submit the screenshot for each of the above configurations from Azure TCO. Networking configuration screenshot should be submitted here.	
Screenshot 5 Once the TCO Report is generated, submit a screenshot of the price comparison graph (line graph) here.	

Screenshot 6

Once the TCO Report is generated, submit a screenshot of the price comparison graph (pie chart) here.



Screenshot 7

Once the TCO Report is generated, submit a screenshot of the price comparison chart (tabular format) here.

On-premises cost breakdown summary

Category	Cost
Compute	$904,385.75
Hardware	$365,668.00
Software	$103,663.75
Electricity	$51,222.00
Database	$383,832.00
Data Center	$81,333.80
Networking	$80,968.72
Storage	$467.20
IT Labor	$36,800.00
Total	$1,103,955.00

Azure cost breakdown summary

Category	Cost
Compute	$209,202.00
Data Center	$0.00
Networking	$0.00
Storage	$4,179.91
IT Labor	$19,167.05
Total	$232,549.00

Explanation 1

Explain the breakdown of the costs and show your understanding of how on-prem costs

Hardware Costs: On-premises infrastructure requires upfront investment in purchasing servers, networking equipment, storage devices, and other hardware components. These costs can be significant and contribute to the overall on-premises expenses. In Azure, hardware costs are included in the pricing model, and you only pay for the resources you use, eliminating the need for upfront hardware investments.

versus Azure compare	Software Costs: On-premises infrastructure often requires purchasing licenses for operating systems, databases, middleware, and other software components. These costs can add up, especially for large-scale deployments. In Azure, the cost of software licenses is included in the pricing, reducing the need for separate software purchases. Maintenance Costs: On-premises infrastructure requires ongoing maintenance, including hardware repairs, software updates, security patches, and system administration. These maintenance activities can be time-consuming and require dedicated IT staff. In Azure, Microsoft takes care of the infrastructure maintenance, reducing the maintenance burden on your organization.

STEP 2: Azure Pricing Calculator Cost Estimates

Purpose: You want to only move the engineering workloads (so just your VM's) to Azure first to try and understand how Azure cloud works. In addition, this will also help you demonstrate to your CIO that by doing that small migration your company can achieve resiliency. You want to provide precise monthly costs to your CIO.

Use the Azure Pricing Calculator to submit the following screenshots.

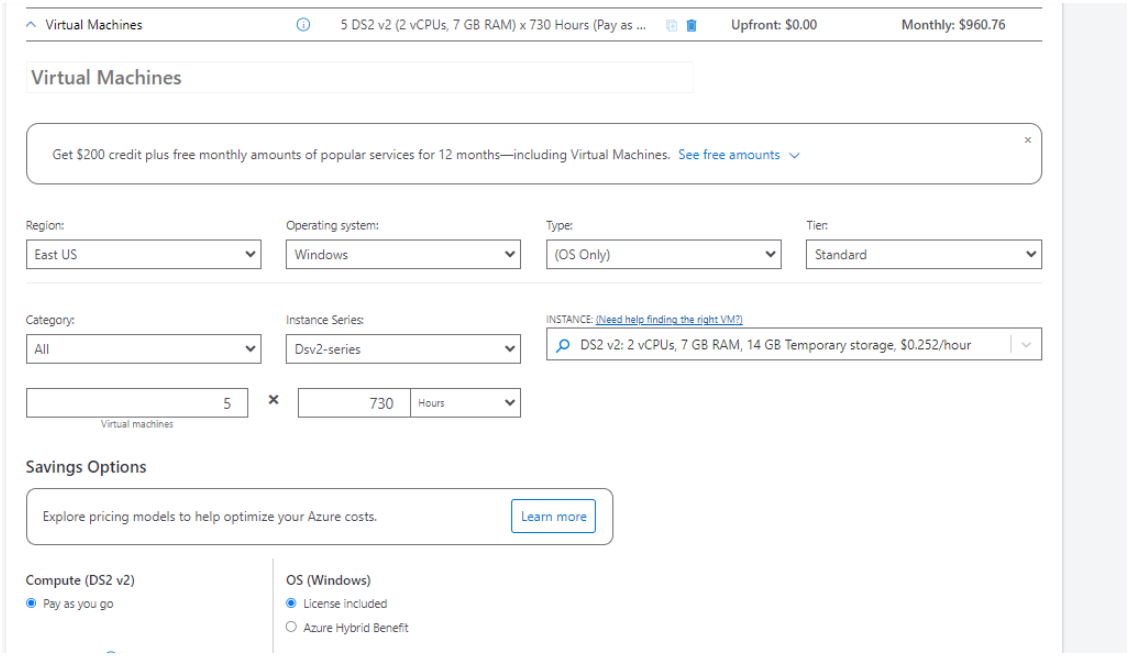
Note: *If you are using Udacity Cloud Labs, you will be allowed to create a few VM sizes only. Visit this link to see all possible VM sizes and go through the classroom instructions for more details.*

Task 1	Matching Azure Services: Match the list of on-premises servers and services to the corresponding Azure ones. Here is the VM configuration you will pick. • 5 VM's will be in US East Coast, and 5 will be in US West Coast. • Choose the instance you want to create in both the regions from the possible VM sizes mentioned in the classroom. • Compute Option will be pay-as-you-go; so, there are no upfront costs.

- The default of 730 hours is selected.

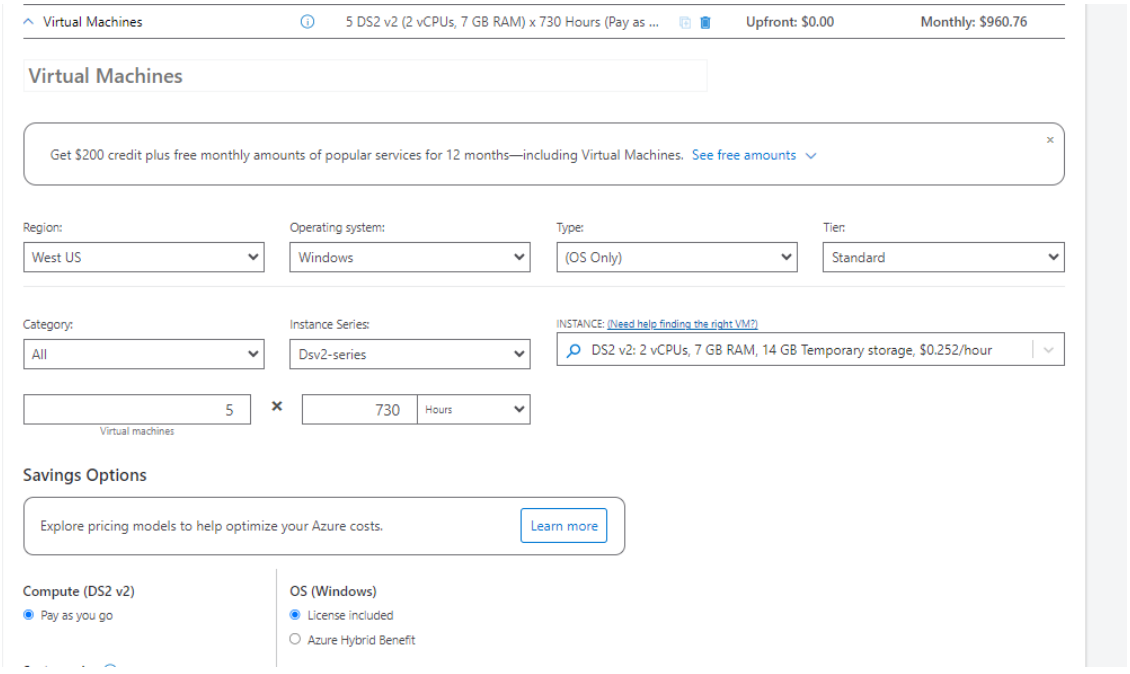
Screenshot 1

Submit the screenshot for each of the above configurations from the Azure Pricing Calculator. Submit the US East Coast monthly costs here.



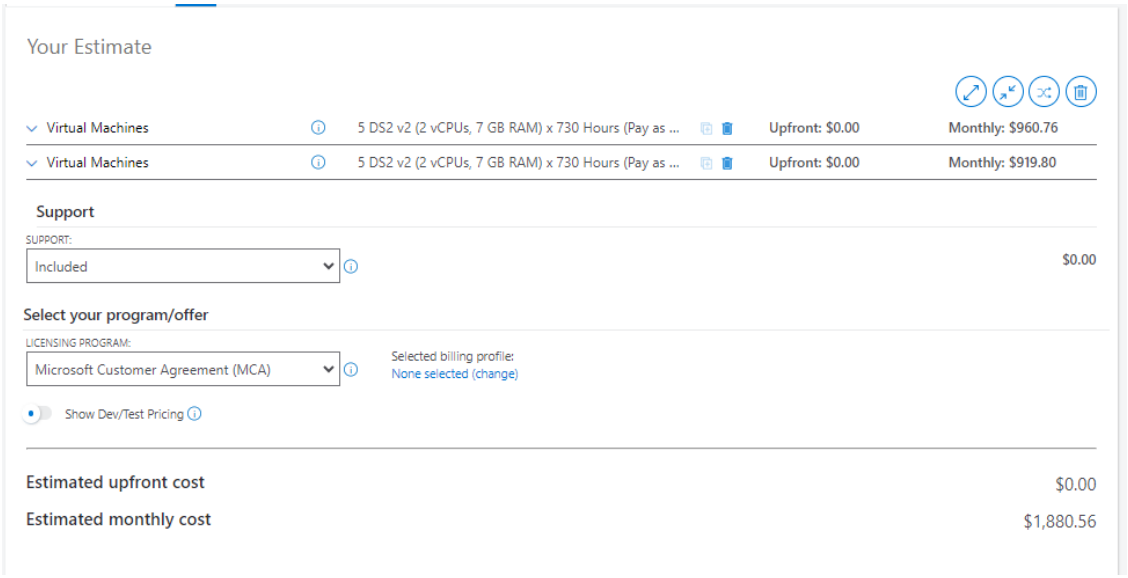
Screenshot 2

Submit the screenshot for each of the above configurations from the Azure Pricing Calculator. Submit the **US West Coast** monthly costs here.



Screenshot 3

Submit the screenshot for total cost per month for both US East and West Coasts.

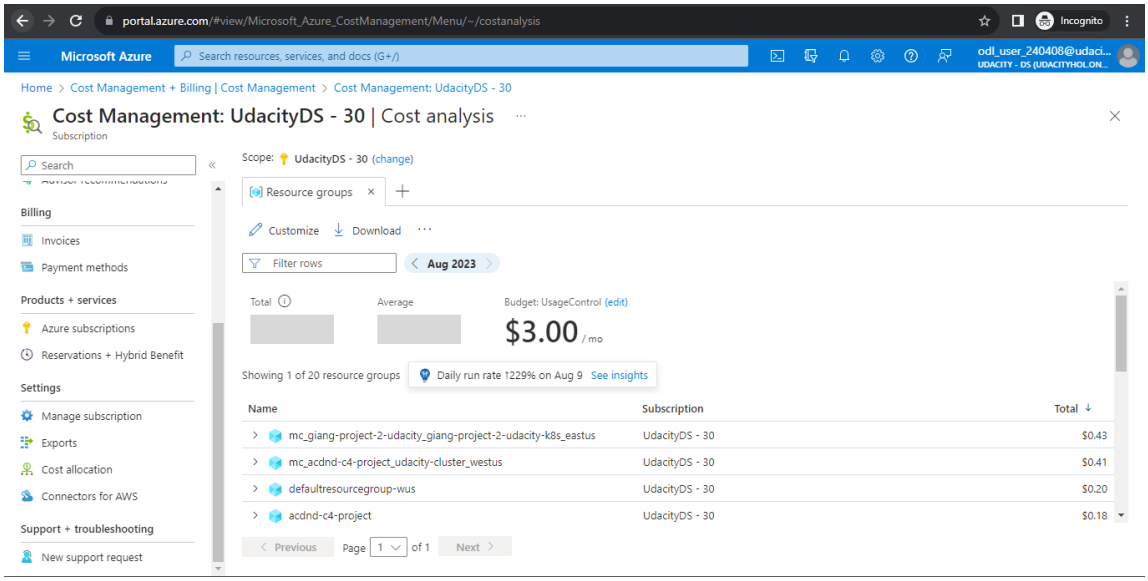


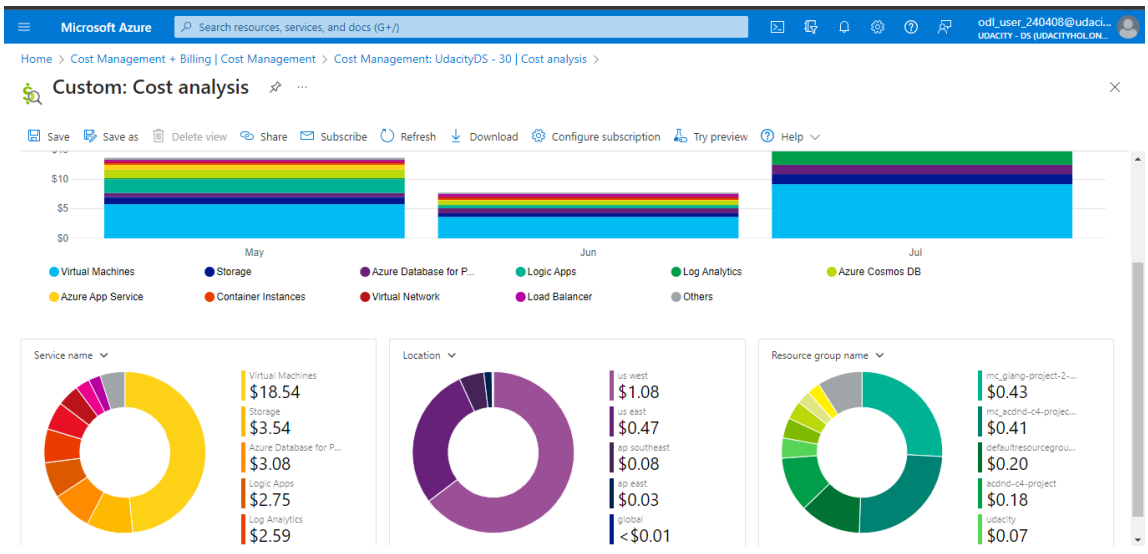
Explanation 1

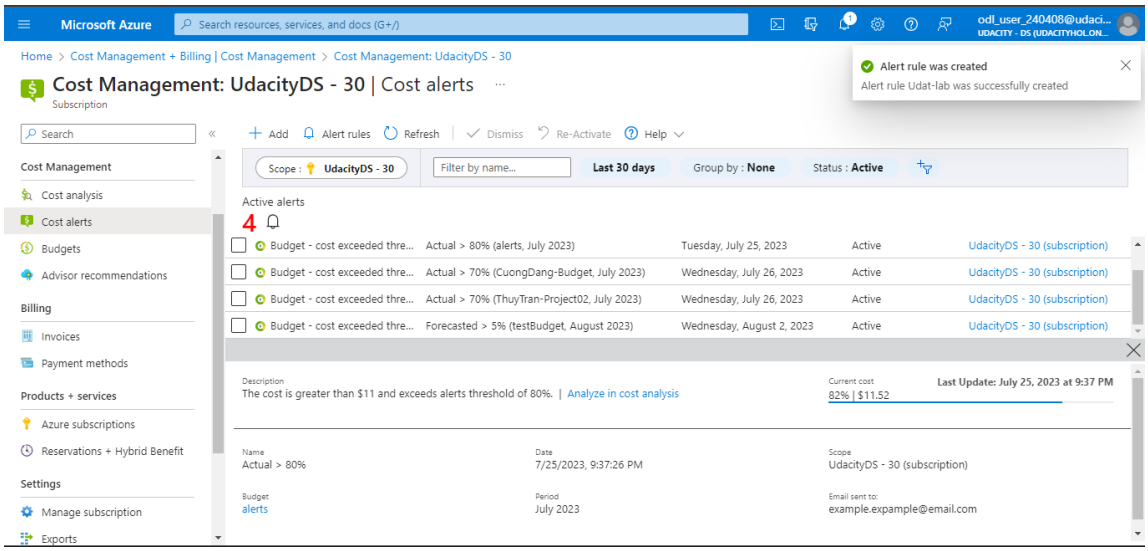
Explain how resilience is built in by moving to Azure

1) High Availability: Azure ensures your apps stay accessible during failures. Deploy across regions for redundancy.
2) Fault Tolerance: Services withstand failures without downtime. Azure Storage replicates data for protection.
3) Disaster Recovery: Shield apps from disasters using Azure Site Recovery for failover and Azure Backup for data protection.
4) Load Balancing: Optimize app performance with Azure Load Balancer and Application Gateway for traffic distribution and failover.
5) Auto Scaling: Automatically adjust resources as needed for peak or low demand, ensuring cost-efficient performance.
6) Monitoring and Alerting: Proactively detect issues with Azure Monitor. Set alerts for rapid response and maintain app health.
7) Security and Compliance: Azure offers robust security, including encryption, access control, and compliance with standards.

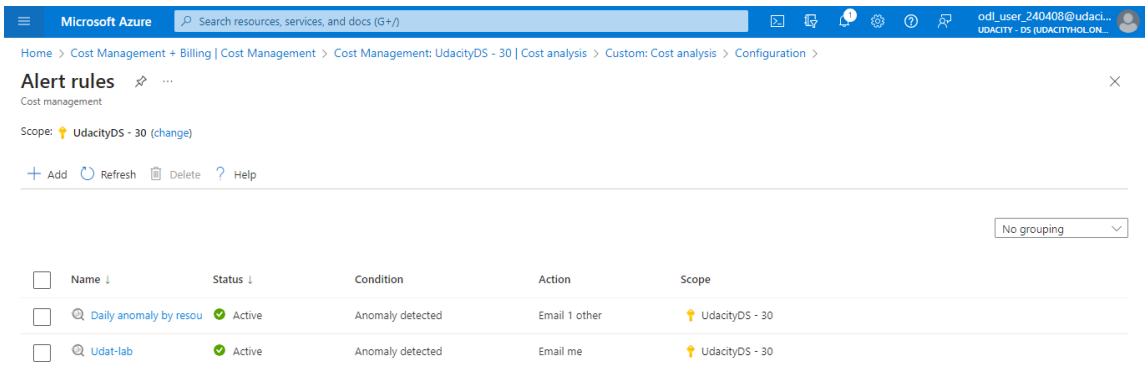
STEP 3: Azure Cost Management + Billing

Background	You have now configured your Azure Production Workload environment and been using Azure for a few days. You have now been tasked by your CIO to present some metrics on how the costs are being billed within Azure and also what other functionalities Azure has in regards to cost management, which were not previously available.
Question 1 Submit the explanation	What is the purpose of Azure Cost Mgmt + billing Dashboard?
Explanation 1	The purpose of the Azure Cost Management + Billing Dashboard is to provide users and organizations with a comprehensive tool to monitor, manage, and optimize their spending and usage on Microsoft Azure services. It offers insights and controls related to the financial aspects of running workloads in the Azure cloud
Screenshot 2 Submit the screenshot for main Cost Mgmt + Billing Dashboard.	**Hint:** Navigate to the Cost Management Section on the left and then click "Cost Analysis" to reach this dashboard. Students need to submit the main screenshot of the Billing dashboard 

Explanation 2 Explain the key components of the screenshot submitted. An explanation to be provided for Scope and Area dropdown from the screenshot submitted.	**Hint**: Make sure the right time period is selected to see the data. Effectively manage and monitor costs associated with resources. It provides a structured approach to organizing resources, allocating costs, and gaining insights into resource usage patterns.
Screenshot 3 Submit the screenshot for breakdown of costs by Service Name and Location.	**Hint**: Navigate to Cost Management Section on the left, and then click “Cost Analysis” to reach this dashboard. These pie charts are under the above graph submitted. 
Explanation 3	This allows to track spending at a granular level and identify areas where cost optimization can be achieved. Generate reports, set up budgets, and apply cost management practices specific to each service name and location combination.

Explain the key components of the screenshot submitted.	
Screenshot 4 Submit the screenshot for breakdown of costs by Service Name and Location.	**Hint**: Navigate to Cost Management Section on the left and then click “Cost Alert” to reach this wizard. Next, click on “Add button” on top left under this tab. This is Part 1 of the wizard (of the 2-part process). 
Explanation 4 Explain the key components of the screenshot submitted.	A page cost alert is a feature that allows to set up notifications when Azure spending reaches a certain threshold. It helps to stay informed about the costs and take proactive actions to manage and control spending.
Screenshot 5	**Hint**: This is Part 2 of the wizard (of the 2-part process).

Submit the screenshot for breakdown of costs by Service Name and Location



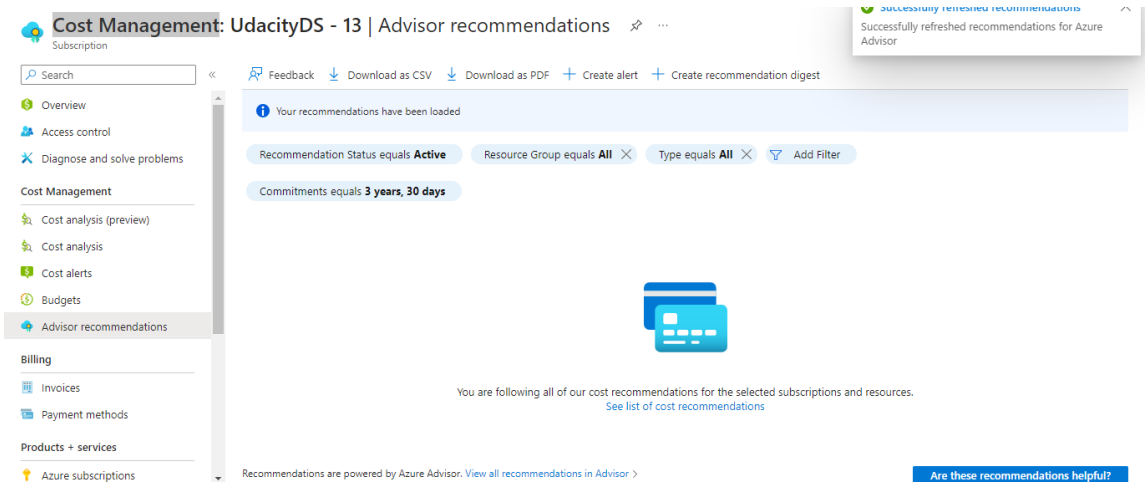
Explanation 5

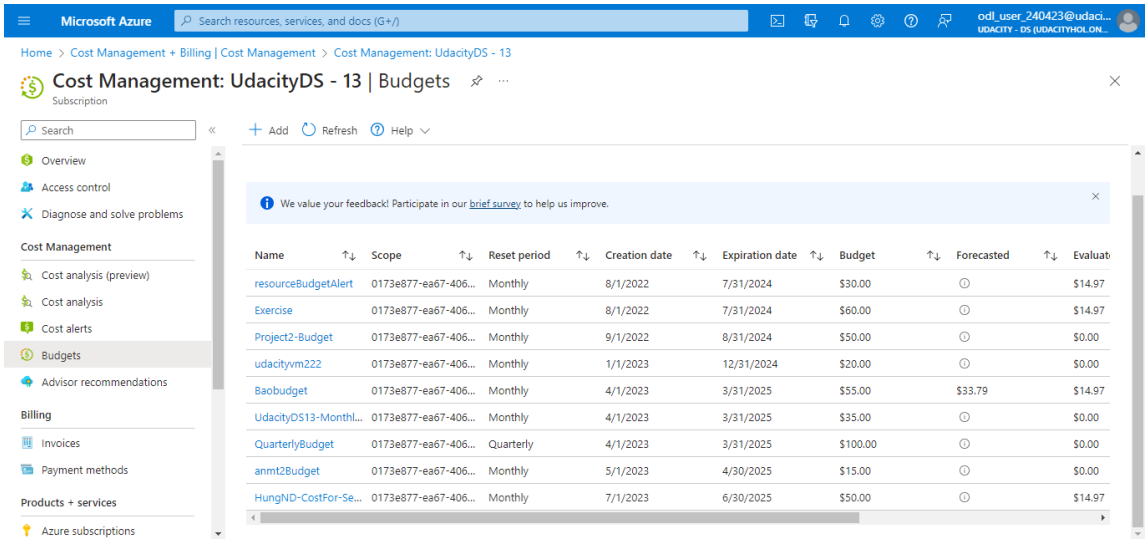
Explain the key components of the screenshot submitted.

Alert rules provide support for proactively monitoring and managing costs in the Azure cloud. Alert rules allow to set up notifications based on specific cost or usage thresholds. This helps you stay informed about any unexpected spikes in spending or usage, allowing to take immediate action.

Screenshot 6

Submit the screenshot for breakdown of costs by Service Name and Location.





Explanation 6

Explain the key components of the screenshot submitted.

Budgets in Azure Cost Management provide valuable support for keeping track of spending and ensuring that you stay within your budget. It helps make informed decisions about resource allocation and cost optimization in Azure environment.

Explanation 7

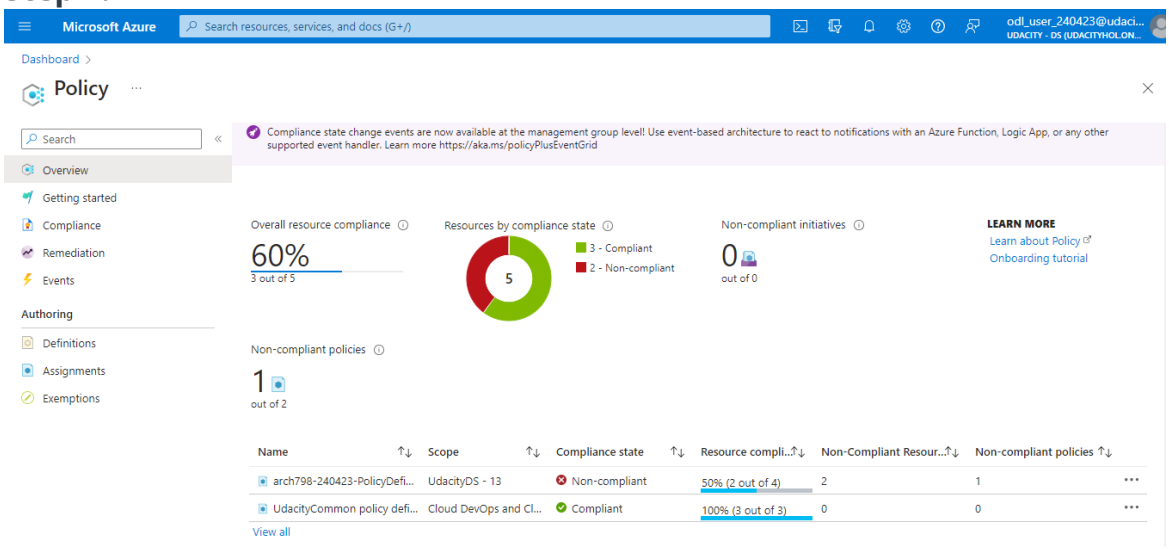
Explain the summarized highlights of this part of the project, Azure Cost Mgmt + Billing

Providing multiple screenshots of the Azure TCO (Total Cost of Ownership) Calculator. These screenshots should show the steps took to create a cost estimate and compare the costs between on-premises and cloud-based solutions. Make sure to explain the details in the screenshots to demonstrate familiarity with the TCO.

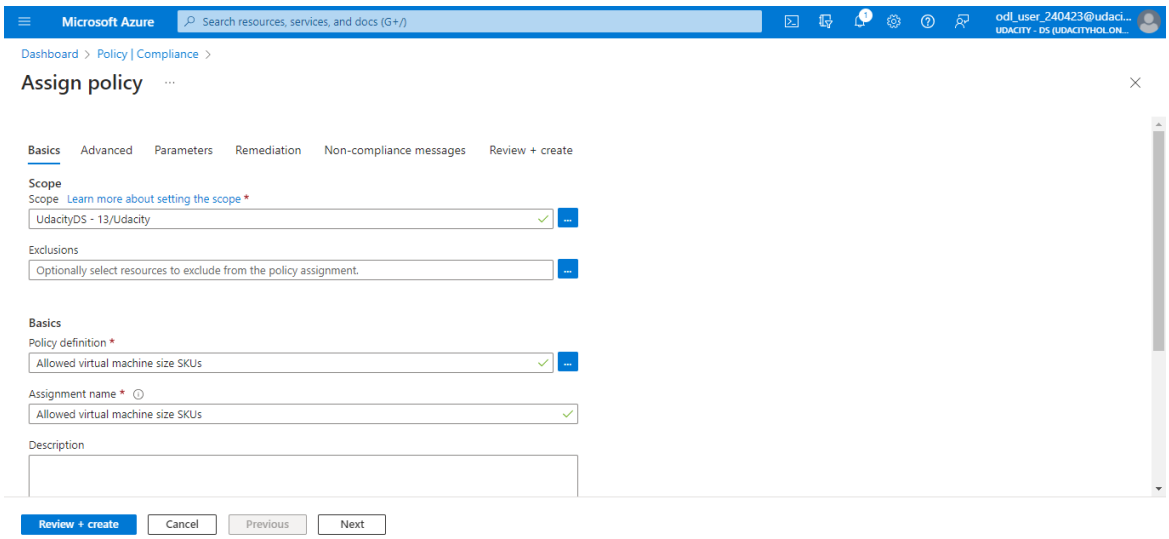
STEP 4: Azure Policy to create and enforce policies

Background	You have now configured your Azure Production Workload environment and been using Azure for a few days. You realize that many infrastructure administrators are creating VM sizes without doing proper due diligence, thus having a direct impact on cost. You now decide to leverage Azure Policy features to ensure that appropriate controls are put in place.
Screenshots 1 through 5 Submit the screenshots for Azure Policy steps.	**Hint**: Navigate to and select the built-in Azure policy "Allowed virtual machine size SKUs;" then follow the wizard steps. Submit a screenshot for every single step of the wizard so that any mistakes in the final step can be caught by your reviewer. **Very important note:** 1. Due to lab restrictions, while you go through the wizard, you will not be allowed to create the policy in the final step. Please submit all screenshots though 2. So for the Part 2 of this project to be submitted, a successful policy has already been created in the lab for you, which can be used to test the VM creation scenario. Please ensure to double check which VM series is allowed to be created in the lab and ensure that you do not use the same series for passing this part of the project

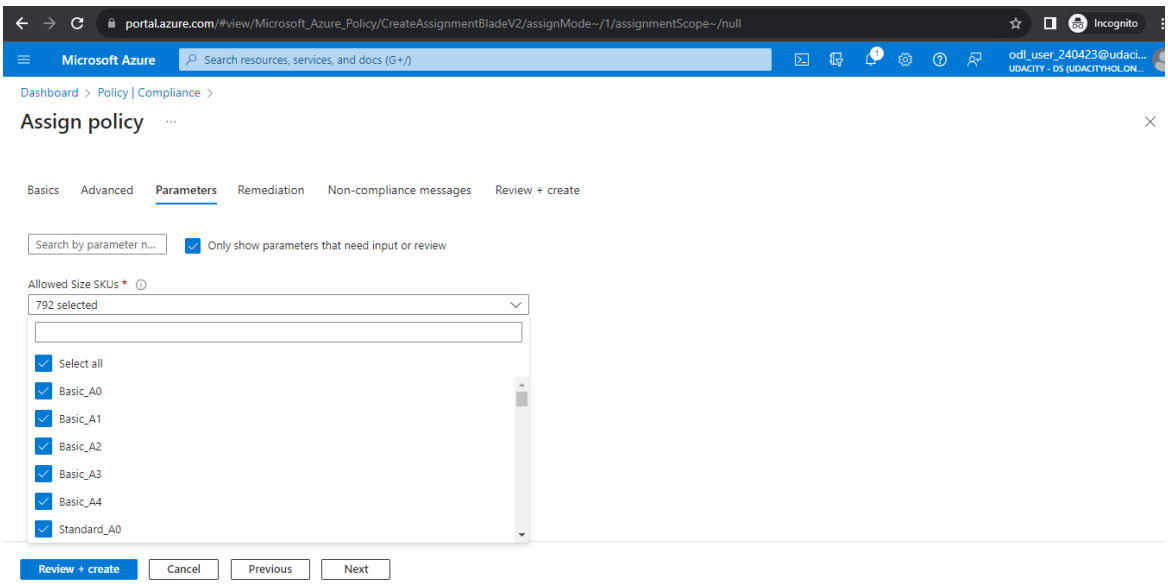
Step 1:



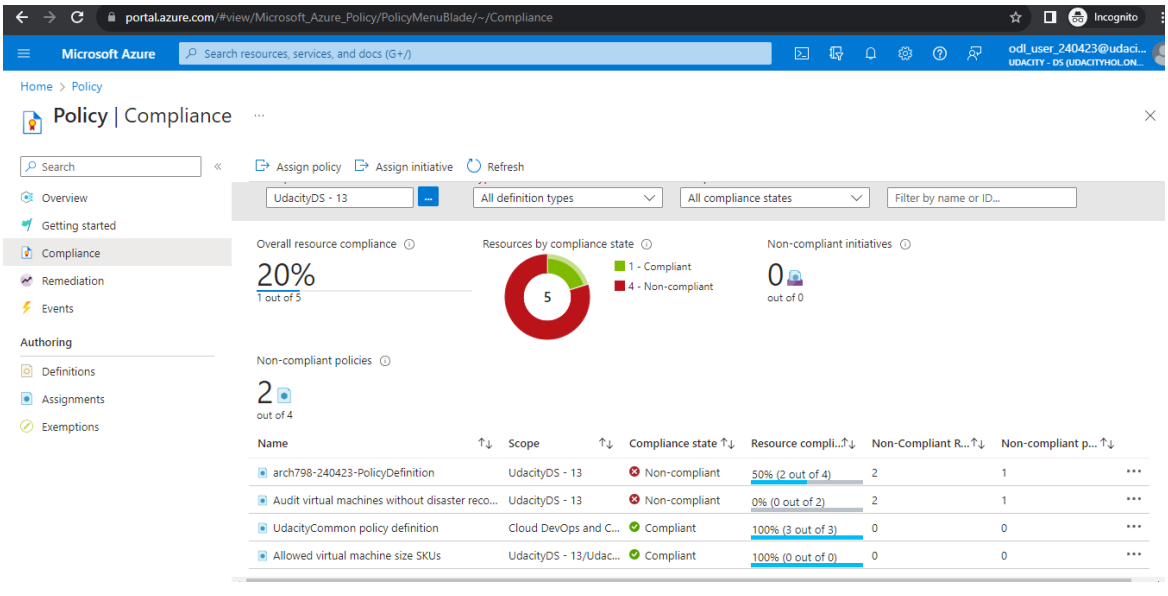
Step 2:



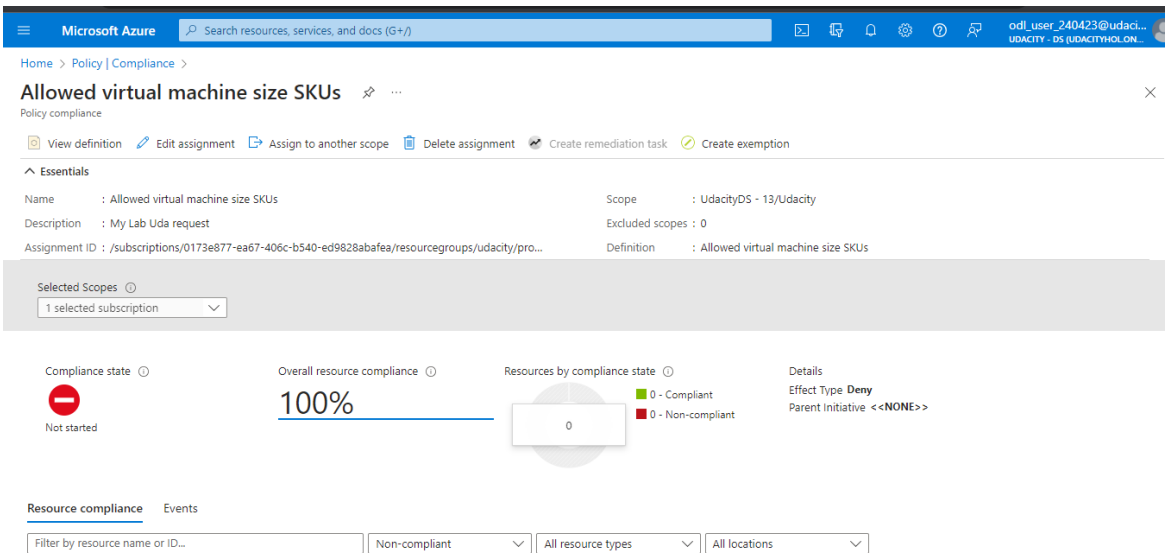
Step 3


portal.azure.com/#view/Microsoft_Azure_Policy/CreateAssignmentBladeV2/assignMode~/1/assignmentScope~/null
Incognito
Microsoft Azure
Search resources, services, and docs (G+/)
odl_user_240423@udaci...
UDACITY - DS (UDACITYHOLON...
Dashboard > Policy | Compliance >
Assign policy
Basics
Advanced
Parameters
Remediation
Non-compliance messages
Review + create
Search by parameter n...
Only show parameters that need input or review
Allowed Size SKUs *
792 selected
Select all
Basic_A0
Basic_A1
Basic_A2
Basic_A3
Basic_A4
Standard_A0
Review + create
Cancel
Previous
Next

Step 4:


portal.azure.com/#view/Microsoft_Azure_Policy/PolicyMenuBlade/~/Compliance
Incognito
Microsoft Azure
Search resources, services, and docs (G+/)
odl_user_240423@udaci...
UDACITY - DS (UDACITYHOLON...
Home > Policy
Policy | Compliance
Search
Overview
Getting started
Compliance
Remediation
Events
Authoring
Definitions
Assignments
Exemptions
Assign policy
Assign initiative
Refresh
UdacityDS - 13
All definition types
All compliance states
Filter by name or ID...
Overall resource compliance
20%
1 out of 5
Resources by compliance state
5
1 - Compliant
4 - Non-compliant
Non-compliant initiatives
0
out of 0
Non-compliant policies
2
out of 4
Name
Scope
Compliance state
Resource compli...
Non-Compliant R...
Non-compliant p...
arch798-240423-PolicyDefinition
UdacityDS - 13
Non-compliant
50% (2 out of 4)
2
1
Audit virtual machines without disaster reco...
UdacityDS - 13
Non-compliant
0% (0 out of 2)
2
1
UdacityCommon policy definition
Cloud DevOps and C...
Compliant
100% (3 out of 3)
0
0
Allowed virtual machine size SKUs
UdacityDS - 13/Udac...
Compliant
100% (0 out of 0)
0
0

Step 5:



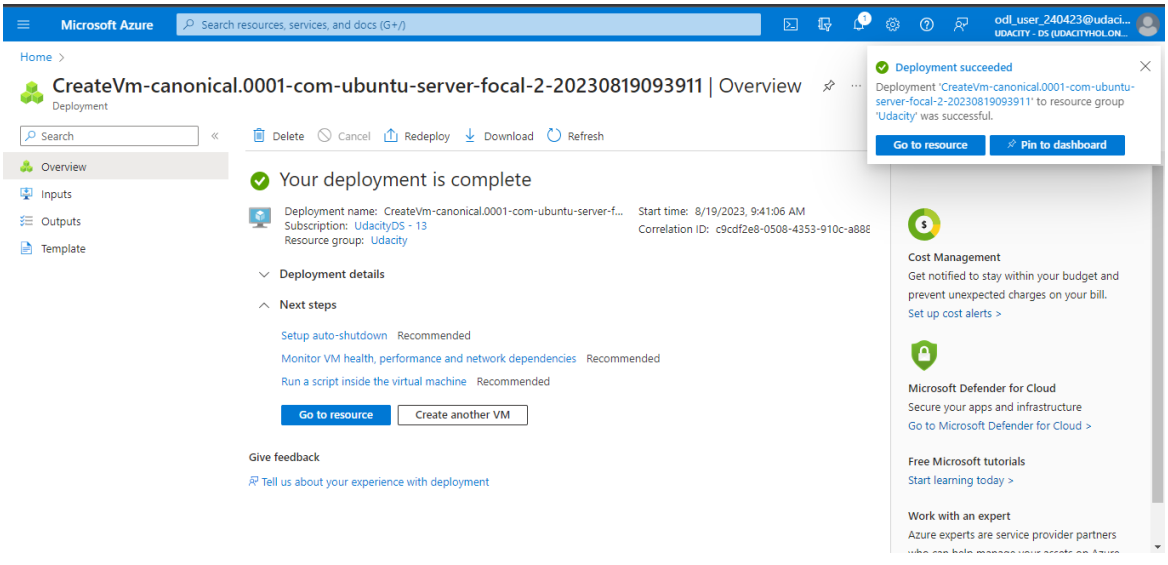
Screenshot 6

Explain through screenshots what happens when you create a VM which is in violation with the policy you just created.

Once the Azure policy creation is complete, try to create a VM which is of a “NOT ALLOWED” size.

Hint: pick any size; it doesn’t matter as long as it's not in the allowed list in Azure policy you just created.

Once you go through the wizard, in the final step you will see the following screenshot, which needs to be submitted.



Explanation 1 Explain the summarized highlights of this part of the project, Azure Policy.	Using Azure Policy to enforce allowed virtual machine size SKUs, it can ensure that only the approved sizes are used, which helps in controlling costs, optimizing resource allocation, and maintaining consistency across your Azure environment.

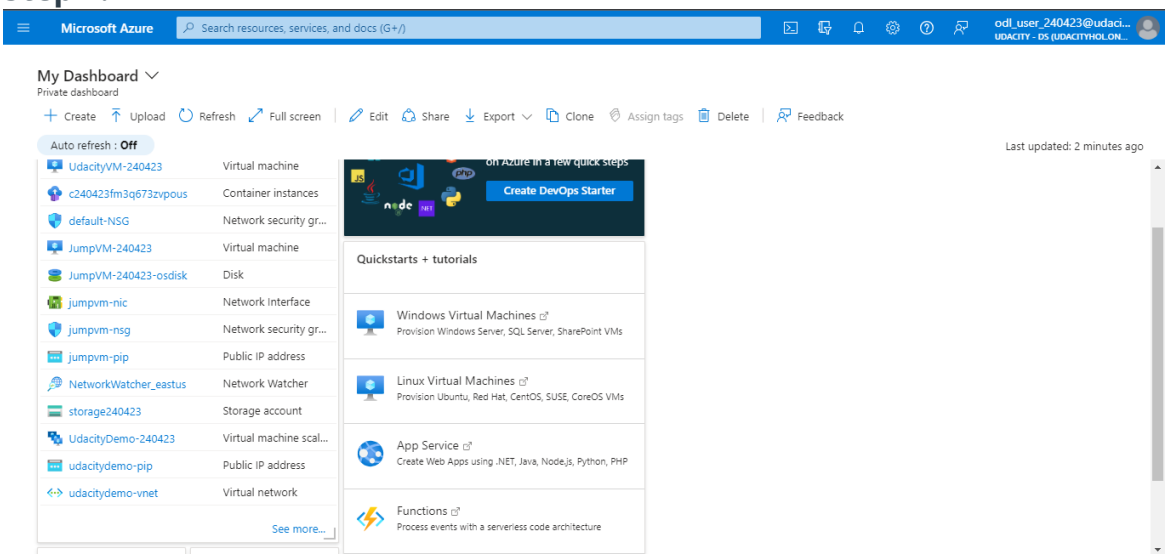
STEP 5: Azure Dashboards

Background	Azure Dashboards are a one stop shop to monitor • Your logs • Your infrastructure • Your applications
Task 1	You need to create an Azure dashboard that will pull in a few widgets: Percentage CPU, All Resources, Resource Groups & Avg CPU Credits Consumed. Submit the screenshots and explain the key components of the Dashboard. Be sure to include a screenshot of the final Dashboard.

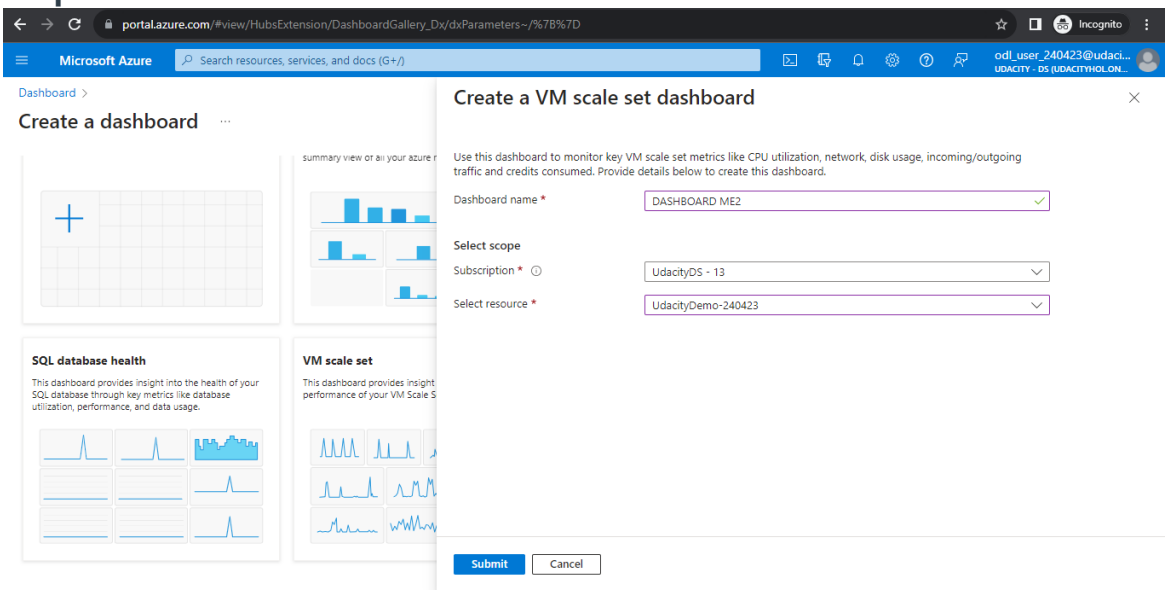
Screenshots 1 through 3

You will submit the screenshots for Overview tab.

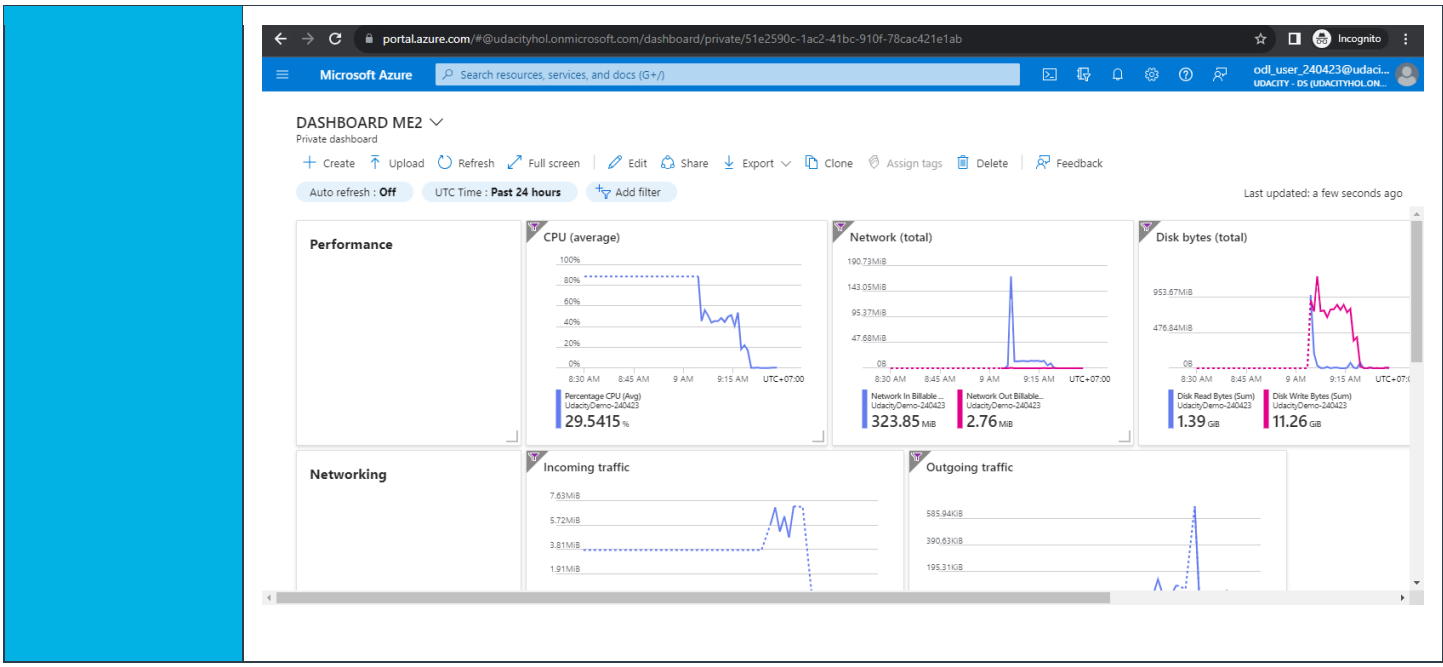
Step 1:



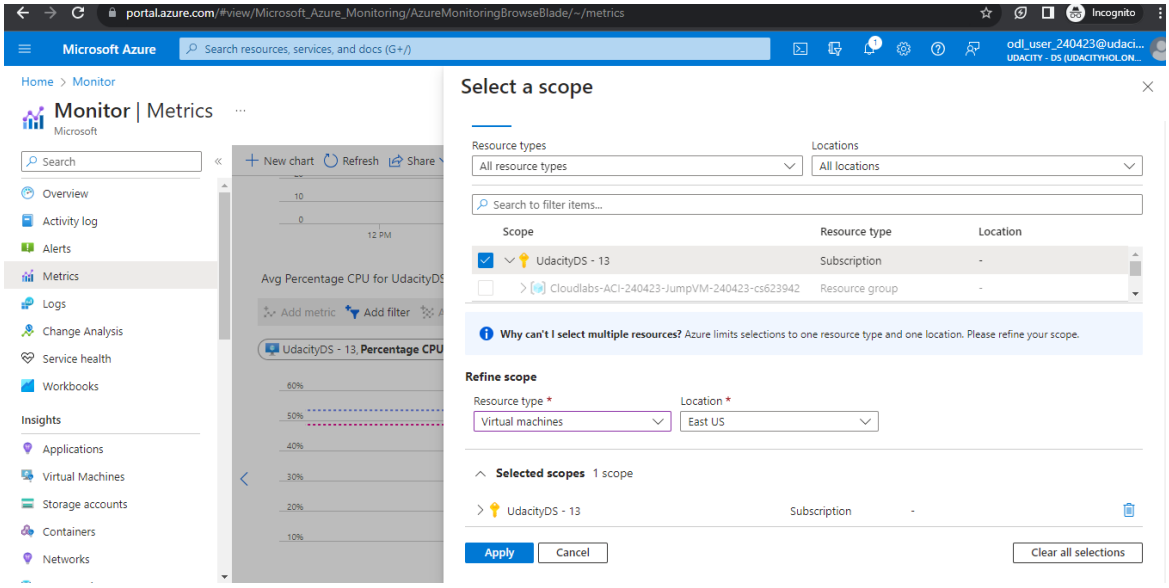
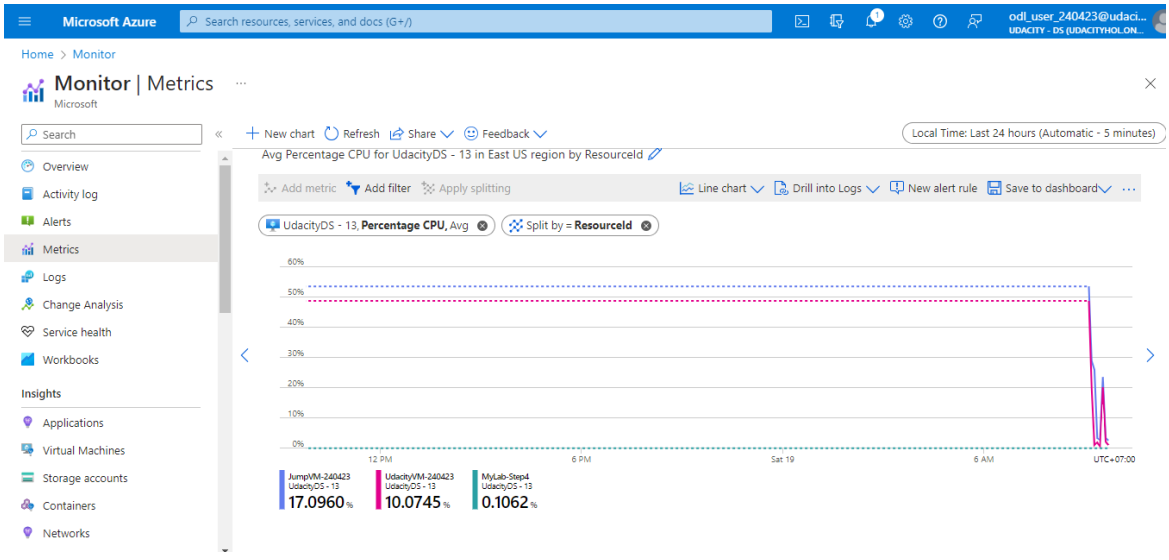
Step 2:



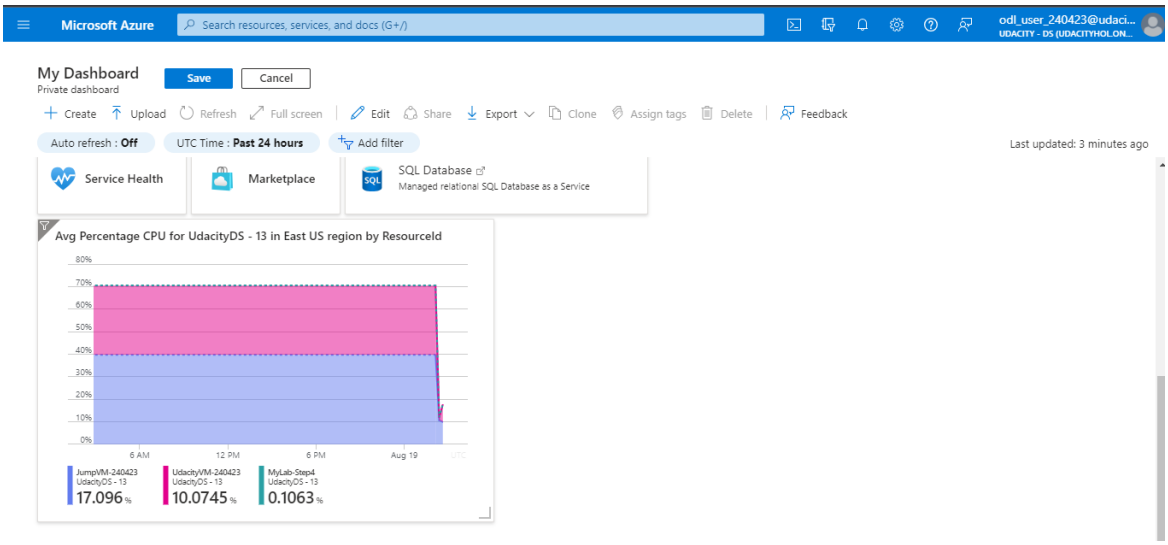
Step 3 (Final Output):


portal.azure.com/#@udacityhol.onmicrosoft.com/dashboard/private/51e2590c-1ac2-41bc-910f-78cac421e1ab
Incognito
Microsoft Azure
Search resources, services, and docs (G+/)
odl_user_240423@udaci...
UDACITY - DS (UDACITYHOL.ON...
DASHBOARD ME2
Private dashboard
Create
Upload
Refresh
Full screen
Edit
Share
Export
Clone
Assign tags
Delete
Feedback
Auto refresh : Off
UTC Time : Past 24 hours
Add filter
Last updated: a few seconds ago
Performance
CPU (average)
100%
80%
60%
40%
20%
0%
8:30 AM
8:45 AM
9 AM
9:15 AM
UTC+07:00
Percentage CPU (Avg)
UdacityDemo-240423
29.5415 %
Network (total)
190.73MiB
143.05MiB
95.37MiB
47.68MiB
0B
Network In Billable ...
UdacityDemo-240423
323.85 MiB
Network Out Billable...
UdacityDemo-240423
2.76 MiB
Disk bytes (total)
953.67MiB
476.84MiB
Disk Read Bytes (Sum)
UdacityDemo-240423
1.39 GiB
Disk Write Bytes (Sum)
UdacityDemo-240423
11.26 GiB
Networking
Incoming traffic
7.63MiB
5.72MiB
3.81MiB
1.91MiB
Outgoing traffic
585.94KiB
390.63KiB
195.31KiB

STEP 6: Azure Monitor – Metrics

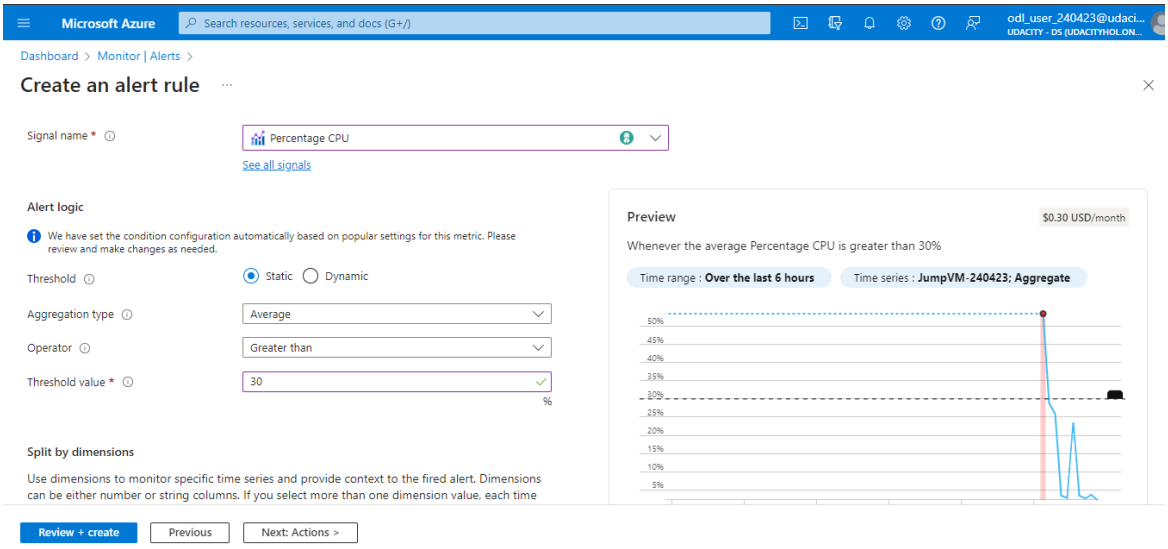
Task 1	You need to navigate to Azure Monitor > Metrics screen and create a Percentage CPU as a metric and submit screenshot of the graph generated and pin to dashboard.
Screenshots 1 through 3 You will submit the screenshots for Monitor | Metrics screen as you are setting up	**Step 1:**  **Step 2:** 

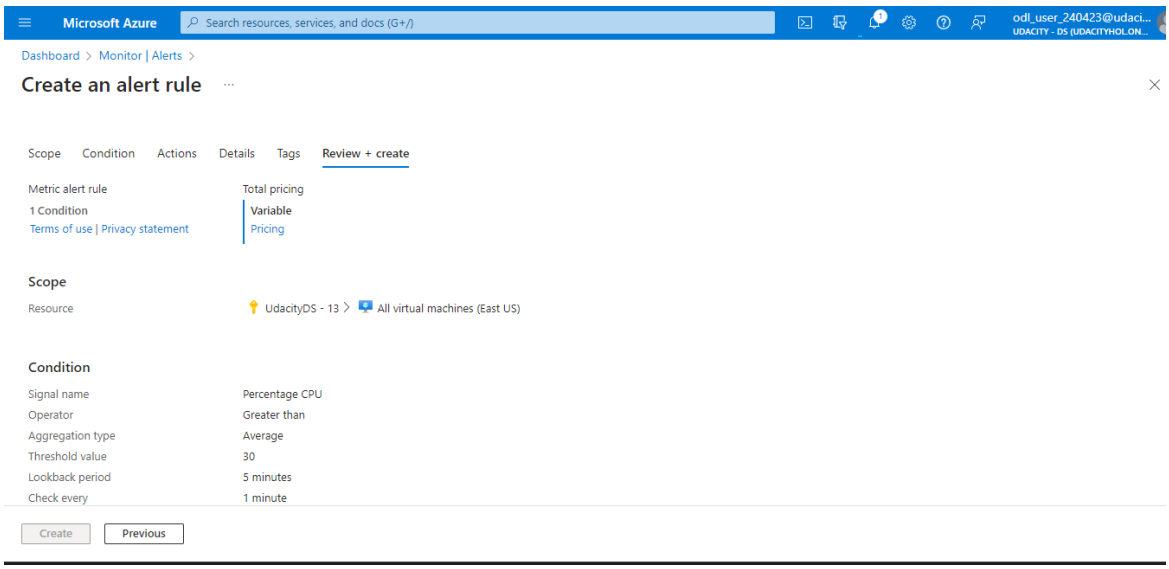
Step 3:



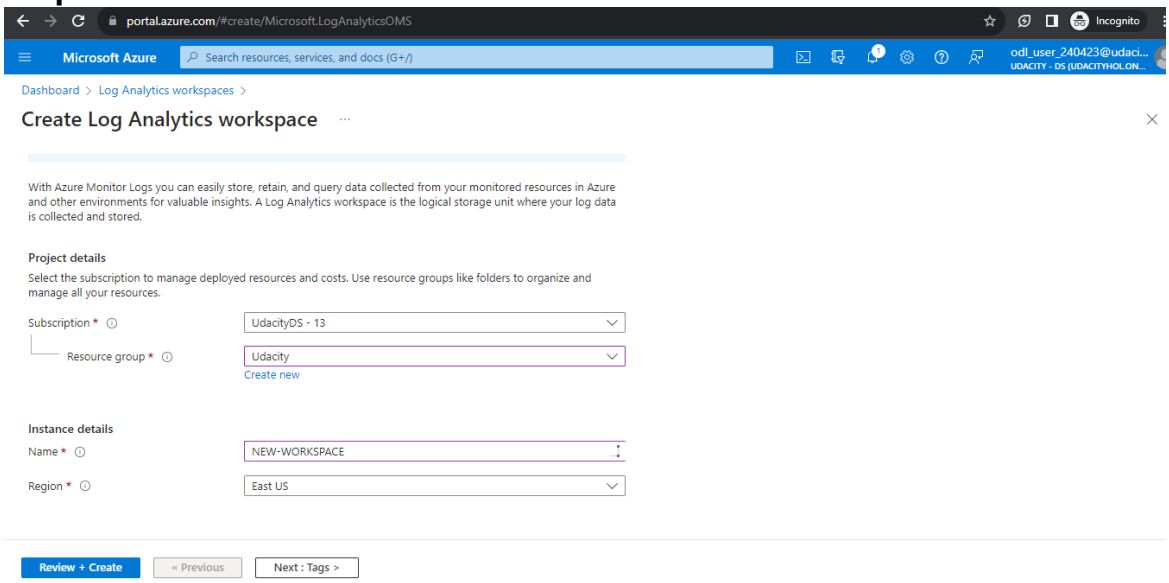
Screenshot 4

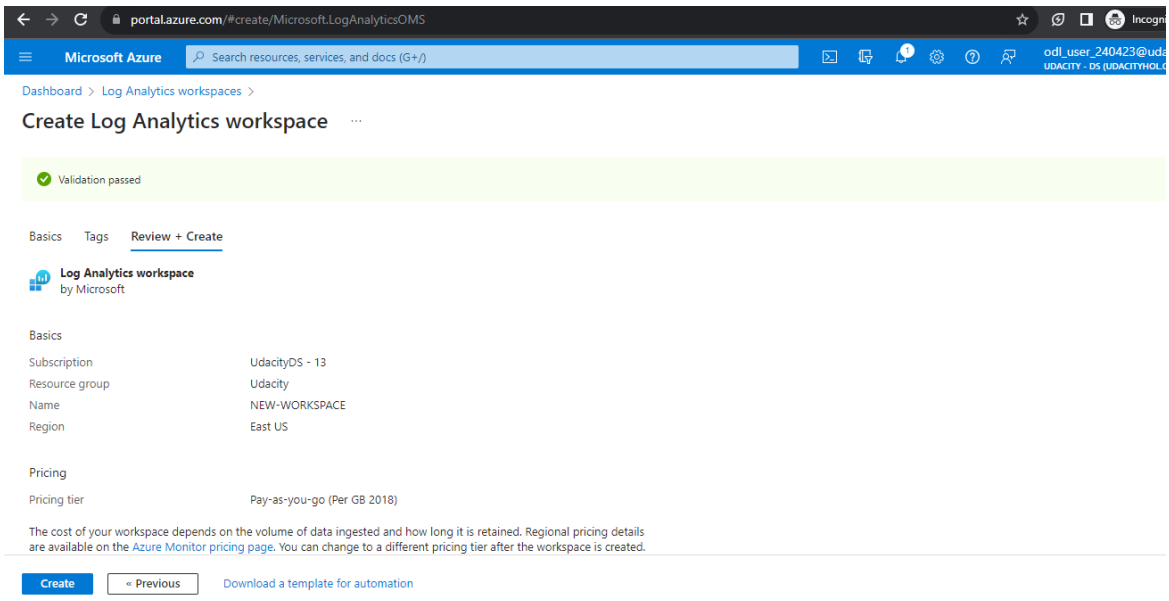
Now that Azure Metrics Monitor is configured, please set an alert for that metric. The alert is whenever the Avg % CPU is greater than 0.3; then the alert will be triggered.



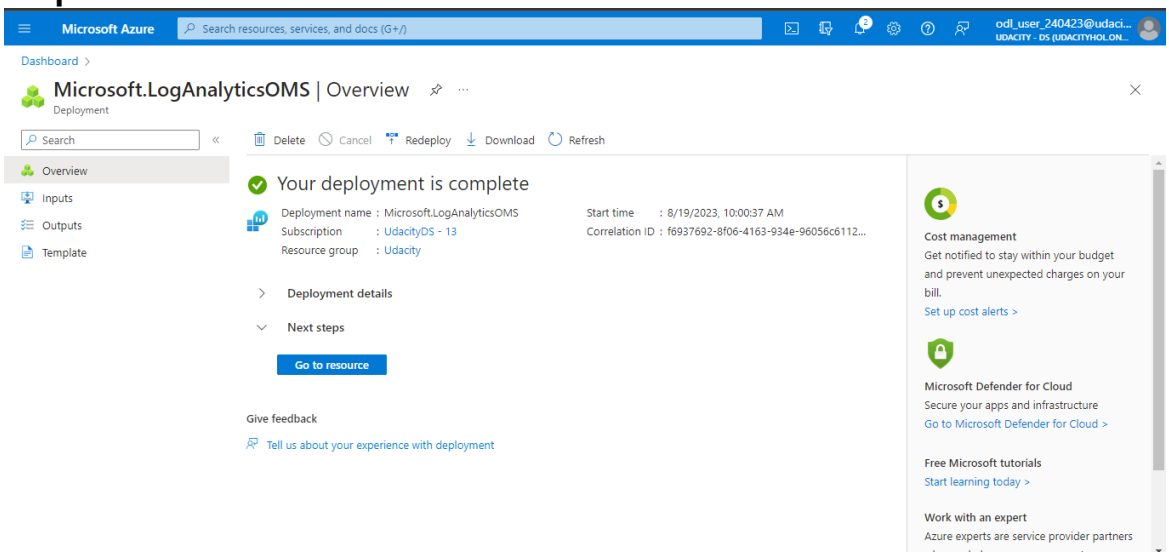


STEP 7: Azure Monitor – Log Analytics

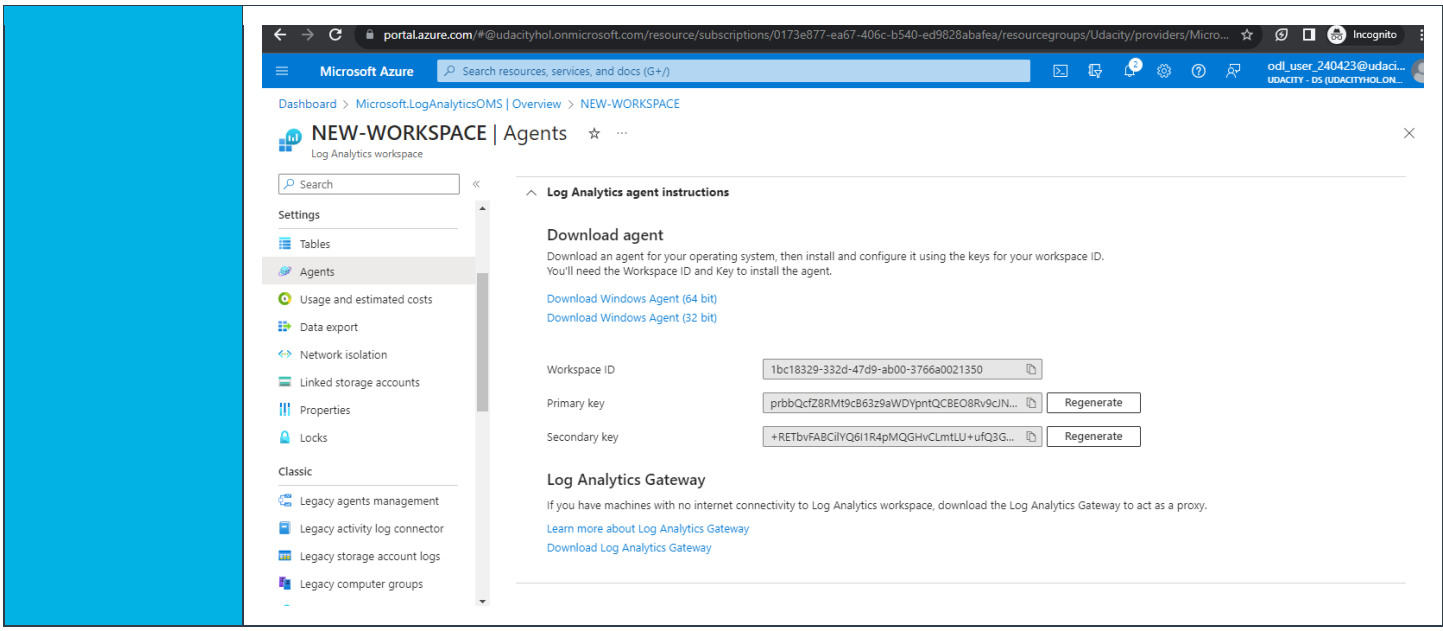
Task 1	You need to create a Log Analytics workspace and submit step-by-step screenshots.
Screenshots 1 through 4 You will submit the screenshots for Log Analytics workspace creation screens.	**Step 1:**  **Step 2:**


portal.azure.com/#create/Microsoft.LogAnalyticsOMS
Microsoft Azure
Search resources, services, and docs (G+/)
Dashboard > Log Analytics workspaces >
Create Log Analytics workspace
Validation passed
Basics Tags Review + Create
Log Analytics workspace
by Microsoft
Basics
Subscription UdacityDS - 13
Resource group Udacity
Name NEW-WORKSPACE
Region East US
Pricing
Pricing tier Pay-as-you-go (Per GB 2018)
The cost of your workspace depends on the volume of data ingested and how long it is retained. Regional pricing details are available on the Azure Monitor pricing page. You can change to a different pricing tier after the workspace is created.
Create
« Previous
Download a template for automation

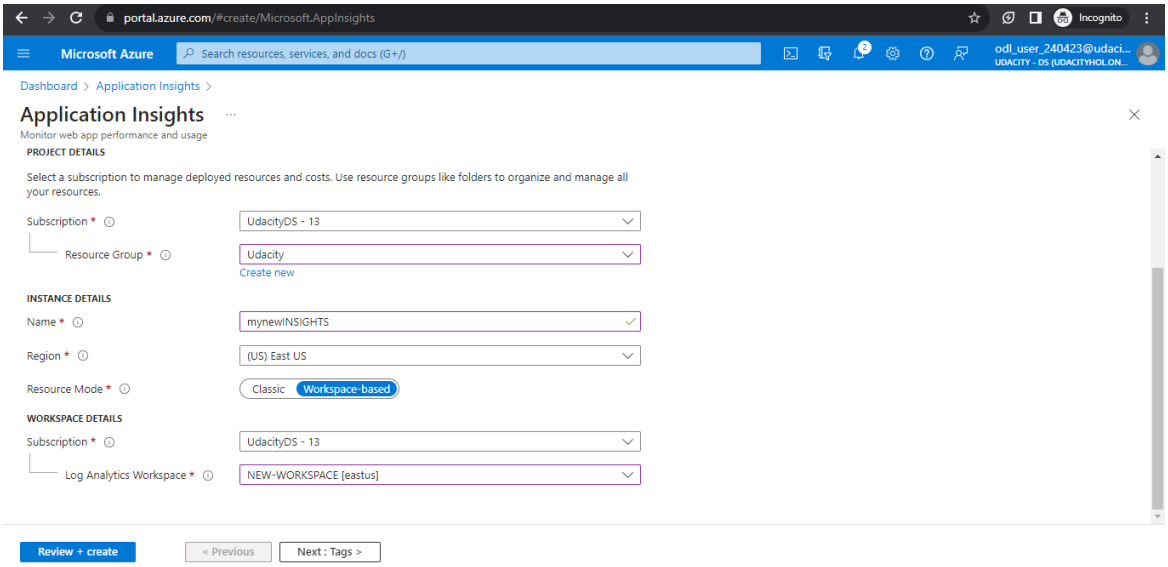
Step 3:

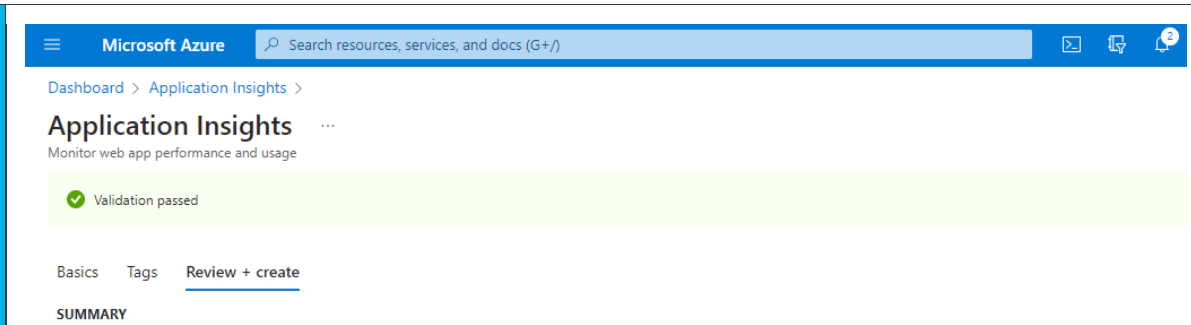

Microsoft Azure
Search resources, services, and docs (G+/)
Dashboard >
Microsoft.LogAnalyticsOMS | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Your deployment is complete
Deployment name : Microsoft.LogAnalyticsOMS
Subscription : UdacityDS - 13
Resource group : Udacity
Start time : 8/19/2023, 10:00:37 AM
Correlation ID : f6937692-8f06-4163-934e-96056c6112...
Deployment details
Next steps
Go to resource
Give feedback
Tell us about your experience with deployment
Cost management
Get notified to stay within your budget and prevent unexpected charges on your bill.
Set up cost alerts >
Microsoft Defender for Cloud
Secure your apps and infrastructure
Go to Microsoft Defender for Cloud >
Free Microsoft tutorials
Start learning today >
Work with an expert
Azure experts are service provider partners

Step 4:


portal.azure.com/#@udacityhol.onmicrosoft.com/resource/subscriptions/0173e877-ea67-406c-b540-ed9828abafea/resourcegroups/Udacity/providers/Micro...
Incognito
Microsoft Azure
Search resources, services, and docs (G+/)
odl_user_240423@udaci...
UDACITY - DS (UDACITYHOLON...
Dashboard > Microsoft.LogAnalyticsOMS | Overview > NEW-WORKSPACE
NEW-WORKSPACE | Agents
Log Analytics workspace
Search
Settings
Tables
Agents
Usage and estimated costs
Data export
Network isolation
Linked storage accounts
Properties
Locks
Classic
Legacy agents management
Legacy activity log connector
Legacy storage account logs
Legacy computer groups
Log Analytics agent instructions
Download agent
Download an agent for your operating system, then install and configure it using the keys for your workspace ID.
You'll need the Workspace ID and Key to install the agent.
Download Windows Agent (64 bit)
Download Windows Agent (32 bit)
Workspace ID
1bc18329-332d-47d9-ab00-3766a0021350
Primary key
prbbQcfZ8RMt9cB63z9aWDYpntQCBEO8Rv9cJN...
Regenerate
Secondary key
+RETbvFABCilYQ6l1R4pMQGHvCLmtLU+ufQ3G...
Regenerate
Log Analytics Gateway
If you have machines with no internet connectivity to Log Analytics workspace, download the Log Analytics Gateway to act as a proxy.
Learn more about Log Analytics Gateway
Download Log Analytics Gateway

STEP 8: Azure Insights

Background	Azure Insights can only be created once you have the Log Analytics workspace completed.
Screenshots 1 through 6 You will submit the screenshots for the Monitor | Metrics screen as you are setting up.	**Hint 1:** Navigate to Insights > Applications and then click Add button **Hint 2:** The Log Analytics workspace you created before will be used here **Step 1:**  **Step 2:**

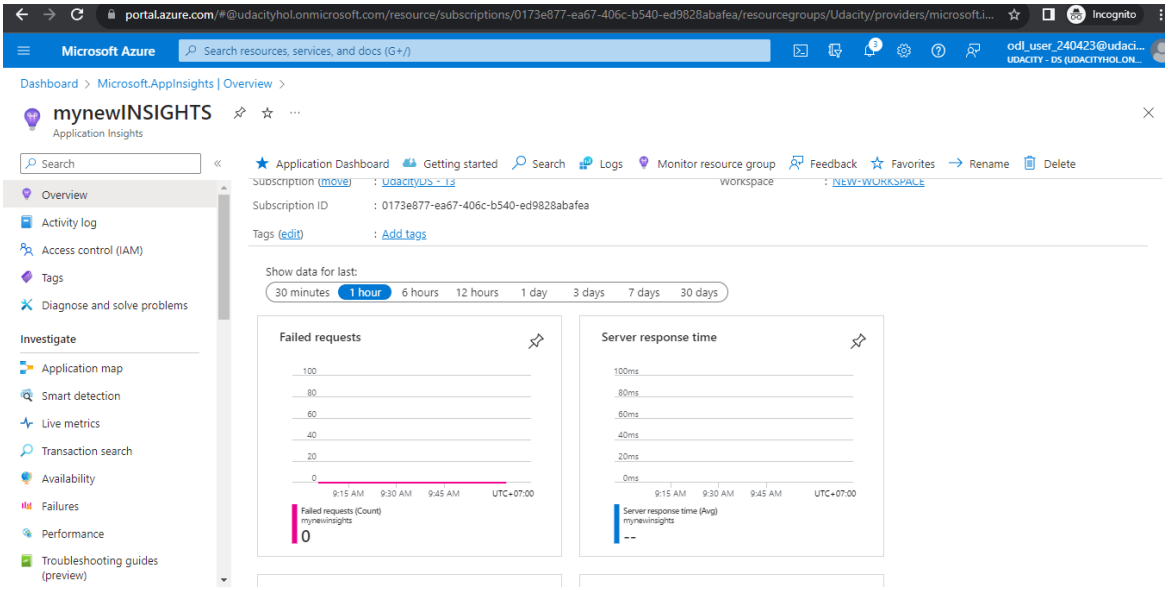


Step 3:

Step 4:

Step 5:

Step 6: Click “Go to resource”



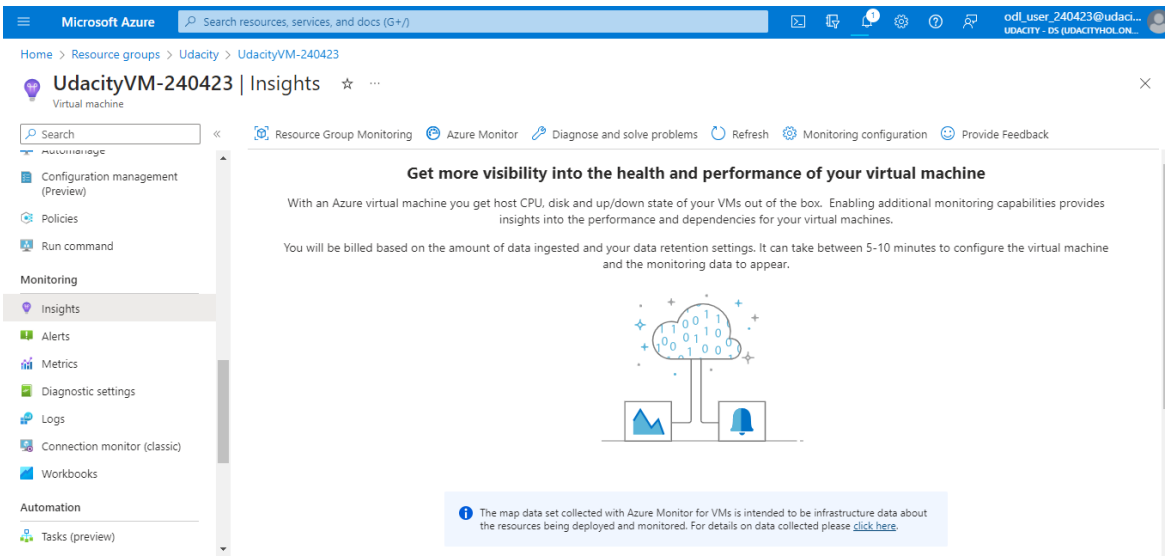
Screenshots 7 through 12

You will submit screenshots of you enabling the VM.

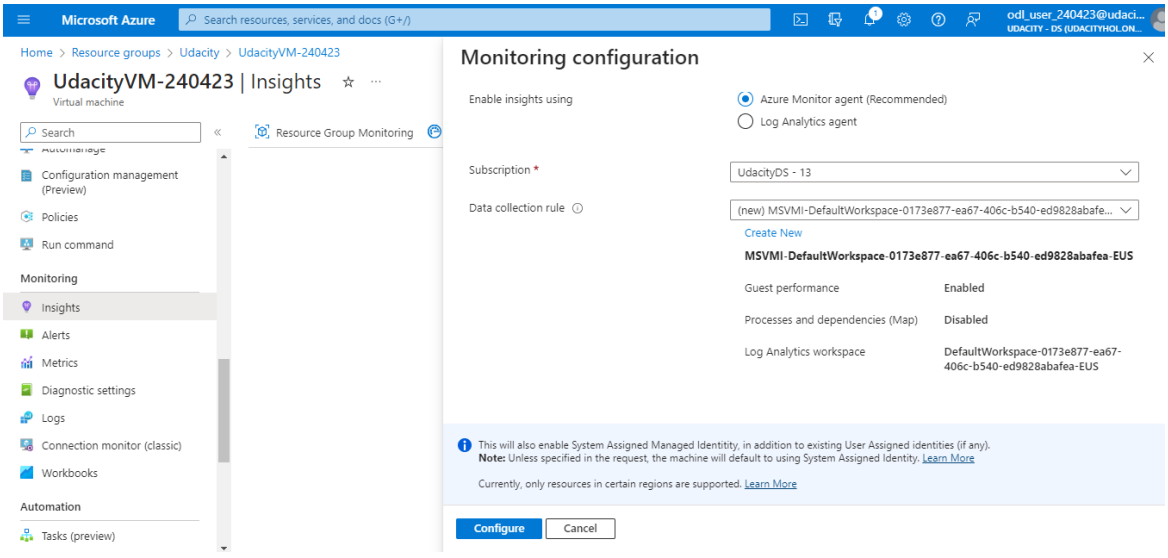
Hint 1: So now that you have created Azure Insights for the Resource group, you need to go to Virtual Machines tab and actually enable it for the VM itself.

Hint 2: The key is to select the Log Analytics workspace which you created above in STEP 7: Azure Monitor – Log Analytics.

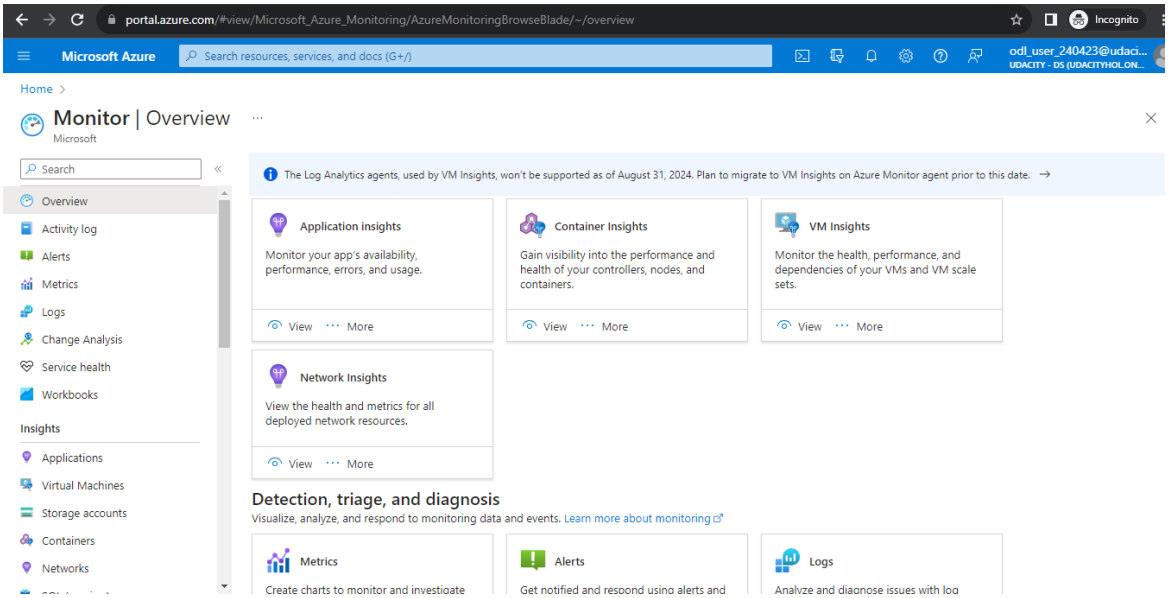
Step 7:


Microsoft Azure
Search resources, services, and docs (G+/)
odl_user_240423@udaci...
UDACITY - DS (UDACITYHOL.ON...
Home > Resource groups > Udacity > UdacityVM-240423
UdacityVM-240423 | Insights
Virtual machine
Search
Resource Group Monitoring
Azure Monitor
Diagnose and solve problems
Refresh
Monitoring configuration
Provide Feedback
Configuration management (Preview)
Policies
Run command
Monitoring
Insights
Alerts
Metrics
Diagnostic settings
Logs
Connection monitor (classic)
Workbooks
Automation
Tasks (preview)
Get more visibility into the health and performance of your virtual machine
With an Azure virtual machine you get host CPU, disk and up/down state of your VMs out of the box. Enabling additional monitoring capabilities provides insights into the performance and dependencies for your virtual machines.
You will be billed based on the amount of data ingested and your data retention settings. It can take between 5-10 minutes to configure the virtual machine and the monitoring data to appear.
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.

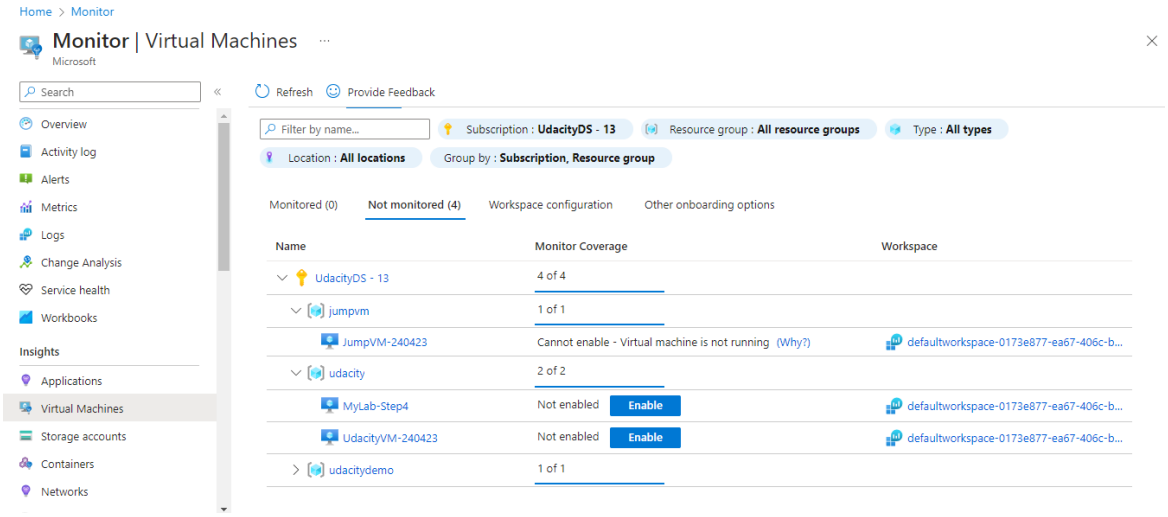
Step 8:


Microsoft Azure
Search resources, services, and docs (G+/)
odl_user_240423@udaci...
UDACITY - DS (UDACITYHOL.ON...
Home > Resource groups > Udacity > UdacityVM-240423
UdacityVM-240423 | Insights
Virtual machine
Search
Resource Group Monitoring
Configuration management (Preview)
Policies
Run command
Monitoring
Insights
Alerts
Metrics
Diagnostic settings
Logs
Connection monitor (classic)
Workbooks
Automation
Tasks (preview)
Monitoring configuration
Enable insights using
Azure Monitor agent (Recommended)
Log Analytics agent
Subscription *
UdacityDS - 13
Data collection rule
(new) MSVMI-DefaultWorkspace-0173e877-ea67-406c-b540-ed9828abafe...
Create New
MSVMI-DefaultWorkspace-0173e877-ea67-406c-b540-ed9828abafea-EUS
Guest performance
Enabled
Processes and dependencies (Map)
Disabled
Log Analytics workspace
DefaultWorkspace-0173e877-ea67-406c-b540-ed9828abafea-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
Configure
Cancel

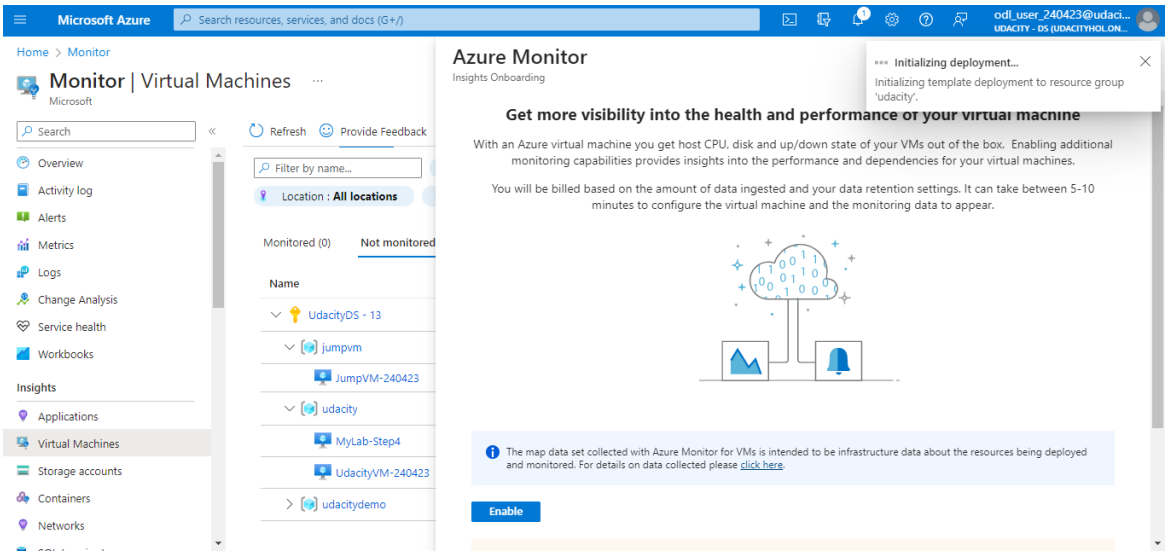
Step 9:



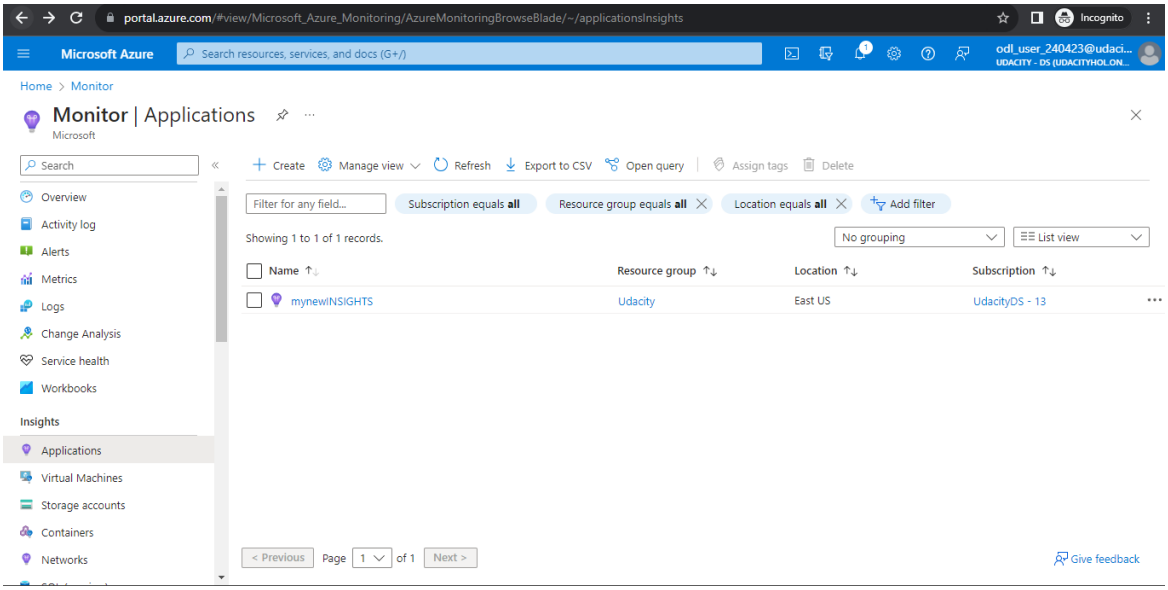
Step 10:



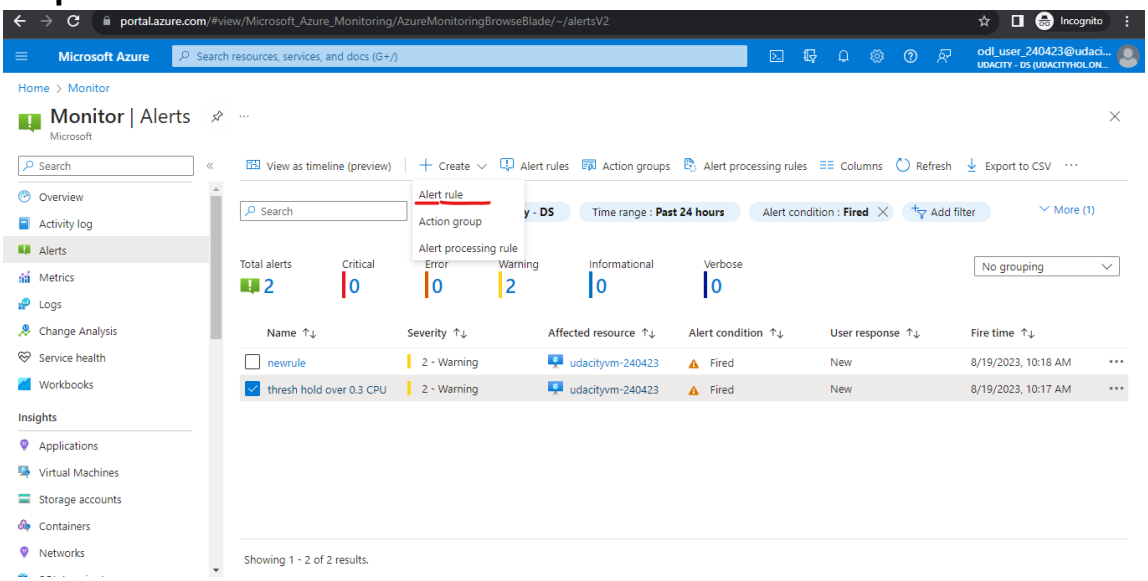
Step 11:



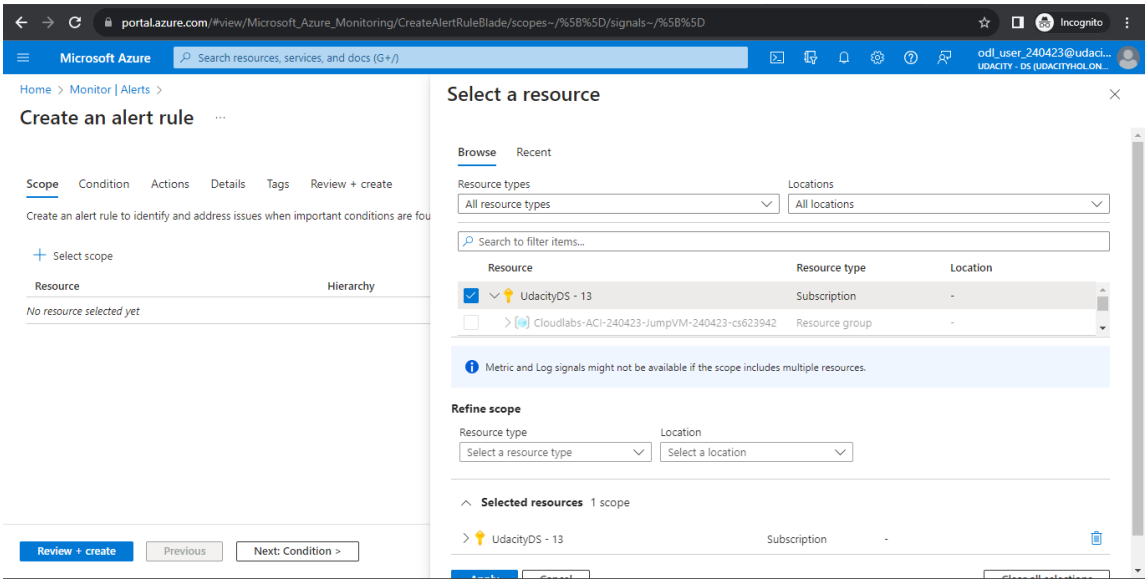
Step 12:



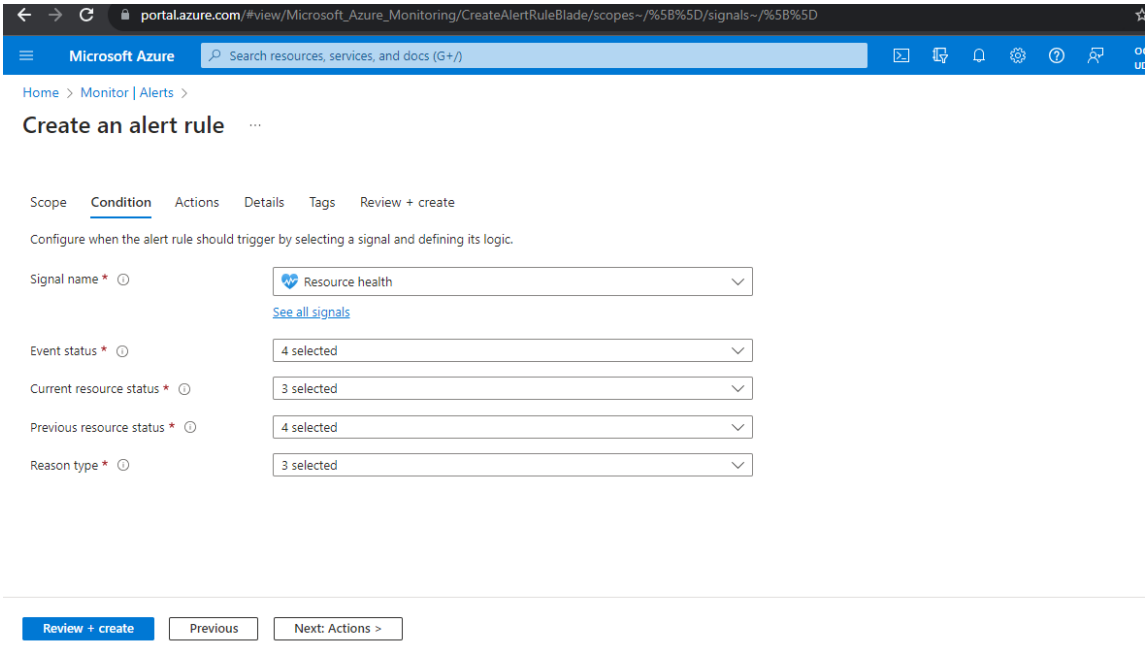
STEP 9: Azure Monitor – Smart Alerts

Task 1	Navigate to Setup Alert & Actions under Azure Monitor >Overview. The condition name should be CPU units consumed and its value should be greater than 0.3.
Screenshots 1 through 8 You will submit step-by-step screenshots for creating a Setup Alert & Actions.	**Step 1:** 

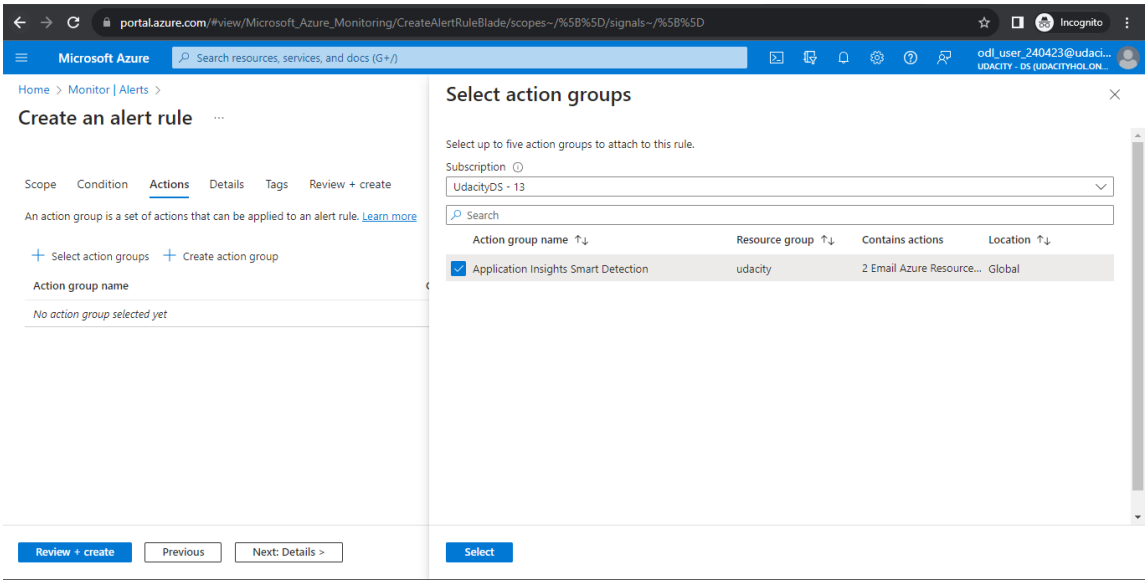
Step 2:


portal.azure.com/#view/Microsoft_Azure_Monitoring/CreateAlertRuleBlade/scopes~/%5B%5D/signals~/%5B%5D
Incognito
Microsoft Azure
Search resources, services, and docs (G+/)
odl_user_240423@udaci...
UDACITY - DS (UDACITYHOL.ON...
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 fou
Select scope
Resource
Hierarchy
No resource selected yet
Review + create
Previous
Next: Condition >
Select a resource
Browse
Recent
Resource types
All resource types
Locations
All locations
Search to filter items...
Resource
Resource type
Location
UdacityDS - 13
Subscription
Cloudlabs-ACI-240423-JumpVM-240423-cs623942
Resource group
Metric and Log signals might not be available if the scope includes multiple resources.
Refine scope
Resource type
Select a resource type
Location
Select a location
Selected resources 1 scope
UdacityDS - 13
Subscription

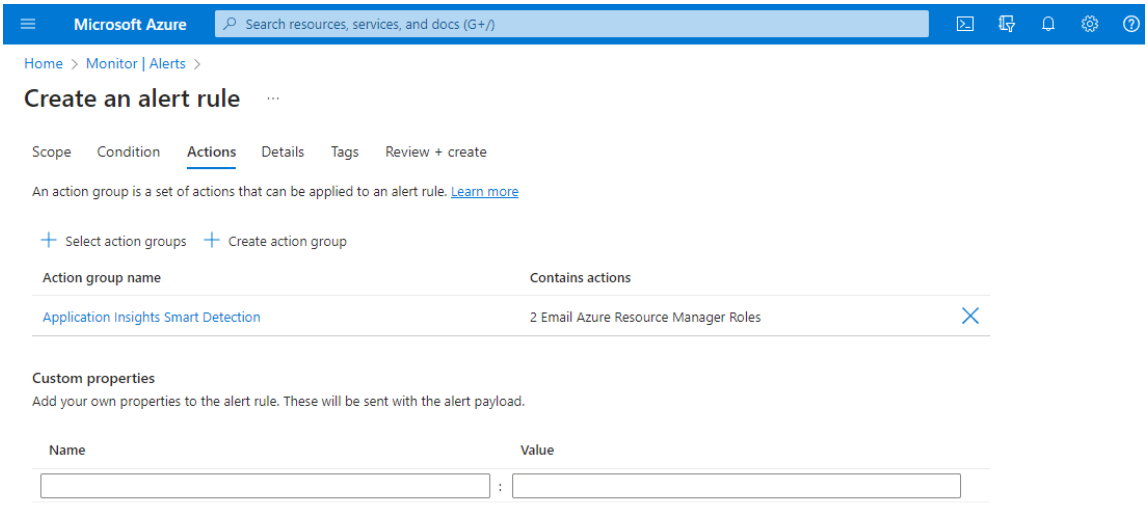
Step 3:

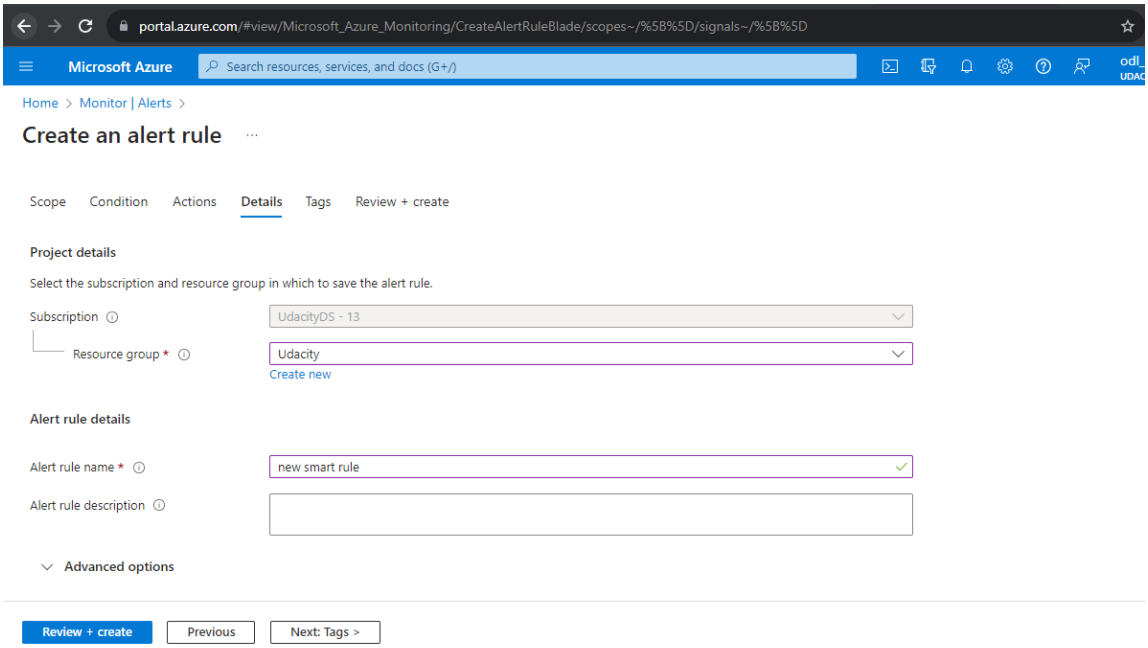

portal.azure.com/#view/Microsoft_Azure_Monitoring/CreateAlertRuleBlade/scopes~/%5B%5D/signals~/%5B%5D
Microsoft Azure
Search resources, services, and docs (G+/)
Home > Monitor | Alerts >
Create an alert rule
Scope
Condition
Actions
Details
Tags
Review + create
Configure when the alert rule should trigger by selecting a signal and defining its logic.
Signal name *
Resource health
See all signals
Event status *
4 selected
Current resource status *
3 selected
Previous resource status *
4 selected
Reason type *
3 selected
Review + create
Previous
Next: Actions >

Step 4:

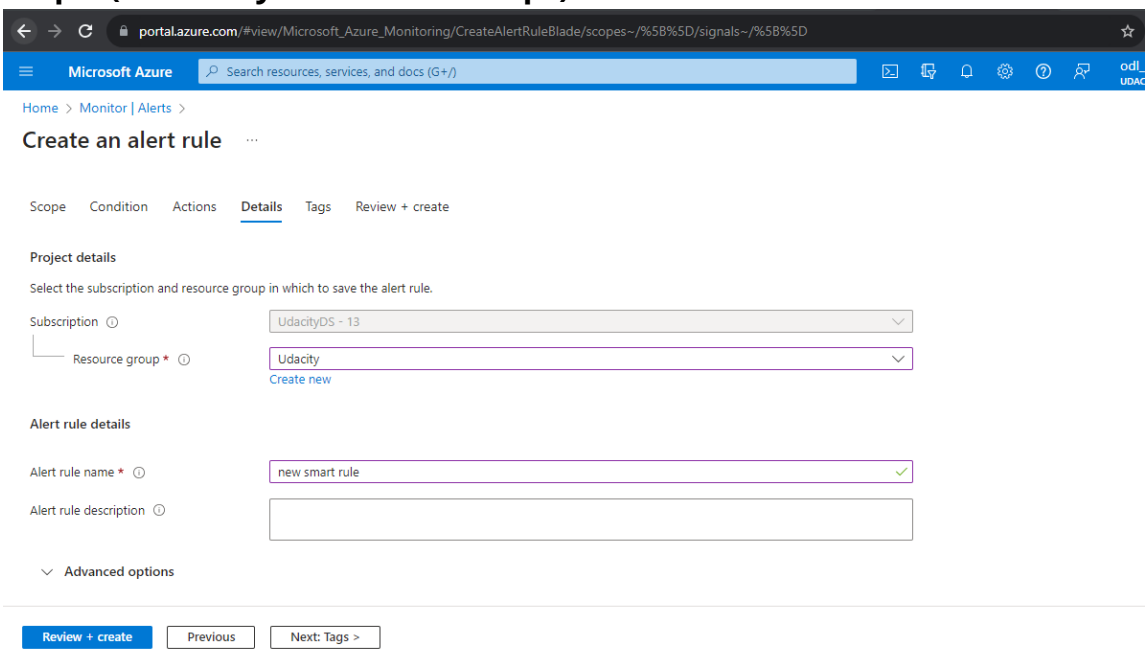

portal.azure.com/#view/Microsoft_Azure_Monitoring/CreateAlertRuleBlade/scopes~/%5B%5D/signals~/%5B%5D
Incognito
Microsoft Azure
Search resources, services, and docs (G+/)
odl_user_240423@udaci...
UDACITY - DS (UDACITYHOLON...
Home > Monitor | Alerts >
Create an alert rule
Scope
Condition
Actions
Details
Tags
Review + create
An action group is a set of actions that can be applied to an alert rule. Learn more
Select action groups
Create action group
Action group name
No action group selected yet
Review + create
Previous
Next: Details >
Select action groups
Select up to five action groups to attach to this rule.
Subscription
UdacityDS - 13
Search
Action group name
Resource group
Contains actions
Location
Application Insights Smart Detection
udacity
2 Email Azure Resource...
Global
Select

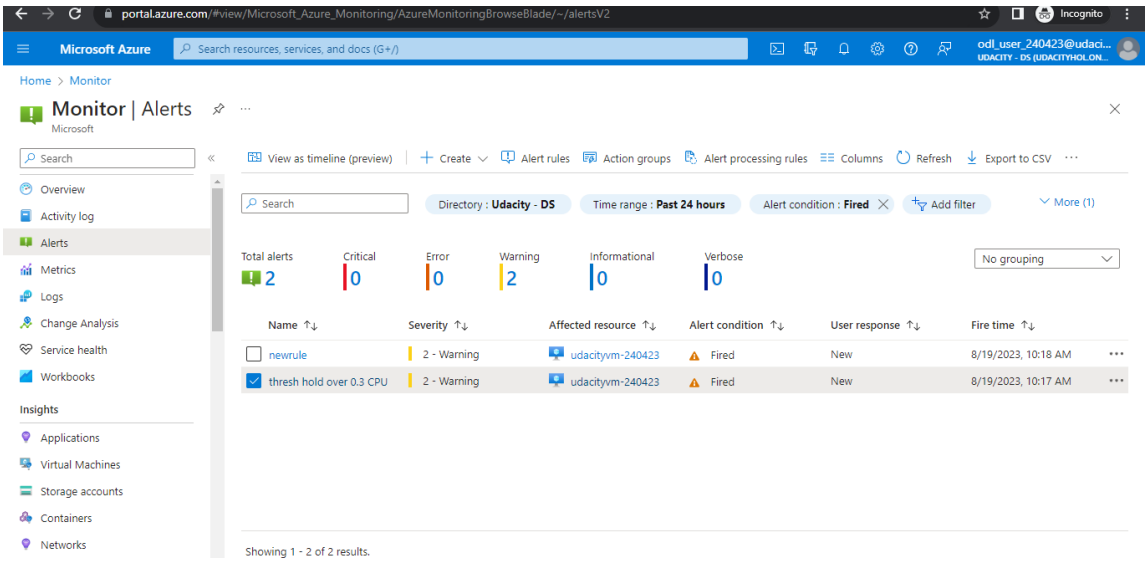
Step 5:


Microsoft Azure
Search resources, services, and docs (G+/)
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 action groups
Create action group
Action group name
Contains actions
Application Insights Smart Detection
2 Email Azure Resource Manager Roles
Custom properties
Add your own properties to the alert rule. These will be sent with the alert payload.
Name
Value

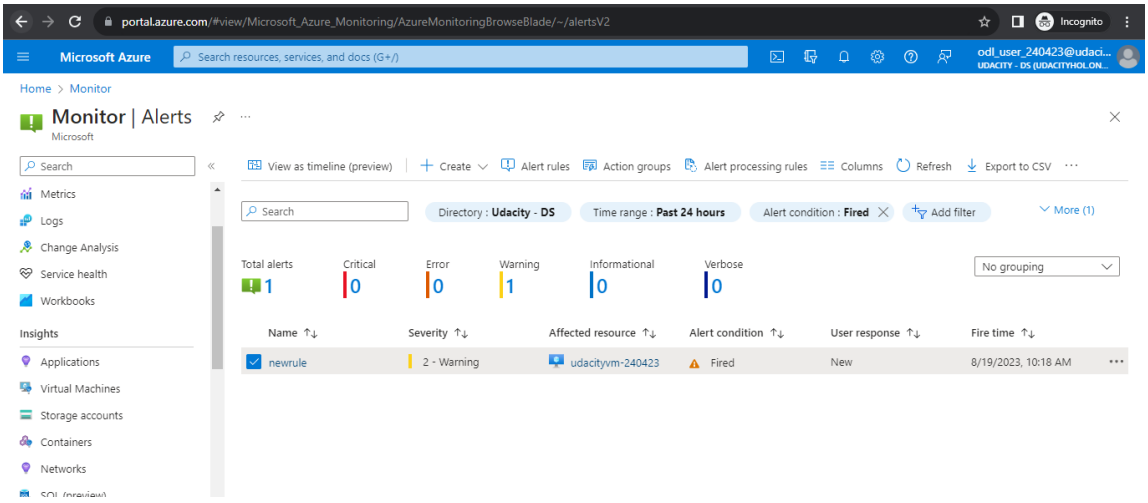


Step 6 (Summary after above steps):





Step 7 (Screenshot post-creation of the alert):

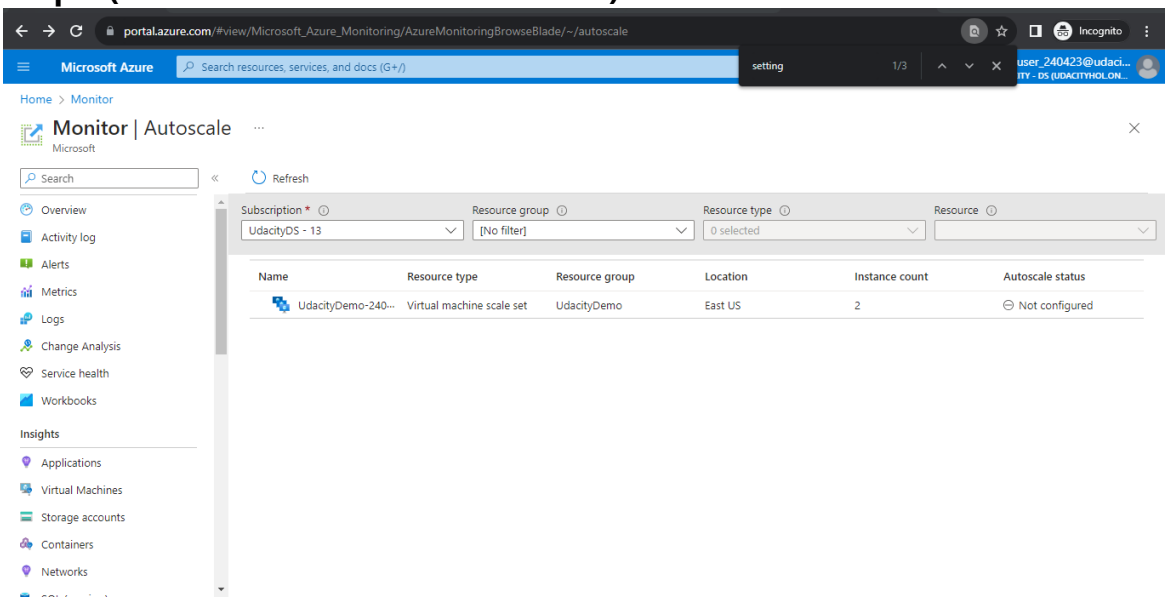


Step 8 (If you had any alerts, they would be submitted here):

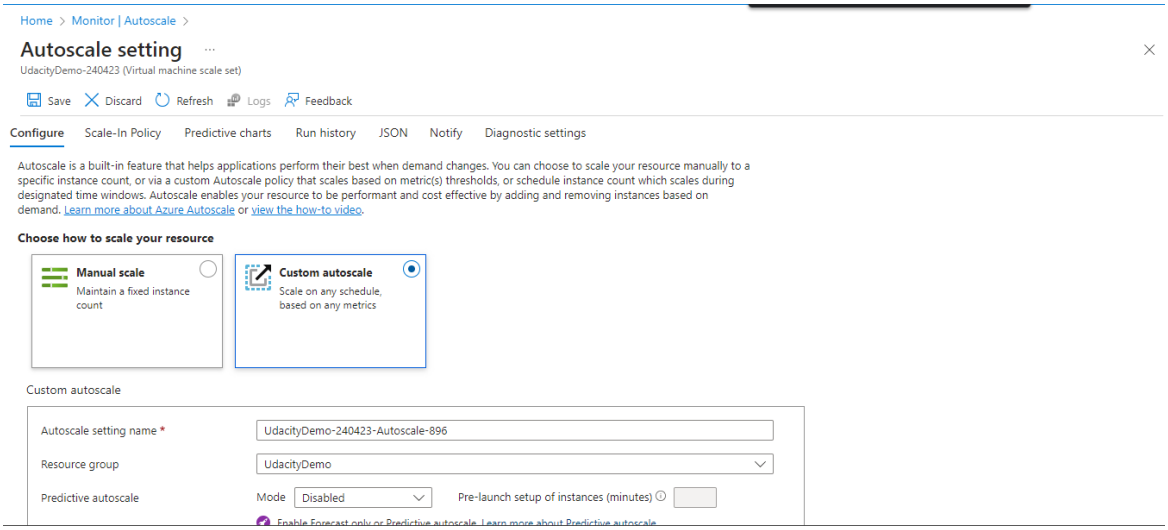
Explanation 1 Explain the purpose of Azure Dashboards,	Azure Monitor is a comprehensive monitoring solution that collects and analyzes data from various sources, including Azure resources, applications, and external services. Azure Dashboards allow to create customized dashboards that provide a consolidated view of your Azure resources. Add various widgets to

Azure Monitor and alerts	dashboard, such as charts, metrics, and logs, to monitor the health and performance of resources. Alerts in Azure Monitor allow to set up notifications based on specific conditions or thresholds.

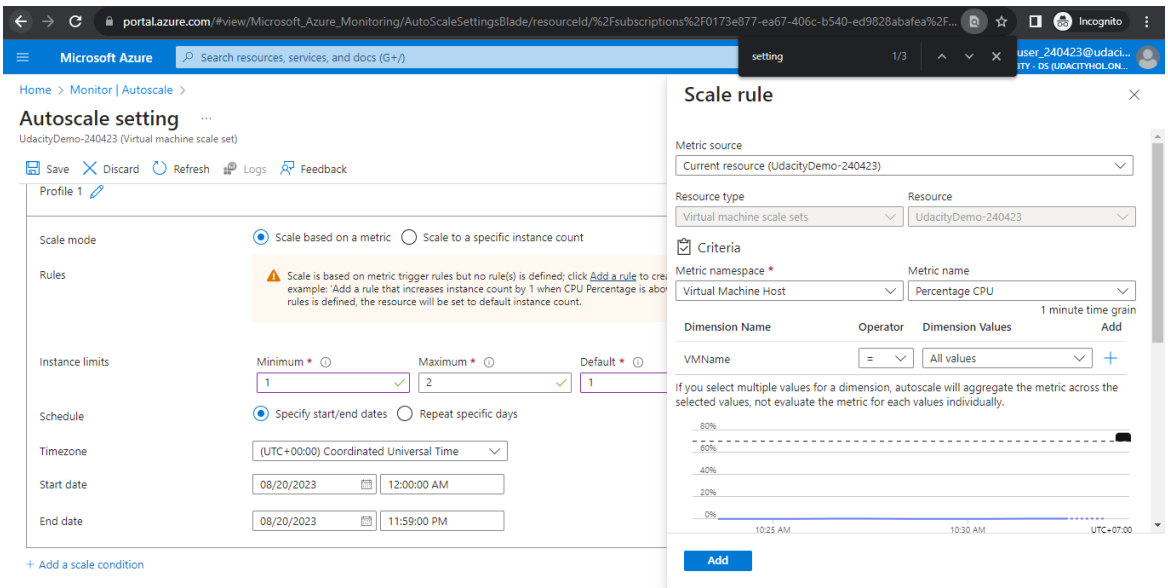
STEP 10: Autoscale In-Out Based on Number of Users per CPU Core

Task 1	The lab will have a Virtual Machine Scale set already created. Navigate to Azure Monitor > Settings > Autoscale. You will create an Autoscale rule as part of this project.
Screenshots 1-5 You will submit step-by-step screenshots for creating an autoscale rule under Azure Monitor.	**Step 1 (Browse to Monitor > Autoscale):** 

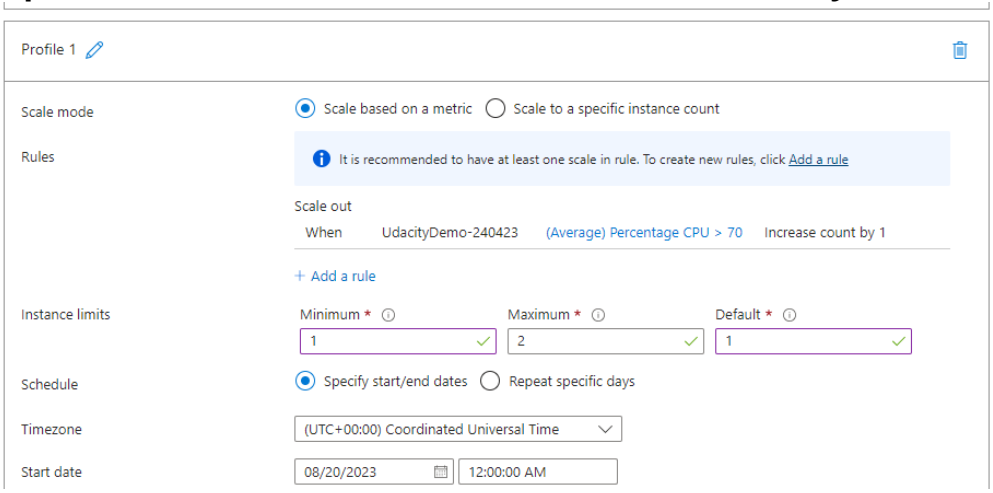
Step 2 (Select the option for Custom autoscale and within that Scale based on metric and then click “Add Rule”):



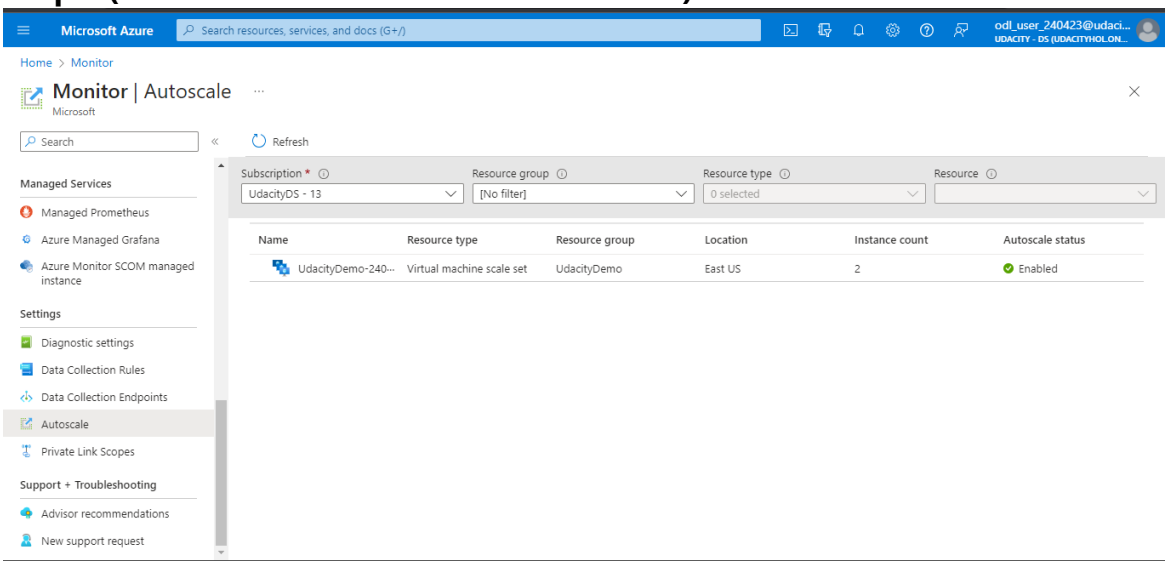
Step 3 (Create the scale rule. They key part on this screen is that Percentage CPU metric is selected):



Step 4 (Once scale rule is created, submit the summary screenshot):



Step 5 (Screenshot for "Autoscale Enabled"):



Explanation 1

Explain the key details of autoscale screenshots you have submitted.

Auto Scaling in Azure Monitor allows you to automatically adjust the capacity of your Azure resources based on predefined rules and metrics, in this sample rule which bases one CPU metric. It helps you optimize resource utilization and ensure that your applications can handle varying workloads efficiently.