



Microsoft Azure Security Technologies

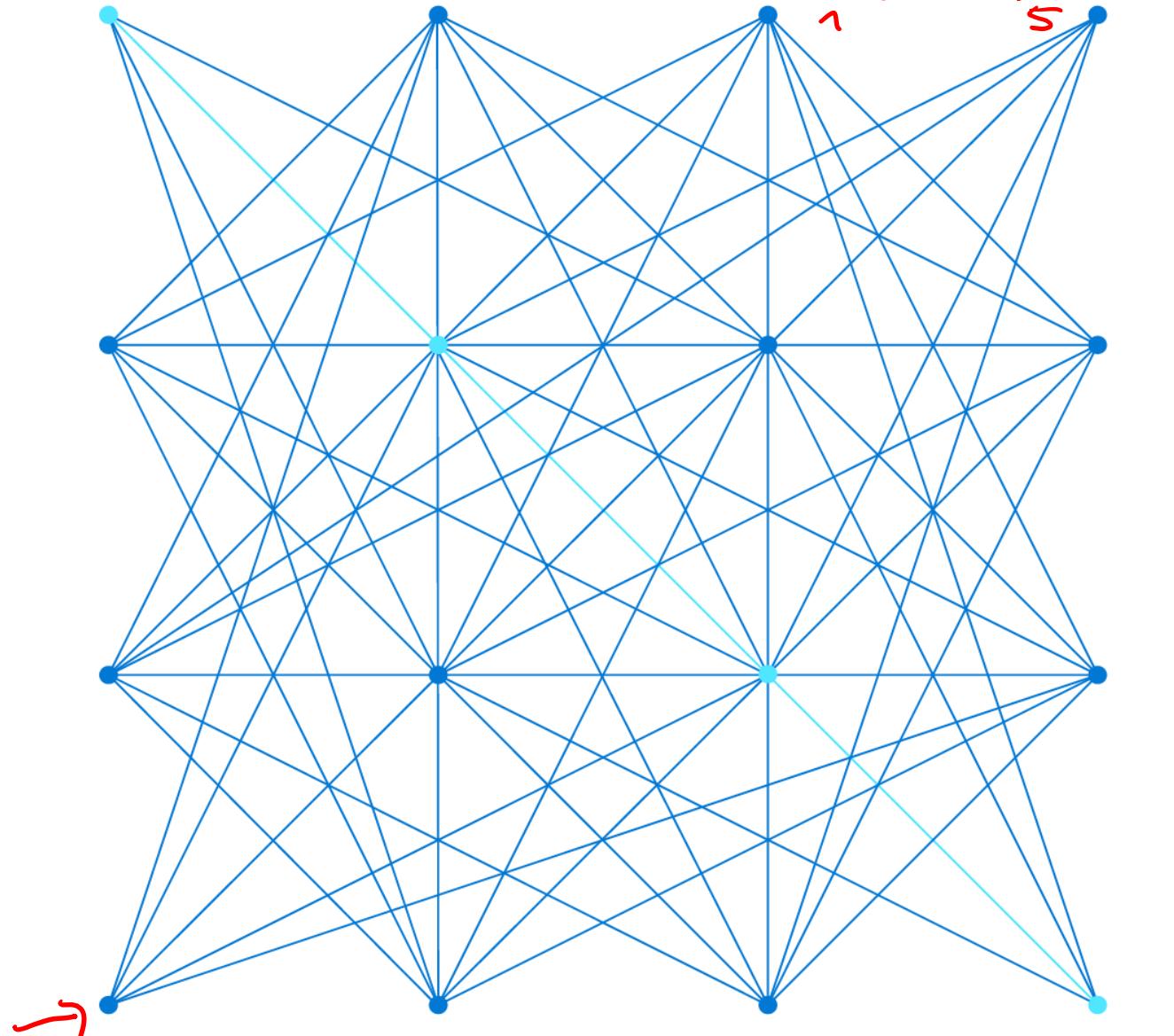
Tag 4

Guten Morgen!

claim Badges

Feedback

~~MTM~~
~~0'000*~~
15 →



AZ-500 Agenda



Learning Path 1 Identity and Access

GP Storage Account v2
LRS



Learning Path 2 Implement Platform Protection

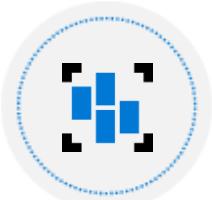
Azure Files



SMB

:445

.vhdx



Learning Path 3 Data and Application Security

Roles



Learning Path 4 Security Operations

AVD

AZ-140

FSLogix

AZ-500 Agenda



Learning Path 1 Identity and Access

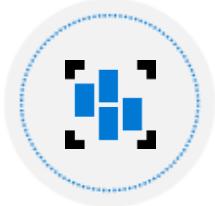


OAuth
Kerberos



Learning Path 2 Implement Platform Protection

K8S



Learning Path 3 Data and Application Security

SQL always
KV



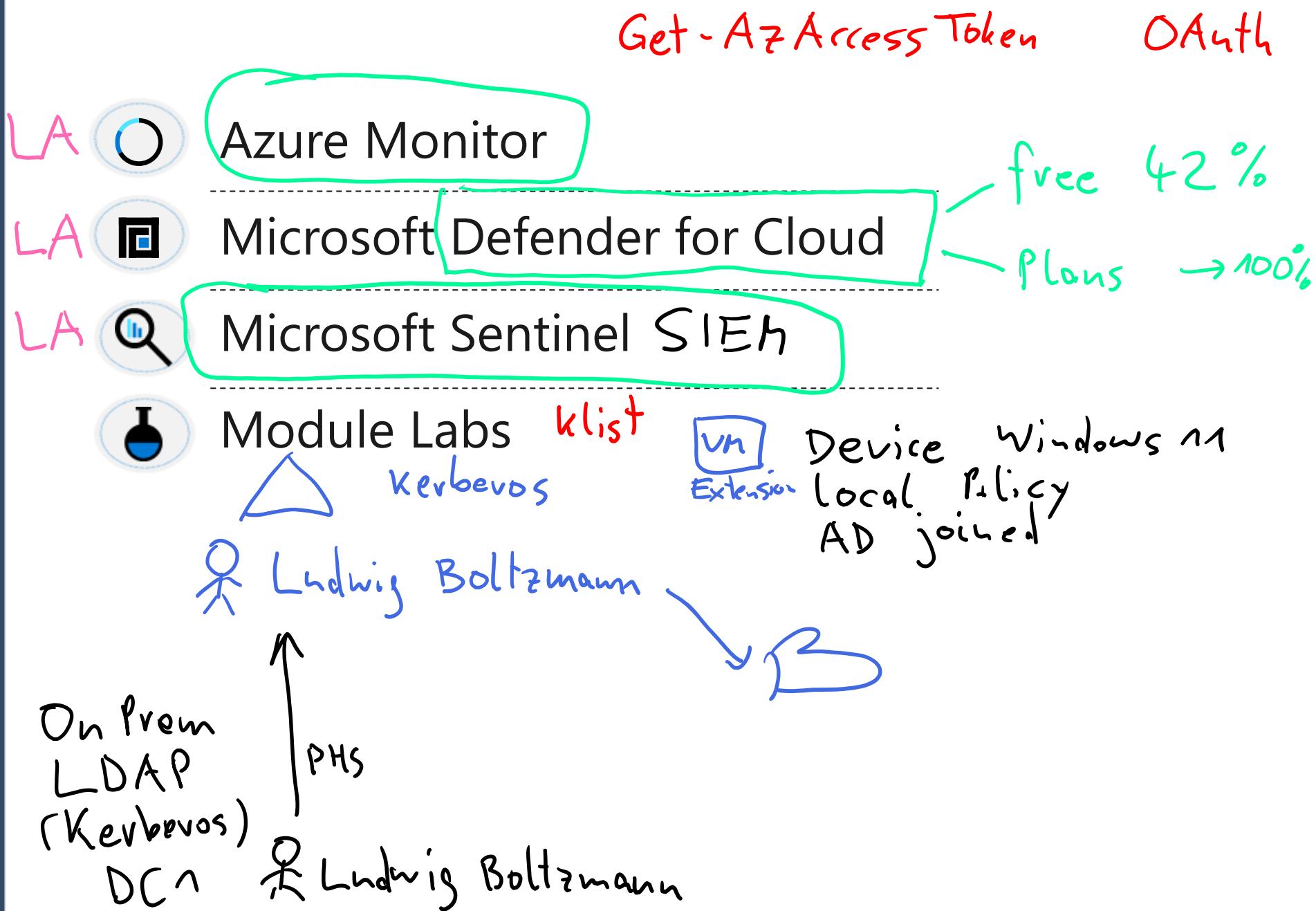
Learning Path 4 Security Operations

Sentinel

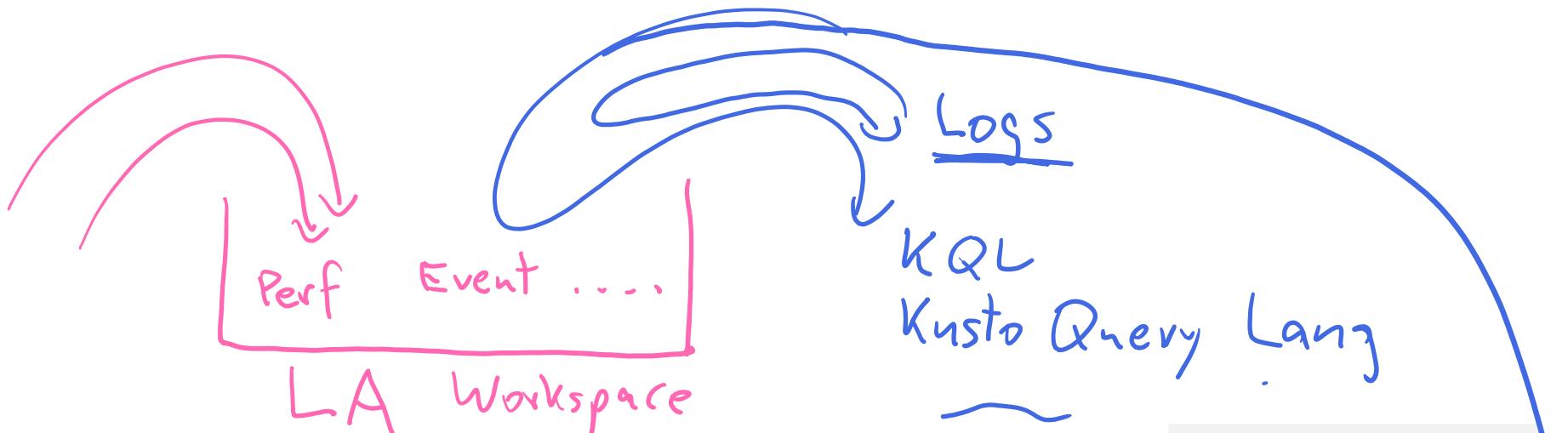
Log Analytics
workspace

Blob
Data Lake

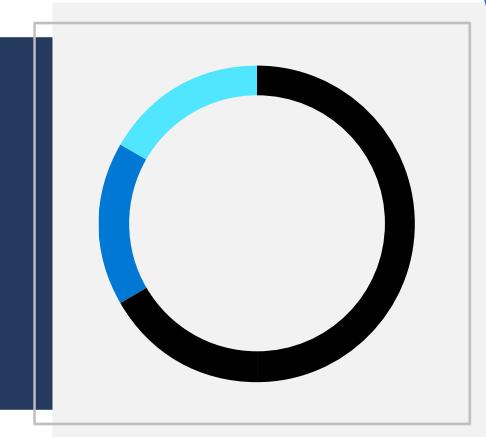
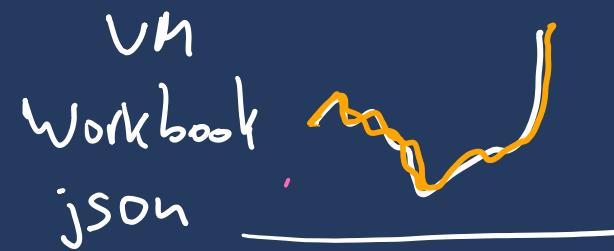
Learning Path:
Security
Operations



Table



Azure Monitor ✓



ADE
Azure Data Explorer

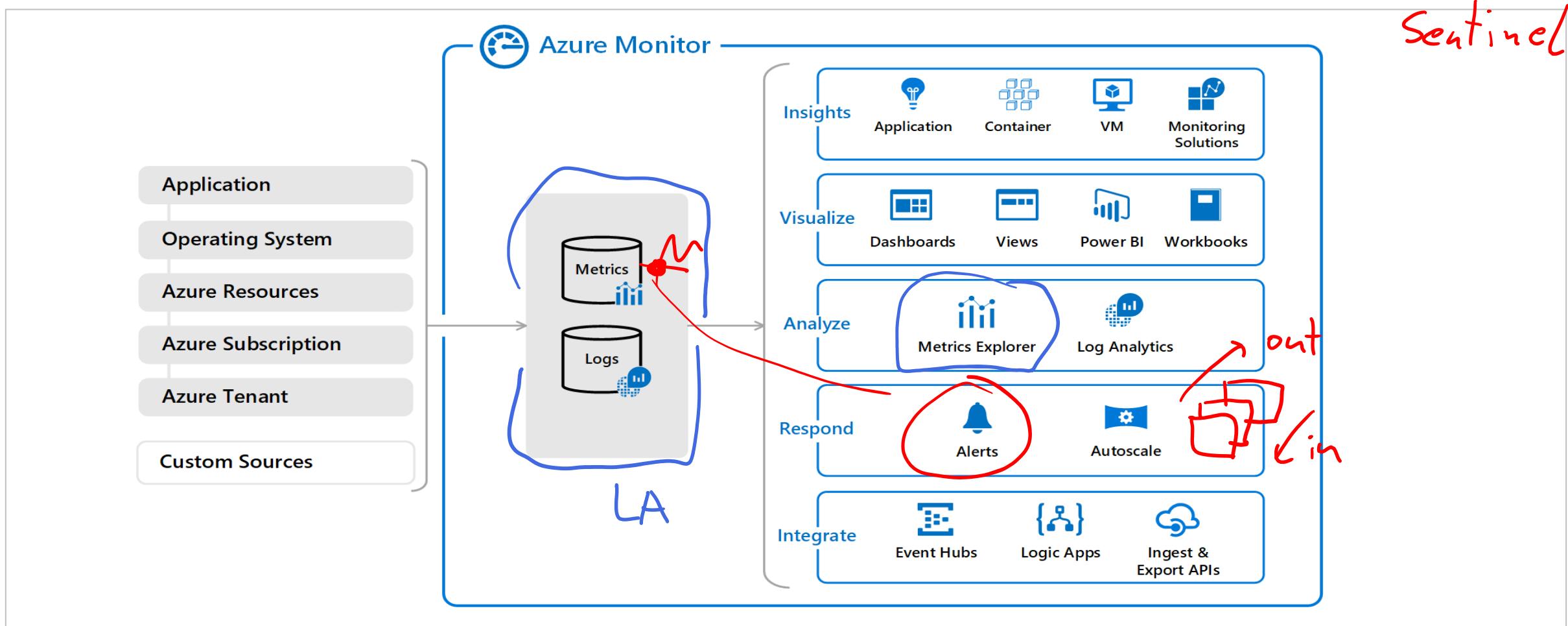
Kusto Explorer

Azure Monitor

-  Azure Monitor
 -  Metrics and Logs
 -  Log Analytics
 -  Connected Sources
 -  Azure Monitor Alerts
 -  Diagnostic Logging
- MMA
(Legacy)
Agent
AMA

Azure Monitor Architecture

Azure Monitor offers a consolidated pipeline for routing any of your monitoring data into a SIEM tool – ~~Security Center~~



Metrics and Logs



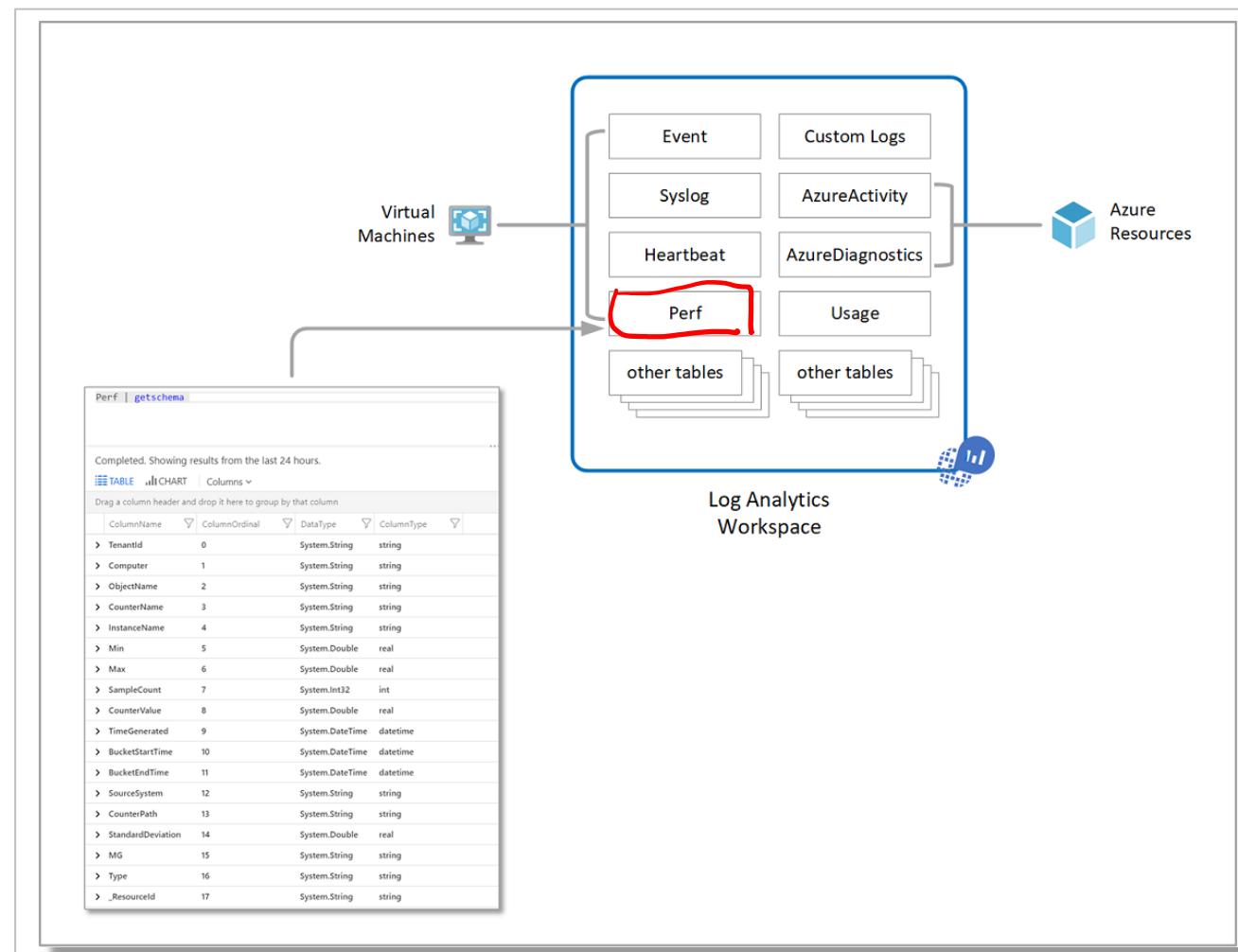
Metrics are numerical values that describe some aspect of a system at a point in time

They are lightweight and capable of supporting near real-time scenarios

Logs contain different kinds of data organized into records with different sets of properties for each type
Telemetry (events, traces) and performance data can be combined for analysis

Log Analytics

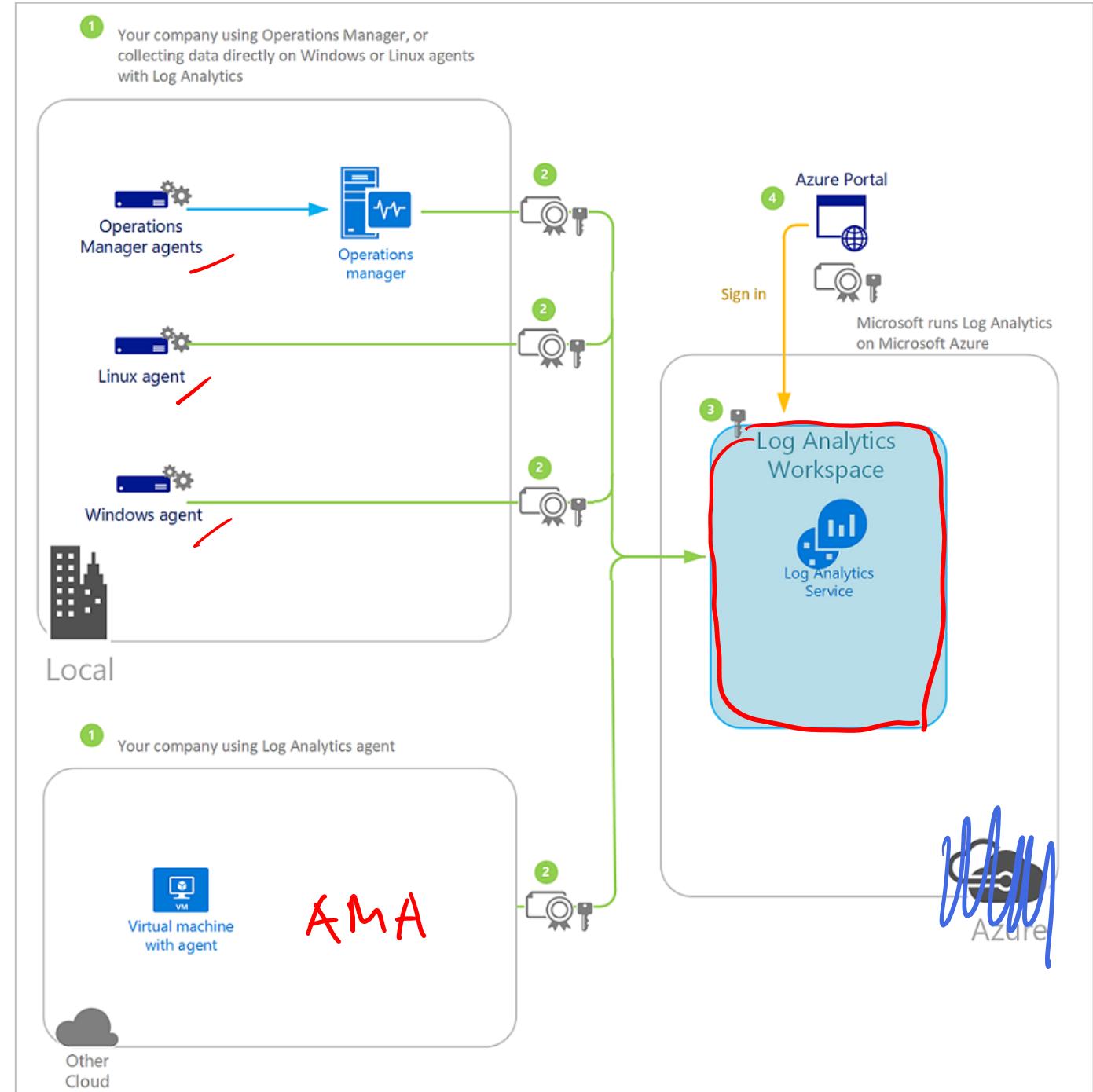
Collect and analyze resource data (cloud and on-premises) - write log queries and interactively analyze their results.



Connected Sources

Connected Sources generate data

Data can be collected from Windows,
Linux, SCOM and Azure Storage



Azure Monitor Alerts

Select the target resource to monitor

Add a condition to select a signal and define the logic

Notify the team or automate follow-on actions

Display by severity (0 to 4)

Administer with New, Acknowledged, and Closed status

Create alert rule ...

Create an alert rule to identify and address issues when important conditions are found in your monitoring data. [View tutorial + read more](#)

Scope

Select the target resource you wish to monitor.

Resource

Hierarchy

No resource selected yet

[Select resource](#)

Condition

Configure when the alert rule should trigger by selecting a signal and defining its logic.

Condition name

No condition selected yet

[Add condition](#)

Actions

Send notifications or invoke actions when the alert rule triggers, by selecting or creating a new action group. [Learn more](#)

Action group name

Contains actions

No action group selected yet

[Add action groups](#)

Alert rule details

Provide details on your alert rule so that you can identify and manage it later.

Alert rule name * ⓘ

Specify the alert rule name

Description

Specify the alert rule description

Enable alert rule upon creation

[Create alert rule](#)

UH: Guest Metrics

Diagnostic Settings

Tenant Logs – logs from outside of the Azure Subscriptions

Resource Logs – Logs from services inside of the subscription

Configure Diagnostic Settings to send logged metrics to different destinations

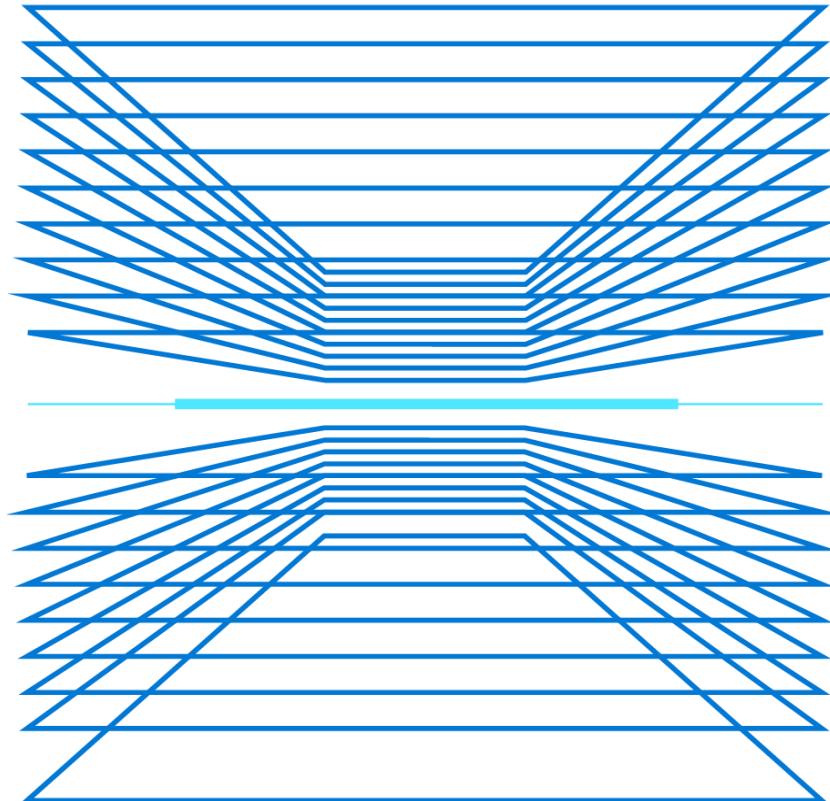
Retention times are available for archiving to a storage account

The screenshot shows the 'Diagnostics settings' configuration page in the Azure portal. At the top, there are buttons for Save, Discard, Delete, and Provide feedback. Below that, a descriptive text explains what a diagnostic setting is: '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.' It links to 'Learn more about the different log categories and contents of those logs'. The main area is divided into 'Category details' and 'Destination details'. Under 'Category details', there are two sections: 'log' (with 'WorkflowRuntime' checked) and 'metric' (with 'AllMetrics' checked). Under 'Destination details', there are three checkboxes: 'Send to Log Analytics' (unchecked), 'Archive to a storage account' (unchecked), and 'Stream to an event hub' (unchecked, highlighted with a blue border).

△ Tenant Signin Log → LA Blob

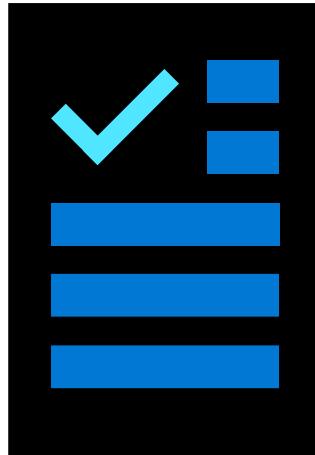
Demonstration: Azure Monitor

- Activity logs and alerts
- Log analytics



Additional Study – Azure Monitor

Module Review Questions



Microsoft Learn Modules (docs.microsoft.com/Learn)

Analyze your Azure infrastructure by using Azure Monitor logs (Exercise)

Design a holistic monitoring strategy on Azure Monitor and report on security events in Azure AD (Exercise)

Improve incident response with alerting on Azure (Exercise)

Chaos Monkey

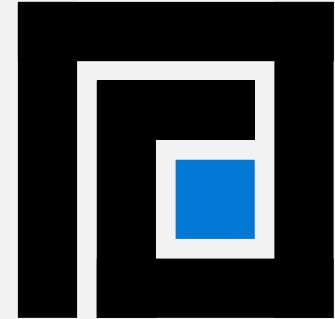
CSPM

42%

Defender M365
ATP

Microsoft Defender for Cloud

ASC



LA Workspace

Kusto QL

Intrude ?

MEM

Intrude !

Microsoft
Defender for
Cloud

Azure
Red Dog
Kerberos Q90



MITRE | ATT&CK®



Microsoft Defender for Cloud



Microsoft Defender for Cloud Features



Microsoft Defender for Cloud Security Policies



Microsoft Defender for Cloud Recommendations



Secure Score



Brute Force Attacks



Just in Time Virtual Machine Access

MITRE | ATT&CK® matrix

SOC
NS.

The MITRE ATT&CK matrix is a **publicly accessible knowledge base** for understanding the various **tactics** and **techniques** used by attackers during a cyberattack.

The knowledge base is organized into several categories: **pre-attack**, **initial access**, execution, persistence, privilege escalation, defense evasion, credential access, discovery, lateral movement, collection, exfiltration, and command and control.

Defender for Cloud leverages the MITRE Attack matrix to **associate alerts** with their **perceived intent**, helping formalize security domain knowledge.

Home > Microsoft Defender for Cloud | Security alerts >

Security alert

2517210707511130134_c97105c5-13a7-45c1-b132-b30dfa7a96f6

! Suspected brute-force attack attempt Sample alert

High
Severity

Active
Status

04/11/23, 11:20 AM
Activity time

Alert description

Copy alert JSON

THIS IS A SAMPLE ALERT: Someone is attempting to brute force credentials to your SQL server 'Sample-SQL'.

Affected resource

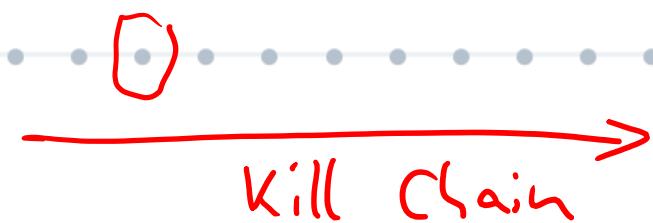
SQL Sample-DB

MITRE ATT&CK® tactics

- Pre-attack



Pre-
attack



MITRE | ATT&CK® matrix (continued)

Pre-Attack could be either an **attempt to access a certain resource** regardless of a malicious intent, or a failed attempt to gain access to a target system **to gather information prior to exploitation.**

This step is usually detected as an attempt, originating from outside the network, to scan the target system and identify an entry point.

MITRE Tactic Example: Pre-attack

The screenshot shows a Microsoft Azure Defender security alert interface. At the top, it displays the alert ID: 2517210707531130134_ba91d7e0-db28-434f-8bf2-ae5dac85c7d. Below the ID, the alert title is "Attempted logon by a potentially harmful application". The alert is categorized as "High Severity" and "Active". The activity time is listed as "04/11/23, 11:20 AM". The alert description states: "THIS IS A SAMPLE ALERT: A potentially harmful application attempted to access SQL server 'Sample-SQL'." The affected resources are listed as "Sample-DB" (SQL) and "MCAPS-Hybrid-REQ-48118-2022-serlingdavis" (Subscription). In the "MITRE ATT&CK® tactics" section, the tactic "Pre-attack" is highlighted with a cursor icon, indicating it is the current focus.

MITRE | ATT&CK® matrix (continued)

Initial Access is the stage where an **attacker manages to get a foothold** on the attacked resource.

This stage is relevant for **compute hosts and resources** such as **user accounts, certificates etc.**

Threat actors will often be able to control the resource after this stage.

mimikatz

LSA iso
krb

MITRE Tactic Example: Initial Access

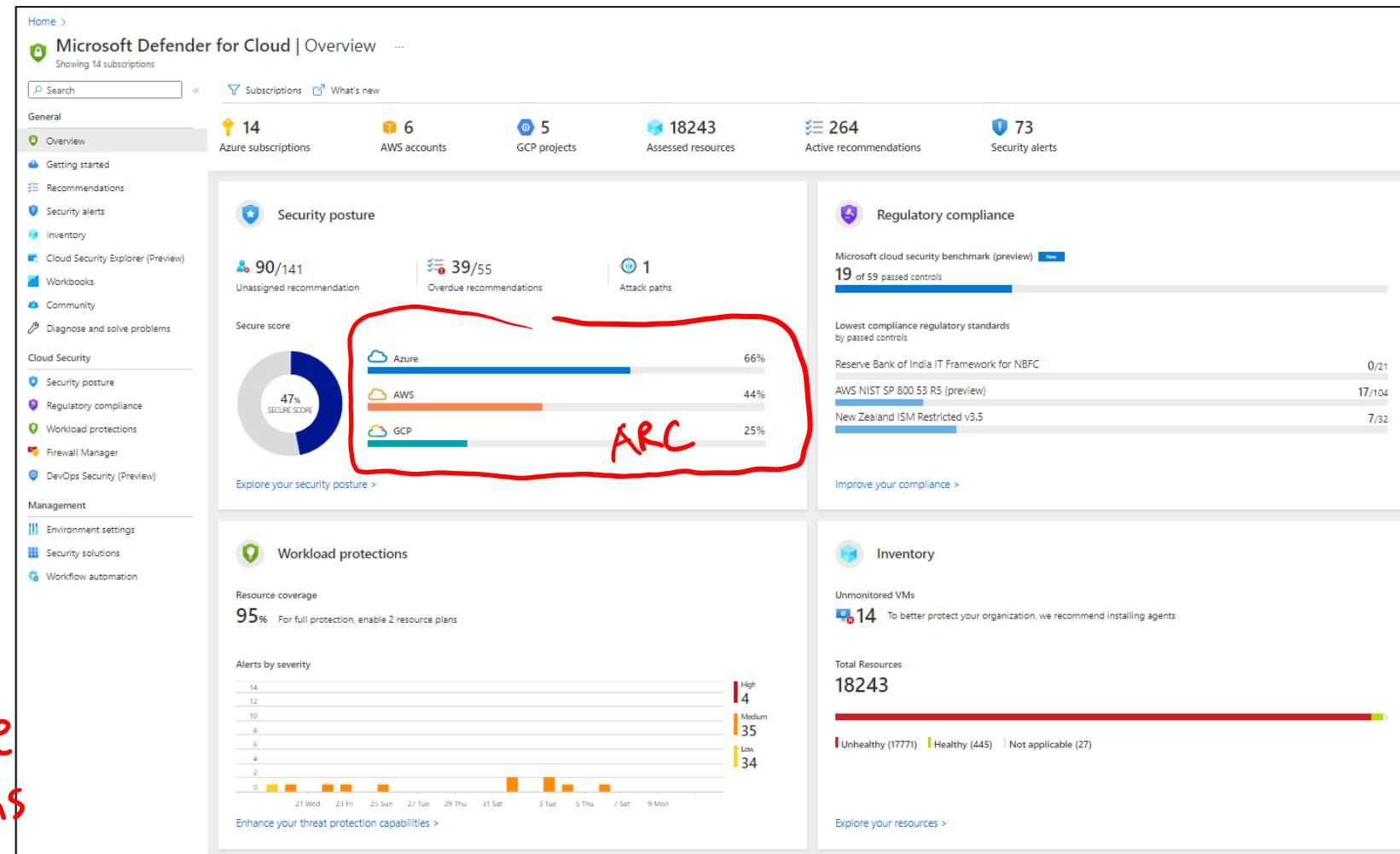
The screenshot shows a Microsoft Azure security alert for 'Access from a suspicious IP'. The alert is categorized under 'Microsoft Defender for Cloud | Security alerts' and is titled 'Security alert'. It has a severity of 'High' and is 'Active'. The activity time is listed as '04/11/23, 11:18 AM'. The alert description states: 'THIS IS A SAMPLE ALERT: Azure Cosmos DB account 'Sample-AzureCosmosDBAccount' was successfully accessed from an IP address that was identified as a threat by Microsoft Threat Intelligence. The threat actor's access was authenticated using Aad.' The affected resource section lists 'Sample-AzureCosmosDBAccount' and 'MCAPS-Hybrid-REQ-48118-2022-serlingdavis Subscription'. The MITRE ATT&CK® tactics section shows a timeline with 'Initial Access' highlighted, indicated by a red circle.

Implement Microsoft Defender for Cloud

Microsoft Defender for Cloud is a Security Posture Management and Workload Protection Platform for Azure, on-premises, and multicloud (Amazon AWS and Google GCP) resources.

Microsoft Defender for Cloud's features covers the two broad pillars of cloud security:

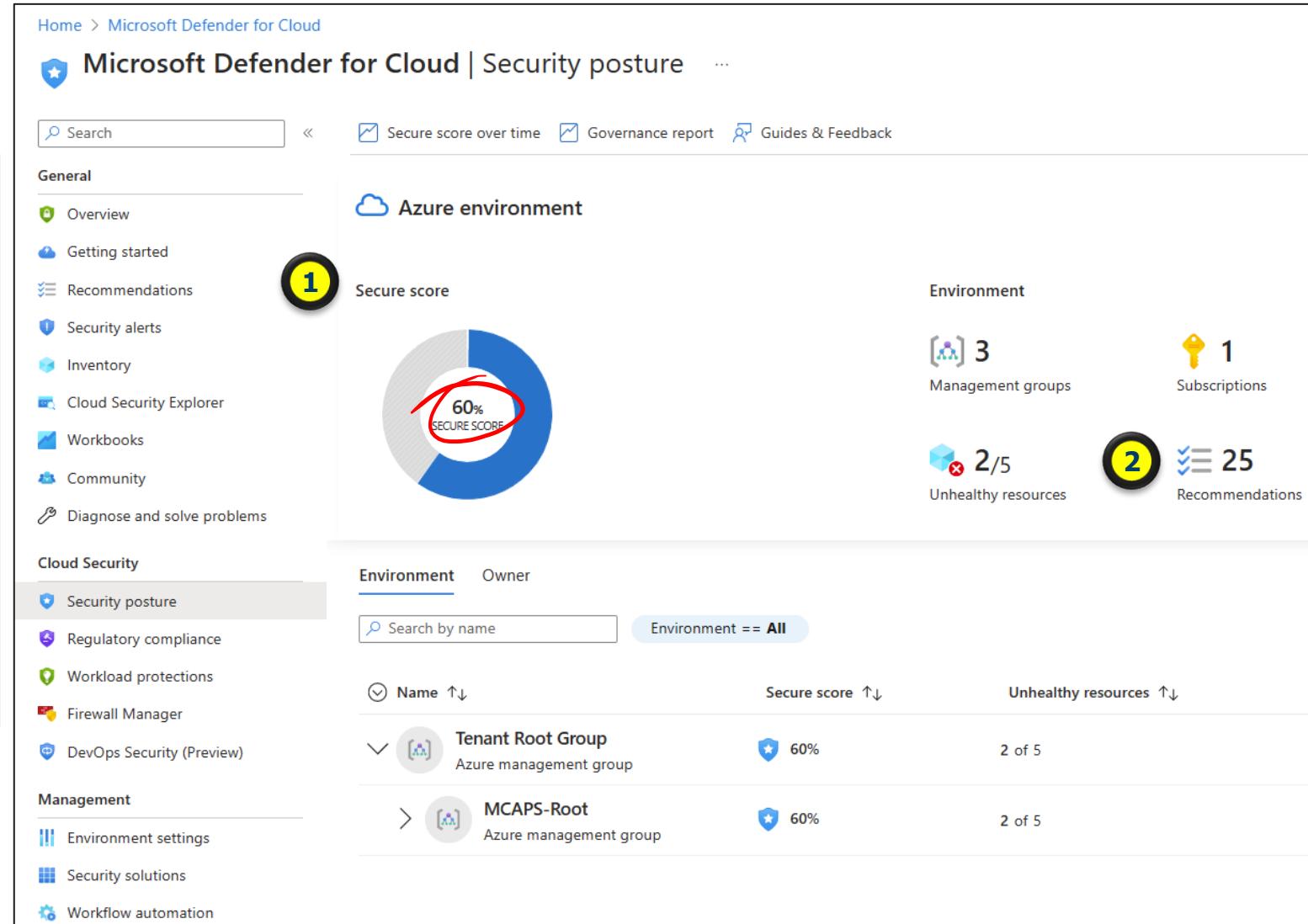
1. Security Posture Management **free**
2. Workload Protection **free / Plans**



Cloud security posture management (CSPM)

The cloud security posture management features provide the following:

- 1** Visibility - to help you understand your current security situation.
- 2** Hardening guidance - to help you efficiently and effectively improve your security.



The screenshot shows the Microsoft Defender for Cloud Security posture dashboard. At the top left is a search bar and navigation links for 'Secure score over time', 'Governance report', and 'Guides & Feedback'. On the left, a sidebar menu includes 'General' (Overview, Getting started, Recommendations, Security alerts, Inventory, Cloud Security Explorer, Workbooks, Community, Diagnose and solve problems), 'Cloud Security' (Security posture, Regulatory compliance, Workload protections, Firewall Manager, DevOps Security (Preview)), and 'Management' (Environment settings, Security solutions, Workflow automation). The main area displays the 'Azure environment' secure score, which is 60% (circled in red). To the right, there are four summary cards: 'Environment' (3 Management groups, 1 Subscriptions), 'Unhealthy resources' (2/5), and 'Recommendations' (25). Below these is a table showing security posture for Azure management groups:

Name	Secure score	Unhealthy resources
Tenant Root Group Azure management group	60%	2 of 5
MCAPS-Root Azure management group	60%	2 of 5

Cloud workload protection (CWP)

1

Microsoft Defender
for Cloud coverage

2

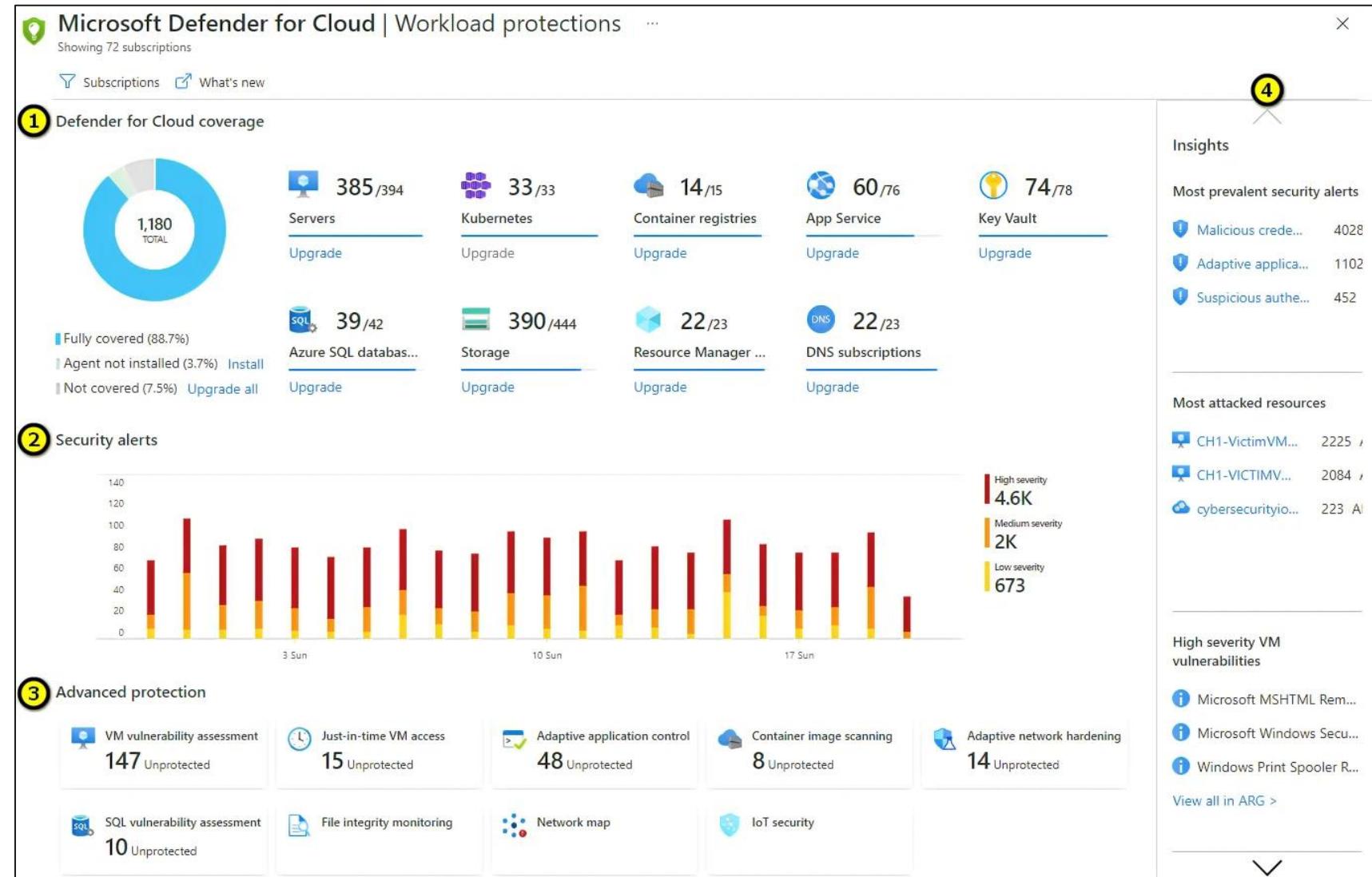
Security alerts

3

Advanced
protection

4

Insights



Basic security features

Defender for cloud offers **foundational** multicloud Cloud Security Posture Management (CSPM) capabilities for free and automatically enabled by default on any subscription or account that has onboarded to Defender for Cloud.

Free

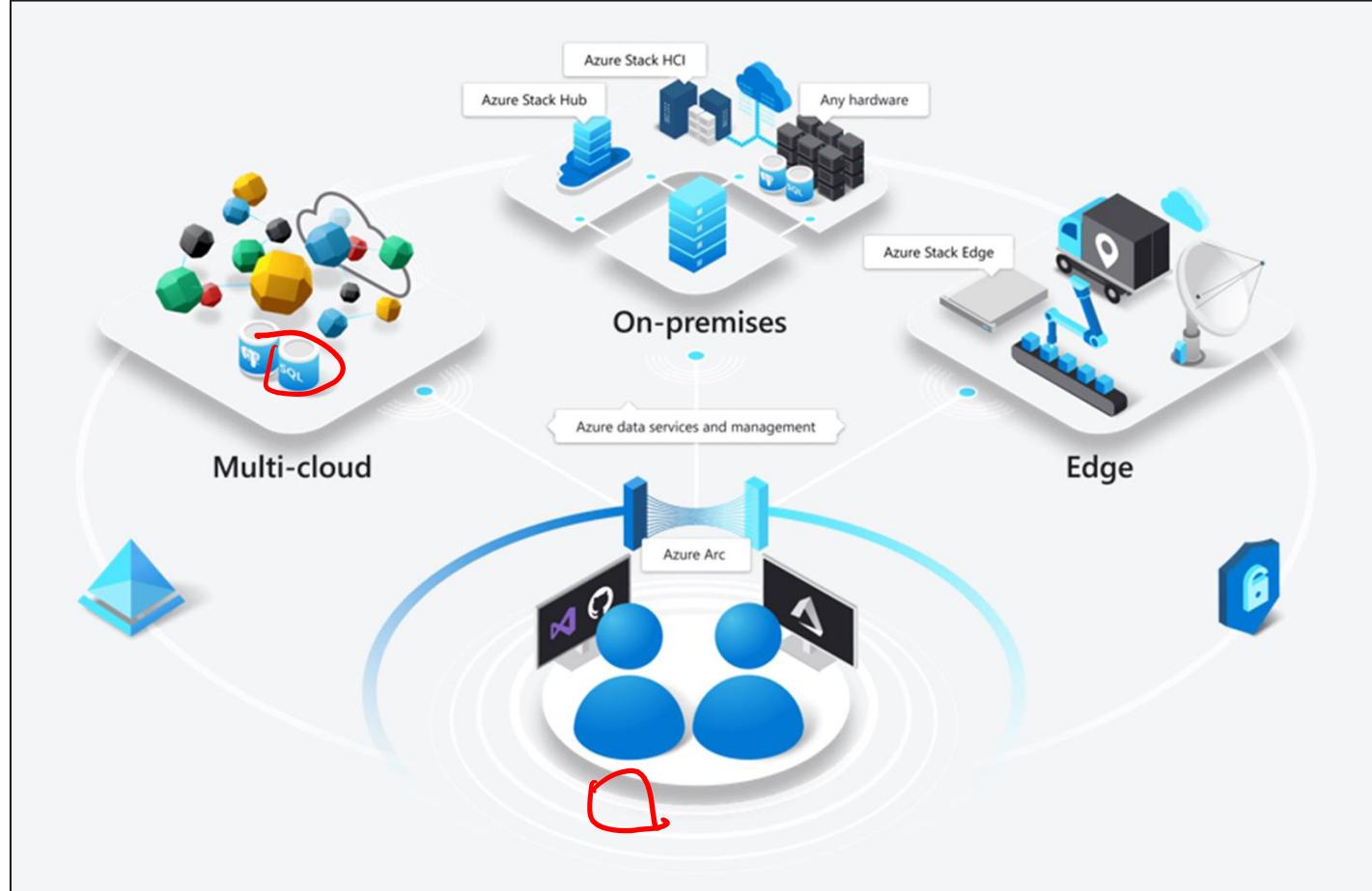
Feature	Foundational CSPM capabilities	Defender CSPM	Cloud availability
Continuous assessment of the security configuration of your cloud resources	✓	✓	Azure, AWS, GCP, on-premises
Security recommendations to fix misconfigurations and weaknesses	✓	✓	Azure, AWS, GCP, on-premises
Secure score	✓	✓	Azure, AWS, GCP, on-premises
Governance	—	✓ (circled)	Azure, AWS, GCP, on-premises
Regulatory compliance	—	✓	Azure, AWS, GCP, on-premises
Cloud security explorer	—	✓	Azure, AWS
Attack path analysis	—	✓	Azure, AWS
Agentless scanning for machines	—	✓	Azure, AWS

Enhanced features

Save  Settings & monitoring			
 Foundational CSPM	Free Details >		 Full
 Defender CSPM	Free (during preview) Details >	N/A	 Partial Settings >
 Servers	Plan 2 (\$15/Server/Month)  Change plan >	1 servers	 Partial Settings >
 App Service	\$15/Instance/Month  Details >	0 instances	 Full
 Databases	Selected: 4/4  Select types >	Protected: 0/0 instances	 Full Settings >
 Storage	\$0.02/10K transactions  New pricing plan available 	1 storage accounts	 Full
 Containers	\$7/VM core/Month  Details >	0 container registries; 0 kubernetes cores	 Partial Settings >
 Kubernetes (deprecated)	\$2/VM core/Month 	0 kubernetes cores	 Full
 Container registries (deprecated)	\$0.29/Image	0 container registries	 Full
 Key Vault	\$0.02/10k transactions Details >	1 key vaults	 Full
 Resource Manager	\$4/1M resource management operations  Details >		 Full
 DNS	\$0.7/1M DNS queries  Details >		 Full

When you enable the **enhanced** security features (**paid**), Defender for Cloud can provide unified security management and threat protection across your cloud workloads.

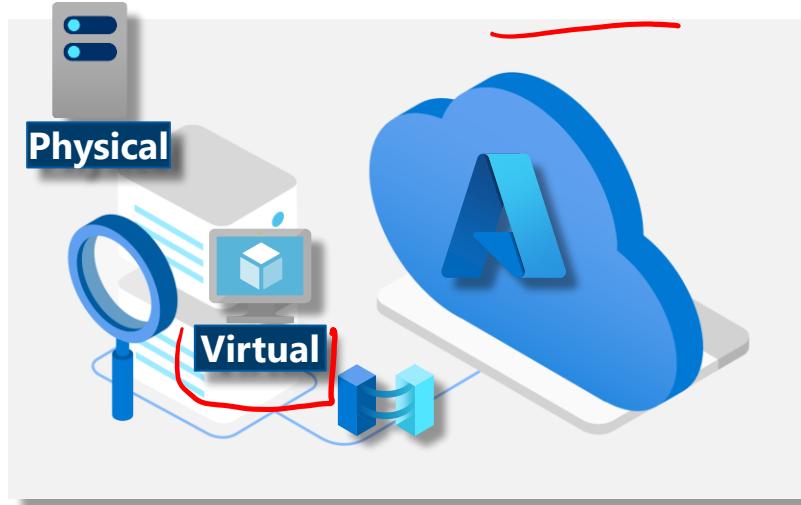
Azure Arc



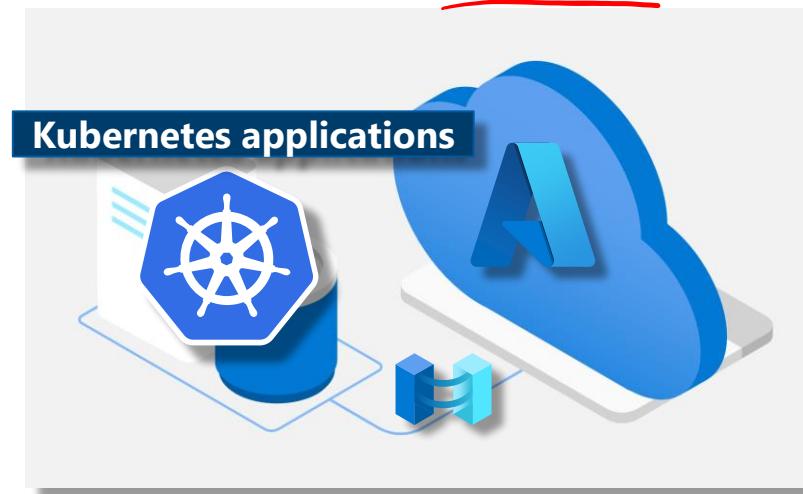
Azure Arc simplifies governance and management by delivering a consistent multi-cloud and on-premises management platform.

Azure Arc capabilities

Azure Arc for Servers



Azure Arc for Kubernetes



Azure data services on Azure Arc



Organize and govern servers across environments

Agent

Manage Kubernetes applications at-scale

Service Mesh
pod

Run data services anywhere

?

Microsoft cloud security benchmark in Defender for Cloud

- The Microsoft cloud security benchmark (**MCSB**) provides best practices and recommendations, with input from a set of holistic Microsoft and industry security guidance that includes:



Cloud Adoption Framework: Guidance on security, including strategy, roles and responsibilities, Azure Top 10 Security Best Practices, and reference implementation.



Azure Well-Architected Framework: Guidance on securing your workloads on Azure.



The Chief Information Security Officer (CISO) Workshop: Program guidance and reference strategies to accelerate security modernization using Zero Trust principles.



Other industry and cloud service providers security best practice standards and framework: Examples include the Amazon Web Services, Center for Internet Security Controls, National Institute of Standards and Technology, and the Payment Card Industry Data Security Standard.

Regulatory compliance dashboard

Microsoft Defender for Cloud streamlines the process for meeting regulatory compliance requirements, using the regulatory compliance dashboard.

The compliance dashboard gives you a view of your overall compliance standing.

Security for non-Azure platforms follows the same cloud-neutral security principles as Azure.

The screenshot shows the Microsoft Defender for Cloud Regulatory Compliance Dashboard. At the top, there are navigation links: Download report, Manage compliance policies, Open query, Compliance over time workbook, Audit reports, and Compliance offerings. A message bar says: "You can now fully customize the standards you track in the dashboard. Update your dashboard by selecting 'Manage compliance policies' above. →".

Two main sections are displayed:

- Microsoft cloud security benchmark:** Shows "52 of 62 passed controls" with a progress bar. Below it is a list of compliance standards with their respective scores:
 - SOC TSP: 1/13
 - PCI DSS 3.2.1: 13/43
 - ISO 27001: 9/20
 - Azure CIS 1.4.0: 94/109
- Lowest compliance regulatory standards:** A section titled "Show all 5" followed by a list of standards with their scores.

At the bottom, there's a survey question: "Is the regulatory compliance experience clear to you? Yes No". Below that, a link to "Microsoft cloud security benchmark" and other standards like ISO 27001, PCI DSS 3.2.1, SOC TSP, and Azure CIS 1.4.0. A note states: "Recommendations from Microsoft Defender for Cloud - Regulatory Compliance should not be interpreted as a guarantee of compliance. It is up to you to evaluate a environment. These services are subject to the terms and conditions in the [licensing terms](#)".

Finally, there's a section with checkboxes for expanding compliance controls and a list of categories: NS. Network Security (red X), IM. Identity Management (green checkmark), and PA. Privileged Access (red X).

What are security initiatives, and policies

Microsoft Defender for Cloud applies security initiatives to your subscriptions.

These initiatives contain one or more security policies.

Each of those policies results in a security recommendation for improving your security posture.

The screenshot shows the Microsoft Defender for Cloud interface for managing security initiatives. At the top, there are buttons for 'Assign policy', 'Assign initiative', and 'Refresh'. Below that are filters for 'Scope' (empty), 'Type' (Initiative selected), 'Compliance state' (All compliance states selected), and a search bar ('Filter by name or ID...').

Key statistics displayed are:

- Overall resource compliance: 100%
- Resources by compliance state: 0 - Compliant (green circle), 0 - Non-compliant (red circle)
- Non-compliant initiatives: 0 out of 7
- Non-compliant policies: 0 out of 623

A table lists the security policies:

Name	Scope	Compliance state	Resource compli...	Non-Compliant Resources	Non-compliant policies
ASC DataProtection (subscription)	MCAPS-Hybrid-REQ-48...	Compliant	100% (0 out of 0)	0	0
Audit Azure Security Baseline	08cc2a62-5116-449e-be...	Compliant	100% (0 out of 0)	0	0
Azure Security Baseline	16b3c013-d300-468d-ac...	Compliant	100% (0 out of 0)	0	0
Audit SQL_Synapse Threat Prot...	08cc2a62-5116-449e-be...	Compliant	100% (0 out of 0)	0	0
CIS Microsoft Azure Foundatio...	MCAPS-Hybrid-REQ-48...	Compliant	100% (0 out of 0)	0	0
ASC OpenSourceRelationalDat...	MCAPS-Hybrid-REQ-48...	Compliant	100% (0 out of 0)	0	0
Audit SQL_Synapse Transparen...	08cc2a62-5116-449e-be...	Compliant	100% (0 out of 0)	0	0

Out of the box examples: Microsoft Defender for Cloud > Environment settings > Subscription > Policy settings > Security policy

What is a security initiative?

A Security initiative is a collection of Azure Policy definitions, or rules, that are grouped together towards a specific goal or purpose.



Security initiatives simplify management of your policies by grouping a set of policies together, logically, as a single item.

Home > Policy | Definitions >

CIS Microsoft Azure Foundations Benchmark v1.1.0

Initiative Definition

Assign Edit initiative Duplicate initiative Delete initiative

Essentials

Name : CIS Microsoft Azure Foundations Benchmark v1.1.0
Description : The Center for Internet Security (CIS) is a nonprofit entity whose mission is to 'identify, develop, validate, and publish consensus-based security benchmarks, methodologies, and tools to assist the information security community in protecting their assets.'
Category : Regulatory Compliance
Version : 16.0.0

Automated Definition Microsoft managed Assignments (0) Parameters

Filter by reference ID, policy name... All effects All types

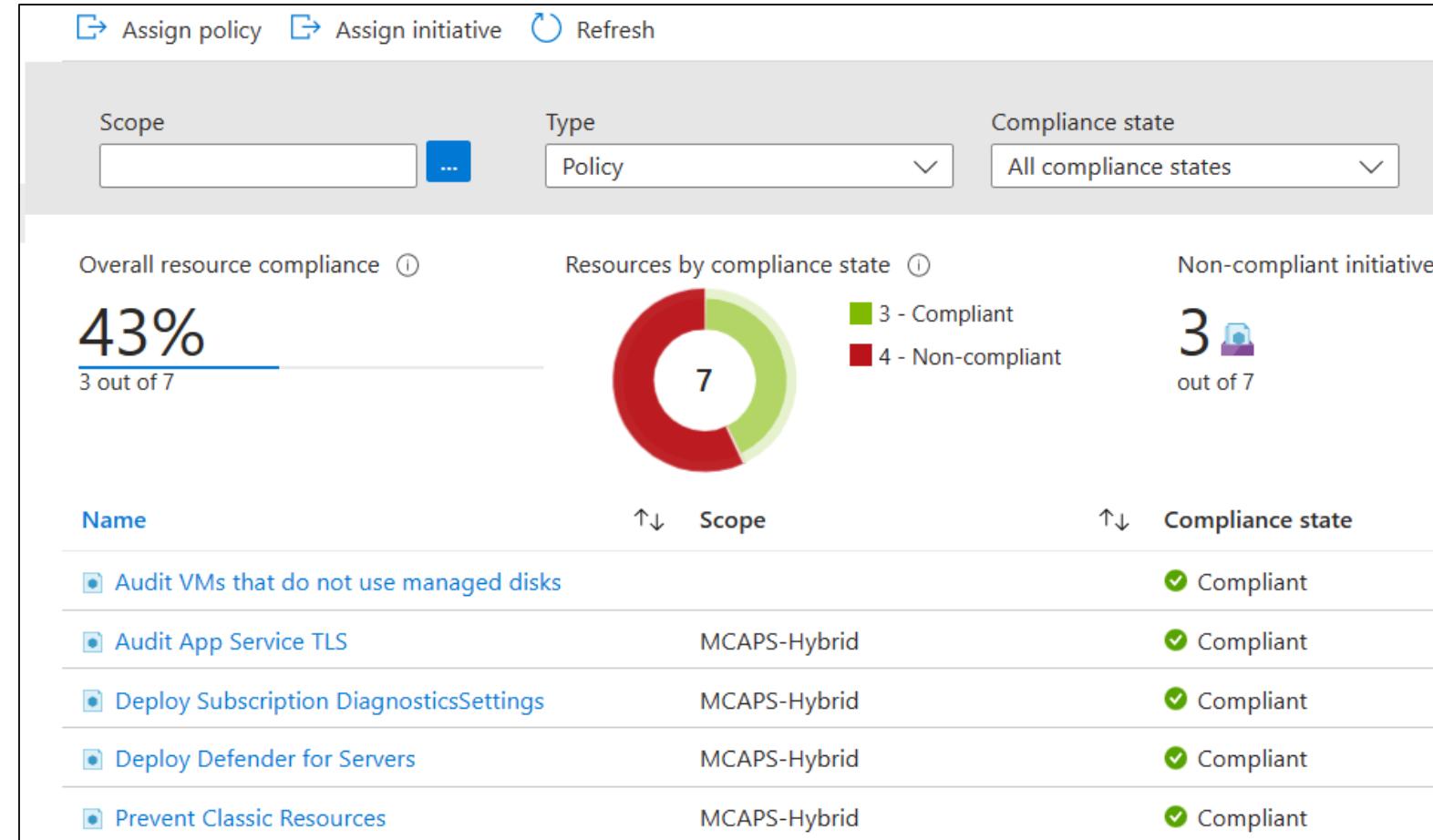
Policy ↑↓

- MFA should be enabled on accounts with owner permissions on your subscription
- MFA should be enabled for accounts with write permissions on your subscription
- MFA should be enabled on accounts with read permissions on your subscription
- External accounts with read permissions should be removed from your subscription
- External accounts with write permissions should be removed from your subscription
- External accounts with owner permissions should be removed from your subscription
- Azure Defender for servers should be enabled
- Azure Defender for Azure SQL Database servers should be enabled
- Azure Defender for Storage should be enabled
- Microsoft Defender for Containers should be enabled

What is a security policy?

An Azure Policy definition, created in Azure Policy, is a rule about specific security conditions that you want controlled.

For example, controlling what type of resources can be deployed or enforcing the use of tags on all resources.



Viewing and editing security policies

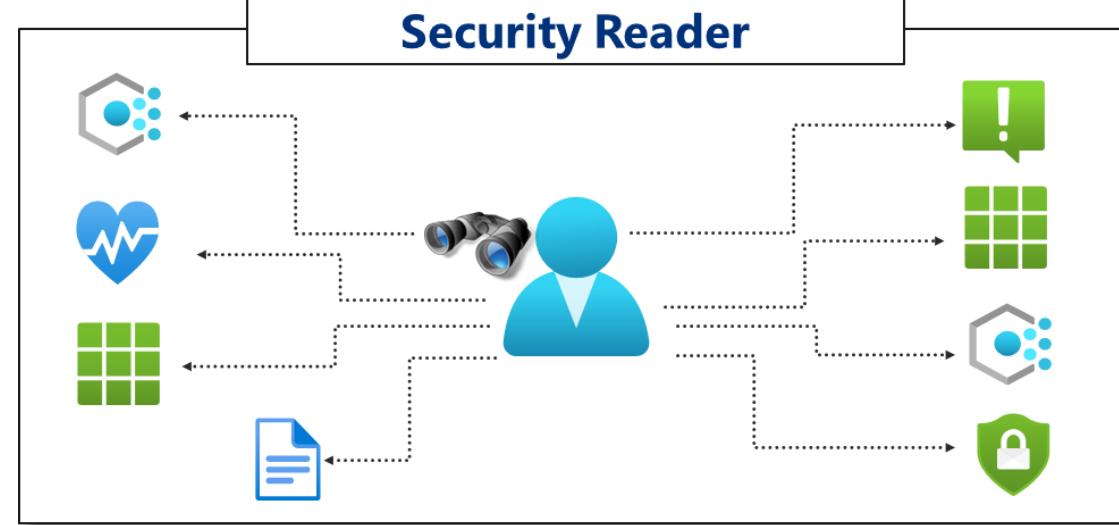
View, Update, and Dismiss Alerts

Security Administrator
vs.
Security Reader

View Only



Security Reader



Recommendations

Using the policies, Defender for Cloud periodically analyzes the compliance status of your resources to identify potential security misconfigurations and weaknesses.

It then provides you with recommendations on how to remediate those issues.

Recommendations result from assessing your resources against the relevant policies and identifying resources that aren't meeting your defined requirements.

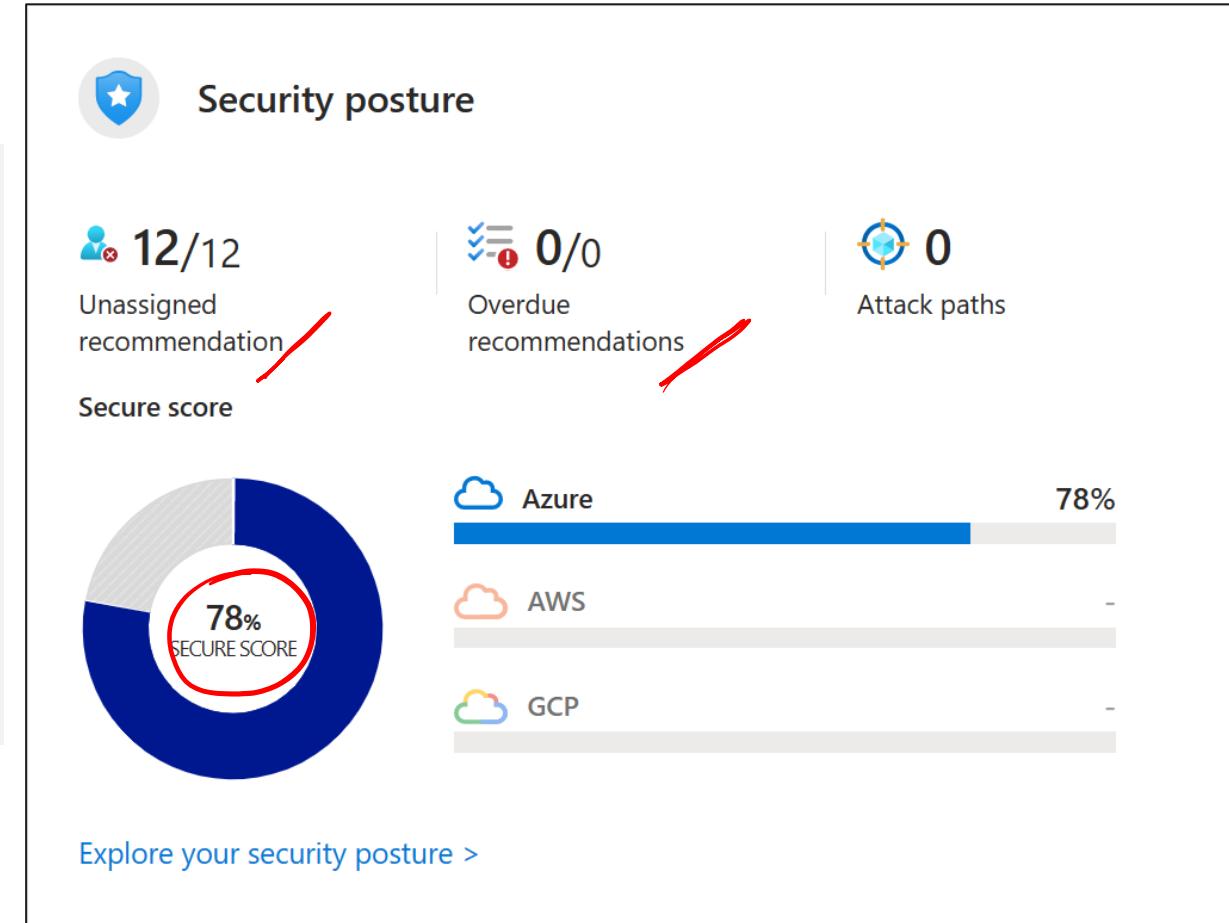
The screenshot shows the 'Secure score recommendations' section of the Microsoft Defender for Cloud portal. At the top, it displays a secure score of 77% with a blue shield icon, which is circled in red. To the right, it shows 7 active recommendations out of 38 total. Below this, there's a search bar and a filter for 'Recommendation status == None'. A table lists ten recommendations with their names and maximum scores:

Name	Max score
Enable MFA	10
Secure management ports	8
Remediate vulnerabilities	6
Apply system updates	6
Encrypt data in transit	4
Manage access and permissions	4
Enable encryption at rest	4
Remediate security configurations	4
Restrict unauthorized network access	4

Secure Score

Microsoft Defender for Cloud has two main goals:

1. To help you understand your current security situation
2. To help you efficiently and effectively improve your security



Improve your secure score

To improve your secure score, remediate security recommendations from your recommendations list.

You can remediate each recommendation manually for each resource or use the **Fix**  option (**when available**) to resolve an issue on multiple resources quickly.

Unhealthy resources	Insights
0 of 1 resources	
0 of 1 resources	
1 of 1 resources	
 1 of 1 virtual machines	 
 0 of 1 virtual machines	
0 of 1 resources	
0 of 1 resources	
0 of 4 resources	 
1 of 1 resources	

Security controls

Recommendations are grouped into **security controls** and each control is a logical group of related security recommendations and reflects your vulnerable attack surfaces.

Your score only improves when you **remediate all of the recommendations** for a single resource within a control.

Example: Security Controls

	Max score
➤ Name ↑↓	
➤ Enable MFA	10
➤ Secure management ports	8
➤ Remediate vulnerabilities	6
➤ Apply system updates	6
➤ Encrypt data in transit	4
➤ Manage access and permissions	4
➤ Enable encryption at rest	4
➤ Remediate security configurations	4
➤ Restrict unauthorized network access	4

Define brute force attacks

23



A Brute force attack is a type of **hacking technique** in which an attacker tries to gain access to a network or system by guessing the **username** and **password** combination through an automated process.

The attacker typically uses a **program** that generates a large number of login attempts in a short period of time to try every possible combination of characters until the correct one is discovered.

This type of attack can be very effective against **weak passwords** and security systems with no protection against brute force attacks, but it is time-consuming and can be detected by security measures such as account lockouts after a certain number of failed login attempts.

Management services, ports, and protocols

- Typically, management services over **commonly used ports** are used when guessing passwords.

Management Service	Port and Protocol
SSH (Secure Shell)	22 / TCP (Transmission Control Protocol)
Telnet (Teletype Network)	23 / TCP (Transmission Control Protocol)
FTP (File Transfer Protocol)	21 / TCP (Transmission Control Protocol)
NetBIOS (Network Basic Input/Output System)/ SMB (Server Message Block)/ Samba	139 and 445 / TCP (Transmission Control Protocol)
LDAP (Lightweight Directory Access Protocol)	389 / TCP (Transmission Control Protocol)
Kerberos	88 / TCP (Transmission Control Protocol)
RDP (Remote Desktop Protocol)	3389 / TCP (Transmission Control Protocol)
HTTP/HTTP (Hypertext Transfer Protocol) Management Services	80 and 443 / TCP (Transmission Control Protocol)
MSSQL (Microsoft Structured Query Language)	1433 / TCP (Transmission Control Protocol)
Oracle	1521 / TCP (Transmission Control Protocol)
MySQL (My Structured Query Language)	3306 / TCP (Transmission Control Protocol)
VNC (Virtual Network Computing)	5900 / TCP (Transmission Control Protocol)
SNMP (Simple Network Management Protocol)	161 and 162 / UDP (User Datagram Protocol) / 162 / TCP (Transmission Control Protocol)

Brute force attack programs and use cases

- There are several types of brute force attack programs used by attackers, including:

Types of Brute Force Attack Programs and Use Case	
Password crackers	used for guessing passwords and encryption keys.
Port scanners	used to identify open ports on a network or system.
Network mappers	used to map the topology of a network.
Web application servers	used to test web applications for vulnerabilities.
SSH brute force tools	used to guess SSH login credentials.
Remote desktop brute force tools	used to guess RDP login credentials.
FTP brute force tools	used to guess FTP login credentials.
SNMP brute force tools	used to guess SNMP community strings.

- These programs can be used individually or in combination to launch a successful brute force attack on a target network or system.

Indications of an attack

Extreme counts of **failed sign-ins** from many unknown usernames.

Never previously “**successfully authenticated**” from multiple remote desktop protocol (RDP) connections or from new source IP addresses.

 Potential SQL Brute Force attempt [Sample alert](#)

High Severity | Active Status | 10/25/22, 03:32 PM (UTC-5...) Activity time

[Copy alert JSON](#)

Alert description

THIS IS A SAMPLE ALERT: Someone is attempting to brute force credentials to your SQL server 'Sample-SQL'.

Affected resource

 Sample-DB

 Visual Studio Enterprise Subscription

Example: Alert

Subscription

MITRE ATT&CK® tactics ⓘ

- Pre-attack

View full details [Take action](#)



Practices to blunt a Brute Force Attacks

To counteract brute-force attacks, you can take multiple measures such as:

1. Disable the public IP address and use one of these connection methods:
 - a. Use a **point-to-site** virtual private network (VPN)
 - b. Create a **site-to-site** VPN
 - c. Use **Azure ExpressRoute** to create secure links from your on-premises network to Azure
2. Require two-factor authentication
3. Increase password length and complexity. (i.e., **Ztyn%9*qvB**)
4. Limit login attempts
5. Implement Completely Automated Public Turing test "**CAPTCHA**"
6. Limit the amount of time that the ports are open.

Understanding just-in-time (JIT) VM access (example)

Home > Microsoft Defender for Cloud | Workload protections >

Just-in-time VM access

Last week

Some of your subscriptions don't have Defender for Cloud's full protections enabled. To upgrade those subscriptions, click here. →

- > What is just-in-time VM access?
- > How does it work?

Virtual machines

Configured Not Configured Unsupported

VMs for which the just-in-time VM access control is already in place. Presented data is for the last week.

1 VMs

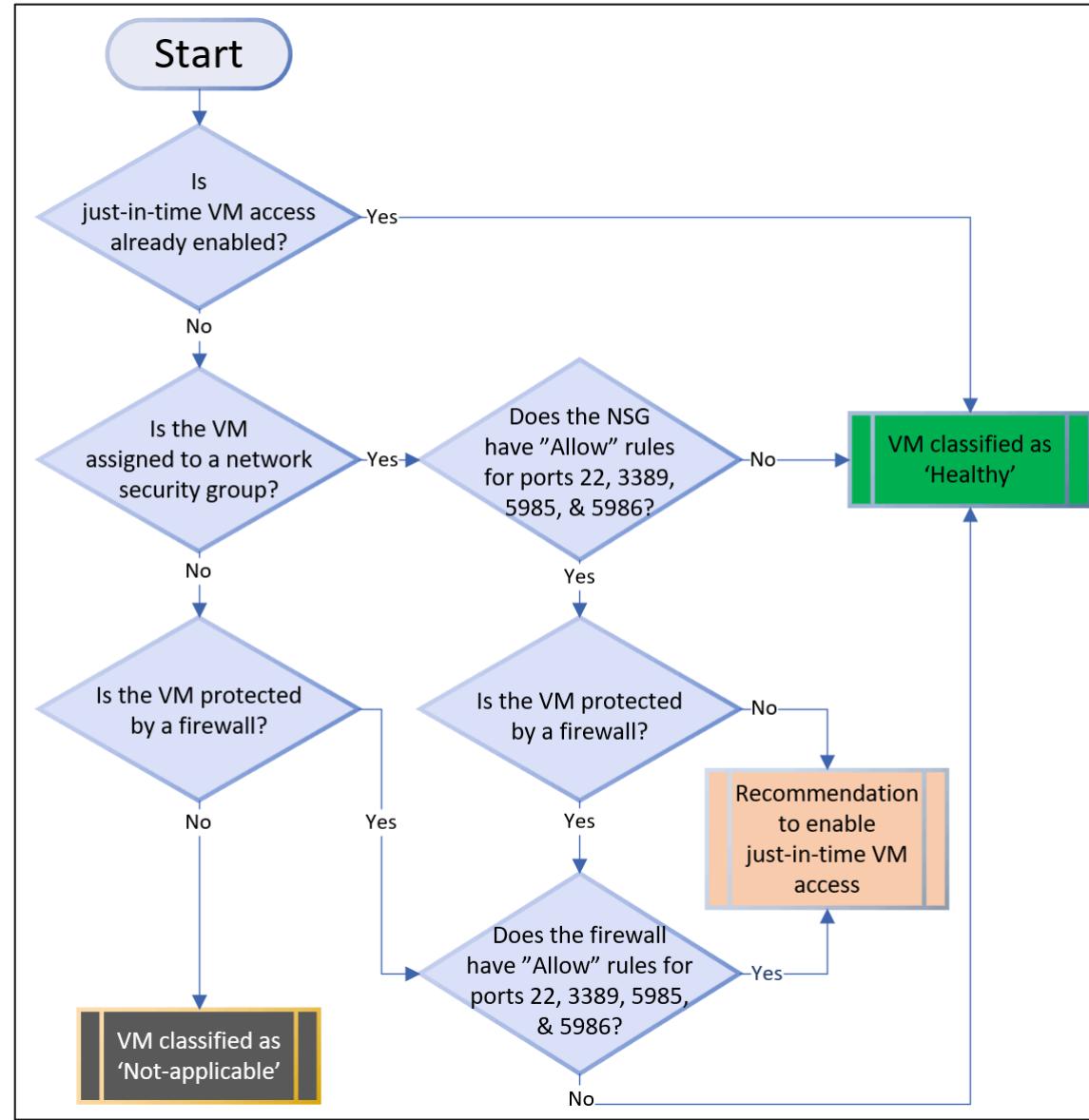
Request access

Search to filter items...

Virtual machine ↑↓	Approved ↑↓	Last access ↑↓	Connection details	Last user ↑↓	...
<input type="checkbox"/>  romebuild	0 Requests	N/A	 -	N/A	...

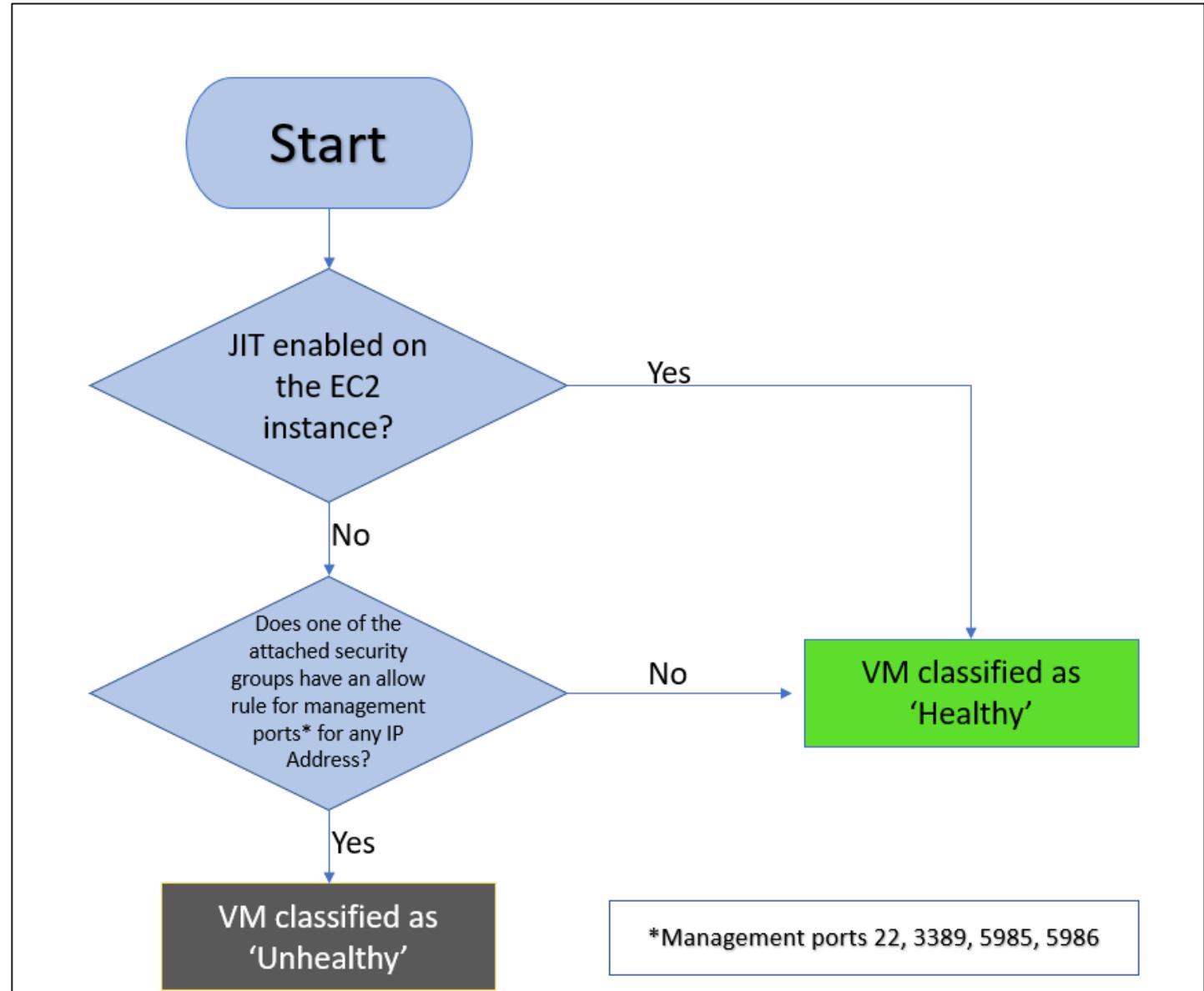
Just-in-time VM is enabled an Azure Virtual Machine

Example: Azure Virtual Machine



Just-in-time VM is enabled on the AWS EC2 Instance

Example: AWC EC2 Instance



Added to the recommendation's Unhealthy resources tab

When Defender for Cloud finds a machine that can benefit from JIT, it adds that machine to the recommendation's Unhealthy resources tab.

Dashboard > Microsoft Defender for Cloud | Recommendations >

Management ports of virtual machines should be protected with just-in-time network access control

Description
Microsoft Defender for Cloud has identified some overly-permissive inbound rules for management ports in your Network Security Group. Enable just-in-time access control to protect your VM from internet-based brute-force attacks. [Learn more](#).

Remediation steps

Affected resources

Example: Affected resources

Unhealthy resources (78)		Healthy resources (112)	Not applicable resources (66)
<input type="checkbox"/>	conto		
<input type="checkbox"/>	ContosoWeb2	Contoso IT - demo	
<input type="checkbox"/>	ContosoWeb1	Contoso IT - demo	
<input type="checkbox"/>	ContosoSQLSrv3	Contoso IT - demo	
<input type="checkbox"/>	ContosoSQLSrv3	Contoso IT - demo	
<input type="checkbox"/>	ContosoSQLSrv2	Contoso IT - demo	

Implement Just-in-time VM access

:3388

temp rule in NSG

- Just-in-time (JIT) virtual machine (VM) access is used to lock down inbound traffic to your Azure VMs, reducing exposure to attacks while providing easy access to connect to VMs when needed.



To use Just-in-Time VM access, you must **enable** Microsoft Defender for Cloud.



After you enable Defender, you can view which virtual machines have JIT configured.

The screenshot shows the Microsoft Defender for Cloud Overview page. Step 1 highlights the top navigation bar. Step 2 highlights the 'Workload protections' section. Step 3 highlights the 'Just-in-time VM access' section, which displays '2 Unprotected' VMs. A red circle with the number 1 is on the top navigation bar, 2 is on the workload protections section, and 3 is on the JIT access section.

The screenshot shows the 'Virtual machines' list page. Step 4 highlights a button labeled 'Enable JIT on 2 VMs'. The table lists two VMs: SGVM1 and SGMME, both of which are currently 'Not Configured'. A red circle with the number 4 is on the 'Enable JIT on 2 VMs' button. The table has columns for Virtual machine, Resource group, Subscription Name, Severity, and Reason.

Virtual machine	Resource group	Subscription Name	Severity	Reason
SGVM1	DALLASVDC1A	Visual Studio Enterprise Subscription	High	This VM is protected by an NSG that allows access to management ports.
SGMME	DALLASVDC1A	Visual Studio Enterprise Subscription	High	This VM is protected by an NSG that allows access to management ports.

Implement Just-in-time VM access (continued)



For each virtual machine, you are provided with a list of recommended specific ports and access.



You can save the recommendations or Add other ports of your choosing.

Home > Microsoft Defender for Cloud > Just-in-time VM access >

JIT VM access configuration

5GVM1, 5GMME

5

+ Add Save Discard

Configure the ports for which the just-in-time VM access will be applicable

Port	Protocol	Allowed source IPs	IP range	Time range (hours)	...
22 (Recommended)	Any	Per request	N/A	3 hours	...
3389 (Recommended)	Any	Per request	N/A	3 hours	...
5985 (Recommended)	Any	Per request	N/A	3 hours	...
5986 (Recommended)	Any	Per request	N/A	3 hours	...

Add port configuration

Port *

Protocol

Any TCP UDP

Allowed source IPs

Per request CIDR block

IP addresses (i)

Max request time

3
(hours)

Discard

OK

Implement Just-in-time VM access (continued)

E

Once everything is in place, users must request access to the virtual machine.



You can also monitor the usage of each virtual machine.

Virtual machines

Configured Not Configured Unsupported

VMs for which the just-in-time VM access control is already in place. Presented data is for the last week.

2 VMs

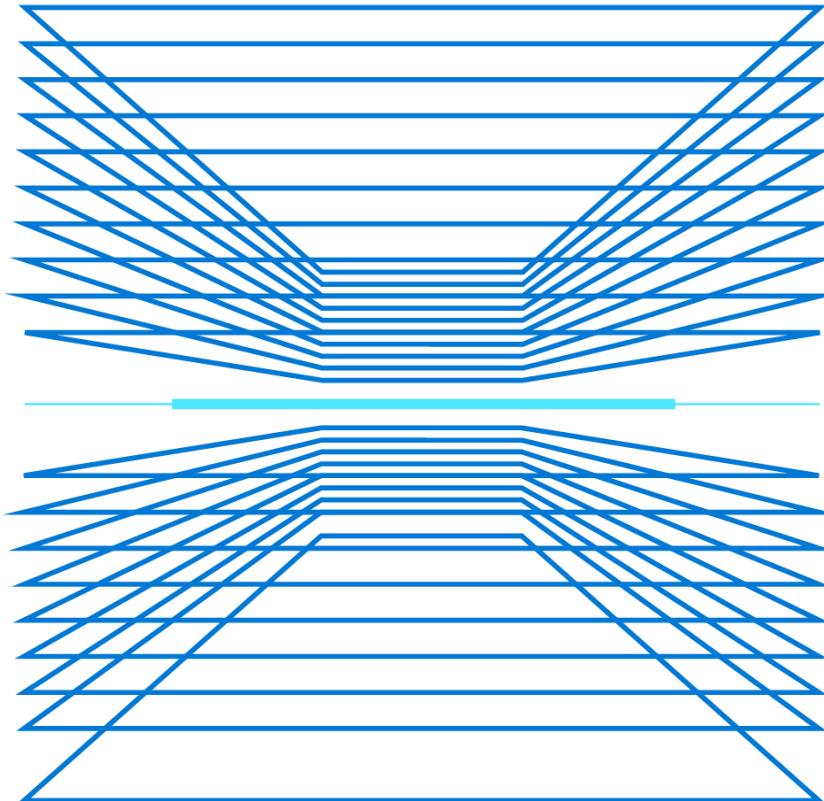
Search to filter items...

Virtual machine ↑↓	Approved ↑↓	Last access ↑↓	Connection details	Last user ↑↓
5GVM1	0 Requests	N/A	-	N/A
5GMME	0 Requests	N/A	-	N/A

Request access A large blue button labeled "Request access" with a white hand cursor icon pointing towards it. A red circle with the number "6" is positioned above the button, indicating pending requests.

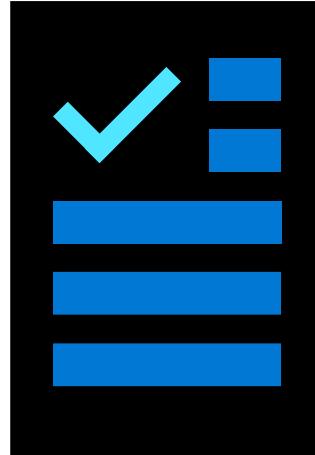
Demonstration: Microsoft Defender for Cloud

- Review Microsoft Defender for Cloud recommendations
- Review Microsoft Defender for Cloud security policies
- Review Microsoft Defender for Cloud regulatory compliance



Additional Study – Microsoft Defender for Cloud

Module Review Questions



Microsoft Learn Modules (docs.microsoft.com/Learn)

Resolve security threats with Microsoft Defender for Cloud (Exercise)

Protect your servers and VMs from brute-force and malware attacks with Microsoft Defender for Cloud (Exercise)

Identify security threats with Microsoft Defender for Cloud

Top 5 security items to consider before pushing to production

SIEM

SOAR

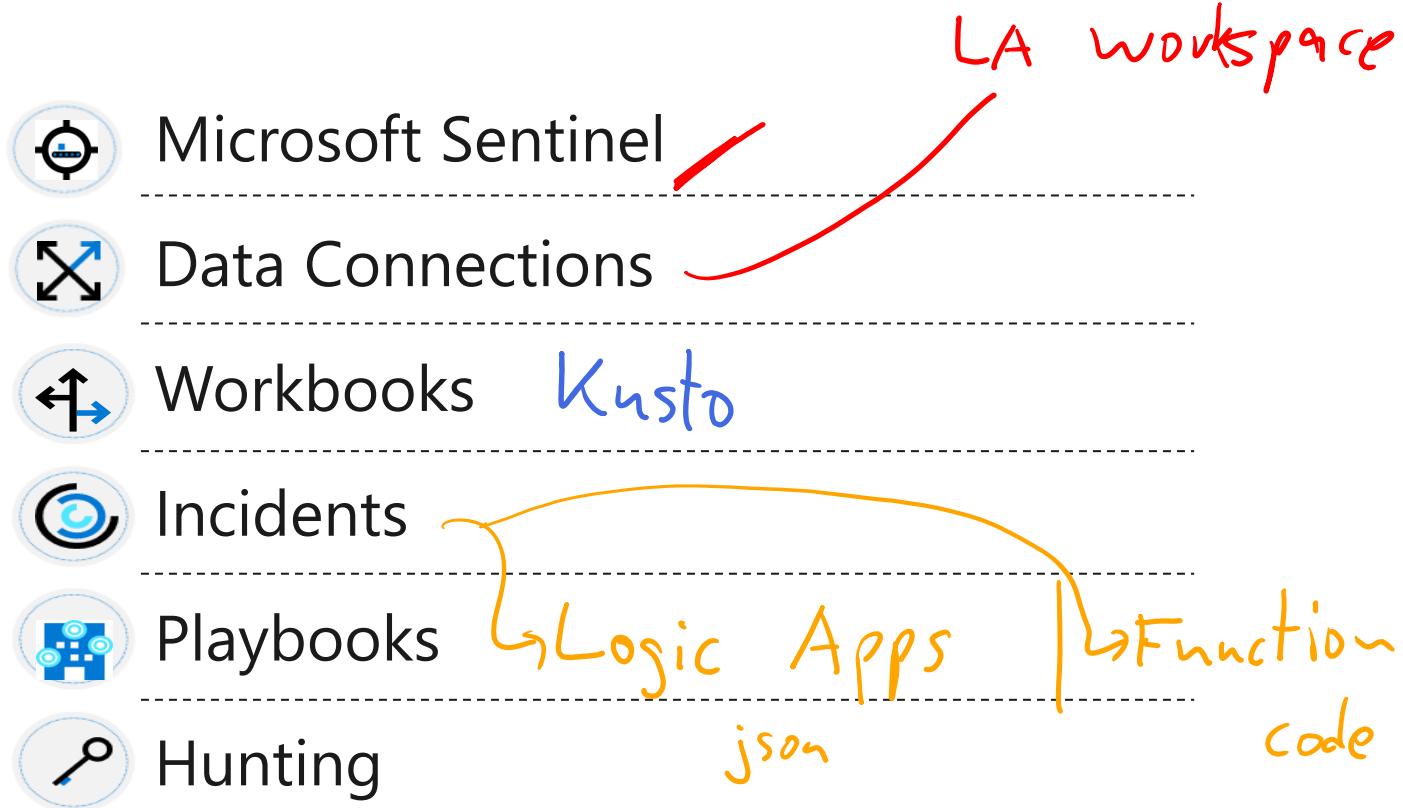
Microsoft Sentinel



AZ - 200

AZ - 100

Microsoft Sentinel



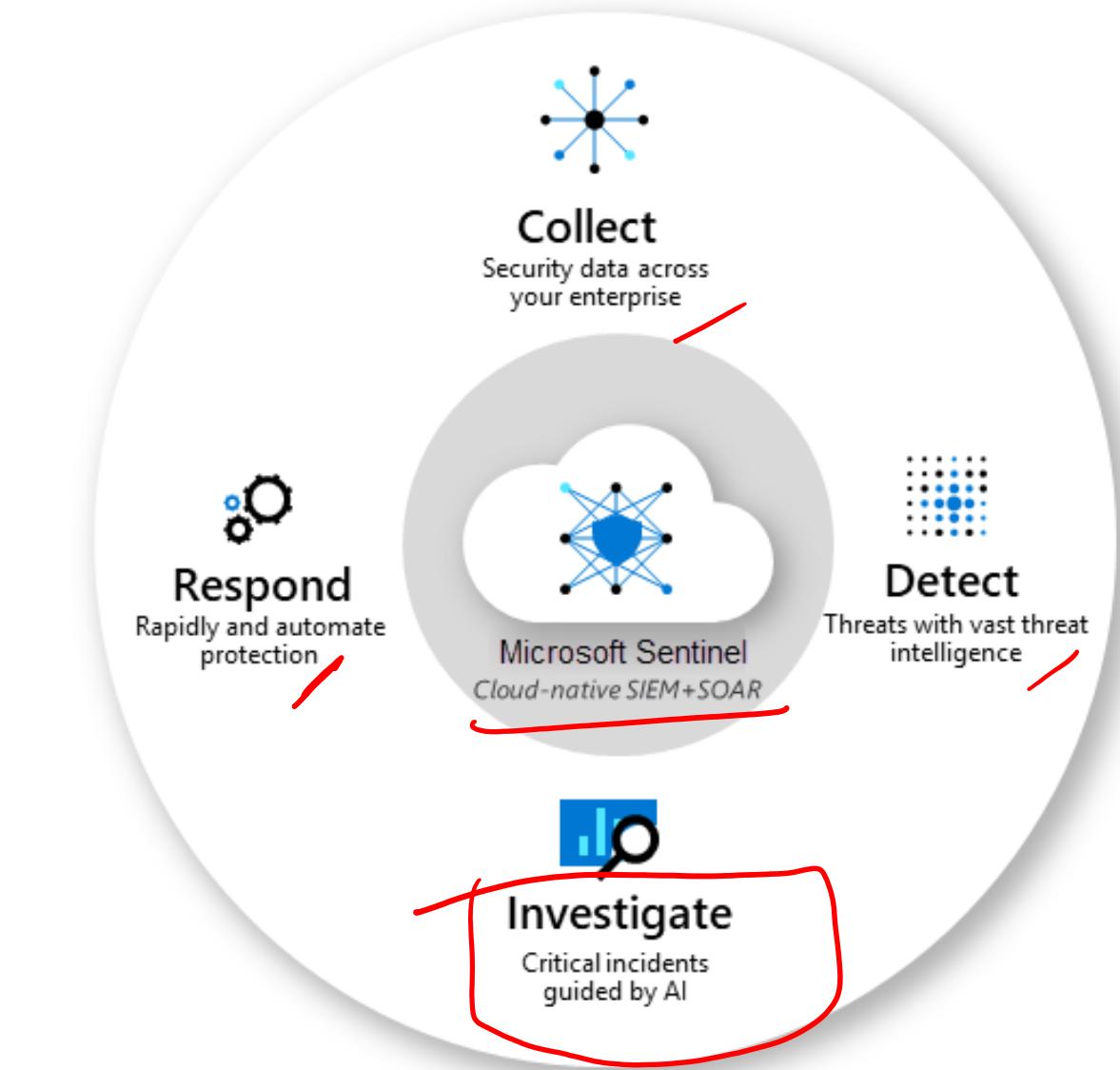
Microsoft Sentinel

Collect data at cloud scale across all users, devices, applications, and infrastructure

Detect threats, and minimize false positives

Investigate threats with artificial intelligence, and hunt for suspicious activities at scale

Respond to incidents rapidly with built-in orchestration and automation of common tasks



Data Connections

Microsoft Sentinel comes with many connectors for Microsoft solutions that are available out of the box and provide real-time integration.

Microsoft sources like Microsoft 365 Defender, Microsoft Defender for Cloud, Office 365, Microsoft Defender for IoT.

Azure service sources like Azure Active Directory, Azure Activity, Azure Storage, Azure Key Vault, Azure Kubernetes service, and more.

The screenshot shows the Microsoft Sentinel Data connectors page. At the top, it displays "Selected workspace: 'msftwrkspc1a'". Below this is a search bar and a navigation menu with links for Overview (Preview), Logs, News & guides, and Search. The main area is titled "Data connectors" and shows a summary: "126 Connectors" with "0 Connected". A red circle highlights the "Connected" status. There is also a link to "More content at Content hub". Below this, there is a search bar and filters for "Providers : All", "Data Types : All", and "Status : All". The main list is titled "Status" and "Connector name ↑". It lists several connectors:

Status	Connector name
	Agari Phishing Defense and Brand Protection (Preview) Agari
	AI Analyst Darktrace (Preview) Darktrace
	AI Vectra Detect (Preview) Vectra AI
	Akamai Security Events (Preview) Akamai
	Alcide kAudit (Preview) Alcide
	Alsid for Active Directory (Preview) Alsid
	Amazon Web Services Amazon

Azure

Workbooks

After you onboard to Microsoft Sentinel, monitor your data by using the integration with Azure Monitor workbooks.

Microsoft Sentinel allows you to create custom workbooks across your data.

Microsoft Sentinel also comes with built-in workbook templates to allow you to quickly gain insights across your data as soon as you connect a data source.

The screenshot shows the Microsoft Sentinel Workbooks interface. At the top, there's a navigation bar with 'Home > Microsoft Sentinel > Microsoft Sentinel' and a search bar. Below it, a summary section shows '1 Saved workbooks', '90 Templates', and '0 Updates'. On the left, a sidebar menu includes 'General' (Overview, Logs, News & guides), 'Threat management' (Incidents, Workbooks, Hunting, Notebooks, Entity behavior, Threat intelligence (Preview)), and 'Configuration' (Data connectors, Analytics, Watchlist (Preview), Automation, Community, Settings). The main area is titled 'My workbooks' and 'Templates'. It lists several templates: 'AI Analyst Darktrace Model Breach Summary' (DARKTRACE), 'AI Vectra Detect' (VECTRA AI), 'Alsid for AD | Indicators of Exposure' (ALSID), 'Analytics Efficiency' (MICROSOFT), 'ASC Compliance and Protection' (MICROSOFT SENTINEL COMMUNITY), 'AWS Network Activities' (MICROSOFT), 'AWS User Activities' (MICROSOFT), and 'Azure Activity'. A detailed preview of the 'Analytics Efficiency' template is shown on the right, featuring a dashboard with various charts and metrics. A callout box highlights 'Required data types: SecurityAlert, SecurityIncident'. At the bottom right of the preview, there are 'View template' and 'Save' buttons.

Incidents

To help you reduce noise and minimize the number of alerts you have to review and investigate, Microsoft Sentinel uses analytics to correlate alerts into incidents.

Incidents are groups of related alerts that together indicate an actionable possible-threat that you can investigate and resolve.

Use the built-in correlation rules as-is, or use them as a starting point to build your own.

The screenshot shows the Microsoft Sentinel Incidents page. At the top, it displays summary counts: 403 Open incidents, 400 New incidents, and 3 Active incidents. Below this is a chart titled "Open incidents by severity" showing the distribution across High (82), Medium (95), Low (207), and Informational (19) levels. The main area is a table of incidents with columns for Severity, Status, Incident ID, Title, Alerts, Product names, and Created time. One specific incident is highlighted with a red border: "Authentication Methods Changed for Privileged Acc..." (Incident ID: 203443). The details pane on the right shows the incident's properties: Unassigned Owner, New Status, and High Severity. It also includes sections for Description (identifying authentication methods being changed for a privileged account), Alert product names (Microsoft Sentinel), Evidence (1 Events, 1 Alerts, 0 Bookmarks), Last update time (05/11/22, 12:50 PM), Creation time (05/11/22, 12:49 PM), Entities (2), Tactics and techniques, and links to View full details and Actions.

M365: Flow → Power Platform / Power Automate

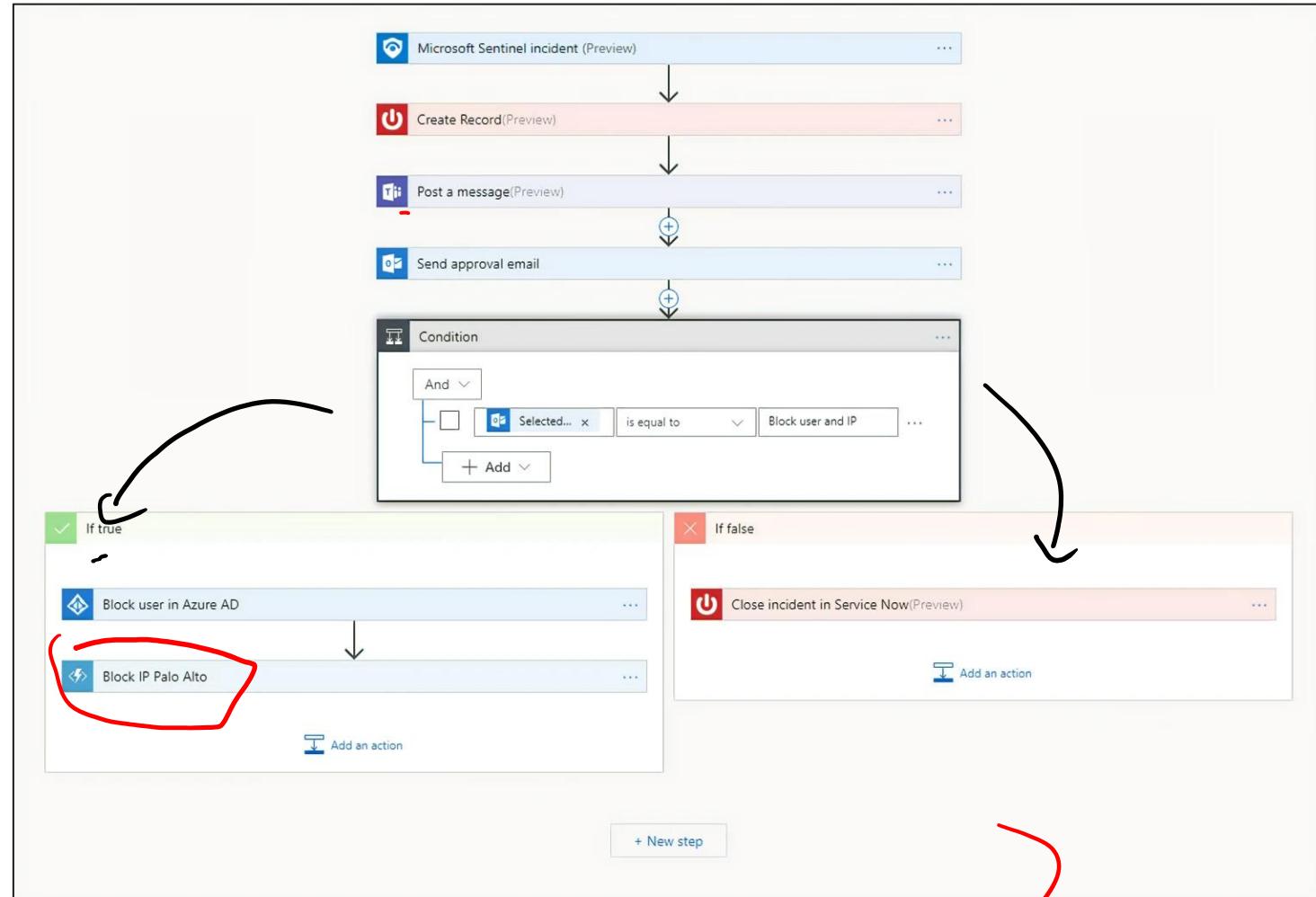
Azure Logic App Designer

Playbooks

Automate your common tasks and simplify security orchestration with playbooks that integrate with Azure services and your existing tools.

Playbooks automate and simplify tasks, including data ingestion, enrichment, investigation, and remediation.

Playbooks work best with single, repeatable tasks, and don't require coding knowledge.



json

Hunting

Microsoft Sentinel's search-and-query tool, is based on the MITRE framework, which enables you to hunt for security threats across your organization's data sources, before an alert is triggered.

Create custom detection rules based on your hunting query.

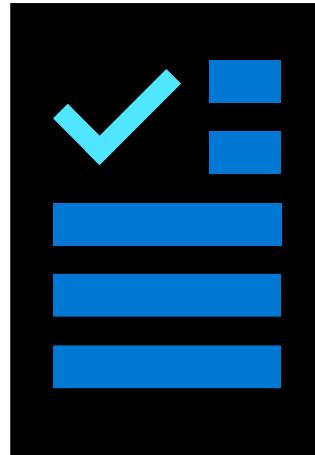
Surface insights as alerts to your security incident responders.

The screenshot shows the Microsoft Sentinel - Hunting interface. On the left, there's a sidebar with options like Overview, Logs, Threat management, Cases, Dashboards, User profiles (Coming soon), and Hunting (which is selected). The main area displays a table of 19 total queries and 106 total results. The table columns include QUERY, DESCRIPTION, PROVIDER, DATA SO..., RE..., and TACTICS. A red arrow points to the 'TACTICS' filter button at the top of the table. To the right, there's a section titled 'New processes observed in last 24 hours' with details for Microsoft provider and SecurityEvent data source. Below that is a 'Query Information' section with a code snippet and a 'Run Query' button.

QUERY	DESCRIPTION	PROVIDER	DATA SO...	RE...	TACTICS
New processes observed in last 24 h...	Shows new processes observed in the last ...	Microsoft	SecurityEvent	103	...
Azure AD signins from new locations	New AzureAD signin locations today versus...	Microsoft	SignInLogs	3	...
Processes executed from binaries hid...	Process executed from binary hidden in Ba...	Microsoft	SecurityEvent	0	...
Processes executed from base-encod...	Finding base64 encoded PE files header se...	Microsoft	SecurityEvent	0	...
Anomalous Azure AD apps based on ...	This query over Azure AD sign-in activity h...	Microsoft	SignInLogs	0	...
Summary of users creating new user ...	New user accounts may be an attacker pro...	Microsoft	OfficeActivity
User and Group enumeration	The query finds attempts to list users or gr...	Microsoft	SecurityEvent
Summary of failed user logons by rea...	A summary of failed logons can be used to...	Microsoft	SecurityEvent
Hosts with new logons	Shows new accounts that have logged on to...	Microsoft	SecurityEvent
Malware in the recycle bin	Finding attackers hiding malware in the re...	Microsoft	SecurityEvent
Masquerading files	Malware writers often use windows system...	Microsoft	SecurityEvent
Accounts and User Agents associated...	Summary of users/user agents associated ...	Microsoft	OfficeActivity
Office365 authentications	Shows authentication volume by user age...	Microsoft	OfficeActivity
Summary of users created using unc...	Summarizes users of uncommon & undocu...	Microsoft	SecurityEvent
Powershell downloads	Finds PowerShell execution events that co...	Microsoft	SecurityEvent
Script usage summary (cscript.exe)	Daily summary of vbs scripts run across th...	Microsoft	SecurityEvent
Sharepoint downloads	Shows volume of documents uploaded to ...	Microsoft	OfficeActivity
Uncommon processes/files - bottom ...	Shows the rarest processes seen running f...	Microsoft	SecurityEvent
Summary of user logons by logon type	Comparing successful and nonsuccessful lo...	Microsoft	SecurityEvent

Additional Study – Microsoft Sentinel

Module Review Questions



Microsoft Learn Modules (docs.microsoft.com/Learn)

Introduction to threat modeling

Use a framework to identify threats and find ways to reduce or eliminate risk

Create a threat model using data-flow diagram elements

Module Labs



Lab 13 – Azure Monitor

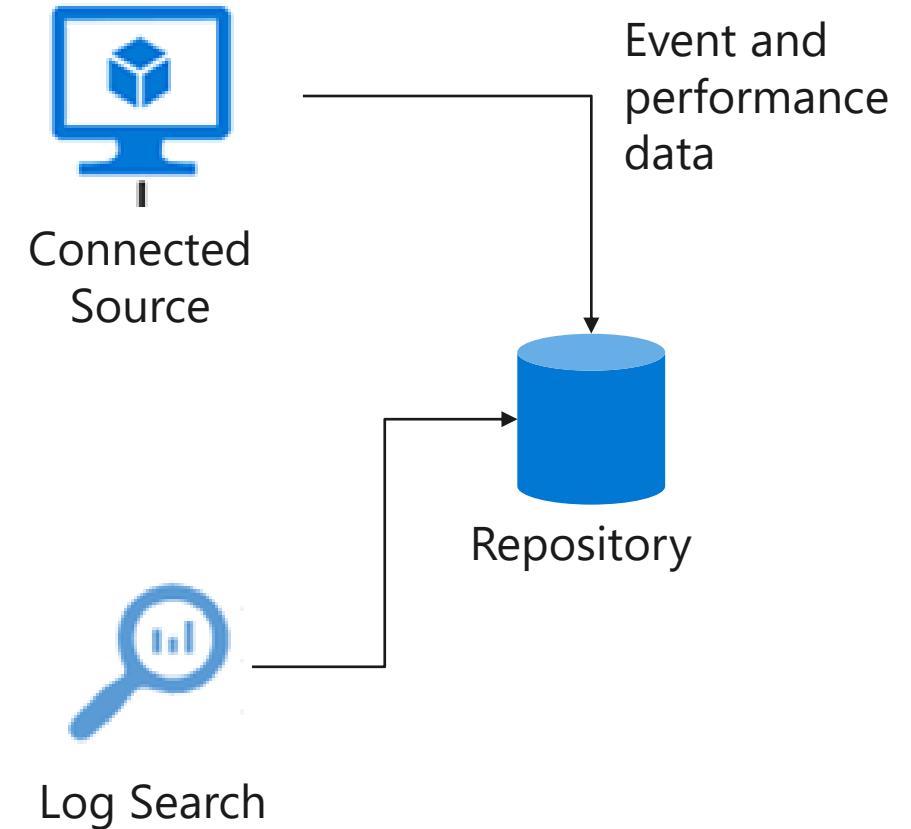
Deploy an Azure virtual machine

Create a Log Analytics workspace

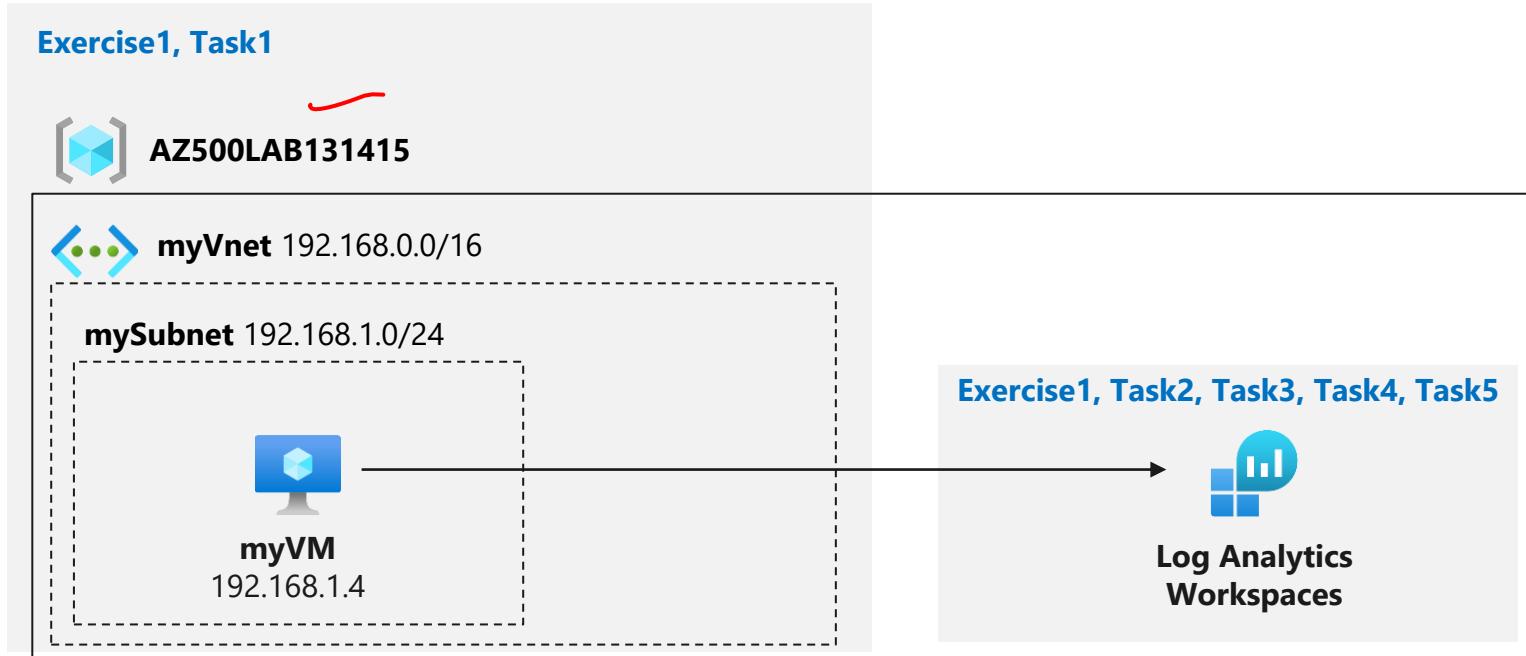
Enable the Log Analytics virtual machine extension

Collect virtual machine event and performance data

View and query collected data



Lab 13 – Azure Monitor



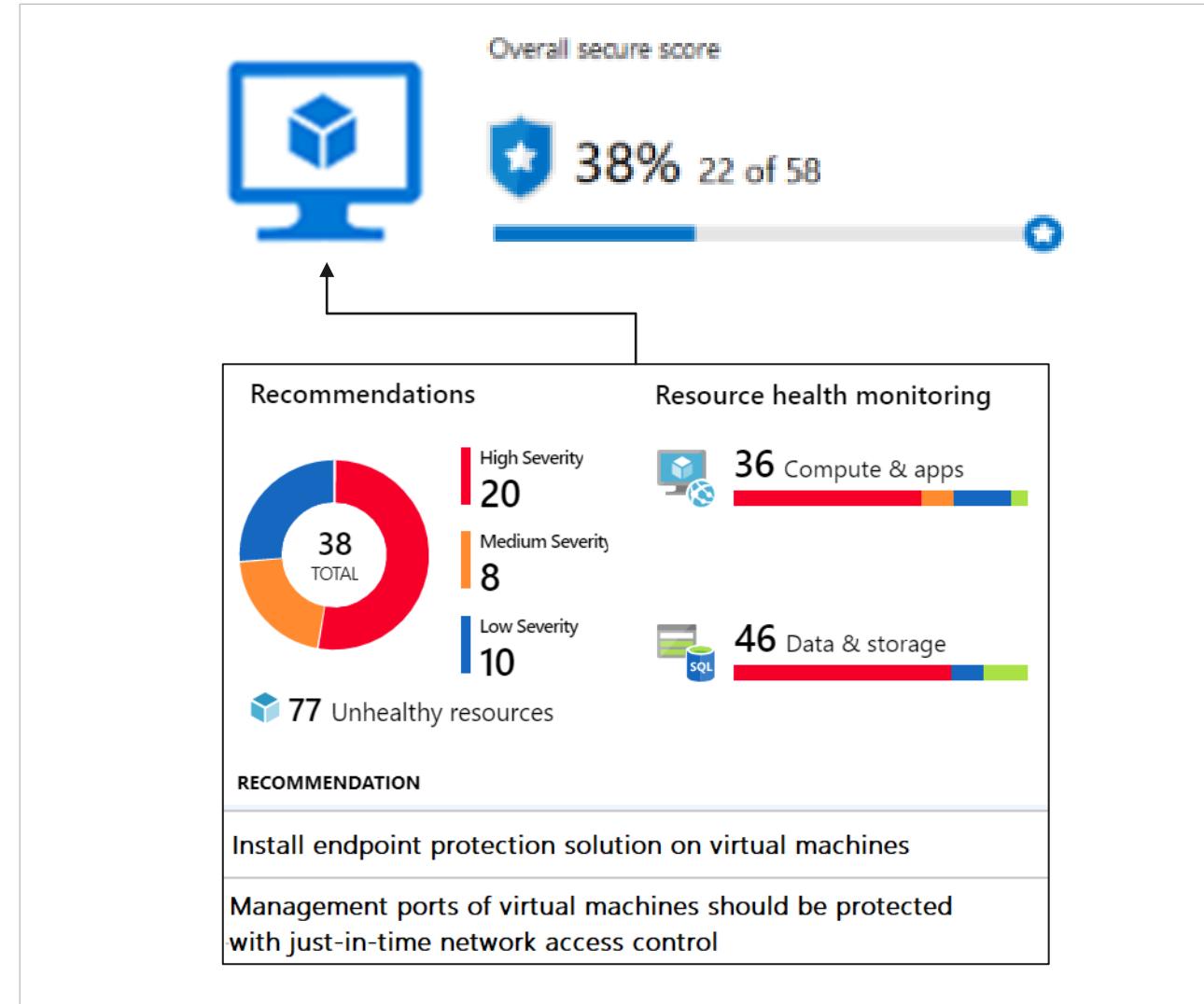
Lab 14 – Microsoft Defender for Cloud

Configure Microsoft Defender for Cloud to monitor a virtual machine

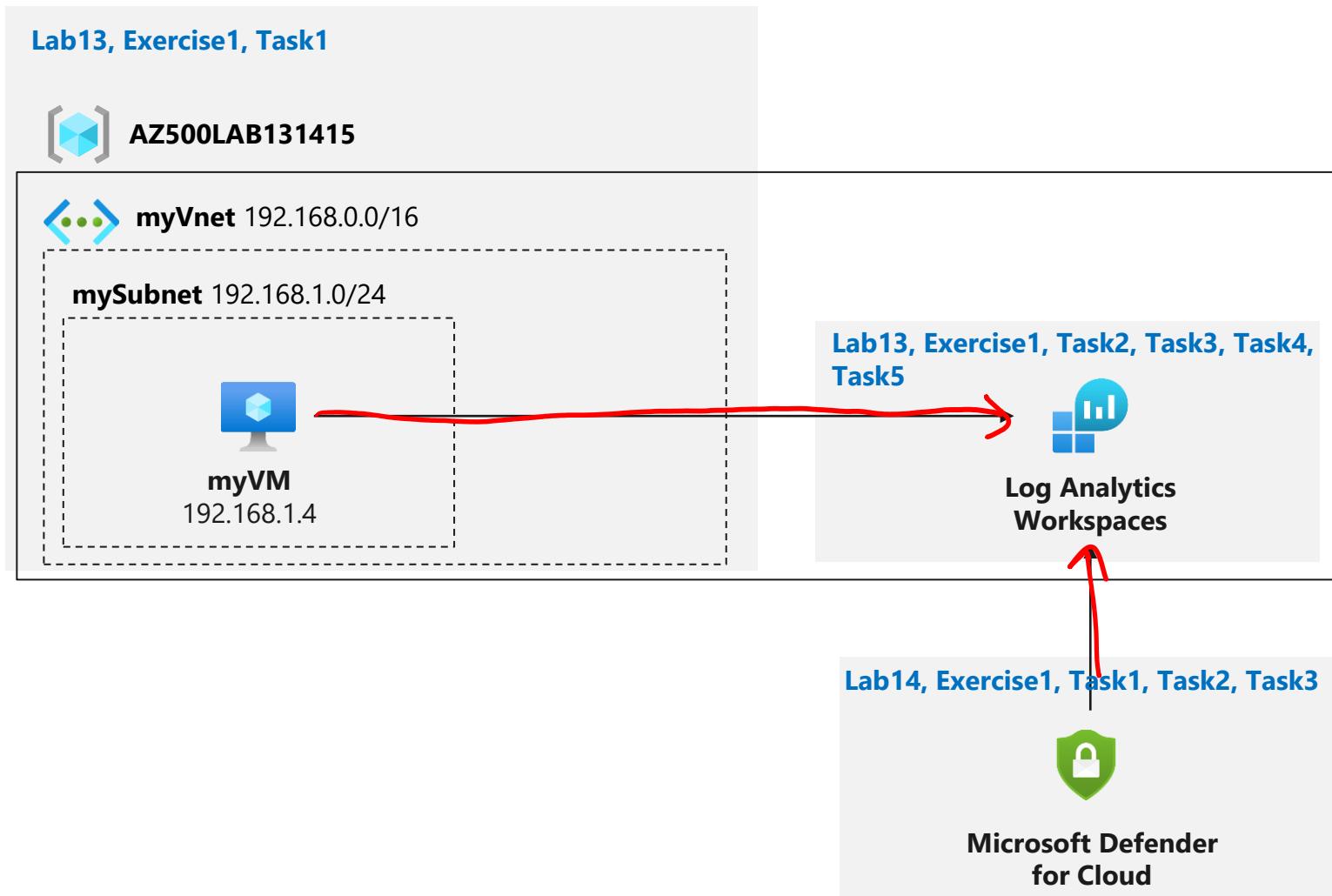
Review Microsoft Defender for Cloud recommendations for the virtual machine

Implement recommendations for endpoint protection and Just in time VM access

Review the Secure Score



Lab 14 – Microsoft Defender for Cloud



Lab 15 – Microsoft Sentinel

On-board Microsoft Sentinel

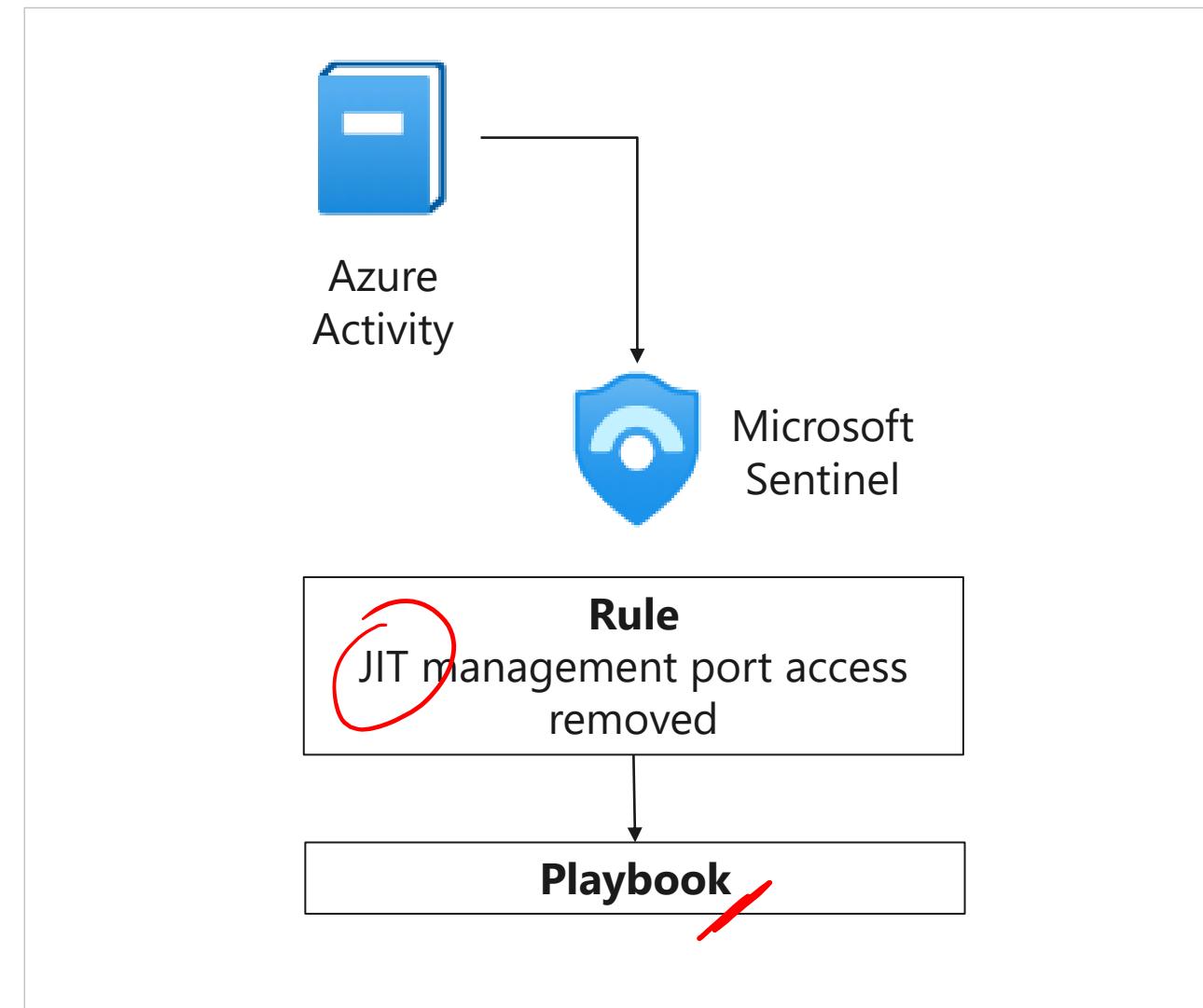
Connect Azure Activity to Sentinel

Review and create a rule that uses the Azure Activity data connector

Create a playbook

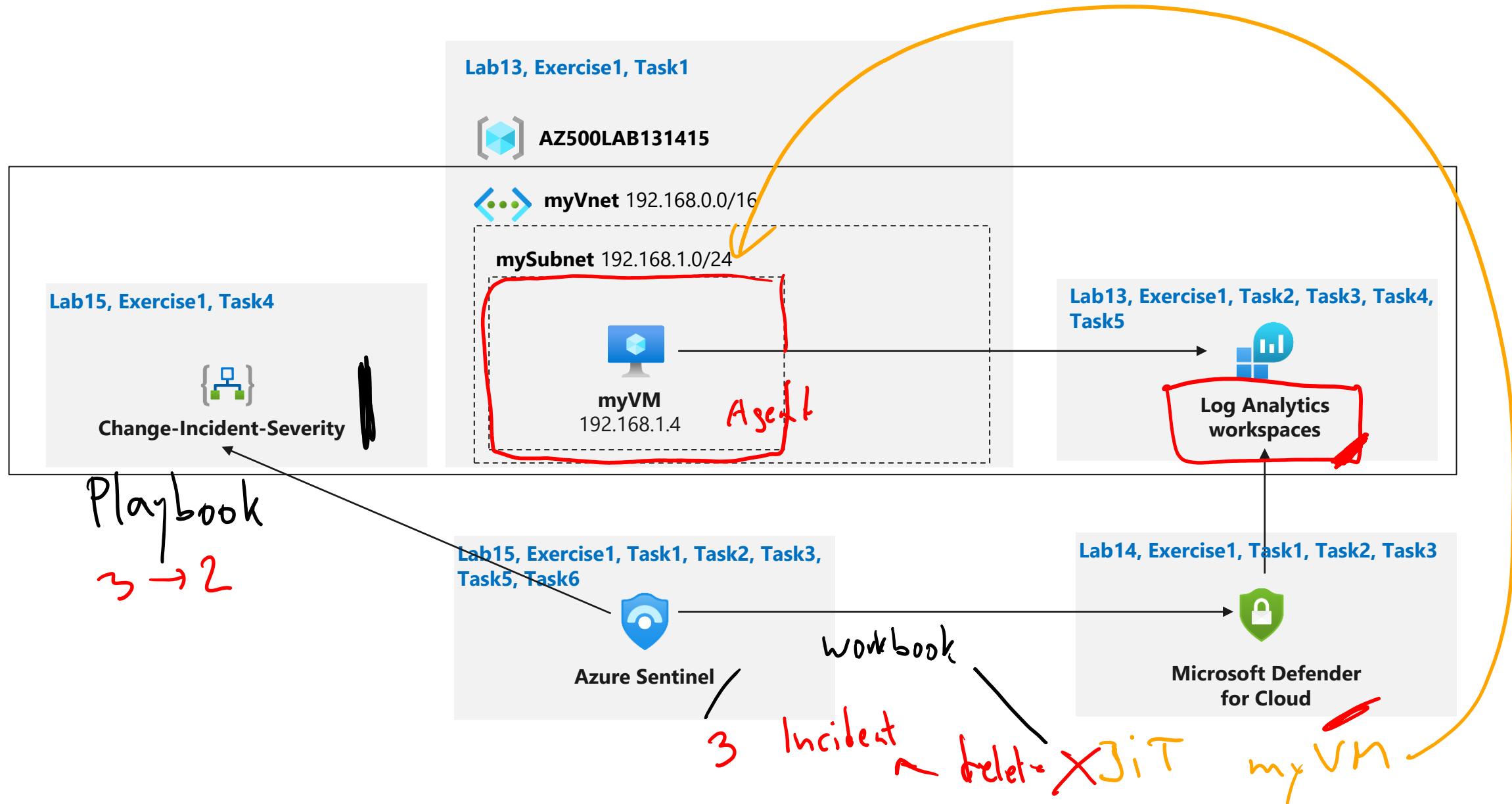
Create a custom alert and configure the playbook as an automated response

Invoke an incident and review the associated actions



13
14

Lab 15 – Microsoft Sentinel



End of presentation