Comprehensive Implementation Guide: PRJ-AZURE-SEC-061 - Unified Azure Security with Microsoft Defender and Sentinel

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1. Project Overview

This project, **PRJ-AZURE-SEC-061**, establishes a **unified, AI-powered security and monitoring solution** across an organization's Azure environment. It is a foundational security architecture that integrates two of Microsoft's most powerful security platforms: **Microsoft Defender for Cloud (MDC)** and **Microsoft Sentinel** (formerly Azure Sentinel). The primary goal is to shift from reactive security to a proactive, automated, and centralized security operations model.

The solution is designed to provide **Cloud Security Posture Management (CSPM)** and **Cloud Workload Protection Platform (CWPP)** capabilities via MDC, ensuring continuous assessment of security configurations and real-time threat protection for compute, data, and service layers. Simultaneously, **Microsoft Sentinel** acts as the Security Information and Event Management (SIEM) and Security Orchestration, Automation, and Response (SOAR) platform. Sentinel centralizes all security-relevant data, leverages machine learning for advanced threat detection, and orchestrates automated responses to security incidents, significantly reducing the mean time to respond (MTTR) to threats.

By combining these two services, the project delivers a single pane of glass for security management, enabling security teams to:

- **Identify and remediate misconfigurations** before they can be exploited.
- **Detect sophisticated threats** using behavioral analytics and threat intelligence.

- **Automate incident response** workflows to contain and neutralize threats rapidly.
- **Maintain continuous compliance** with industry and regulatory standards.

2. Business Context

The Challenge: The Velocity of Cloud Threats

The rapid adoption of cloud services, while driving innovation, has simultaneously expanded the attack surface. Azure environments face a growing landscape of **sophisticated threats**, including fileless malware, advanced persistent threats (APTs), and complex supply chain attacks. Traditional, perimeter-focused security tools and manual security operations are insufficient to keep pace with the **velocity and scale of cloud-native attacks**. Security teams are often overwhelmed by alert fatigue, siloed data, and the sheer volume of security recommendations, leading to significant security gaps and increased organizational risk [1].

The Solution: A Unified, Automated Security Fabric

The PRJ-AZURE-SEC-061 solution addresses this by deploying a robust, integrated security architecture. It creates a **security fabric** where MDC continuously feeds high-fidelity security alerts and posture recommendations into Sentinel. Sentinel then correlates this data with logs from other sources (Azure AD, network logs, application logs) to form actionable incidents. The SOAR capabilities, powered by Azure Logic Apps, are then triggered to execute pre-defined, automated remediation actions, such as isolating a compromised virtual machine or blocking a malicious IP address.

Quantified Business Value and ROI

The implementation of this unified security solution yields substantial, quantifiable business benefits, translating directly into a strong Return on Investment (ROI) and significant risk reduction.

Metric	Description	Impact and Value
Reduction in MTTR	Mean Time to Respond to critical incidents.	**Up to 80% reduction** through SOAR playbooks, minimizing business disruption and potential data loss [2].
Security Posture Score	Continuous, measurable improvement in the MDC Secure Score.	**15-25% improvement** in the first 90 days, directly correlating to a lower risk of breach.
Operational Efficiency	Time saved by Security Operations Center (SOC) analysts.	**30-40% increase** in analyst efficiency by eliminating alert fatigue and automating Tier 1 triage tasks.
Compliance Cost Savings	Reduction in manual effort for audit preparation.	**20% lower cost** of compliance by providing automated, centralized audit evidence and continuous monitoring against regulatory frameworks.
Cost of Breach Avoidance	Reduction in the likelihood and impact of a major security incident.	The average cost of a data breach is estimated at $4.45 million globally; this solution significantly mitigates this financial risk [3].

The project's ROI is realized through a combination of **cost avoidance** (preventing breaches), **efficiency gains** (automating security operations), and **risk mitigation** (maintaining continuous compliance and a strong security posture).

3. GRC Mapping

Governance, Risk, and Compliance (GRC) are central to this project. The integrated solution provides continuous monitoring and automated evidence generation to align with major industry and regulatory frameworks.

Compliance Frameworks and Control Alignment

The architecture is designed to map directly to critical security controls within leading global standards:

Framework	Control Reference	Description of Alignment
NIST SP 800-53	**AU-2, SI-4, SI-5**	**Audit and Accountability / System and Information Integrity:** Sentinel's centralized log collection (AU-2), automated threat monitoring (SI-4), and incident response capabilities (SI-5) directly support these controls.
ISO/IEC 27001:2022	**A.5.7, A.8.16, A.12.6**	**Information Security Incident Management:** The entire Sentinel workflow, from detection to automated response, fulfills the requirements for security incident management (A.5.7, A.12.6). MDC's CWPP features address monitoring and vulnerability management (A.8.16).
SOC 2	**CC7.2, CC7.3, CC7.4**	**Common Criteria (CC):** Continuous monitoring of system components (CC7.2), automated detection of security events (CC7.3), and timely response to incidents (CC7.4) are all provided by the integrated MDC and Sentinel solution.
GDPR	**Article 32, Article 33**	**Security of Processing / Notification of a Personal Data Breach:** MDC and Sentinel provide the technical and organizational measures required by Article 32 to ensure a level of security appropriate to the risk. Automated incident detection and response support the timely breach notification requirements of Article 33.
HIPAA	**§ 164.308(a)(6)**	**Security Incident Procedures:** The solution provides the necessary mechanisms to identify, respond to, and report security incidents involving Electronic Protected Health Information (ePHI).
PCI DSS v4.0	**Requirement 10, Requirement 11**	**Logging and Monitoring / Security Testing:** Sentinel is the central repository for all log data (Req 10), and MDC provides continuous vulnerability scanning and security posture assessment (Req 11).

Security Controls Implemented

The project deploys several key security controls:

- **Cloud Security Posture Management (CSPM):** Provided by MDC, offering continuous, automated assessment of resource configurations against security benchmarks and regulatory standards.
- **Cloud Workload Protection Platform (CWPP):** Provided by MDC, offering agent-based and agentless protection for VMs, containers, databases, and storage accounts.
- **Security Information and Event Management (SIEM):** Centralized log ingestion, correlation, and analysis via Microsoft Sentinel.
- **Security Orchestration, Automation, and Response (SOAR):** Automated response playbooks (Azure Logic Apps) triggered by Sentinel incidents.
- **Just-in-time (JIT) VM access:** A core MDC feature that reduces the attack surface by only opening management ports when explicitly requested and for a limited time.
- **Adaptive network hardening:** MDC-driven recommendations for tightening Network Security Group (NSG) rules based on actual traffic patterns.

Audit Evidence Generation

The solution is a powerful tool for generating audit evidence. It automatically captures and retains the following:

- **Security Alerts and Incident Records:** Detailed, time-stamped records of all security events and the resulting incidents within Sentinel.
- **SOAR Playbook Execution Logs:** Irrefutable evidence of automated response actions, including the time, action taken, and outcome.
- **Security Posture Assessments:** Historical Secure Score and compliance reports from Microsoft Defender for Cloud, demonstrating continuous improvement and adherence to policies.
- **Threat Intelligence Reports:** Records of integrated threat feeds used for detection, demonstrating a proactive security stance.

4. Prerequisites

Successful deployment requires the following accounts, tools, and permissions.

Required Accounts and Permissions

1. **Azure Subscription:** An active, non-trial Azure subscription.
2. **Azure Role:** The deploying user must have the **Owner** or **Contributor** role at the subscription level to create resource groups, Log Analytics Workspaces, and enable security services. For production, a custom role with specific permissions for `Microsoft.OperationalInsights/*`, `Microsoft.Security/*`, and `Microsoft.SecurityInsights/*` is recommended.
3. **Azure AD Permissions:** Permissions to register applications (for certain data connectors like Office 365) may be required.

Required Tools

1. **Azure CLI (Command-Line Interface):** Used for executing the deployment commands.
   - **Installation:** Follow the official Microsoft documentation for your operating system.
   - **Verification:**

     ```
     az --version
     ```

2. **Bicep CLI (Optional but Recommended):** Used for deploying the Infrastructure as Code (IaC) components.
   - **Installation:** Bicep is often installed as part of the Azure CLI.
   - **Verification:**

     ```
     az bicep version
     ```

3. **Code Editor:** A text editor like Visual Studio Code for editing Bicep or ARM templates.

Initial Setup and Login

Before proceeding, ensure you are logged into the correct Azure subscription:

```
# 1. Log in to Azure
az login

# 2. Set the target subscription (if you have multiple)
# Replace <subscription-id> with your actual subscription ID
# az account set --subscription "<subscription-id>"

# 3. Register required resource providers (if not already registered)
az provider register --namespace 'Microsoft.Security'
az provider register --namespace 'Microsoft.OperationalInsights'
az provider register --namespace 'Microsoft.SecurityInsights'
```

5. Architecture Overview

The solution is built on a hub-and-spoke model, with the **Log Analytics Workspace (LAW)** serving as the central data hub for all security-relevant telemetry.

Core Components

1. **Log Analytics Workspace (LAW):** The foundation of the architecture. It is a scalable data store that ingests, stores, and enables querying of log data from all connected Azure resources, as well as hybrid and multi-cloud assets.
2. **Microsoft Defender for Cloud (MDC):**
    - **CSPM:** Continuously assesses the security posture of the environment, generating the **Secure Score** and providing actionable recommendations.
    - **CWPP:** Provides advanced, real-time threat protection for workloads (VMs, containers, databases, etc.) and generates high-fidelity security alerts.
3. **Microsoft Sentinel:**
    - **SIEM:** Connects to the LAW to analyze and correlate the ingested data, including alerts from MDC. It uses built-in and custom analytics rules to detect threats and create security incidents.

- **SOAR:** Utilizes **Azure Logic Apps** (Playbooks) to automate the response to Sentinel incidents, enabling rapid containment and remediation.

Data Flow

1. **Data Ingestion:** Logs from Azure resources (Activity, AD, Network Watcher, etc.) and MDC security alerts are streamed into the central Log Analytics Workspace.
2. **Threat Detection:** Sentinel's analytics rules continuously scan the data in the LAW. When a rule is triggered (e.g., a brute-force attack detected by MDC), Sentinel creates a security incident.
3. **Incident Response:** The Sentinel incident triggers a pre-configured SOAR Playbook (Azure Logic App).
4. **Automated Remediation:** The Playbook executes the automated action, such as isolating the compromised VM by modifying its Network Security Group (NSG) rules.

> ***Note on Architecture Diagram:*** *The original documentation referenced an architecture diagram (`/home/ubuntu/architecture.png`). Since this is a conceptual guide, the diagram is described as follows: A central Log Analytics Workspace is shown, with arrows pointing in from various data sources (Azure VMs, Azure AD, Azure Activity, MDC). Two main services, Microsoft Defender for Cloud and Microsoft Sentinel, are shown connected to the LAW. An arrow from Sentinel points to an Azure Logic App (SOAR Playbook), which in turn points back to the Azure resources for automated remediation.*

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6. Step-by-Step Implementation

The deployment is executed using the Azure CLI. For production environments, it is strongly recommended to use the provided Bicep template for a repeatable and version-controlled deployment.

6.1. Configure Environment Variables

Define the necessary variables for the deployment. This ensures consistency and simplifies command execution.

```
# --- Environment Variables Configuration ---

# Project ID (used for naming resources)
PROJECT_ID="PRJ-AZURE-SEC-061"

# Azure Region (choose a region close to your primary resources)
LOCATION="eastus"

# Resource Group Name (standard naming convention)
RESOURCE_GROUP="rg-${PROJECT_ID,,}-ops"

# Log Analytics Workspace Name
WORKSPACE_NAME="log-${PROJECT_ID,,}-ws"

# Microsoft Sentinel Instance Name (deployed on the workspace)
SENTINEL_NAME="sentinel-${PROJECT_ID,,}"

# Subscription ID (optional, but good practice to define)
# SUBSCRIPTION_ID="<your-subscription-id>"

# Export variables for the current shell session
export PROJECT_ID LOCATION RESOURCE_GROUP WORKSPACE_NAME SENTINEL_NAME

echo "Environment variables configured successfully."
```

6.2. Create Resource Group and Log Analytics Workspace

The resource group provides a logical container, and the LAW is the central data repository.

```
# 1. Create Resource Group
echo "Creating Resource Group: $RESOURCE_GROUP in $LOCATION..."
az group create \
    --name $RESOURCE_GROUP \
    --location $LOCATION

# 2. Create Log Analytics Workspace
# We use the PerGB2018 SKU, which is the recommended tier for Sentinel
deployments.
echo "Creating Log Analytics Workspace: $WORKSPACE_NAME..."
az monitor log-analytics workspace create \
    --resource-group $RESOURCE_GROUP \
    --workspace-name $WORKSPACE_NAME \
    --location $LOCATION \
    --sku PerGB2018
```

6.3. Enable Microsoft Defender for Cloud (MDC)

MDC is enabled at the subscription level, but its paid plans (Defender plans) are enabled per resource type. Enabling the **Standard** tier is crucial for advanced threat protection and CWPP features.

```
# Get the current subscription ID
SUBSCRIPTION_ID=$(az account show --query id --output tsv)

echo "Enabling Microsoft Defender for Cloud Standard Plans for Subscription:
$SUBSCRIPTION_ID"

# Enable Defender for Servers (CWPP for VMs)
az security pricing create \
    --name VirtualMachines \
    --tier Standard \
    --scope "/subscriptions/$SUBSCRIPTION_ID"

# Enable Defender for Storage Accounts
az security pricing create \
    --name StorageAccounts \
    --tier Standard \
    --scope "/subscriptions/$SUBSCRIPTION_ID"

# Enable Defender for Azure SQL Databases
az security pricing create \
    --name SqlServers \
    --tier Standard \
    --scope "/subscriptions/$SUBSCRIPTION_ID"

# Enable Defender for Key Vault
az security pricing create \
    --name KeyVaults \
    --tier Standard \
    --scope "/subscriptions/$SUBSCRIPTION_ID"

# Note: Repeat the 'az security pricing create' command for other relevant
resource types
# (e.g., AppServices, Containers, DNS, etc.) based on your environment.
```

6.4. Enable Microsoft Sentinel

Sentinel is deployed as a solution on top of the existing Log Analytics Workspace.

```
# Get the Workspace ID for Sentinel onboarding
WORKSPACE_ID=$(az monitor log-analytics workspace show \
    --resource-group $RESOURCE_GROUP \
    --workspace-name $WORKSPACE_NAME \
    --query id --output tsv)

echo "Onboarding Microsoft Sentinel to Workspace ID: $WORKSPACE_ID"

# The command to enable Sentinel on the workspace
# Note: The 'az security sentinel' command is conceptual/deprecated. The
modern approach is via the 'az resource' command or ARM/Bicep.
# We will use the Bicep approach for a robust deployment (see section 6.6).
# For CLI, the process is often done via the portal or a resource
deployment.

# Conceptual CLI command (for documentation purposes):
# az security sentinel create \
#     --resource-group $RESOURCE_GROUP \
#     --workspace-name $WORKSPACE_NAME \
#     --name $SENTINEL_NAME \
#     --location $LOCATION

# Instead, we will rely on the Bicep deployment in the next step, which
handles both LAW and Sentinel onboarding.
echo "Sentinel onboarding will be finalized via the Bicep deployment."
```

6.5. Configure Data Connectors and Analytics Rules

After the core deployment, the next critical step is to configure data ingestion and threat detection. This is typically a multi-step process involving the Azure Portal or specific API calls, as the Azure CLI does not have a simple command for all connectors.

Key Data Connectors to Enable:

1. **Microsoft Defender for Cloud:** Automatically connected when Sentinel is onboarded to the LAW. Alerts flow seamlessly.
2. **Azure Activity:** Provides logs on all subscription-level control plane operations.
3. **Azure Active Directory (Azure AD):** Ingests sign-in and audit logs for identity-based threat detection.
4. **Office 365:** Ingests audit logs for Exchange, SharePoint, and Teams.

Conceptual Steps for Connector Configuration:

1. **Connect Azure AD:** Requires premium licensing and configuration via the Sentinel Data Connectors blade in the Azure Portal.
2. **Connect Azure Activity:**

```
# Conceptual command to enable Azure Activity log streaming to the LAW
# This is done via a Diagnostic Setting on the subscription level.
echo "Configure Diagnostic Settings for Azure Activity to stream to $WORKSPACE_NAME."
```

Analytics Rules: Sentinel comes with hundreds of built-in analytics rules (e.g., Fusion, ML-based rules). Ensure these are enabled. Custom rules should be created using **Kusto Query Language (KQL)** to detect specific threats relevant to the organization.

6.6. Deploy Infrastructure as Code (IaC) with Bicep

For a production-ready deployment, using IaC is mandatory. The following Bicep template defines the Log Analytics Workspace and the Sentinel onboarding state.

1. Create Bicep File (`main.bicep`)

```
 param location string = resourceGroup().location
param workspaceName string = 'log-${uniqueString(resourceGroup().id)}-ws'
param sentinelName string = 'sentinel-${uniqueString(resourceGroup().id)}'

// Resource 1: Log Analytics Workspace
resource law 'Microsoft.OperationalInsights/workspaces@2020-08-01' = {
  name: workspaceName
  location: location
  properties: {
    sku: {
      name: 'PerGB2018' // Recommended SKU for Sentinel
    }
    retentionInDays: 90 // Default retention, can be optimized
  }
}

// Resource 2: Microsoft Sentinel Onboarding
// This resource enables Sentinel on the Log Analytics Workspace
resource sentinel 'Microsoft.SecurityInsights/onboardingStates@2021-03-01-
preview' = {
  name: 'default'
  scope: law
  properties: {}
}

// Output the Workspace ID for future reference (e.g., connecting agents)
output workspaceId string = law.id
output workspaceName string = law.name
```

2. Deploy the Bicep Template

```
# Save the Bicep content above to a file named 'main.bicep'
# (Assuming the file is saved)

echo "Deploying Bicep template to Resource Group: $RESOURCE_GROUP"

az deployment group create \
    --resource-group $RESOURCE_GROUP \
    --template-file main.bicep \
    --parameters location=$LOCATION workspaceName=$WORKSPACE_NAME
sentinelName=$SENTINEL_NAME
```

6.7. Deploy SOAR Playbooks (Logic Apps)

SOAR playbooks are Azure Logic Apps that are triggered by Sentinel incidents. A common playbook is **VM Isolation**.

Conceptual Steps for SOAR Deployment:

1. **Develop Logic App:** Create the Logic App workflow (e.g., using the Azure Portal designer or a Bicep template). The workflow must include:
    - **Trigger:** Microsoft Sentinel Incident trigger.
    - **Action:** Azure VM Isolation (e.g., updating an NSG rule to deny all inbound/outbound traffic).
2. **Deploy Logic App:** Deploy the Logic App using its Bicep/ARM template.
3. **Attach to Sentinel:** In Sentinel, create an **Automation Rule** that links the Logic App to a specific Analytics Rule (e.g., “High-Severity Malware Alert”).

7. Validation & Testing

A robust validation process ensures the end-to-end security pipeline is functioning correctly.

7.1. Verify Core Deployment

1. **Resource Status:** Check the Azure Portal to ensure the Log Analytics Workspace and Sentinel instance are active and healthy within the `$RESOURCE_GROUP`.
2. **MDC Status:** Verify that the Secure Score is being calculated and that security recommendations are appearing for your resources.

7.2. Check Data Ingestion (KQL Queries)

Use Kusto Query Language (KQL) in the Log Analytics or Sentinel Logs blade to confirm data flow.

```
 # Check Azure Activity Logs
AzureActivity
| where TimeGenerated > ago(1h)
| take 10
| project TimeGenerated, OperationName, Caller

# Check Microsoft Defender for Cloud Alerts
SecurityAlert
| where TimeGenerated > ago(1h)
| where ProductName == "Azure Security Center"
| take 10
| project TimeGenerated, AlertName, Description
```

7.3. Test Analytics Rules and Incident Creation

Simulate a low-level threat to ensure Sentinel's detection rules fire and create an incident.

1. **Simulate a Suspicious Login:** If Azure AD logs are connected, attempt a failed login from a suspicious location to trigger a built-in rule.
2. **Simulate a Defender Alert:** If Defender for Servers is enabled on a VM, create a test file to trigger a known alert (e.g., using the EICAR test file).
    - *Action:* Wait 5-10 minutes for the alert to be generated in MDC and then ingested by Sentinel.
    - *Validation:* Confirm a new incident is created in the Sentinel **Incidents** blade.

7.4. Validate SOAR Playbook Execution

Test the automated response capability using a test incident.

1. **Manual Trigger:** Manually run the SOAR playbook against the test incident created in step 7.3.
2. **Validation:**
    - Check the Logic App run history to ensure the execution was successful.
    - Verify the intended action was taken (e.g., if the playbook was for VM isolation, check the NSG rules on the target VM to confirm the new "DENY ALL" rule is in place).

8. Troubleshooting

Common issues and their resolutions during deployment and operation.

Issue	Potential Cause	Resolution
No data in Sentinel	Data connectors are not enabled, or the resource providers are not registered.	1. Verify connector status in the Azure Portal. 2. Check `az provider register` status. 3. Ensure Diagnostic Settings are configured for all relevant resources to stream to the LAW.
SOAR Playbook failure	Logic App permissions (Managed Identity) are incorrect, or the target resource is inaccessible.	1. Check the Logic App run history for detailed error messages. 2. Ensure the Logic App's Managed Identity has the necessary **RBAC roles** (e.g., Contributor, Network Contributor) on the target resource group or subscription.
High False Positives	Analytics rules are too broad, or the baseline of normal activity is not established.	1. Refine KQL queries in the analytics rules to be more specific. 2. Use **exclusion lists** or entity-based filtering to suppress known benign activity. 3. Adjust the rule threshold or lookback period.
MDC Secure Score is low	Security recommendations are not being remediated.	1. Prioritize remediation based on the Secure Score impact. 2. Use **Azure Policy** to enforce critical security settings (e.g., disk encryption, network segmentation).
Deployment Fails (Bicep/CLI)	Incorrect resource naming or missing permissions.	1. Check the error message for specific resource provider errors. 2. Ensure the user has the **Owner/Contributor** role on the resource group. 3. Verify that the resource names adhere to Azure naming conventions.
Log Ingestion Throttling	Daily ingestion volume exceeds the LAW limit (if using a capped tier).	1. Switch to a **Commitment Tier** in the Log Analytics Workspace settings. 2. Review data collection policies and filter out non-essential logs at the source.

9. Cost Optimization

Security solutions can be costly. Strategic configuration is essential to maximize protection while minimizing expenditure.

9.1. Log Analytics Workspace (LAW) Optimization

The LAW is the primary cost driver due to data ingestion and retention.

- **Commitment Tiers:** If daily ingestion exceeds 100 GB, switch from the **Pay-As-You-Go (PerGB2018)** tier to a **Commitment Tier** (e.g., 100 GB/day, 200 GB/day). This provides a significant discount on the per-GB price.
- **Data Retention:** Configure a minimal retention period (e.g., 30-90 days) for operational logs. Use **Azure Storage** for long-term archival of logs (e.g., 7 years for compliance) at a much lower cost.
- **Data Filtering:** Use **Data Collection Rules (DCRs)** to filter out noisy or non-essential logs at the source before they are ingested into the LAW, reducing the overall volume.

9.2. Microsoft Defender for Cloud (MDC) Optimization

MDC costs are based on the number of protected resources and the enabled plans.

- **Selective Enabling:** Only enable the paid **Standard** plans for the specific resources that require advanced protection. For example, if you only have a few critical VMs, only enable Defender for Servers on those specific VMs, not the entire subscription.
- **Free Tier Utilization:** Utilize the **Free** tier for basic CSPM (Secure Score and recommendations) across all resources, as this is free of charge and provides significant value.
- **Decommissioning:** Ensure that Defender plans are disabled for any decommissioned or non-production resources to avoid unnecessary charges.

9.3. Microsoft Sentinel Optimization

Sentinel’s cost is tied to the data ingested into the LAW.

- **Free Data Sources:** Utilize the free data sources provided by Microsoft (e.g., Azure Activity, Office 365 Audit Logs, MDC alerts) which do not incur Sentinel ingestion charges.
- **SOAR Efficiency:** Optimize Logic App playbooks to run efficiently and only when necessary. Minimize the number of actions and external API calls within the playbook to reduce consumption costs.

10. Security Best Practices

Beyond the core deployment, maintaining a strong security posture requires continuous adherence to best practices.

10.1. Principle of Least Privilege (RBAC)

- **Sentinel/MDC Access:** Implement strict **Role-Based Access Control (RBAC)**. Only security operations personnel should have **Azure Sentinel Reader** or **Azure Sentinel Contributor** roles. Developers and general IT staff should not have access to the security console.
- **Managed Identities:** Use **Managed Identities** for all automated processes (e.g., Logic Apps, Azure Functions) instead of service principals or hard-coded credentials. Assign the least-privileged custom RBAC role required for the task.

10.2. Secure Credential Management

- **Azure Key Vault:** All sensitive credentials, API keys, connection strings, and certificates used by the security solution (e.g., for SOAR playbooks to interact with external systems) **MUST** be stored in a dedicated **Azure Key Vault**. Access to the Key Vault should be restricted via network controls and RBAC.

10.3. Continuous Security Posture Management

- **Secure Score Remediation:** Establish a process for the continuous review and remediation of security recommendations provided by Microsoft Defender for Cloud. Aim to maintain a Secure Score above 90%.
- **Policy Enforcement:** Use **Azure Policy** to enforce critical security settings (e.g., requiring all VMs to have the Defender agent installed, enforcing encryption at

rest) to prevent configuration drift.

10.4. Threat Intelligence and Hunting

- **Integrate TI:** Integrate external **Threat Intelligence (TI)** feeds into Azure Sentinel to enrich alerts and improve detection capabilities.
- **Proactive Hunting:** Dedicate time for **Proactive Threat Hunting** using Sentinel's hunting queries. This involves manually searching for signs of compromise that automated rules may have missed, based on the latest threat landscape.

Cleanup

To remove all deployed resources and avoid future charges, execute the following Azure CLI command. **Use with caution**, as this will permanently delete the resource group and all contained resources (LAW, Sentinel, etc.).

```
# Delete the resource group and all contained resources
az group delete --name $RESOURCE_GROUP --yes --no-wait
```

References

[1] Microsoft. *The Total Economic Impact™ Of Microsoft Sentinel*. Forrester Consulting, 2023. [2] IBM. *Cost of a Data Breach Report 2023*. IBM Security, 2023. [3] Microsoft. *Microsoft Defender for Cloud Documentation*. Microsoft Learn. [4] Microsoft. *Microsoft Sentinel Documentation*. Microsoft Learn.