Azure SOC Lab – Microsoft Sentinel End-to-End Detection & Response Project

📌 Overview

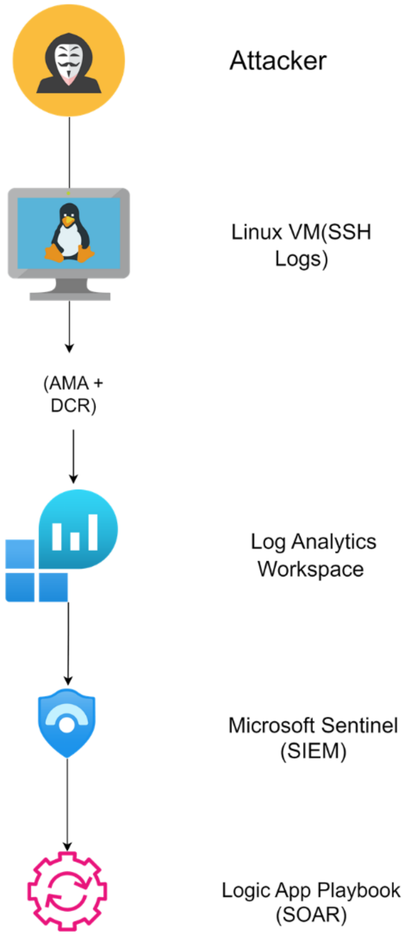
This project demonstrates a complete **SOC Level 1 style security monitoring lab** built on **Microsoft Azure + Microsoft Sentinel (SIEM/SOAR)**.

The lab covers the **full security lifecycle**:

Log Collection → Detection Engineering → Incident Investigation → Automation (SOAR) → Lab Preservation (IaaC)

It is designed as a **hands-on, portfolio-ready project** for SOC Analyst fresher roles.

🏗 Lab Architecture



Core Components

- **Azure Virtual Machine (Ubuntu Linux)**
  Acts as the monitored endpoint and log source (SSH authentication logs).
- **Network Security Group (NSG)**
  Controls inbound traffic (SSH allowed for lab access).
- **Azure Monitor Agent (AMA)**
  Installed on the VM to collect telemetry.
- **Data Collection Rule (DCR)**
  Defines what logs are collected (Linux Syslog) and where they are sent.
- **Log Analytics Workspace**
  Central log storage and query engine.
- **Microsoft Sentinel (SIEM)**
  Performs detection, analytics, incidents, investigation, and automation.
- **Logic App Playbook (SOAR)**
  Automatically tags SSH brute-force incidents.
- **Sentinel Training Solution**
  Provides simulated incidents (e.g., Solorigate) for investigation practice.

📁 Repository Structure & Documentation Layout

This repository is organized **phase-wise**.
Each phase is documented as a separate **PDF file** stored in the root directory.

Structure

- 01-Phase 1 - Azure Virtual Machine Installation.pdf
- 02-Phase 2 - Microsoft Sentinel Onboarding.pdf
- 03-Phase 3 - Network Security Group (NSG) Design & Hardening.pdf
- 04-Phase 4 - Azure Monitor Agent (AMA) & Data Collection Rules.pdf
- 05-Phase 5 - Sentinel Training Solution & Detection Setup.pdf
- 06-Phase 6 - Incident Investigations (Solorigate & Disabled Account Sign-ins).pdf
- 07-Phase 7 - Detection Debugging & Log Validation.pdf

- 08-Phase 8 - Playbook Automation (Incident Enrichment & Tagging).pdf
- README.pdf – Detailed lab overview and notes
- azure_config_lab.json – Exported lab configuration (ARM template)

How to Read the Documentation

Each phase PDF contains:

- Intro (What & Why)
- Step-by-step configuration
- GUI flow (portal navigation paths)
- Outcomes / learning points

If a GUI flow is not explicitly written for a step, the **screenshots in that phase are self-explanatory** and show the exact configuration and portal navigation used.

Lab Preservation (JSON Export)

The complete Azure lab configuration is exported as a JSON file and stored in the **main branch**:

- azure_config_lab.json

This file represents the Infrastructure-as-Code snapshot of the lab and can be used for:

- Reference
- Documentation
- Partial re-deployment or future rebuild of the environment

This structure allows anyone reviewing the project to quickly navigate each phase and understand the full SOC lab lifecycle without confusion.

🔐 Security Use Cases Implemented

- SSH Brute-Force Detection (custom KQL rule)
- Entity Mapping (IP, Account, Host)
- Incident Creation & Correlation
- Investigation of:
  - Brute-force attempts
  - Disabled account sign-in abuse
  - Solorigate (SolarWinds) network beacon IOC
- Automated Incident Tagging using Playbook
- Detection Debugging (query tuning based on real logs)

🧪 Phases Covered in This Lab

Phase	Description
Phase 1	Azure VM deployment (Linux)
Phase 2	Microsoft Sentinel onboarding
Phase 3	Network Security Group hardening
Phase 4	AMA + Data Collection Rule setup
Phase 5	Sentinel Training Solution & analytics
Phase 6	Incident investigation (brute force & Solorigate)
Phase 7	Detection debugging & log validation
Phase 8	Playbook automation (SOAR)
Phase 9	Lab export & preservation (Cloud Shell JSON export)

🧠 Key SOC Concepts Demonstrated

- Log pipeline design (AMA + DCR)
- KQL-based detection engineering
- Entity mapping for investigations
- MITRE ATT&CK alignment
- Alert → Incident → Investigation workflow
- SOAR automation using Logic Apps
- Cloud-as-Code (CaaS) mindset via ARM JSON export

🛠️ Tools & Technologies

- Microsoft Azure
- Microsoft Sentinel (SIEM)
- Azure Monitor Agent (AMA)
- Log Analytics Workspace
- KQL (Kusto Query Language)
- Azure Logic Apps (SOAR)
- Azure Cloud Shell
- ARM Template (JSON Export)

🎯 Learning Outcomes

By completing this lab, you demonstrate:

- Practical SOC Level 1 skills
- Real detection engineering (not just theory)
- Hands-on Microsoft Sentinel usage
- End-to-end incident handling

- Basic SOAR automation
- Cloud lab preservation for reproducibility

This project can be showcased in:

- GitHub portfolio
- Resume (SOC / Cloud Security projects)
- Interviews (practical discussion points)

⚠️ Important Notes

- This is a **learning lab**, not a production-hardened environment.
- SSH is intentionally exposed for testing detections.
- Some Azure resources (extensions, internal sub-resources) are not fully exportable via ARM template. This is expected Azure behaviour.

📜 License / Usage

- This project is intended for **educational and portfolio use**.
- Do not use this setup as-is in production environments.