Microsoft Sentinel Workspace Architecture

$whoami

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Bio:

- Microsoft 365 Security + Azure Security
- Enterprise Security
- 10+ years, architecting and securing enterprise infrastructures
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Thank you

Compute
Networking
Data Analytics
Identity
Storage & Databases
Integration
DevOps
Microsoft Azure
Microsoft Azure Pakistan Community

Objective

- New or existing Microsoft Sentinel deployments
- Focusing on “Data + Workspace”
- Help make informed decisions for data and workspace design

Agenda

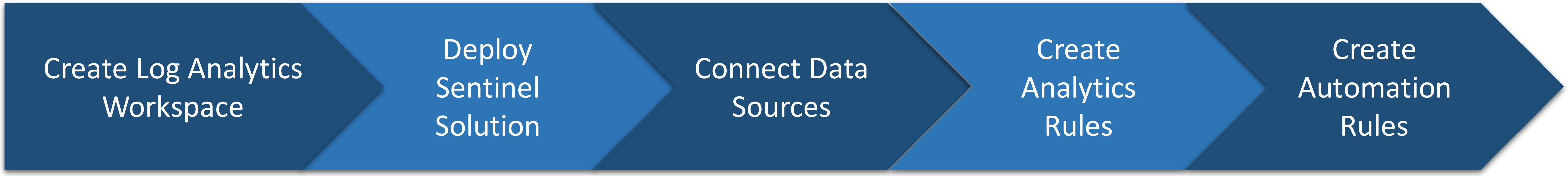
1. Sentinel Overview
2. Data sources
3. Compliance
4. Data Access
5. Azure Regions
6. Azure Tenants
7. Azure Lighthouse
8. Deployment
9. Summary

Sentinel Overview

What is Microsoft Sentinel

- Security Information and Event Management (SIEM) and Security Orchestration, Automation, and Response (SOAR) solution
- Collect data across enterprise – users, devices, on-premises, and multi-clouds
- Detect, Investigate, and Respond to threats

Sentinel Deployment



Create Log Analytics Workspace

Deploy Sentinel Solution

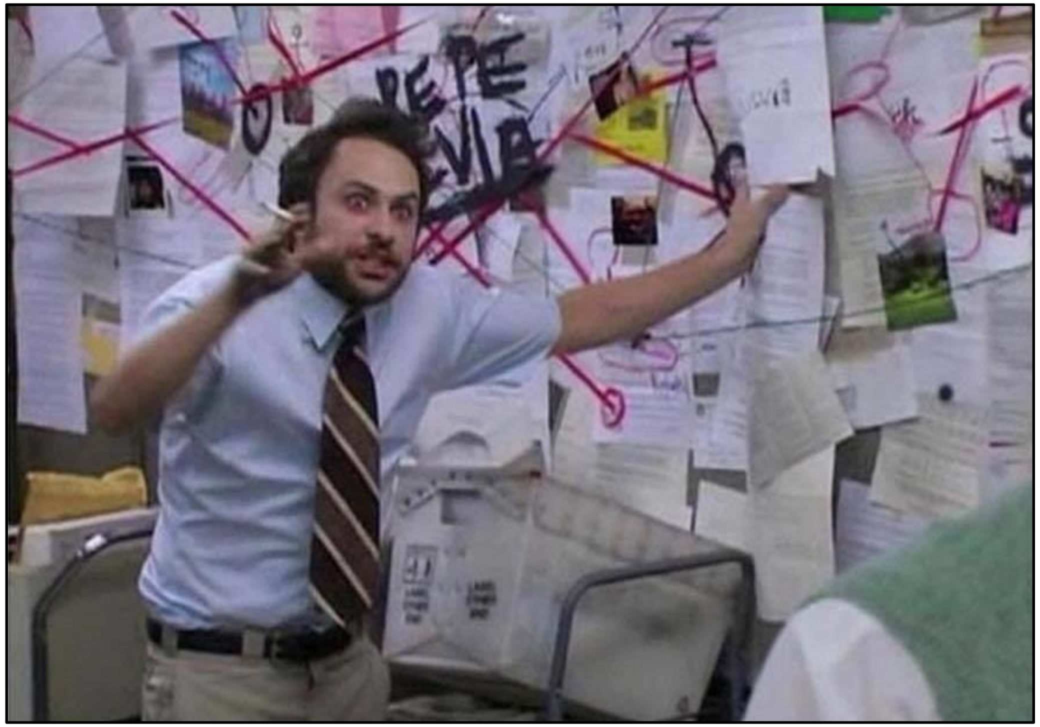
Connect Data Sources

Create Analytics Rules

Create Automation Rules

Deployment Considerations

- Acquisition?
- Subsidiary?
- Compliance?
- Separation of duties?
- Data retention?
- Cost?
- Region?
- Log sources?
- Azure tenants?
- ???



Data sources

What, Where, and How

- **What** data would be ingested?
- **What** value are the data?
- **Where** are the data located?
- **Where** would it be stored?
- **How** would the data be ingested?
- **How** and who would access this data?
- **How** long would it be retained?

Identity “Quick Win” Data Sources

- High value data sources
  - Azure Sign-in logs
  - Office 365 Logs
  - Domain Controller security logs
- Migrating from another SIEM
  - Which logs are highly utilized
- Free Microsoft log ingestion

Free Data Source

Microsoft Sentinel Data Connector	Data type	Cost
Azure Activity Logs	AzureActivity	Free
Azure AD Identity Protection	SecurityAlert (IPC)	Free
Office 365	OfficeActivity (SharePoint)	Free
	OfficeActivity (Exchange)	Free
	OfficeActivity (Teams)	Free
Microsoft Defender for Cloud	SecurityAlert (Defender for Cloud)	Free
Microsoft Defender for IoT	SecurityAlert (Defender for IoT)	Free
Microsoft 365 Defender	SecurityIncident	Free
	SecurityAlert	Free
Microsoft Defender for Endpoint	SecurityAlert (MDATP)	Free
Microsoft Defender for Identity	SecurityAlert (AATP)	Free
Microsoft Defender for Cloud Apps	SecurityAlert (Defender for Cloud Apps)	Free

https://docs.microsoft.com/en-us/azure/sentinel/billing?tabs=commitment-tier#free-data-sources

Where Are These Data Sources?

- Same Azure Tenant
- Different Azure region (same tenant)
- Different Azure Tenant
- On-premise
- 3rd party cloud provider

Data Source Table Example

Source	Description	Value	Cost	Location	Region	Connector	Access	Retention	Archive
Azure AD Sign-in logs	Account sign-in logs for Azure AD	High	Not Free	Azure	NA	Built-in	SecOps	1 Year	7 Years

Compliance

Corporate Profile

- What type of business are they in?
- Which country(ies) do they operate in?
- Data compliance requirements?

Data Residency

- To isolate data to a given geographical region
- This is an important feature because it allows the client to keep data under the laws and policies of a particular territory

Data Sovereignty

- Foreign operations could be required to comply with a warrant, court order or subpoena request from a foreign law enforcement agency seeking to obtain data
- Example - US Foreign Intelligence Surveillance Act (FISA)

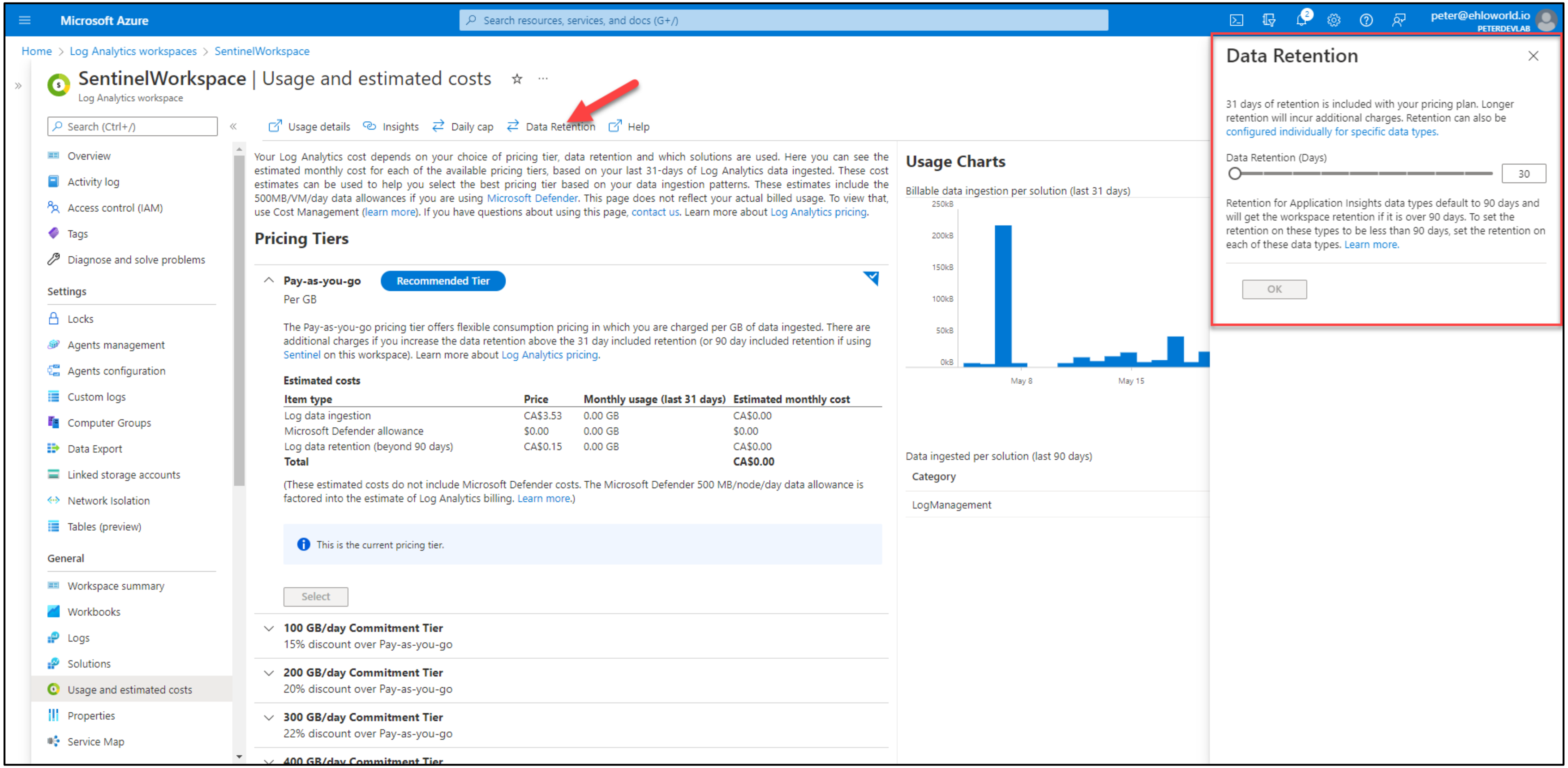
Regulatory Compliance

- Data isolation requirements
- Data retention and purging requirements

Data Retention

- Workspace retention
- Table-level retention
- Basic Log
- Archive

Workspace-level Retention



Your Log Analytics cost depends on your choice of pricing tier, data retention and which solutions are used. Here you can see the estimated monthly cost for each of the available pricing tiers, based on your last 31-days of Log Analytics data ingested. These cost estimates can be used to help you select the best pricing tier based on your data ingestion patterns. These estimates include the 500MB/VM/day data allowances if you are using Microsoft Defender. This page does not reflect your actual billed usage. To view that, use Cost Management (learn more). If you have questions about using this page, contact us. Learn more about Log Analytics pricing.

Pricing Tiers

Pay-as-you-go

Per GB

The Pay-as-you-go pricing tier offers flexible consumption pricing in which you are charged per GB of data ingested. There are additional charges if you increase the data retention above the 31 day included retention (or 90 day included retention if using Sentinel on this workspace). Learn more about Log Analytics pricing.

Estimated costs

Item type	Price	Monthly usage (last 31 days)	Estimated monthly cost
Log data ingestion	CA$3.53	0.00 GB	CA$0.00
Microsoft Defender allowance	$0.00	0.00 GB	$0.00
Log data retention (beyond 90 days)	CA$0.15	0.00 GB	CA$0.00
Total			**CA$0.00**

(These estimated costs do not include Microsoft Defender costs. The Microsoft Defender 500 MB/node/day data allowance is factored into the estimate of Log Analytics billing. Learn more.)

This is the current pricing tier.

100 GB/day Commitment Tier

15% discount over Pay-as-you-go

200 GB/day Commitment Tier

20% discount over Pay-as-you-go

300 GB/day Commitment Tier

22% discount over Pay-as-you-go

400 GB/day Commitment Tier

Data ingested per solution (last 90 days)

Category
LogManagement

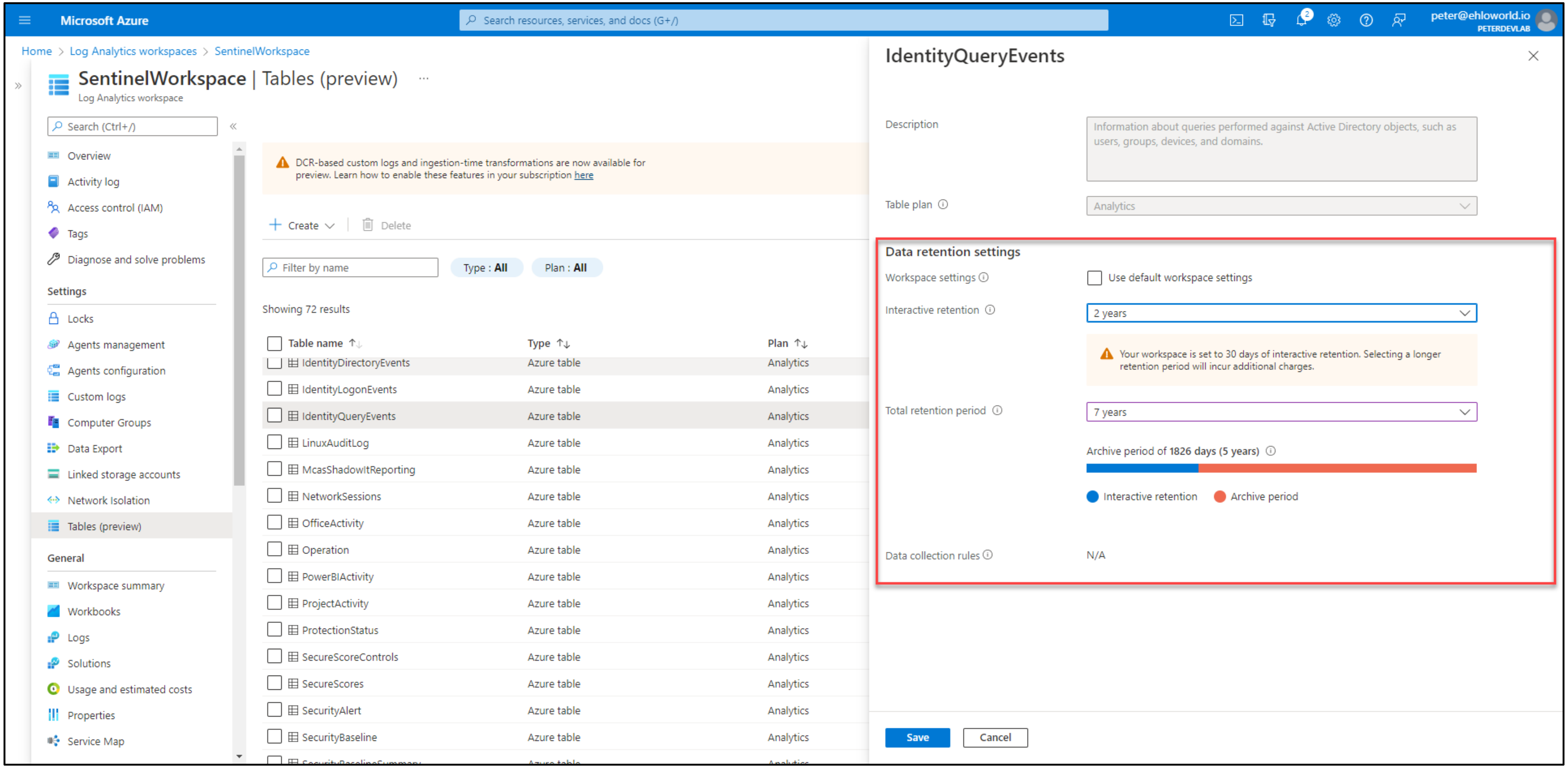
Data Retention

31 days of retention is included with your pricing plan. Longer retention will incur additional charges. Retention can also be configured individually for specific data types.

Data Retention (Days): 30

Retention for Application Insights data types default to 90 days and will get the workspace retention if it is over 90 days. To set the retention on these types to be less than 90 days, set the retention on each of these data types. Learn more.

Table-level Retention



DCR-based custom logs and ingestion-time transformations are now available for preview. Learn how to enable these features in your subscription here

Showing 72 results

Table name	Type	Plan
IdentityDirectoryEvents	Azure table	Analytics
IdentityLogonEvents	Azure table	Analytics
IdentityQueryEvents	Azure table	Analytics
LinuxAuditLog	Azure table	Analytics
McasShadowItReporting	Azure table	Analytics
NetworkSessions	Azure table	Analytics
OfficeActivity	Azure table	Analytics
Operation	Azure table	Analytics
PowerBIActivity	Azure table	Analytics
ProjectActivity	Azure table	Analytics
ProtectionStatus	Azure table	Analytics
SecureScoreControls	Azure table	Analytics
SecureScores	Azure table	Analytics
SecurityAlert	Azure table	Analytics
SecurityBaseline	Azure table	Analytics

IdentityQueryEvents

Description: Information about queries performed against Active Directory objects, such as users, groups, devices, and domains.

Table plan: Analytics

Data retention settings

Workspace settings: □ Use default workspace settings

Interactive retention: 2 years

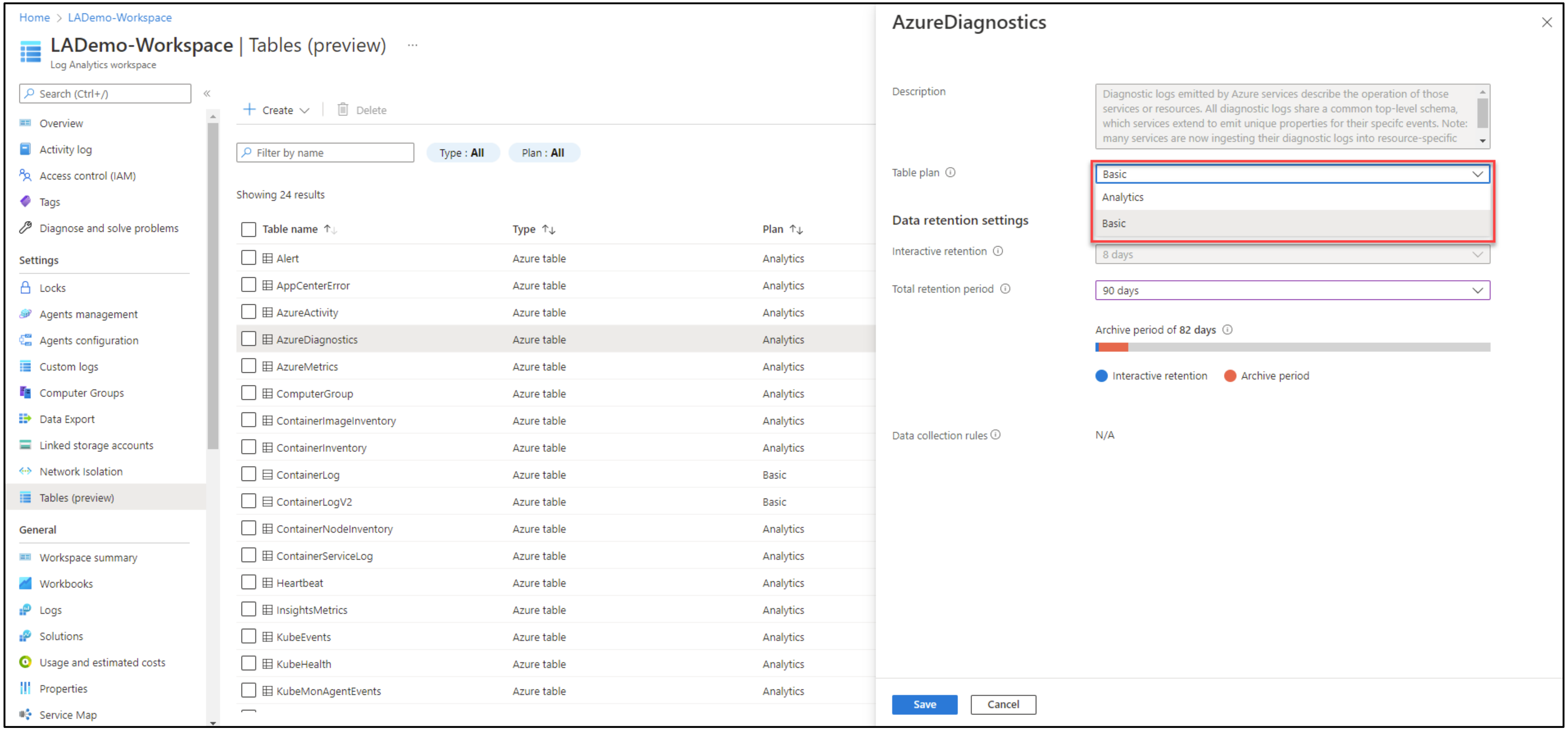
Your workspace is set to 30 days of interactive retention. Selecting a longer retention period will incur additional charges.

Total retention period: 7 years

Archive period of 1826 days (5 years)

Data collection rules: N/A

Basic Log



Home > LADemo-Workspace

LADemo-Workspace | Tables (preview) ···

Log Analytics workspace

Type : **All** Plan : **All**

Showing 24 results

Table name	Type	Plan
Alert	Azure table	Analytics
AppCenterError	Azure table	Analytics
AzureActivity	Azure table	Analytics
AzureDiagnostics	Azure table	Analytics
AzureMetrics	Azure table	Analytics
ComputerGroup	Azure table	Analytics
ContainerImageInventory	Azure table	Analytics
ContainerInventory	Azure table	Analytics
ContainerLog	Azure table	Basic
ContainerLogV2	Azure table	Basic
ContainerNodeInventory	Azure table	Analytics
ContainerServiceLog	Azure table	Analytics
Heartbeat	Azure table	Analytics
InsightsMetrics	Azure table	Analytics
KubeEvents	Azure table	Analytics
KubeHealth	Azure table	Analytics
KubeMonAgentEvents	Azure table	Analytics

AzureDiagnostics

Description: Diagnostic logs emitted by Azure services describe the operation of those services or resources. All diagnostic logs share a common top-level schema, which services extend to emit unique properties for their specifc events. Note: many services are now ingesting their diagnostic logs into resource-specific

Table plan: Basic

Data retention settings

Interactive retention: 8 days

Total retention period: 90 days

Archive period of **82 days**

Data collection rules: N/A

Data Access

Organization/Team Structure

- Do you need multiple workspaces?
- Who needs access to Sentinel and/or the data collected?
    - IT Ops vs Sec Ops
    - least privilege access
- Could everyone access the same Sentinel Workspace?
    - Separation of duty

Design Example

Options 1 – Decentralized

- Separate data in a different workspace
- Segregate access control to workspace
- Difficult to cross-correlate logs
- Avoid Sentinel cost

Options 2 – Centralized

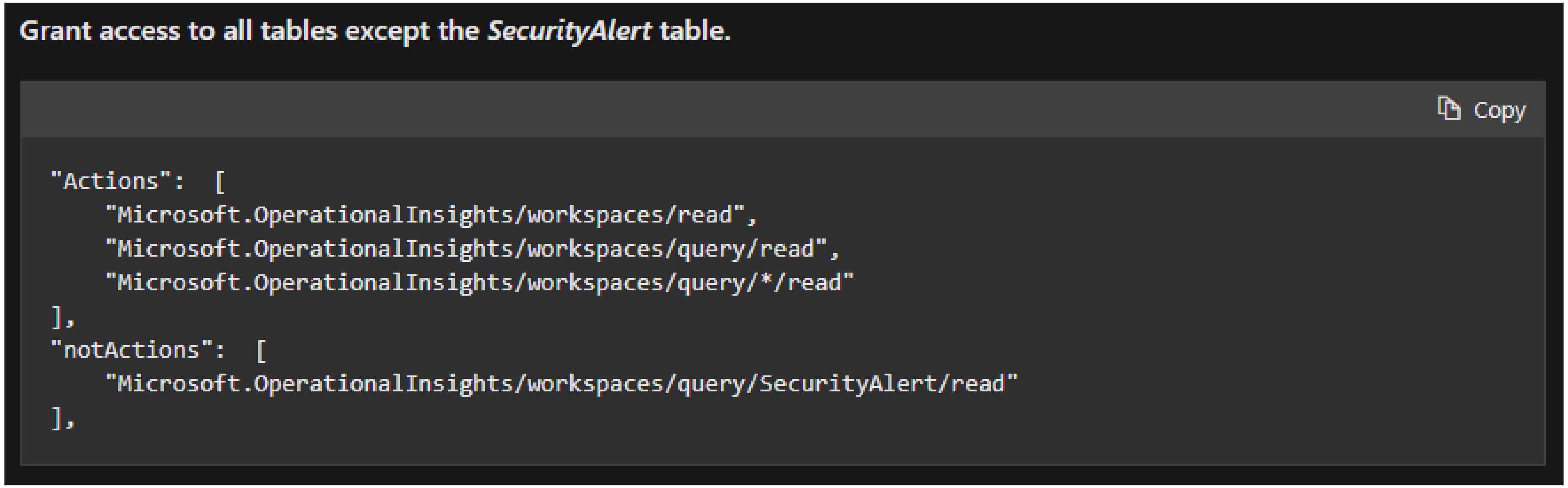
- Combine data in one workspace
- Search across resources and cross-correlate logs
- Management
  - Table-level RBAC
  - Resource-context RBAC
- Incur Sentinel cost

Manage Access to Microsoft Sentinel Data

- Workspace RBAC
- Table-level RBAC
- Resource-context RBAC

Table-level Azure RBAC

- Granular control to data in Log Analytics Workspace
- Specific data types that are accessible only to a specific set of users



Grant access to all tables except the *SecurityAlert* table.

```
"Actions":  [
    "Microsoft.OperationalInsights/workspaces/read",
    "Microsoft.OperationalInsights/workspaces/query/read",
    "Microsoft.OperationalInsights/workspaces/query/*/read"
],
"notActions":  [
    "Microsoft.OperationalInsights/workspaces/query/SecurityAlert/read"
],
```

Resource-context RBAC

- Specific resources only
- Only data for resources that the team is authorized to access

Azure Regions

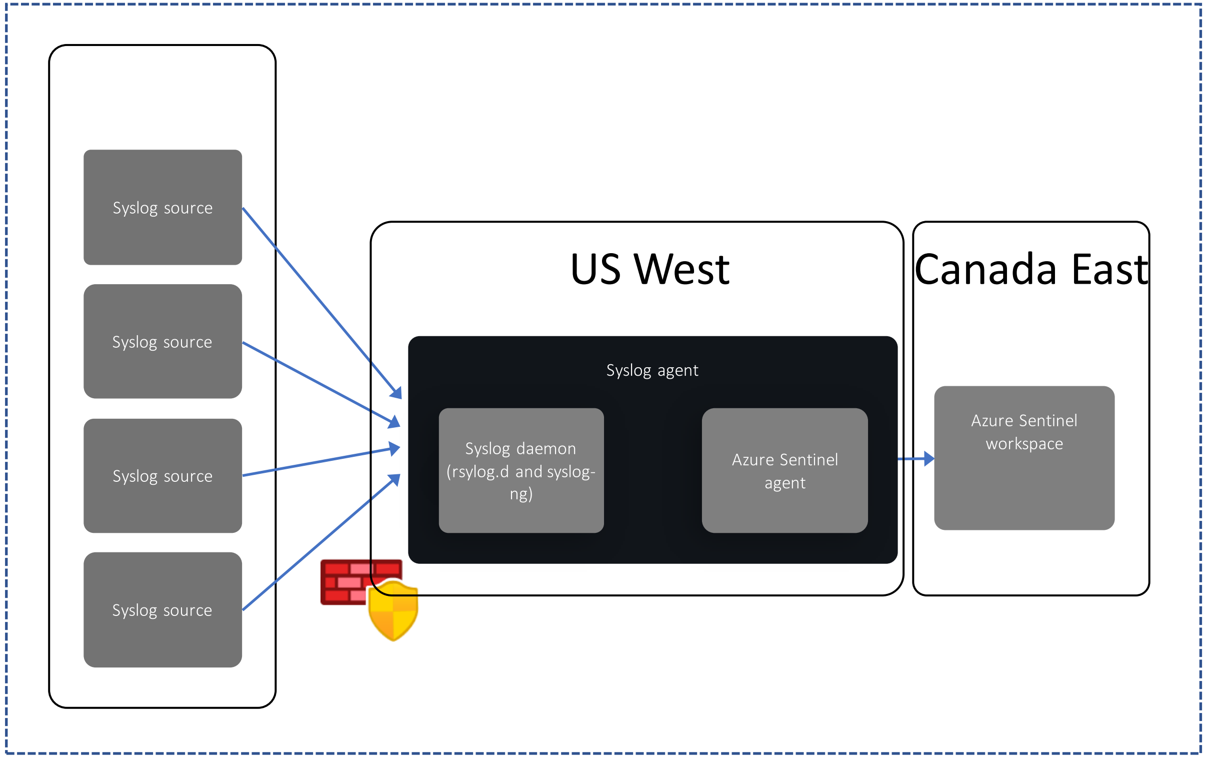
Azure Region Considerations

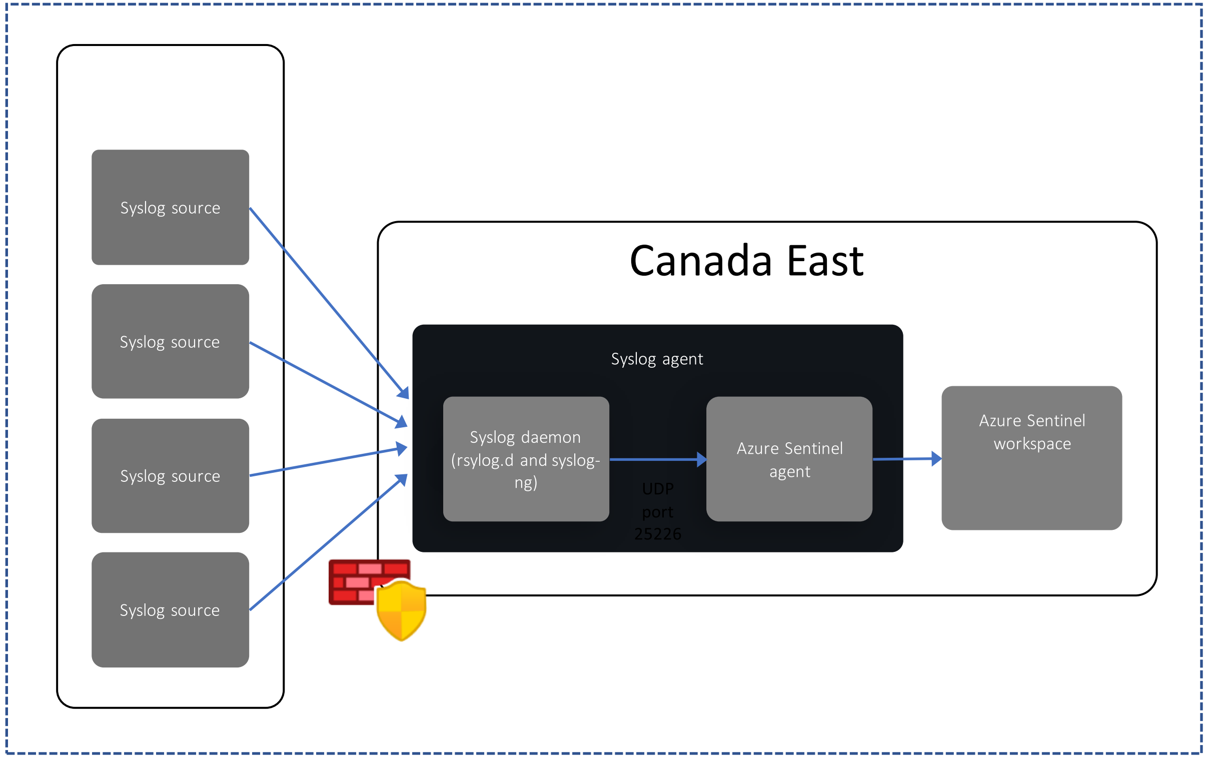
- Does the organization deploy Azure resources in multiple regions?
  - What is the utilization of these resources?

Separate Microsoft Sentinel instances for each region

- Separate instances and workspaces for each region
- Avoid bandwidth / egress costs from moving data across regions
- Syslog collector in the same region as your Microsoft Sentinel workspace to avoid bandwidth costs

Syslog Forwarder Architecture





How concerned are you about data egress cost?

- Not a technical requirement
- Data egress cost VS Maintaining separate workspaces

Azure Tenants

Multi-tenant Considerations

- Does the organization have multiple Azure tenants?
  - Parent/child companies
  - Acquisition
  - Spin-off business
  - Other compliance or configurations

Single-tenant Scenario

- Single log analytics workspace

Multi-tenant Scenario

- One workspace for each Azure AD tenant
- Support built-in, service to service data connectors that work only within their own Azure AD tenant
- All connectors based on diagnostics settings, cannot be connected to a workspace that is not located in the same tenant
  - Connectors such as Azure Firewall, Azure Storage, Azure Activity or Azure Active Directory

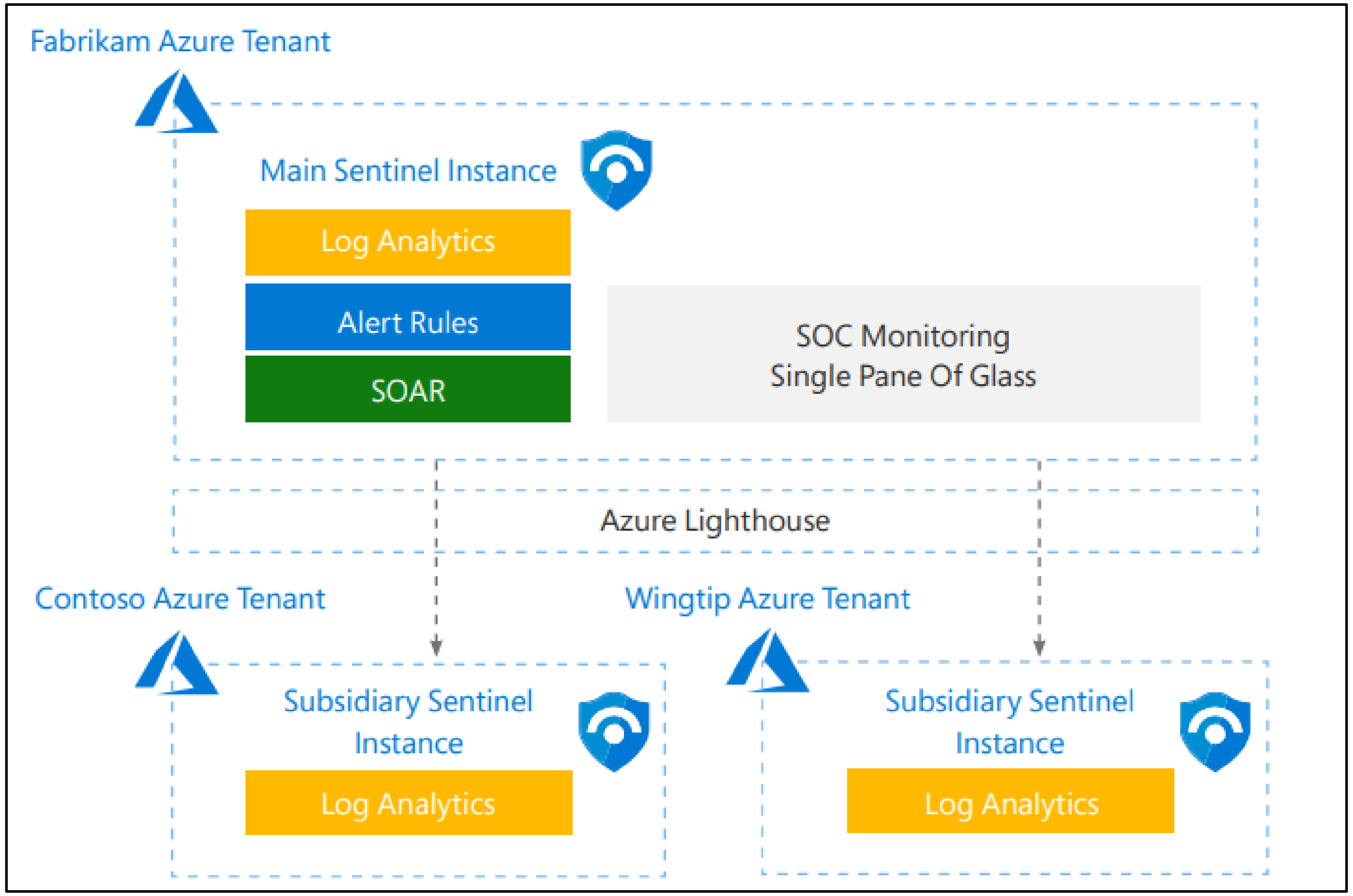
Azure Lighthouse

Azure Lighthouse Solution

Manage multiple tenants in Microsoft Sentinel

- Solution for multiple workspace
- Cross-workspace
  - Monitoring
  - Querying
  - Analytics rules
  - Workbooks
  - Hunting

Azure Lighthouse Architecture



Fabrikam Azure Tenant

Main Sentinel Instance

Log Analytics

Alert Rules

SOAR

SOC Monitoring
Single Pane Of Glass

Azure Lighthouse

Contoso Azure Tenant

Subsidiary Sentinel Instance

Log Analytics

Wingtip Azure Tenant

Subsidiary Sentinel Instance

Log Analytics

Multiple Microsoft Sentinel Workspaces

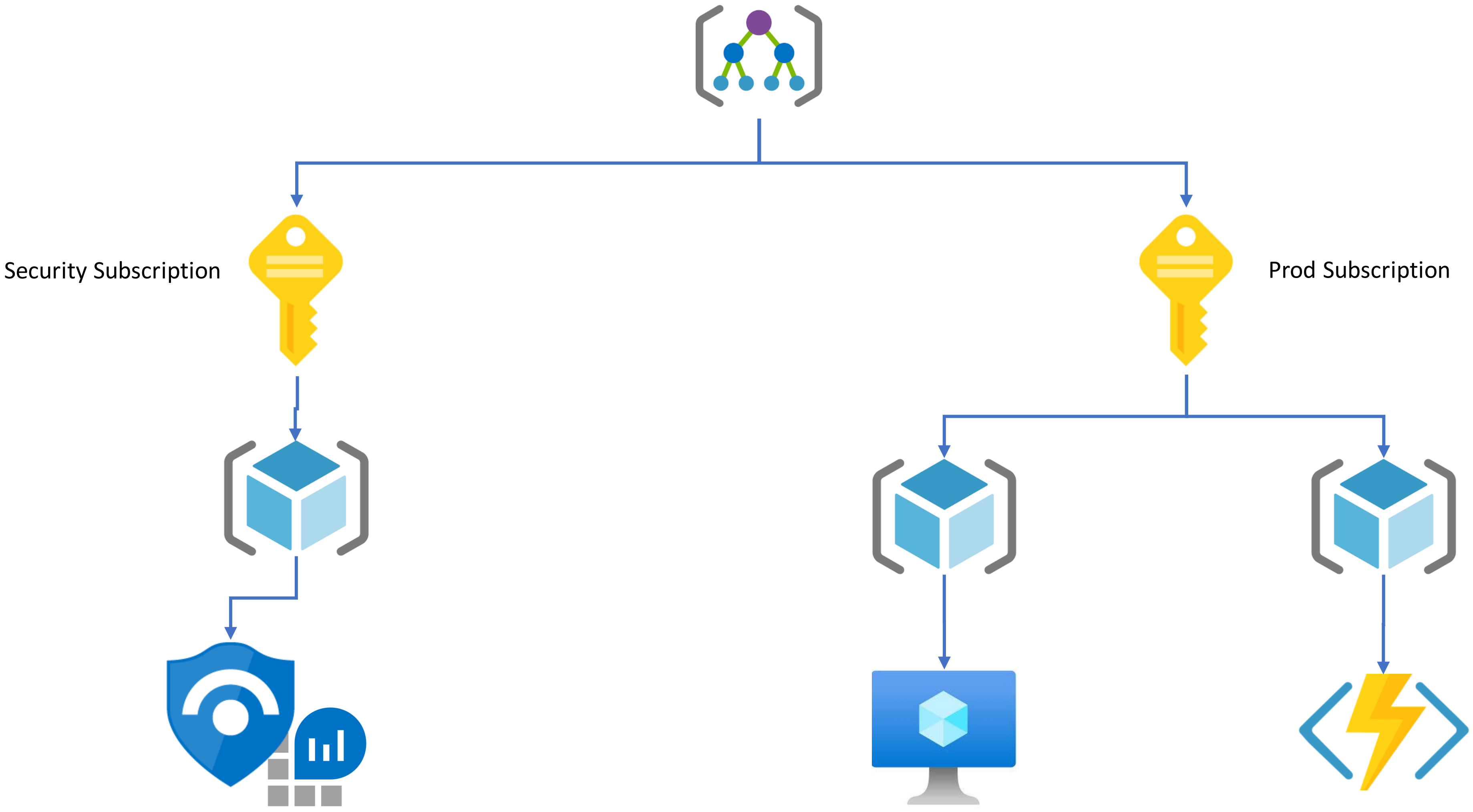
- Separate Microsoft Sentinel workspace for each Azure AD tenant
- Each workspace collects data related to its tenant for all data sources
- Each SOC team has access only to the workspace in its own tenant
- The central SOC team operate from a separate Azure AD tenant, using Azure Lighthouse to access each of the different Microsoft Sentinel environments

Deployment

Deployment considerations

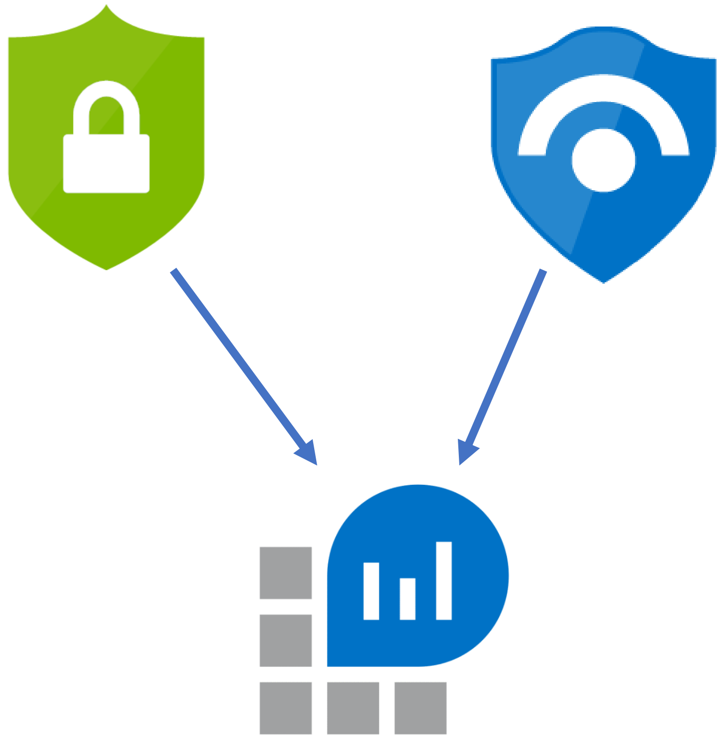
- Deploy to dedicated management group or subscription
  - Dedicated to security team
  - Minimal permission assignments are inherited
- Deploy Sentinel and all related resources in same resource group
  - RBAC roles can be assigned on the resource group level

Deployment Example



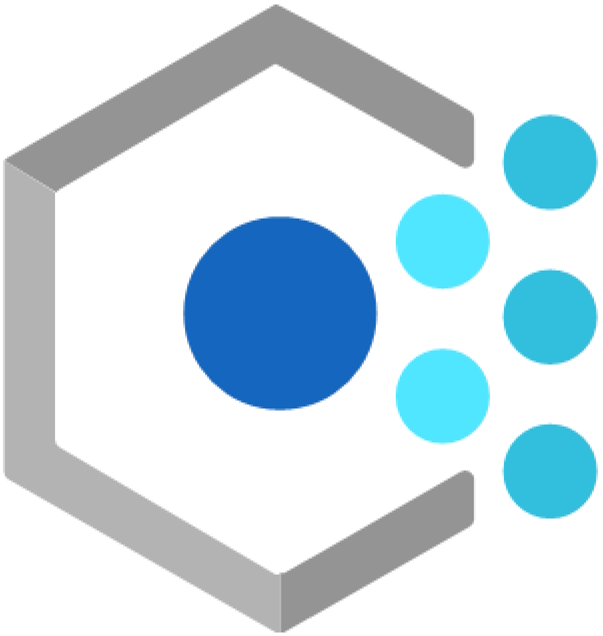
Microsoft Defender for Cloud

- Use the same workspace for both Microsoft Sentinel and Microsoft Defender for Cloud



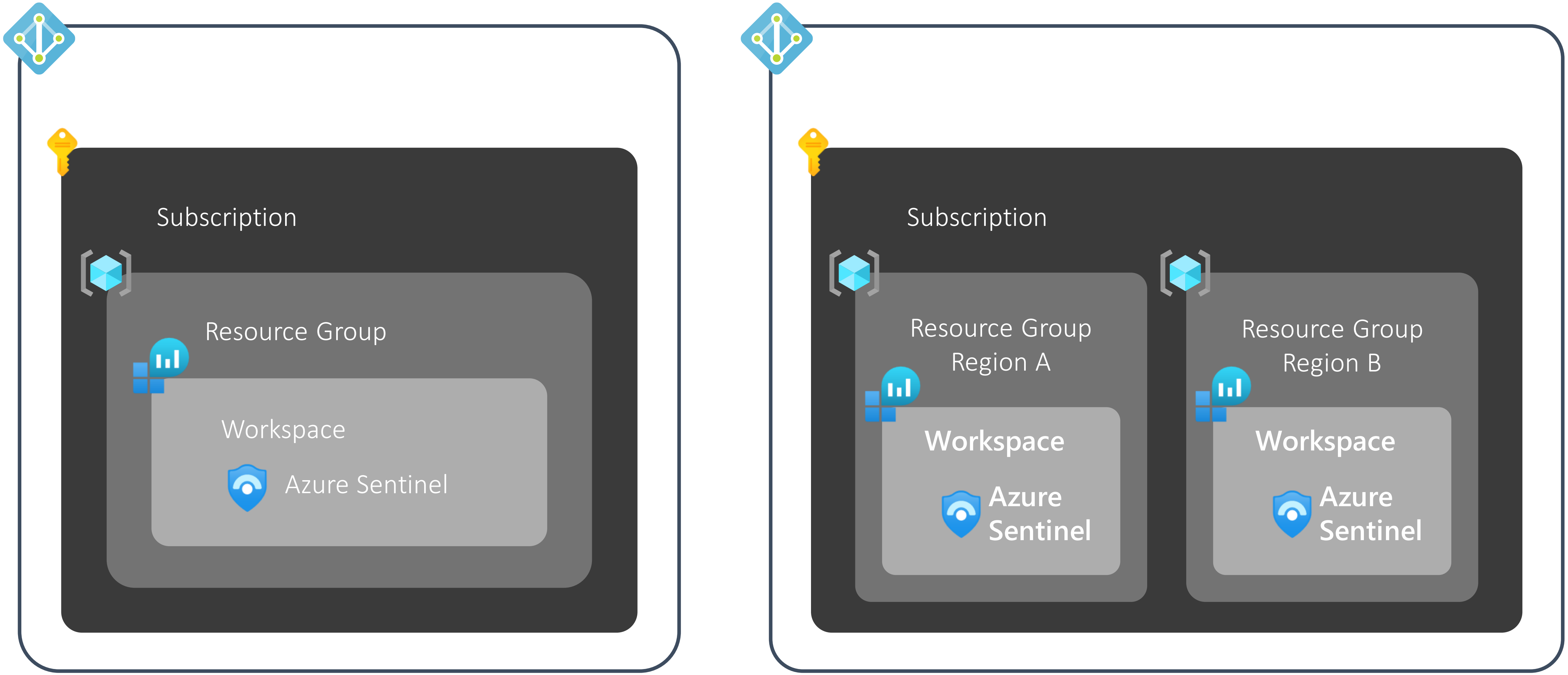
Azure Policy

- Control logging location and compliance
- Policies ensure all resource logs are sent to a particular workspace



Summary

Workspace Design (Single Tenant)



By Microsoft

Workspace Design (Single Tenant)

One single workspace per tenant – many customers can do this today!

Pros

- ✓ Central pane of glass
- ✓ Consolidates all security logs and information
- ✓ Easier to query all information
- ✓ Supported by all features of Azure Sentinel
- ✓ Azure Log Analytics RBAC to control data access
- ✓ Azure Sentinel RBAC for service RBAC

Cons

- ✗ Data governance may drive limited scope
- ✗ Can incur bandwidth cost cross region

By Microsoft

Workspace Design (Single Tenant)

Regional workspaces

Pros

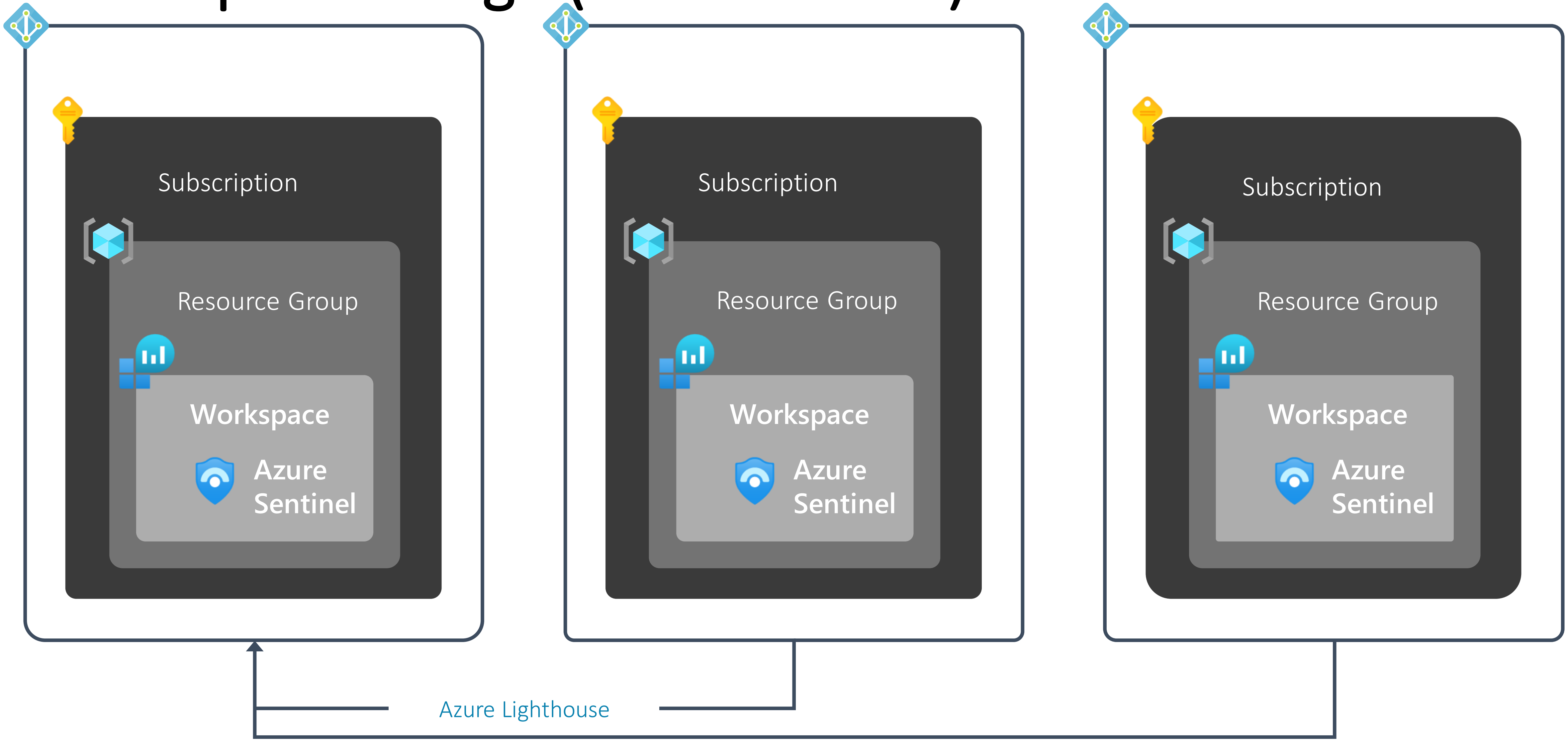
- ✓ No cross-region bandwidth cost
- ✓ May be required to meet regulation requirements
- ✓ Separate workspaces can add even more data control

Cons

- ✗ No central pane of glass
- ✗ Analytics, Workbooks, etc. must be deployed multiple times

By Microsoft

Workspace Design (Multi-Tenant)



By Microsoft

Workspace Design (Multi-Tenant)

One workspace per tenant
Use Azure Lighthouse to delegate access to the central tenant

Pros

✓ Same as single workspace single tenant

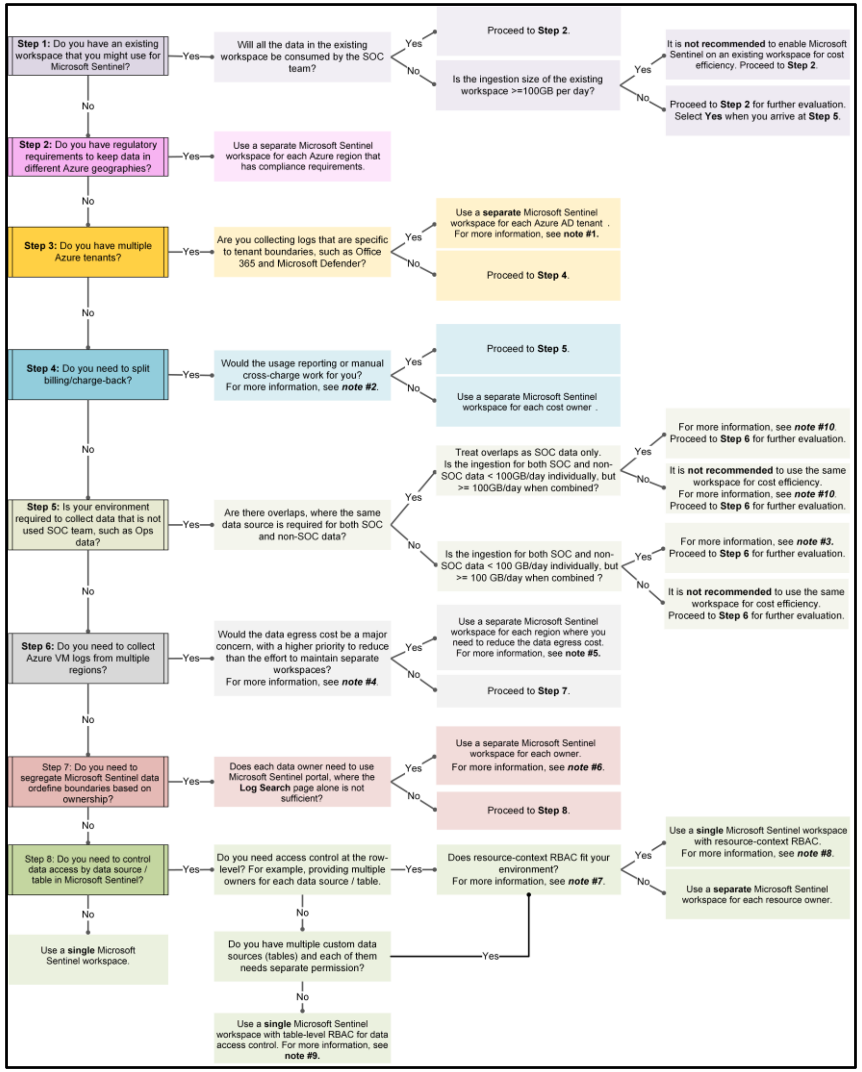
Cons

✗ No single pane across all tenants

By Microsoft

Microsoft Sentinel workspace architecture

Decision tree



Step 1: Do you have an existing workspace that you might use for Microsoft Sentinel?

Will all the data in the existing workspace be consumed by the SOC team?

Proceed to **Step 2**.

Is the ingestion size of the existing workspace >=100GB per day?

It is **not recommended** to enable Microsoft Sentinel on an existing workspace for cost efficiency. Proceed to **Step 2**.

Proceed to **Step 2** for further evaluation. Select **Yes** when you arrive at **Step 5**.

Step 2: Do you have regulatory requirements to keep data in different Azure geographies?

Use a separate Microsoft Sentinel workspace for each Azure region that has compliance requirements.

Step 3: Do you have multiple Azure tenants?

Are you collecting logs that are specific to tenant boundaries, such as Office 365 and Microsoft Defender?

Use a **separate** Microsoft Sentinel workspace for each Azure AD tenant . For more information, see **note #1.**

Proceed to **Step 4**.

Step 4: Do you need to split billing/charge-back?

Would the usage reporting or manual cross-charge work for you? For more information, see ***note #2***.

Proceed to **Step 5**.

Use a separate Microsoft Sentinel workspace for each cost owner .

Step 5: Is your environment required to collect data that is not used SOC team, such as Ops data?

Are there overlaps, where the same data source is required for both SOC and non-SOC data?

Treat overlaps as SOC data only. Is the ingestion for both SOC and non-SOC data < 100GB/day individually, but >= 100GB/day when combined?

For more information, see ***note #10***. Proceed to **Step 6** for further evaluation.

It is **not recommended** to use the same workspace for cost efficiency. For more information, see ***note #10***. Proceed to **Step 6** for further evaluation.

Is the ingestion for both SOC and non-SOC data < 100 GB/day individually, but >= 100 GB/day when combined ?

For more information, see ***note #3.*** Proceed to **Step 6** for further evaluation.

It is **not recommended** to use the same workspace for cost efficiency. Proceed to **Step 6** for further evaluation.

Step 6: Do you need to collect Azure VM logs from multiple regions?

Would the data egress cost be a major concern, with a higher priority to reduce than the effort to maintain separate workspaces? For more information, see ***note #4***.

Use a separate Microsoft Sentinel workspace for each region where you need to reduce the data egress cost. For more information, see **note #5.**

Proceed to **Step 7**.

Step 7: Do you need to segregate Microsoft Sentinel data ordefine boundaries based on ownership?

Does each data owner need to use Microsoft Sentinel portal, where the **Log Search** page alone is not sufficient?

Use a separate Microsoft Sentinel workspace for each owner. For more information, see ***note #6***.

Proceed to **Step 8**.

Step 8: Do you need to control data access by data source / table in Microsoft Sentinel?

Do you need access control at the row-level? For example, providing multiple owners for each data source / table.

Does resource-context RBAC fit your environment? For more information, see ***note #7***.

Use a **single** Microsoft Sentinel workspace with resource-context RBAC. For more information, see ***note #8***.

Use a **separate** Microsoft Sentinel workspace for each resource owner.

Do you have multiple custom data sources (tables) and each of them needs separate permission?

Use a **single** Microsoft Sentinel workspace with table-level RBAC for data access control. For more information, see **note #9.**

Use a **single** Microsoft Sentinel workspace.

https://docs.microsoft.com/en-us/azure/sentinel/design-your-workspace-architecture#decision-tree

Thank You !!!

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Appendix

- https://techcommunity.microsoft.com/t5/microsoft-sentinel-blog/best-practices-for-designing-a-microsoft-sentinel-or-azure/ba-p/832574
- https://i.crn.com/sites/default/files/ckfinderimages/userfiles/images/crn/custom/2021/BlueVoyant_CloseUp_Whitepaper_Microsoft_Azure_Sentinel_Deployment_Q3_2021.pdf
- https://www.youtube.com/watch?v=DyL9MEMhqmI&ab_channel=MicrosoftSecurity
- https://www.youtube.com/watch?v=hwahlwgJPnE&ab_channel=MicrosoftSecurityCommunity
- https://docs.microsoft.com/en-us/azure/azure-monitor/logs/workspace-design
- https://docs.microsoft.com/en-us/azure/sentinel/extend-sentinel-across-workspaces-tenants
- https://docs.microsoft.com/en-us/azure/sentinel/best-practices-workspace-architecture
- https://docs.microsoft.com/en-us/azure/sentinel/design-your-workspace-architecture
- https://docs.microsoft.com/en-us/azure/sentinel/sample-workspace-designs
- https://www.youtube.com/watch?v=DyL9MEMhqmI&ab_channel=MicrosoftSecurity
- https://docs.microsoft.com/en-us/azure/sentinel/multiple-tenants-service-providers