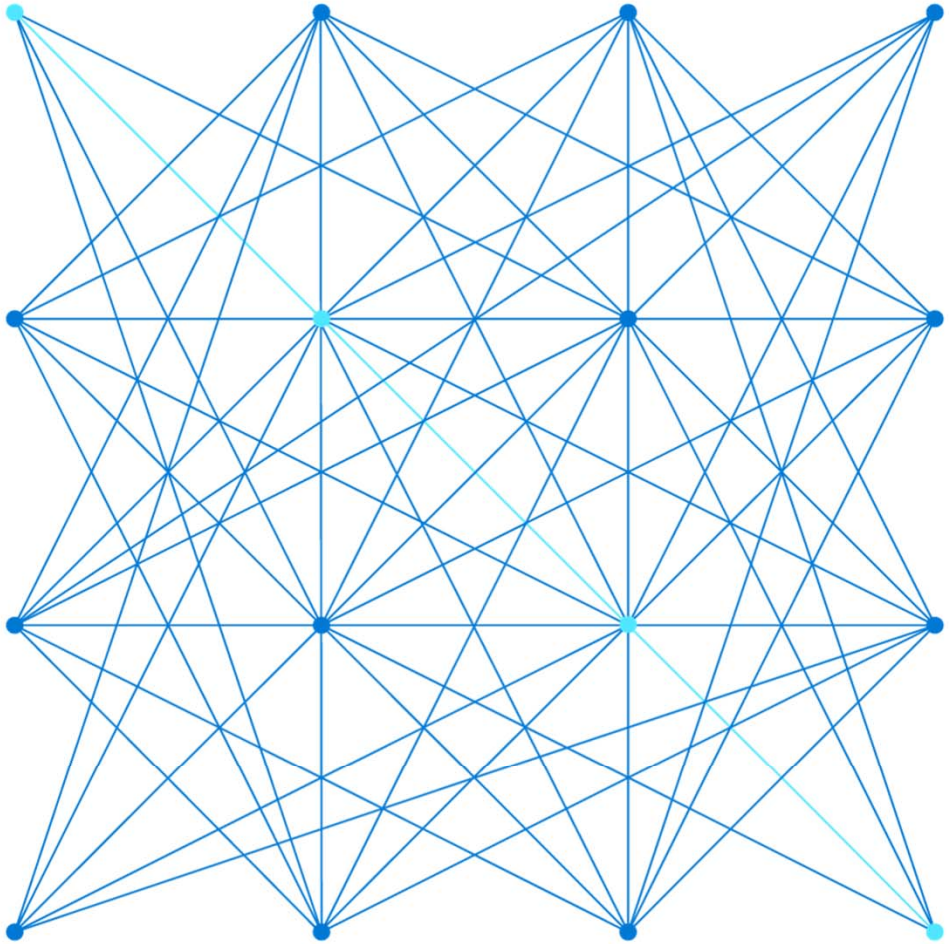
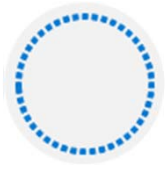
Microsoft Azure

DP-203T00: End-to-end security with Azure Synapse Analytics

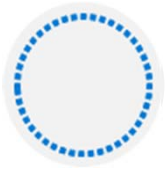


Agenda

Lesson 01: Secure a data warehouse in Azure Synapse Analytics



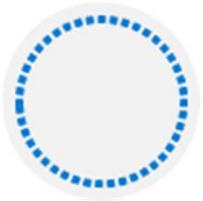
Lesson 02: Configure and manage secrets in Azure Key Vault



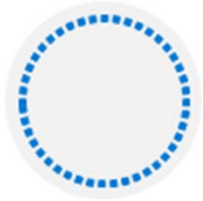
Lesson 03: Implement compliance controls for sensitive data

Lesson 01: Secure a data warehouse in Azure Synapse Analytics

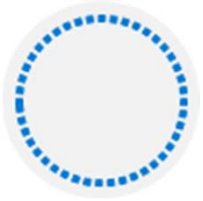
Secure a data warehouse in Azure Synapse Analytics



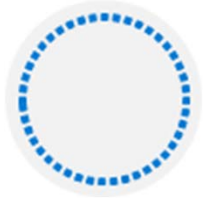
Network security



Identity and access management



Managing sensitive data



Encryption capabilities built into Azure

Network security

Securing your network from attacks and unauthorized access is an important part of any architecture

Internet protection	Firewalls	DDoS protection	Network security groups
Assess the resources that are internet-facing, and to only allow inbound and outbound communication where necessary. Make sure you identify all resources that are allowing inbound network traffic of any type	To provide inbound protection at the perimeter, there are several choices: • Azure Firewall • Azure Application Gateway • Azure Storage Firewall	The Azure DDoS Protection service protects your Azure applications by scrubbing traffic at the Azure network edge before it can impact your service's availability	Network Security Groups allow you to filter network traffic to and from Azure resources in an Azure virtual network. An NSG can contain multiple inbound and outbound security rules

Identity and access

Authentication

This is the process of establishing the identity of a person or service looking to access a resource. Azure Active Directory is a cloud-based identity service that provide this capability

Authorization

This is the process of establishing what level of access an authenticated person or service has. It specifies what data they're allowed to access and what they can do with it. Azure Active Directory also provides this capability

Azure Active Directory features

Single sign-on

Enables users to remember only one ID and one password to access multiple applications

Apps & device management

You can manage your cloud and on-premises apps and devices and the access to your organizations resources

Identity services

Manage Business to business (B2B) identity services and Business-to-Customer (B2C) identity services

Encryption

Encryption at rest

Data at rest is the data that has been stored on a physical medium. This could be data stored on the disk of a server, data stored in a database, or data stored in a storage account

Encryption in transit

Data in transit is the data actively moving from one location to another, such as across the internet or through a private network. Secure transfer can be handled by several different layers

Encryption on Azure

Raw encryption

Enables the encryption of:

- Azure Storage
- V.M. Disks
- Disk Encryption

Database encryption

Enables the encryption of databases using:

- Transparent Data Encryption

Encrypting secrets

Azure Key Vault is a centralized cloud service for storing your application secrets

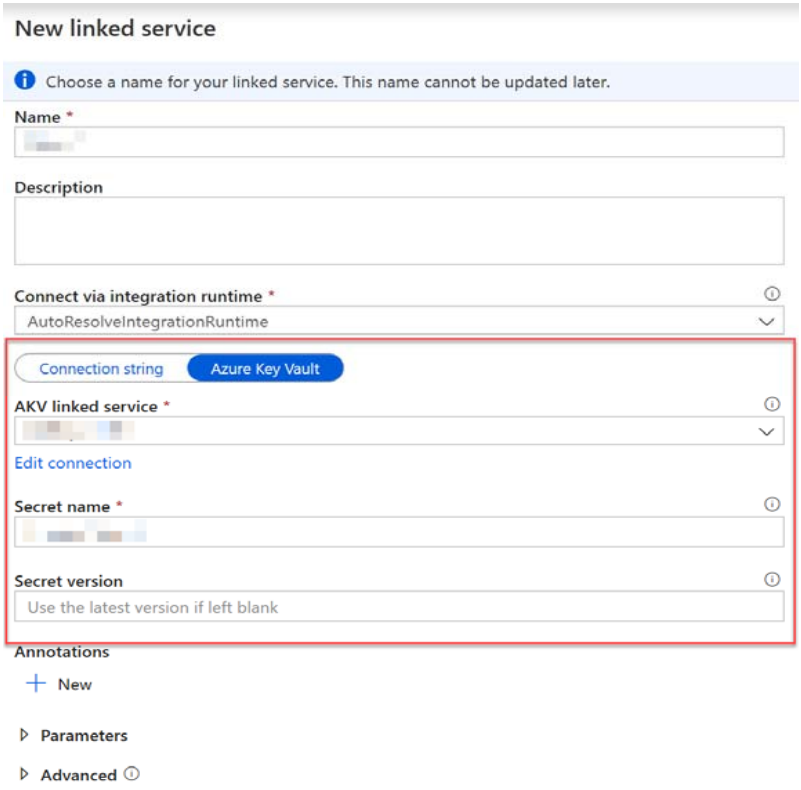
Lesson 01: Configure and manage secrets in Azure Key Vault

Configure and manage secrets in Azure Key Vault

Azure Key Vault protects

1. Secrets
2. Keys
3. Certificates

Data Engineers are typically concerned with accessing the data contained in Key Vault to apply to linked services



Lesson 01: Implement compliance controls for sensitive data

Managing sensitive data

Column level security

```
GRANT SELECT ON wwi_security.Sale([ProductID], [Analyst], [Product], [
CampaignName],[Quantity], [Region], [State], [City], [RevenueTarget])
TO DataAnalystMiami;
```

Row level security

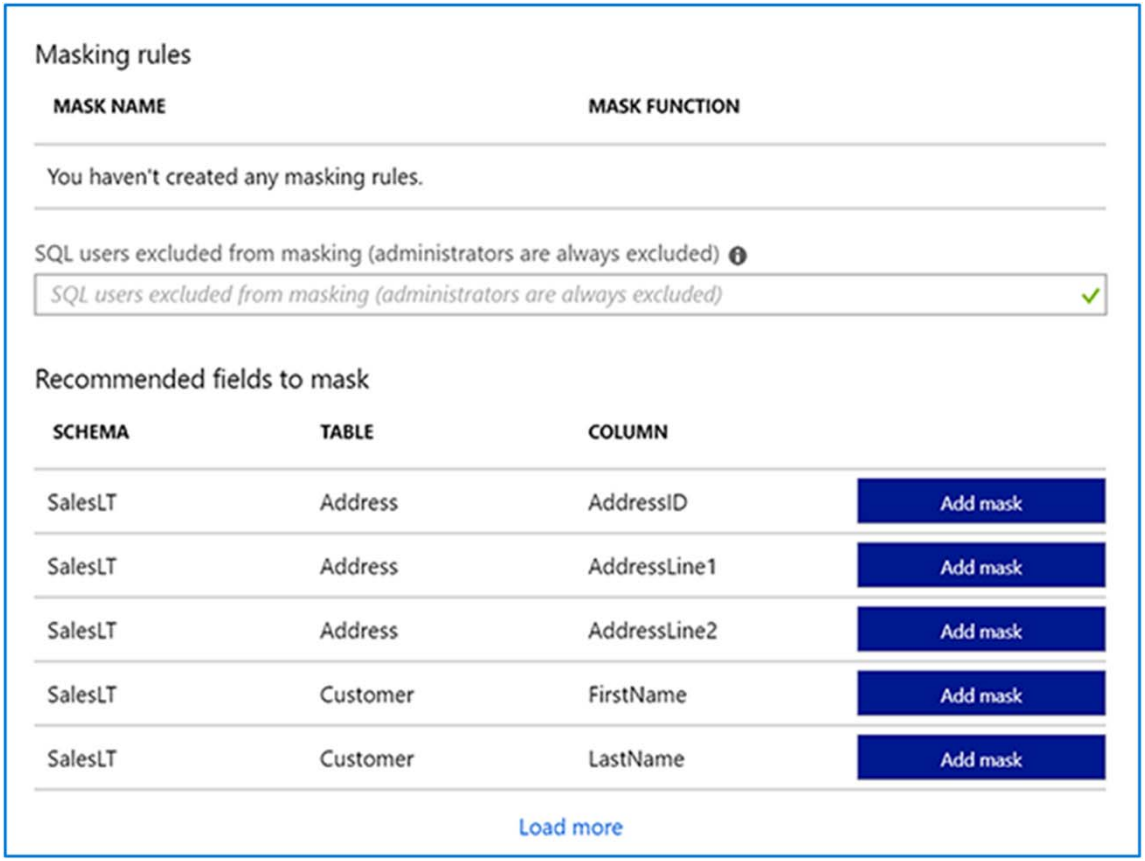
```
CREATE FUNCTION wwi_security.fn_securitypredicate(@Analyst AS sysname)
    RETURNS TABLE
WITH SCHEMABINDING
AS
    RETURN SELECT 1 AS fn_securitypredicate_result
    WHERE @Analyst = USER_NAME() OR USER_NAME() = 'CEO'
GO

CREATE SECURITY POLICY SalesFilter
ADD FILTER PREDICATE wwi_security.fn_securitypredicate(Analyst)
ON wwi_security.Sale
WITH (STATE = ON);

GRANT SELECT ON wwi_security.Sale TO CEO, DataAnalystMiami
, DataAnalystSanDiego;
```

Implement compliance controls for sensitive data

Dynamic data masking



Review questions

Q01 – Which TCP ports should be configured on your network and computer to allow Azure Synapse Studio to work?

A01 – TCP Port 80, 443 and 1443

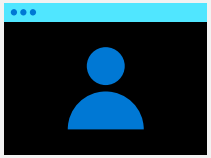
Q02 – Which Azure Key Vault object stores storage account key information?

A02 – Secrets

Q03 – Encrypted communication is turned on automatically when connecting to Azure Synapse Analytics. True or False?

A03 – True

Lab: Run interactive queries using Azure Synapse Analytics serverless SQL pools



Lab overview

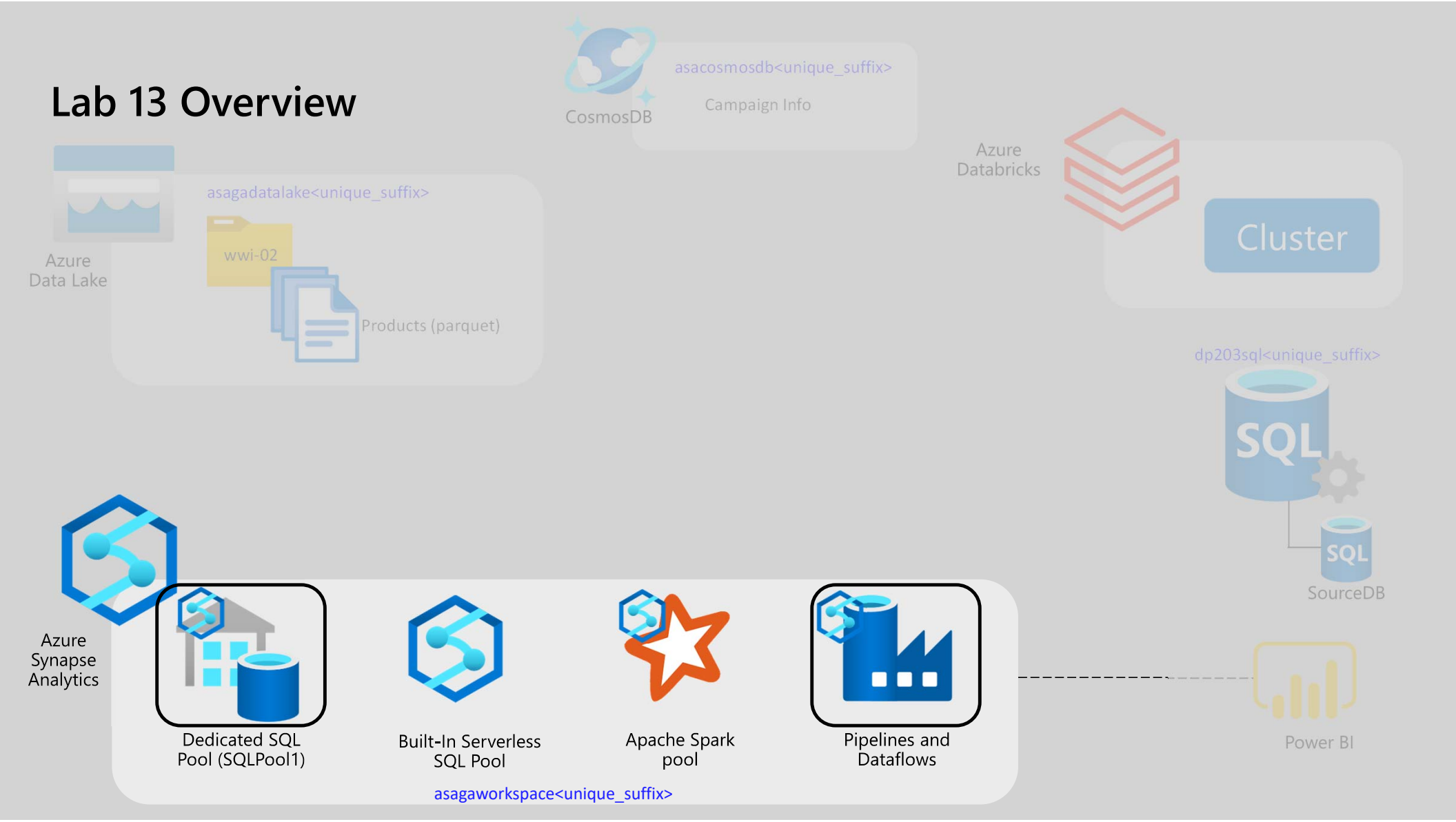
In this lab, students will learn how to secure a Synapse Analytics workspace and its supporting infrastructure. The student will observe the SQL Active Directory Admin, manage IP firewall rules, manage secrets with Azure Key Vault and access those secrets through a Key Vault linked service and pipeline activities. The student will understand how to implement column-level security, row-level security, and dynamic data masking when using dedicated SQL pools.

Lab objectives

After completing this lab, you will be able to:

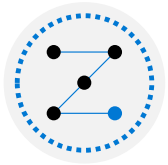
- Securing Azure Synapse Analytics supporting infrastructure
- Securing the Azure Synapse Analytics workspace and managed services
- Securing Azure Synapse Analytics workspace data

Lab 13 Overview

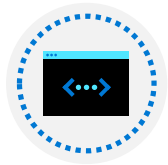


Lab review

Question 1 – Where do you set the SQL Active directory admin account?



Question 2 – Which UDP port should be open to use Azure Synapse Studio?



Question 3 – Which Azure Key Vault permission are required for your Azure Synapse workspace to access the values for secrets that it stores?

Question 4 – How can you set Transparent Data Encryption in Azure Synapse Analytics?

Module summary

In this module, you have learned about:

- Secure a data warehouse in Azure Synapse Analytics
- Configure and manage secrets in Azure Key Vault
- Implement compliance controls for sensitive data

Next steps

After the course, consider visiting [Azure security baseline for Synapse Analytics]. The Azure Security Benchmark provides recommendations on how you can secure your cloud solutions on Azure.