

SQL Server Always Encrypted with Azure Key Vault (1 Day)

Code: Azure-102

About this course

This 1 day course provides a deep dive into SQL Always Encrypted with Local Key Store and Azure Key Vault, enabling secure encryption of sensitive data in SQL Server. Participants will learn how to configure Always Encrypted, integrate with Azure Key Vault for key management, and troubleshooting common issues. Through hands-on exercises, attendees will gain practical experience in securing database operations while maintaining performance and compliance. Ideal for IT professionals, DBAs, and security engineers looking to enhance data protection strategies.

Product: SQL Server, Microsoft Azure
Audience(s): IT administrators, SQL DBA
Language: Speaker Thai / Presentation English & Thai
Time: 9:00-12:00 and 13:00-16:30 (1 Day)

Module



Module 1: Introduction to SQL Always Encrypted

Lessons:

- What is SQL Always Encrypted
- Column keys
- Types of encryptions
- Feature Limitation
- Always Encrypted with secure enclaves
- Attestation
- SQL Server with attestation using HGS
- Local Key Store
- Create a self-signed certificate
- About Azure Key Vault
- Process flow of using the Azure Key Vault
- Column Master Keys in Azure Key Vault
- Landing zone
- Example Select Query
- Parameterization for Always Encrypted



Module 2: Setting Up SQL Always Encrypted with Local Key Store (Hand on Labs)

Lessons:

- Download and install SQL Server Management Studio
- Create a simple database with table
- Create Self Certificate
- Create Column Master Keys and Encryption Keys
- Configure Deterministic Encrypt Column
- Query encrypted column
- Enable Always Encrypted to select query
- Export and import Certificate
- Enable Parameterization
- Configure Randomized Encrypt Column
- Enable secure enclaves in SQL (unattested)
- Create Column Master Keys and Encryption Keys with enclave
- Question



Module 3: SQL Server with attestation using HGS (Hand on Labs)

Lessons:

- Prerequisites for Install HGS Server
- Configure the HGS
- Configure the SQL Server as a guarded host
- Connect SQL Server with HGS
- Configure HGS for HTTPS communication



Module 4: Setup Azure Key vault (Hand on Labs)

Lessons:

- Set up a Microsoft Entra ID
- Set up a Microsoft Entra service principal
- Creating Azure Key vault
- Setup Access control for Azure Key vault
- Create a key in Azure Key vault



Module 5: Setting up SQL Always Encrypted with Azure Key vault (Hand on Labs)

Lessons:

- Service Monitoring
- Search Service Management
- Issue Logging & Troubleshooting (Example)
- Backup & Restore



Module 6: Integration with Web Application (Hand on Labs)

Lessons:

- Integration Process
- Integrate applications with Always Encrypted
- Install Visual Studio
- Setup and configure for source code, package
- Demo



Module 7: Managing & Troubleshooting SQL Always Encrypted (Hand on Labs)

Lessons:

- Key Rotation & Lifecycle Management
- Rotate Local Store Key
- Key Rotation process
- Azure Key vault Rotation policy
- Set key Rotation policy