

Microsoft SQL Server 2016 and 2017 System Administration Fundamentals

Duration : 3 Days



Course Overview

This 3 day course is intended for students who need to learn the essential skills necessary to maintain a Microsoft SQL Server 2016 or 2017 system infrastructure. Being concise and hands-on, it is aimed at quickly getting students familiar with the Microsoft SQL Server administration concepts, tools and utilities. The installation of SQL Server, covered in the first module of the course, is optional and can be omitted to free up time for other topics if desired.

The course focuses on managing a single on-premise SQL Server Database instance and does not delve into more advanced enterprise features such as high availability and replication. Neither do we consider cloud-based solutions in this course. That said, for delegates looking to get a strong grounding in SQL Server architecture and administration, perhaps before advancing on to more advanced features, this is an ideal course upon which to build.

Attendees will gain insight into the infrastructure and architecture of SQL Server, enabling individuals to fully understand the product with which they are dealing. Configuration of server instances and databases is given full treatment, as are database transaction logs, and the creation and maintenance of indexes. Concise treatment is given to managing SQL Server security, including both at the server and database level. The focus then shifts to examining how best to move and protect data, such as when importing or exporting it between heterogeneous data sources, backing it up to external media, and restoring data from a backup. Many tasks involved in the day to day administration of a SQL Server instance can be performed automatically, making an administrators life potentially simpler, and such is the subject matter in the module dealing with SQL Server Automation. The final part of the course looks at monitoring and troubleshooting SQL Server performance and related issues.

Prerequisites

Delegates should be familiar with working in a Microsoft Windows Server operating system environment. Delegates should also have an understanding of the fundamental design of relational databases including, but not restricted to, the purpose of primary and foreign keys, entity relationships, and data normalization. A good working knowledge of the SQL language will also be assumed.

Objectives

Upon successful completion of this course, delegates will be able to:

- Configure a SQL Server 2016 or 2017 Instance
- Create, Configure and Manage Databases
- Understand SQL Server Internal Storage Mechanisms
- Implement and Manage Indexes
- Understand and Implement SQL Server Security
- Understand Data Transfer Utilities
- Backup and Restore Databases
- Automate Tasks in SQL Server
- Monitor and Troubleshoot SQL Server
- Understand SQL Server Transactions and Locking

Course Content

Install and Configure a SQL Server Instance

Overview of SQL Server 2016 and 2017
Installing SQL Server (optional)
Configuring Instance-Level Settings

Configuring and Managing Databases

Creating and Managing Database Files and Filegroups
Configuring Databases
System Databases
TempDB Database Considerations
Managing Log Files

SQL Server Internals

How SQL Server Stores and Manages Data Internally
Examining Internal Storage Mechanisms

Creating and Managing Indexes

SQL Server Index Architecture
Clustered v Non-Clustered Indexes
Creating and Modifying Indexes
Missing and Unused Indexes
Understanding and Managing Index Fragmentation
Understanding and Managing Statistics

SQL Server Security

Managing Logins and Server Roles
Managing Users and Database Roles
Assigning and Managing Permissions
Using Schemas

Transferring Data

Overview of Copying and Exporting Data
Using BCP to Import and Export Data
BULK INSERT
OPENROWSET(BULK)
SELECT INTO
Using the SQL Server Import and Export Wizard
Introducing SQL Server Integration Services (SSIS)

Backups and Recovery

Understanding Database Recovery Models Indirect Checkpoints
Understanding Backup Types
Backup Options
Encrypted Backups
Performing Database and Log Backups
Backing Up System Databases
Viewing Backup History
Restoring Database and Log Backups
Restoring System Databases

SQL Server Automation

Overview of SQL Server Automation
The SQL Server Agent Service
Configuring Credentials and Proxy Accounts
Implementing Jobs
Implementing Operators and Notifications
Implementing Alerts
Maintenance Plans

Monitoring and Troubleshooting SQL Server

Introduction to Monitoring SQL Server
Using DMVs and DMFs
Activity Monitor
Performance Monitor
Introduction to Extended Events
Diagnosing Common Issues