Administering Microsoft SQL Server Databases

Cette formation vous permettra de tout savoir sur l'administration de SQL Server 2016,
avec la possibilité d'ajouter « sur demande » les nouveautés de SQL Server 2016 (en fonction de la version choisie).

Détails

* Code : SQL S2014A
* Durée : 4 jours (28 heures)

Public

* Database Administrators

Pré-requis

* (10774A: Writing T-SQL Queries for Microsoft SQL Server 2012)

Objectifs

* Plan and install SQL Server.
* Describes the system databases, the physical structure of databases and the most common configuration options related to them.
* Explain the concept of the transaction log and SQL Server recovery models and implement different backup strategies available with SQL Server.
* Create SQL Server Backups.
* Restore SQL Server databases.

Programme

Module 1: Introduction to SQL Server 2016 and its Toolset

* Description
  * This module introduces the entire SQL Server platform and its major tools
  * It covers editions, versions, basics of network listeners, and concepts of services and service accounts
* Lessons
  * Introduction to the SQL Server Platform
  * Working with SQL Server Tools
  * Configuring SQL Server Services
* Lab: Introduction to SQL Server and its Toolset
  * Verifying SQL Server Component Installation
  * Altering Service Accounts for New Instance
  * Enabling Named Pipes Protocol for Both Instances
  * Creating an Alias for AdvDev
  * Ensuring SQL Browser is Disabled and Configure a Fixed TCP/IP Port (Only if time permits
* After completing this module, students will be able to:
  * Describe the SQL Server Platform
  * Work with SQL Server Tools
  * Configure SQL Server Services

Module 2: Preparing Systems for SQL Server 2012

* Description
  * This module covers planning for an installation related to SQL Server I/O requirements, 32 bit vs 64 bit, memory configuration options and I/O subsystem pre-installation checks using SQLIOSim and SQLIO
* Lessons
  * Overview of SQL Server Architecture
  * Planning Server Resource Requirements
  * Pre-installation Testing for SQL Server

* Lab: Preparing Systems for SQL Server
  * Adjust memory configuration
  * Pre-installation Stress Testing
  * Check Specific I/O Operations
* After completing this module, students will be able to:
  * Describe the SQL Server architecture
  * Plan for server resource requirements
  * Conduct pre-installation stress testing for SQL Server

Module 3: Installing and Configuring SQL Server 2012

* Description
  * This module details installing and configuring SQL Server
* Lessons
  * Preparing to Install SQL Server
  * Installing SQL Server
  * Upgrading and Automating Installation
* Lab: Installing and Configuring SQL Server
  * Review installation requirements
  * Install the SQL Server instance
  * Perform Post-installation Setup and Checks
  * Configure Server Memory
* After completing this module, students will be able to:
  * Prepare to install SQL Server
  * Install SQL Server
  * Upgrade and automate the installation of SQL Server

Module 4: Working with Databases

* Description
  * This module describes how data is stored in databases, how to create databases, and how to move databases either within a server or between servers
* Lessons

- - Overview of SQL Server Databases
    - Working with Files and Filegroups
    - Moving Database Files
  - Lab: Working with Databases
    - Adjust tempdb configuration
    - Create the RateTracking database
    - Attach the OldProspects database
    - Add multiple files to tempdb
  - After completing this module, students will be able to:
    - Describe the role and structure of SQL Server databases
    - Work with files and filegroups
    - Move database files within servers and between servers

Module 5: Understanding SQL Server 2016 Recovery Models

- Description
  - This module describes the concept of the transaction log and SQL Server recovery models
  - It introduces the different backup strategies available with SQL Server
- Lessons
  - Backup Strategies
  - Understanding SQL Server Transaction Logging
  - Planning a SQL Server Backup Strategy
- Lab: Understanding SQL Server Recovery Models
  - Plan a backup strategy
  - Configure Recovery Models
  - Review recovery models and strategy
- After completing this module, students will be able to:
  - Describe the critical concepts surrounding backup strategies
  - Explain the transaction logging capabilities within the SQL Server database engine
  - Plan a SQL Server backup strategy

Module 6: Backup of SQL Server 2016 Databases

- Description
  - This module describes SQL Server Backup and the backup types
- Lessons
  - Backing up Databases and Transaction Logs
  - Managing Database Backups
  - Working with Backup Options
- Lab: Backup of SQL Server Databases
  - Investigate backup compression
  - Transaction log backup
  - Differential backup
  - Copy-only backup
  - Partial backup
- After completing this module, students will be able to:
  - Back up databases and transaction logs
  - Manage database backups
  - Work with more advanced backup options

Module 7: Restoring SQL Server 2016 Databases

- Description
  - This module describes the restoration of databases

- Lessons
  - Understanding the Restore Process
  - Restoring Databases
  - Working with Point-in-time recovery
  - Restoring System Databases and Individual Files
- Lab: Restoring SQL Server 2012 Databases
  - Determine a restore strategy
  - Restore the database
  - Using STANDBY mode
- After completing this module, students will be able to:
  - Understand the restore process
  - Restore databases
  - Work with Point-in-time Recovery
  - Restore system databases and individual files

Module 8: Importing and Exporting Data

- Description
  - This module covers the use of the import/export wizards and explains how they relate to SSIS
  - Also introduces BCP
- Lessons
  - Transferring Data To/From SQL Server
  - Importing & Exporting Table Data
  - Inserting Data in Bulk
- Lab: Importing and Exporting Data
  - Import the Excel spreadsheet
  - Import the CSV file
  - Create and test an extraction package
  - Compare loading performance
- After completing this module, students will be able to:
  - Transfer data to and from SQL Server
  - Import and export table data
  - Insert data in bulk and optimize the bulk insert process

Module 9: Authenticating and Authorizing Users

- Description
  - This module covers SQL Server security models, logins and users
- Lessons
  - Authenticating Connections to SQL Server
  - Authorizing Logins to Access Databases
  - Authorization Across Servers
- Lab: Authenticating and Authorizing Users
  - Create Logins
  - Correct an Application Login Issue
  - Create Database Users
  - Correct Access to Restored
- After completing this module, students will be able to:
  - Describe how SQL Server authenticates connections
  - Describe how logins are authorized to access databases
  - Explain the requirements for authorization across servers

Module 10: Assigning Server and Database Roles

- Description
  - This module covers fixed server roles, user-defined

server roles, fixed database roles and user-defined database roles
- Lessons
  - Working with Server Roles
  - Working with Fixed Database Roles
  - Creating User-defined Database Roles
- Lab: Assigning Server and Database Roles
  - Assign Server Roles
  - Assign Fixed Database Roles
  - Create and Assign User-defined Database Roles
  - Check Role Assignments
- After completing this module, students will be able to:
  - Work with server roles
  - Work with fixed database roles
  - Create user-defined database roles

Module 11: Authorizing Users to Access Resources
- Description
  - This module covers permissions and the assignment of permissions
- Lessons
  - Authorizing User Access to Objects
  - Authorizing Users to Execute Code
  - Configuring Permissions at the Schema Level
- Lab: Authorizing Users to Access Resources
  - Assign Schema-level Permissions
  - Assign Object-level Permissions
  - Test Permissions
- After completing this module, students will be able to:
  - Authorize user access to objects
  - Authorize users to execute code
  - Configure permissions at the schema level

Module 12: Auditing SQL Server Environments
- Description
  - This module covers SQL Server Audit
- Lessons
  - Options for Auditing Data Access in SQL
  - Implementing SQL Server Audit
  - Managing SQL Server Audit
- Lab: Auditing SQL Server Environments
  - Determine audit configuration and create audit
  - Create server audit specifications
  - Create database audit specifications
  - Test audit functionality
- After completing this module, students will be able to:
  - Describe the options for auditing data access in SQL Server
  - Implement SQL Server Audit
  - Manage SQL Server Audit

Module 13: Automating SQL Server 2016 Management
- Description
  - This module covers SQL Server Agent, jobs and job history
- Lessons
  - Automating SQL Server Management
  - Working with SQL Server Agent
  - Managing SQL Server Agent Jobs

- Lab: Automating SQL Server Management
  - Create a Data Extraction Job
  - Schedule the Data Extraction Job
  - Troubleshoot a Failing Job
- After completing this module, students will be able to:
  - Automate SQL Server Management
  - Work with SQL Server Agent
  - Manage SQL Server Agent jobs

Module 14: Configuring Security for SQL Server Agent
- Description
  - This module covers SQL Server agent security, proxy accounts and credentials
- Lessons
  - Understanding SQL Server Agent Security
  - Configuring Credentials
  - Configuring Proxy Accounts
- Lab: Configuring Security for SQL Server Agent
  - Troubleshoot job execution failure
  - Resolve the security issue
  - Perform further troubleshooting
- After completing this module, students will be able to:
  - Explain SQL Server Agent security
  - Configure credentials
  - Configure Proxy accounts

Module 15: Monitoring SQL Server 2016 with Alerts and Notifications
- Description
  - This module covers the configuration of database mail, alerts and notifications
- Lessons
  - Configuration of Database Mail
  - Monitoring SQL Server Errors
  - Configuring Operators, Alerts and Notifications
- Lab: Monitoring SQL Agent Jobs with Alerts and Notifications
  - Configure Database Mail
  - Implement Notifications
  - Implement Alerts
- After completing this module, students will be able to:
  - Configure database mail
  - Monitor SQL Server errors
  - Configure operators, alerts and notifications

Module 16: Performing Ongoing Database Maintenance
- Description
  - This module covers database maintenance plans
- Lessons
  - Ensuring Database Integrity
  - Maintaining Indexes
  - Automating Routine Database Maintenance
- Lab: Performing Ongoing Database Maintenance
  - Check database integrity using DBCC CHECKDB
  - Correct index fragmentation
  - Create a database maintenance plan
  - Investigate table lock performance
- After completing this module, students will be able to:
  - Ensure database integrity

- Maintain indexes
- Automate routine database maintenance

Module 17: Tracing Access to SQL Server 2016

- Description
  - This module covers SQL Profiler and SQL Trace stored procedures
- Lessons
  - Capturing Activity using SQL Server Profiler
  - Improving Performance with the Database Engine Tuning Advisor
  - Working with Tracing Options
- Lab: Tracing Access to SQL Server 2016
  - Capture a trace using SQL Server Profiler
  - Analyze a trace using Database Engine Tuning Advisor
  - Configure SQL Trace
- After completing this module, students will be able to:
  - Capture activity using SQL Server Profiler and Extended Events Profiler
  - Improve performance with the Database Engine Tuning Advisor
  - Work with tracing options

Module 18: Monitoring SQL Server 2016

- Description
  - This module introduces DMVs and the configuration of data collection
- Lessons
  - Monitoring Activity
  - Capturing and Managing Performance Data
  - Analyzing Collected Performance Data
- Lab: Monitoring SQL Server 2016
  - Investigating DMVs
  - Configure Management Data Warehouse
  - Configure Instances for Data Collection
  - Work with Data Collector Reports
- After completing this module, students will be able to:
  - Monitor current activity
  - Capture and manage performance data

- Analyze collected performance data

Module 19: Managing Multiple Servers

- Description
  - This module covers Central Management Servers and Multi-Server queries, Virtualization of SQL Server and Data-Tier Applications
- Lessons
  - Working with Multiple Servers
  - Virtualizing SQL Server
  - Deploying and Upgrading Data-Tier Applications
- Lab: Managing Multiple Servers
  - Configure CMS and execute multi-server queries
  - Deploy a data-tier application
  - Register and extract a data-tier application
  - Upgrade a data-tier application
- After completing this module, students will be able to:
  - Work with multiple servers
  - Describe options for virtualizing SQL Server
  - Deploy and upgrade Data-Tier Applications

Module 20: Troubleshooting Common SQL Server 2016 Administrative Issues

- Description
  - This module covers common issues that require troubleshooting and gives guidance on where to start looking for solutions
- Lessons
  - SQL Server Troubleshooting Methodology
  - Resolving Service-related Issues
  - Resolving Concurrency Issues
  - Resolving Login and Connectivity Issues
- Lab: Troubleshooting Common Issues
  - Troubleshoot and resolve SQL Server administrative issues
- After completing this module, students will be able to:
  - Explain SQL Server troubleshooting methodology
  - Resolve service-related issues
  - Resolve concurrency issues
  - Resolve login and connectivity issues

Modalités

- Type d'action :Acquisition des connaissances
- Moyens de la formation :Formation présentielle – 1 poste par stagiaire – 1 vidéo projecteur – Support de cours fourni à chaque stagiaire
- Modalités pédagogiques :Exposés – Cas pratiques – Synthèse
- Validation :Exercices de validation – Attestation de stages