

## Course 20465C: Designing a Data Solution with Microsoft SQL Server

Five days, instructor-led

### About this Course

The focus of this five-day instructor-led course is on planning and implementing enterprise database infrastructure solutions by using SQL Server 2014 and other Microsoft technologies. It describes how to consolidate SQL Server workloads, work with both on-premises and Microsoft Azure cloud-based solutions, and how to plan and implement high availability and disaster recovery solutions.

**Note:** This course is designed for customers who are interested in learning SQL Server 2012 or SQL Server 2014. It covers the new features in SQL Server 2014, but also the important capabilities across the SQL Server data platform.

### Audience Profile

This course is intended for database professionals who need who plan, implement, and manage database solutions. Primary responsibilities include:

- Planning and implementing database infrastructure.
- Planning and implementing consolidation strategies.
- Implementing SQL Server in on-premises, cloud, and hybrid IT scenarios.
- Planning and implementing high availability solutions.
- Planning and implementing disaster recovery solutions.

### At Course Completion

After completing this course, students will be able to:

- Assess an existing enterprise environment.
- Plan and implement Policy-Based Management.
- Describe the considerations for consolidating workloads with SQL Server 2014.
- Describe considerations for including SQL Server 2014 in a private cloud.
- Use Microsoft Azure storage with SQL Server 2014.
- Implement and configure databases in Microsoft Azure SQL Database.
- Implement and configure databases in Microsoft Azure virtual machines.
- Describe high availability technologies in SQL Server 2014 and implement log shipping.
- Describe Windows Server Failover Clustering and Implement an AlwaysOn Failover Cluster Instance.
- Implement an Always On Availability Group.
- Plan high availability and disaster recovery solutions.

- Plan and implement database replication.

## Prerequisites

This course requires that you meet the following prerequisites:

- At least 2 years' experience of working with relational databases, including:
- Planning and implementing databases
- Managing databases
- Querying with Transact-SQL
- Some basic knowledge of high availability and disaster recovery
- Some basic knowledge of Microsoft Azure technologies and concepts around cloud computing

## Course Outline

### Module 1: Introduction to Enterprise Data Architecture

As organizations grow to enterprise scale, their IT infrastructure requirements become more complex and the network environment often includes an increasing number of servers, client computers, network segments, and other components. Because data is fundamental to most IT operations, careful thought must be given to the provisioning and management of databases across the enterprise.

#### Lessons

- Considerations for Enterprise Data
- Assessing an Existing Infrastructure

### Lab: Assessing an Existing Enterprise Data Infrastructure

- Using the MAP Toolkit
- Reviewing MAP Toolkit Reports

After completing this module, you will be able to:

- Describe the considerations for enterprise data infrastructure.

- Use the MAP Toolkit to assess an existing enterprise data environment.

### Module 2: Multi-Server Configuration Management

When an enterprise infrastructure includes multiple database servers, it can be useful to standardize and enforce configuration settings in order to ensure compliance and manageability. This module discusses Policy-Based Management in SQL Server, and describes how it can be used together with enterprise configuration management tools such as Microsoft System Center to aid enterprise database server management.

#### Lessons

- Policy-Based Management
- Microsoft System Center

### Lab: Planning and Implementing Policy-Based Management

- Planning a Policy-Based Management Strategy
- Implementing Policy-Based Management

- Testing Policy Compliance

After completing this module, you will be able to:

- Implement Policy-Based Management
- Describe how System Center can be used to manage database infrastructure

### **Module 3: Consolidating Database Workloads with SQL Server 2014**

This module provides an overview of the benefits of consolidating database workloads by using SQL Server 2014, and describes the different options for implementing a consolidation strategy. It also describes how you can manage a consolidated infrastructure in various scenarios.

#### **Lessons**

- Considerations for Database Server Consolidation
- Managing Resources in a Consolidated Database Infrastructure

#### **Lab: SQL Server Consolidation**

- Preparing for Database Consolidation
- Managing Resources for an Instance of SQL Server
- Managing Resources for Multiple Instances on a Windows Server

After completing this module, you will be able to:

- Describe the considerations for consolidating databases and database servers.
- Explain the options for managing resources in various consolidation scenarios.

### **Module 4: Introduction to Cloud Data Solutions**

Cloud computing has risen to prominence very rapidly within the world of IT, and many organizations have implemented or are planning to implement cloud-based solutions that encompass all or part of their infrastructure. This module describes some of the fundamental concepts of cloud computing and outlines how to include SQL Server 2014 in a private cloud infrastructure.

#### **Lessons**

- Overview of Cloud Computing
- SQL Server in a Private Cloud

#### **Lab: Preparing a SQL Server Installation in a Virtual Machine Template**

- Creating a prepared Instance
- Completing a prepared Instance

After completing this module, you will be able to:

- Explain the fundamental concepts behind cloud computing, and describe the technologies that underpin Microsoft cloud solutions.
- Describe how to provide SQL Server based data services in a private cloud infrastructure.

### **Module 5: Introduction to Microsoft Azure**

Cloud computing has risen to prominence very rapidly within the world of IT, and many organizations have implemented or are planning to implement cloud-based solutions that encompass all or part of their infrastructure. This module describes some of the fundamental

concepts of cloud computing and outlines some of the important technologies, such as Microsoft Azure services, that organizations can use to build a cloud-based platform for SQL Server 2014.

### Lessons

- Microsoft Azure Overview
- Microsoft Azure Storage

### Lab: Using Microsoft Azure

- Creating a Microsoft Azure Storage Account
- Backing Up a Database to Microsoft Azure

After completing this module, you will be able to:

- Describe Microsoft Azure and the services it provides.
- Use Microsoft Azure storage for SQL Server database files and backups.

### Module 6: Microsoft Azure SQL Database

Microsoft's cloud platform includes Microsoft Azure SQL Database, which you can use to use SQL Server to host your databases without having to take on the responsibility of managing SQL Server itself, or the operating system that supports it. This module describes Microsoft Azure SQL Database, including how to provision it, how to implement security, how to manage databases and how to migrate databases to Microsoft Azure SQL Database.

### Lessons

- Introduction to Microsoft Azure SQL Database

- Microsoft Azure SQL Database Security
- Implementing and Managing Databases

### Lab: Using Microsoft Azure SQL Database

- Provisioning Microsoft Azure SQL Database
- Configuring Microsoft Azure SQL Database Security
- Migrating a Database to Microsoft Azure SQL Database

After completing this module, you will be able to:

- Describe the key features of Microsoft Azure SQL Database.
- Explain how to implement security for Microsoft Azure SQL Database.
- Implement and manage a database in Microsoft Azure SQL Database.

### Module 7: SQL Server in Microsoft Azure Virtual Machines

Using virtual machines in Microsoft Azure to host SQL Server instances and databases enables you to take advantage of the benefits of the cloud whilst retaining greater control over the infrastructure than you can when using Microsoft Azure SQL Database. This module explains the benefits and considerations for using virtual machines in Microsoft Azure. It also describes how to create and configure virtual machines in Microsoft Azure, and how to work with SQL Server databases in virtual machines in Microsoft Azure.

### Lessons

- Introduction to Microsoft Azure Virtual Machines

- Microsoft Azure Virtual Machine Connectivity and Security
- Creating Databases in a Microsoft Azure Virtual Machine

**Lab: Using Microsoft Azure Virtual Machines**

- Creating a Microsoft Azure Virtual Machine
- Configuring Microsoft Azure Virtual Machines Security and Connectivity
- Creating Databases on a Virtual Machine

After completing this module, you will be able to:

- Describe the benefits of Microsoft Azure virtual machines and create a Microsoft Azure virtual machine.
- Describe and configure Microsoft Azure virtual machine security and connectivity.
- Create a SQL Server database in a Microsoft Azure virtual machine.

**Module 8: Introduction to High Availability in SQL Server 2014**

Maintaining highly available database services is vital in a 24 hour operating environment. SQL Server 2014 includes many features that can help organizations to deliver the levels of service they require to drive their businesses. This module explains the different ways that you can implement high availability by using SQL Server 2014. It also describes how to use log shipping to promote resilience for individual user databases.

**Lessons**

- High Availability Concepts and Options in SQL Server 2014

- Log Shipping

**Lab: Using Log Shipping**

- Configure Log Shipping
- Test the Log Shipping Configuration
- Test Failover

After completing this module, you will be able to:

- Describe the core concepts and options for implementing high availability in SQL Server 2014.
- Describe how to implement high availability for individual databases by using log shipping.

**Module 9: Clustering with Windows Server and SQL Server 2014**

SQL Server 2014 is closely integrated with the Windows Server Failover Clustering feature in Windows Server 2012 and Windows Server 2012 R2, enabling you to create enterprise-class clustering solutions that can deliver comprehensive high availability and disaster recovery solutions. This module explains how Windows Server Failover Clustering and SQL Server AlwaysOn Failover Cluster Instances work, and describes how to implement clustering to protect service availability.

**Lessons**

- Introduction to Windows Server Failover Clustering
- SQL Server AlwaysOn Failover Cluster Instances

**Lab: Implementing an AlwaysOn Failover Cluster Instance**

- Inspect the Windows Server Failover Cluster Configuration
- Install an AlwaysOn Failover Cluster Instance
- Configure tempdb to Use Local Storage
- Test Automatic Failover and Failback

After completing this module, you will be able to:

- Describe the key benefits and features of Windows Server Failover Clustering.
- Describe how to use SQL Server AlwaysOn Failover Cluster Instances to maintain high availability for SQL Server instances.

### **Module 10: AlwaysOn Availability Groups**

SQL Server 2014 includes AlwaysOn Availability Groups to provide high availability for groups of databases. This module describes AlwaysOn Availability Groups in SQL Server 2014, explains the key concepts of AlwaysOn Availability Groups, and describes how you can use them to maintain highly available databases.

#### **Lessons**

- Introduction to AlwaysOn Availability Groups
- Working with AlwaysOn Availability Groups
- Considerations for Using AlwaysOn Availability Groups

#### **Lab: Implementing and Testing an AlwaysOn Availability Group**

- Implementing an AlwaysOn Availability Group
- Connecting to an AlwaysOn Availability Group

- Testing Failover
- Configure Quorum Voting

After completing this module, you will be able to:

- Describe the fundamental concepts and terminology for AlwaysOn Availability Groups.
- Explain how work with AlwaysOn Availability Groups.

### **Module 11: Planning High Availability and Disaster Recovery**

This module describes the planning considerations for high availability and disaster recovery, and provides common implementation scenarios for on-premises, hybrid, and Microsoft Azure environments.

#### **Lessons**

- High Availability and Disaster Recovery with SQL Server 2014
- High Availability and Disaster Recovery for Databases in Microsoft Azure

#### **Lab: Planning High Availability and Disaster Recovery**

- Planning High Availability and Disaster Recovery Solutions with SQL Server 2014
- Planning High Availability and Disaster Recovery Solutions by Using Microsoft Azure

After completing this module, you will be able to:

- Explain the considerations for implementing high availability and disaster recovery by using SQL Server

2014, and describe some common scenarios.

- Explain the considerations for implementing high availability and disaster recovery by using SQL Server 2014 and Microsoft Azure services, and describe some common scenarios.

## Module 12: Replicating Data

SQL Server replication enables you to copy and distribute data and database objects to other computers and locations in your enterprise, which can improve availability and scalability. This module provides an overview of SQL Server replication and explains the agents used to implement replication. It also describes some common replication scenarios, how to design an appropriate replication system for your requirements, and how to monitor and troubleshoot replication.

### Lessons

- SQL Server Replication
- Planning Replication

### Lab: Planning and Implementing Replication

- Planning Replication
- Implementing Replication

After completing this module, you will be able to:

- Describe SQL Server replication.
- Identify an appropriate replication solution for a particular scenario.

### Course Inclusions:

- Microsoft Official Curriculum (MOC) and/or Wizards Learning Courseware (WLC)
- Microsoft Certified Trainer (MCT)
- Lunch, AM and PM Snacks
- Certificate of Achievement
- Course Notes