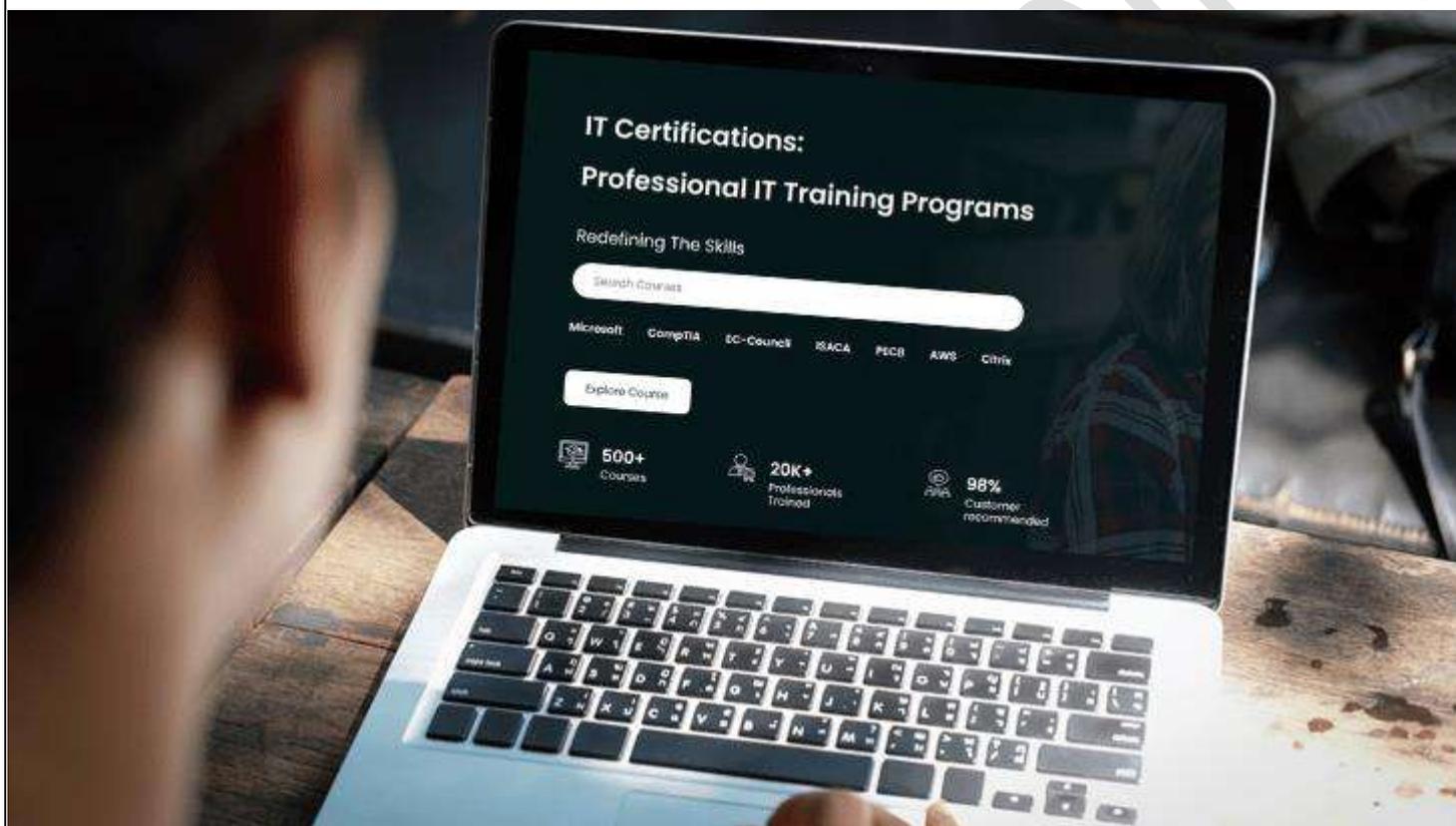# 55246: SQL ALWAYS ON HIGH AVAILABILITY WITH SQL 2016 TRAINING

Duration: 3 Days

Course Description

The instructor-led course is created for Windows engineers and database admins to make them familiarize with Always on High Availability concepts.

The Microtek Learning course uses SQL 2016 to explain the differences between SQL 2012 and SQL 2014.

This training is designed based on the objectives of the course variant 55246A.

Training Exclusives

- Live instructor-led interactive sessions with Microsoft Certified Trainers (MCT).
- Access to Microsoft Official Courseware (MOC).
- Real-time Virtual Lab Environment.
- Experience 24*7 Learner Support.
- Self-paced learning and flexible schedules.

Who should attend this course?

- Professional Database admins, windows engineers, and team leads are suitable candidates for this course.
- Microtek Learning offers this lab-intense course based on the experience of teaching hundreds of batches to thousands of learners.
- Extremely hard efforts are made to keep the labs oriented to a concept like Transferring Logins or Adding Replicas.
- More emphasis is put on practical aspects as long exercises on theories are not effective.
- Experts deliver the course keeping the fact in mind that all the enrolled students are new to the tech and want to learn it.

What you will learn

- Understanding Always-On and High Availability
- Employing Failover Clustering for Server 2016
- Deploying Failover Clusters on SQL
- Working with Availability Groups
- Performing maintenance
- Monitoring and Troubleshooting Availability Groups

Curriculum

Module 1: Introduction

This module explains the course and objectives.

- Introduction

After completing this module, students will be able to:

- Course introduction

Module 2: ALWAYSON AND HIGH AVAILABILITY CONCEPTS AND TERMINOLOGY

This module will introduce the participants to the concepts and terminology used in the course.

- Concepts and Terminology
- Table of Availability
- High Availability
- Causes of Downtime
- Planned downtime
- Unplanned downtime
- Disaster Recovery
- Recovery Time Objective (RTO)
- Recovery Point Objective (RPO)
- Recovery Level Objective (RLO)
- Storage Area Networks (SAN)
- Edition Changes from SQL 2012
- SQL Server 2014 Changes
- SQL Server 2016 Changes
- Legacy Solutions prior to Always On
- Failover Cluster Instances
- Log Shipping
- A Typical Log Shipping Configuration
- Monitor Server
- Replication
- Database Mirroring
- Database Mirroring Terminology
- Principle
- Mirror
- Witness (red box in image above)
- Database Snapshots
- Limitations of legacy solutions:
- What do we mean by Always On?
- Table of Always On Comparison

After completing this module, students will be able to:

- Terminology
- SQL 2014 Changes
- SQL2016 Changes
- Understand the role of the SANS

Module 3: WINDOWS SERVER 2016 FAILOVER CLUSTERING

Failover clustering is covered in this module and is a critical feature of AlwaysOn High Availability.

- Understanding Failover Clustering in Server 2016
- Statefull High Availability Solution
- Supported in both Standard and Datacenter
- Servers should run similar hardware
- Should run same edition
- Hyper-V best with datacenter
- Certified for Windows server logo
- Shared Storage
- Quorums
- Node Majority
- Node and Disk Majority configuration:
- Node and File Share Majority
- No Majority

- Configuration
- Cluster Networks Best Practices
- Connection to nodes to shared storage
- Private network for internal cluster
- Public network for client connections
- Cluster Aware Updating
- Virtual Machine Failover Clustering
- Preferred Owners
- Failover Failback
- Resources
- Dependences
- Heartbeat

Lab: Set up iSCSI Server

Lab: Install the iSCSI VMS

Lab: Add Servers to Server Manager for Ease of Management

Lab: Add the Windows Cluster Feature to SQL1, SQL2 And SQL3

Lab: Create the iSCSI Initators to add the shared storage

Lab: Create the Windows Cluster

Lab: Add a Clustered Service

Lab: Test The Failover Of The Windows Service

Lab: Delete Role

Lab: Examine the Quorum Settings

After completing this module, students will be able to:

- ISCSI Setup
- Work with Roles
- Understand Quorums
- Understand Windows Failover
- Understand Cluster Service
- Understand Preferred Owners
- Understand Node Majority

Module 4: SQL 2016 FAILOVER CLUSTER INSTANCES

In this module we move from the generic failover clustering to the specifics involving SQL.

- Failover Cluster Instance
- As A FCI Appears To A Client

Lab: Create A Configuration File By Running The Advanced Cluster Preparation Wizard

Lab: Complete The SQL Cluster Installation On SQL1

Lab: Install The Cluster On SQL2 And SQL3

Lab: Test the SQL Cluster

After completing this module, students will be able to:

- Cluster Testing
- Understand Configuration Files
- Install Clusters

Module 5: SQL 2016 ALWAYS ON AVAILABILITY GROUPS

Within the failover clusters of SQL are the concept of Availability groups and their enhancements with the release of SQL 2016 which is the focus of this module.

- Availability Groups and Replicas
- Primary Replica
- Secondary Replicas
- Availability Group Listener
- Availability Mode
- Synchronous Commit Mode
- Asynchronous Commit Mode
- Failover Modes
- Automatic Failover Without Data Loss
- Automatic Failover Requirements:
- Manual
- Manual Failover Requirements
- Common Topologies

Lab: Create a SQL Instance For The Availability Group

Lab: Enable the SQL Server AlwaysOn Availability Group Feature

Lab: Set Up For Availability Groups

Lab: The Availability Group Wizard

Lab: SSMS and Availability Groups

After completing this module, students will be able to:

- Enable AlwaysOn
- Understand and work with availability Groups

Module 6: The Dasboard

Managing AlwaysOn High Availability groups wit SQL 2016 is accomplished with the Dashboard. This module will demonstrate the skills necessary for the accomplishment of the management tasks.

- The Dashboard
- How to view logs
- Using replication with Logins
- Using partially contained databases

Lab: The Dashboard

Lab: Replicating Logins and Jobs

Lab: Contained or Partially Contained Databases

After completing this module, students will be able to:

- Understand the Dashboard
- Perform Logon and Job replication

Module 7: Active Secondary Availability Group Actions

Within Availability groups you may have Active secondary SQL which is covered and demonstrated in this module.

- Reporting with Secondary Replicas
- Configuring a Readable secondary

- Read-Only Routing
- Load Balancing

Lab: Configure a Read-Only Secondary

- Database Backups with Secondary
- Steps of Backup Using secondary
- Backup Preference Options

Lab: Database Backup Using Secondary Replica

Lab: Configure a Read-Only secondary

After completing this module, students will be able to:

- Perform backups with Secondary Replicas
- Configure a Read-Only Replica

Module 8: Maintenance

In this module you explore maintenance procedures for AlwaysOn High Availability Groups.

- DBCC Checks
- Database Adding and Removing

Lab: Add a Database

Lab: Remove a Database

Lab: Add a Replica

Lab: Remove a Replica

After completing this module, students will be able to:

- Add and Remove Databases
- Add and Remove Replicas

Module 9: MONITORING AND TROUBLESHOOTING AVAILABILITY GROUPS

In this the final module you will learn how to monitor the clusters and Availability groups and various common troubleshooting procedures.

- The Dashboard in Depth
- Events
- Policy Based Managemnt for Availability Groups

Lab: Dashboard Wizards

Lab: Create an Extended Event Session

Lab: Using T-SQL

Lab: Policy based management for Availability Groups

Lab: Observe a Policy In Action

Lab: Create Three Conditions To Be Used In The RTO And RPO Policies

Lab: Create Two Policies RTO and RPO

Lab: Test The Policies

Lab: Change Endpoint Owner

After completing this module, students will be able to:

- Change Owners
- Work with Policies
- Work with Extended Events

For any query Contact Us – Microtek Learning