



## SQL Server DBA Modules

### Module: 1

- Installing, Upgrading, Configuration,
- Managing Services and Migration

### Module: 2

- Security, Automation & Monitoring

### Module: 3

- Architecture & Internals of SQL Server Engine

### Module: 4

- High Availability, Replication, Clustering, AOAG

### Module: 5

- Indexing & Performance Tuning

### Course Content :

#### Module 1: SQL Server Architecture

- Introduction to SQL Server 2005,2008,2012,2014,2016,2017,2019.
- Overview on RDBMS and Beyond Relational
- System databases
- What's New in SQL Server
- DBA Check List

#### Chapter 1: SQL Server Component Overview

- Components of SQL Server
- Protocols
- Tabular Data Stream
- The Relational Engine
- The Storage Engine

- SQL OS

#### **Chapter 2:**

- Pages & Extents
- Pages
- Extents [Uniform & Mixed]
- Managing Extent Allocations

#### **Chapter 3:**

- Files and File groups
- Database Files
  - a. Primary data files
  - b. Secondary data files
  - c. Log files
- Database File groups [Primary & User-defined]

#### **Chapter 4:**

- Memory Architecture
- 32-bit Vs 64-bit Architecture
- Dynamic Memory Management
- Effects of min and max server memory
- Buffer Management
- Using AWE
- The Buffer Pool and the Data Cache

#### **Chapter 5: Thread and Task Architecture**

- Allocating threads to CPU
- Using Light weight pooling option
- Thread and Fiber Execution
- Hot Add CPU

#### **Module: 2**

- Installing, Upgrading, Configuration, Managing services and Migration

#### **Chapter 6:**

- SQL server Installation
- Installing SQL server
- Pre-Requisites

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- Installing SQL server
- Best Practices on Installation

#### **Chapter 7:**

- Upgrading to SQL server
- Upgrading the server by applying service packs
- Upgrade advisor
- In-Place Up gradation from SQL server 2005 to 2008
- Best Practices to follow while upgrading

#### **Chapter 8:**

- Configuring SQL Server
- Configuring Network Protocols from SQL Server configuration manager
- Configuring features by using SQL Server surface area configuration manager
- Dedicated Administrator Connection [DAC]
- Using DAC with SQL Server Management Studio
- Configuring through sp\_configure
- Configuring Database Mail
- Best Practices on configuration/Database settings

#### **Chapter 9:**

- Managing services
- Starting and Stopping Services through
  - a. Configuration manager
  - b. Net Command
  - c. Command Prompt [sqlsvr.exe]
- Start Up parameters
- Starting SQL server in single user mode
- Starting SQL server with minimal configuration

#### **Chapter 10: Migrating SQL server**

- Difference between in-place & Side by Side Migration/Upgradation
- Advantages/Disadvantages of In-Place to Side-by-Side
- Migrating database by using Back and restore method
- Migrating database by using Copy Database Wizard
- Migrating database by using Attach and Detach Method
- Migrating Logins [Fixing Orphaned Users]
- Migrating DTS Packages to SSIS

- Import & Export

### **Module: 3 Security, Automation & Monitoring**

#### **Chapter 11:**

- Security
- Security Architecture
- Fixed Server Roles
- Creating Logins
- Creating credentials
- Fixed Database Roles
- Database users
- Permissions

#### **Chapter 12:**

- Automating Administrative Tasks
- About SQL server Agent
- Creating Jobs, Alerts and Operators
- Creating Maintenance Plans
- Best Practices on Job maintenance

#### **Chapter 13:**

- Monitoring SQL Server
- Choosing the Appropriate Monitoring Tools
- Log File Viewer
- Activity Monitor
- Best Practices on Monitoring

### **Module: 4**

- High availability and Replication

#### **Chapter 14:**

- T-Log Architecture
- Transaction Log Logical Architecture
- Transaction Log Physical Architecture
- Checkpoint Operation
- Write-Ahead Transaction Log
- Transaction log truncation

- How transaction log truncation works
- Shrinking the log file

#### **Chapter 15:**

- Backup & Restore:
- How Backup Works
- Recovery Models
- Types of backups
- Recovery states

#### **Chapter 16:**

- Log Shipping
  - a) Log shipping overview
  - b) Pre-requisites/Log-Shipping Process
  - c) Deploying Log Shipping
  - d) Logs hipping Role changing [Fail-Over]
  - e) Frequently Raised Errors In Log-Shipping
  - f) Case Study 1: How to add files to a log-shipped database
  - g) Best Practices on Log-Shipping

#### **Chapter 17:**

- Database Mirroring
- Overview of Database Mirroring
- Operating Modes in Database Mirroring
- Pre-Requisites for Database Mirroring
- Deploying Database Mirroring
- Advantages & Disadvantages of database mirroring
- Mirroring Vs Clustering
- Database Snapshots
- Creating database snapshot
- Best practices on Mirroring

#### **Chapter 18:**

- Replication
- Replication terminology
- Configuring distributor
- Creating publication
- Creating subscriptions

- Peer to peer replication
- Best Practices on Replication

#### **Chapter 19:**

- Clustering SQL server
- What is clustering
- What are types of clustering
- How does clustering work
- Clustering SQL server
- Getting Information on SQL Server Cluster
- Installing SQL Server 2008 cluster
- Adding a node on a SQL Server 2008 Failover Cluster
- Applying patches on a SQL Server 2008 cluster
- Best Practices on clustering

#### **Module: 5 Performance tuning & indexing**

##### **Chapter 20:**

- Indexing
- Table Organization
- Clustered Tables, Heaps, and Indexes
- Heap Structures
- Clustered Index Structures
- Non clustered Index Structures
- Scan and Seek
- Index Fragmentation
- How to determine fragmentation?
- Best practices on indexing

##### **Chapter 21:**

- Performance Tuning
- Factors That Impact Performance
- Transactions and Isolation Levels
- SQL Server Configuration
- Memory-Related Configuration Options
- Database Tuning Advisor - DTA
- Best Practices on Performance Tuning