

# **SQL Server 2008 DBA Modules**

## **Module: 1**

➤ **Architecture & Internals of SQL Server Engine**

## **Module: 2**

➤ **Installing, Upgrading, Migration and Configuration**

## **Module: 3**

➤ **Security, Automation, Monitoring & Optimization**

## **Module: 4**

➤ **High Availability and Replication**

## **Module: 5**

➤ **Performance Tuning & Indexing**

## **Module: 6**

**Corporate Awareness and Handling the Environment.**

## **Module: 1**

### **SQL Server Architecture**

#### **Chapter: 1 SQL Server Component Overview**

1. SQL Server Engine Components

#### **Chapter: 2 Relational Database Components**

- Database Applications and Servers
- Logins – Login Delegation
- Communication Components
  1. Client & Server Net-Libraries.
  2. TDS
- Server Components
  1. SQL server Service
  2. SQL Server Agent Service
  3. MS DTC Service

#### **Chapter: 3 Database Architecture**

- Logical Database Components
- System Databases
- Physical Database Architecture.
  1. Pages, Extents, Physical Database Files and File Groups
  2. Table and Index Architecture
  3. Transactional Log Architecture

#### **Chapter: 4 Relational Database Engine Architecture**

- Database Engine Components
  1. Relational Engine
  2. Storage Engine
  3. SQL Server Language Support.
- Query Processor Architecture.
  1. Execution plan
  2. Finding the clustered scan and seeks
- Memory Architecture.
  1. Effects of min & max server Memory
  2. Dynamically Managing Memory between Instances

- 3. SQL server Memory pool.
- 4. Working with Buffer and cache and procedure cache
- Thread and Task Architecture.
  - 1. Allocating Thread to CPU
  - 2. Using Light weight Pooling Option.
  - 3. Dedicated Administrator connection
- I/O Architecture.
  - 1. Reading Pages
  - 2. Freeing and Writing Buffer Pages
  - 3. Lazywriter and checkpoints
- Transaction Architecture
  - 1. Transaction Recovery
  - 2. Concurrency Architecture
  - 3. Locking Architecture- Latching

## **Module: 2**

### **Installing, Upgrading, Migration and Configuration**

#### **SQL server 2005/2008 Installation**

1. Planning the System
2. Installing SQL server
3. Installing Analysis Services
4. Burning in the System
5. Post-Install Configuration
6. Uninstalling SQL server
7. Common Installation Issues
8. Troubleshooting a Failed Install

#### **Upgrading to SQL server 2005/2008**

1. Upgrading to SQL server 2005/2008
2. Pre-Upgrade Checks
3. Backward Compatibility
4. SQL Server Component Considerations
5. In-Place Upgrade
6. Side-By-Side Upgradation
7. Post-Upgrade Checks

### **Migrating SQL server**

- Migrating Databases
- Migrating Logins
- Migrating Stored Procedures
- Migrating DTS Packages
- Migration by using Attach and Detach Method
- Migration by using Back and restore method
- Migration by using Copy Database Wizard
- Migrating the databases by using SSIS Database Transfer Task.

### **Configuring SQL Server**

- Configuring Memory
- Optimizing CPU and Network
- Selecting Disk RAID Level
- Configuring Server and Agent properties
- Configuring Database Mail
- Configuring TempDB
- Working with Tempdb
- Optimizing Tempdb Utilization
- Resolving Tempdb Issues.

## **Module: 3**

### **Security, Automation, Monitoring & Optimization**

- **Security**
  1. Security Principles [Server and Database Principles]
  2. Creating a Secure Configuration
  3. Surface Area Configuration
  4. Endpoints
  5. Identity and Access Control
  6. Schemas
  7. Securables and Object Permissions
  8. Encryption

### **Automating Administrative Tasks**

1. Creating Maintenance Plans
2. Creating Jobs, Alerts and Operators
3. SQL Server Agent Security
4. Working with Job activity Monitor
5. Resolving failure Jobs

- **Monitoring SQL Server**
  1. The Goal of Monitoring
  2. Choosing the Appropriate Monitoring Tools
  3. Monitoring Events
  4. Monitoring with Dynamic Management Views and Functions
  5. Monitoring Logs
  6. Management Data Warehouse
  7. Database health check
  
- **Optimizing SQL server 2005**
  1. Application Optimization
  2. The Silent Killer: I/O Problems
  3. Table and Index Partitioning
  4. Data Compression
  5. Memory Considerations and Enhancements
  6. CPU Considerations
  7. Hot Memory & CPU addition

#### **Module: 4**

#### **High Availability and Replication**

- **Backup and Recovery**
  1. Types of backups (Full backup/Diff backup/T-log backup/ File and File group backups/Compressed backups)
  2. Developing and Executing a Backup Plan
  3. Managing Backups
  4. Planning for Recovery
  5. Performing Recovery (point-in-time recovery)
  6. Backup and Restore Performance
  7. Disaster Recovery Planning
  8. Resolving Backup failures in real time scenarios
  
- **SQL Server 2005 Log Shipping**
  1. Log Shipping Deployment Scenarios
  2. Log-Shipping Architecture
  3. Log-Shipping Process
  4. System Requirements
  5. Deploying Log Shipping
  6. Monitoring and Troubleshooting
  7. Logs hipping Role changing
  8. Integrating Log shipping with other High-Availability Solutions
  9. Removing Log Shipping
  10. Log-Shipping Performance

- **Database Mirroring**
  1. Overview of Database Mirroring
  2. Monitoring Database Mirroring
  3. Troubleshooting Database Mirroring
  4. Preparing the Mirror Server for Failover
  5. Mirroring Multiple Databases
  6. Database Mirroring and other High-Availability Solutions
  7. Mirroring Event Listener Setups
  8. Database Snapshots
  9. Using Database Snapshots For reporting purposes.
  
- **Replication**
  1. Replication Overview
  2. Replication Models (snapshot/Transactional/Merge)
  3. Implementing Replication
  4. Adding articles to an Existing transactional replication.
  5. Peer-to-Peer Replication
  6. Scripting Replication
  7. Monitoring Replication
  8. Replication performance issues
  
- **Clustering SQL server**
  1. What is a cluster?
  2. Clustering concepts
  3. Overview of MSCS
  4. Examples of Clustered systems
  5. Planning your configuration
  6. Installing and configuring SQL Server 2005/2008 clustering
  7. Migrating cluster systems
  8. Resolving cluster problems in real time scenarios

## **Module: 5**

### **Performance Tuning & Indexing**

- **Indexing**
  1. Index Fundamentals
  2. How to optimally take advantage of indexes
  3. Index Defragmentation options\update Statistics
  4. Partitioned Tables and Indexes
  5. Filtered Indexes and Filtered Statistics (SQL 2008)
  6. Index Maintenance and Tuning
  7. Database Tuning Advisor
  
- **Performance Tuning**
  1. SQL Performance Troubleshooting (Scoping / Problem definition, Bottleneck Analysis, problem query identification, Query Analysis)
  2. Blocking
  3. Latch Contention
  4. Deadlocks and deadlock chain detection.
  5. CPU Bottleneck/Memory Bottleneck/I/O bottlenecks
  6. Troubleshooting slow queries
  7. Tools used
  8. Performance Monitor
  9. SQL Profiler [How to capture events by using Profiler]
  10. Dynamic Management Views (DMV)
  11. Database Tuning Advisor
  12. Performance Dashboard
  13. Data Collector (SQL 2008)

## **Module: 6**

### **Corporate awareness and Handling the environment**

1. Defining the process
2. How they implement the security
3. How they implement the process by using CRM tools
4. Knowledge on MSE and other CRM tools.