

KOENIG SOLUTIONS • COURSE OUTLINE

SQL Server 2016 Admin: High Availability and Performance Tuning

Learn to secure, back up, replicate and tune SQL Server 2016 while implementing high-availability solutions including mirroring, clustering and Always-On groups.

5 Days

40 HOURS

14

MODULES

49

TOPICS

COURSE OVERVIEW

The SQL Server 2016 Admin High Availability and Performance tuning course is designed to provide learners with comprehensive knowledge and skills to maintain the high availability and performance of SQL Server 2016 databases. This course covers a range of crucial topics, from Security models and roles to Backup and recovery strategies, Automation, Replication, Log shipping, Database mirroring, Cluster configuration, and Always On availability groups. It dives deep into Performance tuning, including Index management and Understanding locks. Learners will gain expertise in SQL Server 2016 Performance tuning by using tools and techniques to Monitor and improve query performance and Optimize database operations. The course also emphasizes SQL Server high availability training, teaching students how to implement and manage various High availability solutions that ensure the continuous operation of SQL servers. By the end of the course, participants will be equipped to enhance SQL Server stability and speed, ensuring their organizations' data remains secure, accessible, and efficient.

Who Should Attend

The SQL Server 2016 Admin High Availability and Performance Tuning course equips IT professionals with essential database management skills.

Database Administrators

Systems Engineers

IT Professionals experienced in database management

SQL Server Developers aiming to enhance their knowledge in high availability (HA) and performance tuning

Technical Consultants working in SQL Server environments

Data Center Support Engineers

Database Designers exploring SQL Server's HA and disaster recovery (DR) features

BI Professionals seeking in-depth knowledge of SQL Server backend management

Server Infrastructure Designers

Network Administrators managing database servers

Security Administrators focusing on database security

Professionals preparing for Microsoft SQL Server certification exams

Disaster Recovery Specialists

Data Architects interested in performance tuning with SQL Server

IT Managers supervising database management teams

Cloud Database Engineers

Performance Tuning Consultants

High Availability and Disaster Recovery Consultants

Technical Support Staff specializing in SQL Server environments

Data Management Professionals

Database Migration Specialists

Enterprise Systems Administrators managing SQL Server instances

COURSE SYLLABUS

14 Modules, 49 Topics

01

SQL Server Security

TOPICS

- Introduction to SQL Server security models, logins, and users

02

Assigning Server and Database Roles

TOPICS

- Fixed server roles and user-defined server roles
- Fixed database roles and user-defined database roles

03

Authorizing Users to Access Resources

TOPICS

- Overview of permissions and assigning permissions to users

04

Backup and Restoration of SQL Server Databases

TOPICS

- SQL Server backup overview and types of backups
- Restoring SQL Server databases and recovery options

05

Automating SQL Server Management

TOPICS

- Using SQL Server Agent for task automation
- Benefits of master and target servers for centralized management

06

Monitoring SQL Server with Alerts and Notifications

TOPICS

- Configuring database mail, alerts, and notifications for monitoring

07

Tracing Access to SQL Server with Extended Events

TOPICS

- Utilizing SQL Profiler and SQL Trace stored procedures
- Using Distributed Replay for multi-server trace capture and locking audits

Replication for High Availability

TOPICS

- Merge Replication and Merge Agent Job
- Handling replication conflicts and ROWGUIDCOL
- Subscription reinitialization and expiry settings
- Server and client subscriptions
- Peer-to-peer replication connections and nodes
- Troubleshooting common errors and solutions

Log Shipping (HA & DR)

TOPICS

- Log shipping topology for high availability and disaster recovery
- Configuring primary and secondary servers for recovery
- Managing log shipping monitor, jobs, and alerts
- Configuration in NORECOVERY and STANDBY modes
- Log shipping jobs, manual failover, and monitoring delays
- Troubleshooting broken log shipping chains and errors

Database Mirroring (HA & DR)

TOPICS

- Database mirroring architecture for high availability and disaster recovery
- Comparing log shipping and database mirroring
- TCP endpoints, network security, and polling concepts
- Automatic failover procedures and synchronous/asynchronous modes
- Monitoring database mirroring with jobs and real-time usage
- Resolving common errors and issues

Cluster Configuration

TOPICS

- Windows clusters for high availability and disaster recovery
- Configuring domain controllers, active directory, and public/private IPs
- Setting up MSCS service and RAID levels
- Managing cluster groups, quorum, and MSDTC disks
- Introduction to Always-On Availability Groups (AAG)

Always-On Availability Groups (AOAG)

TOPICS

- Overview of synchronous and asynchronous modes
- Policy-based management and facets for AOAG
- Backup preferences and automated seeding
- Adding replicas, listeners, and configuring failovers
- Monitoring health and dashboards for AOAG

Tuning Tools and Lock Management

TOPICS

- Using workload files, trace files, and tuning templates
- Analyzing execution plans and query costs (IO, CPU, subtree, operator costs)
- NUMA nodes, processor, and IO affinity configuration
- Managing locks, isolation levels, and auditing with SP_WHO2 and SP_LOCK
- Handling deadlocks with XDL files and prevention strategies

Index Management

TOPICS

- Benefits and performance of partitioning tables
- Partition functions, schemes, and compression techniques
- Managing and rebuilding indexes (online and resumable options)
- Auditing statistics, fragmentation, and index conditions
- Setting up database maintenance plans and optimizing parallelism

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

FLEXIBLE DELIVERY

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Live Online Classes (ILO)

Fly-Me-A-Trainer (FMAT)

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