

Workshop	
Name	Synergetics-Standard-SQL Server 2012-DBA-7 day Contents
Duration	7 Day
Objective	SQL Server Code Name "Denali" Community Technology Preview (CTP3) provides the foundation to the cloud-ready information platform and will help customers unlock breakthrough insights across the organization and quickly build solutions that extend data across on-premises and public cloud backed by capabilities for mission critical confidence.
Participants' Entry Profile	Participants attending this course must have: <ul style="list-style-type: none"> • Concepts of Relational Database Design & Implementation • Working Experience/Knowledge of SQL and TSQL.
Training Methodology	The workshop will follow Synergetics methodology of Concept Visualization Active Experimentation Application Development. The workshop will be 100% Hands-On with each participant having access to system during the session

Setup Requirements	
Hardware and Software Requirements	Hardware Requirement Intel Core 2 Duo, 16 GB RAM 200 GB Free Hard Disk Space Software Requirement Operating System - Windows Server 2008 R2 SP1/Windows 7 SP1/Windows Server 2008 SP2/Windows Vista SP2. Windows PowerShell 2.0 Microsoft IIS 7.x or above Internet Explorer 7.0 or above .Net Framework 3.5 SP1 Ms-Office 2010 Visual Studio 2010 Microsoft SQL Server 2012 Sample Databases for SQL Server 2012
Training Lab Requirements	Whiteboard Recommended size - 6 feet by 4 feet Whiteboard markers – Red, Blue, Green, Black Video Projector (1024 X 768 resolutions)

SQL SERVER 2008

Day 1

➤ Components of the SQL Server Architecture

- Protocols used for communication with SQL Server
- Relational Engine Components Overview
- Storage Engine Components Overview
- The SQL OS
- Understanding the Buffer Cache Components
- Observing Engine Behavior and Memory using DMVs and DMFs
- Pages and Extents
- Space Allocation and Reuse
- Table and Index Architecture
- Transaction Log Architecture

➤ Index Structures

- The CREATE INDEX Statement
- Identifying useful Indexes
 - Selectivity
 - Watching Costs: When Less Is More
 - Choosing a Clustered Index
 - Composite Index Keys & Column Order
- Dropping Indexes
- Modify Indexes
- Use the Database Engine Tuning Wizard
- Maintaining Your Indexes
 - Fragmentation
 - Identifying Fragmentation V/s Likelihood of Page Splits
- Filtered Indexes
- Creating Indexes on Computed Columns
- Using the FORCESEEK Hint
- Overview of Partitioning
- Designing Partitioned Tables and Indexes
- Implementing Partitioned Tables and Indexes

Day 2

➤ SQL Server Security

- Security Modes
- Server Security
 - Logins
 - Fixed Server Roles
- Database Security
 - Users
 - Fixed Database Roles
 - User Defined Roles
 - Application Roles
- Setting Permissions to Users and Roles

- Object Level
- Statement Level
- Implementing an Authentication Mode
- Assigning Logins to Users and Roles
- Applying Password Policy
- Separating Schemas from Users
- Permissions
 - Permissions and .NET Objects
 - Execution Context for Procedural Code
 - Execution Context and Ownership Chains
- **Security Enhancements In 2012**
 - Provisioning During Setup
 - New Permissions
 - New Role Management
 - Default Schema for Groups
 - Audit Enhancements
 - Deprecation of RC4
 - Certificate Key Length
 - Encryption changes
 - Create Certificates from Binary
- **Measuring Performance**
 - Measuring Accuracy
 - Using Performance Monitor
 - System Monitor
 - Counter Logs
 - Using SQL Server Profiler
 - Defining a New Trace
 - Selecting Events
 - Filtering Events
 - Organizing Columns
 - Using the Profiler Trace
 - Integrating Performance Monitor Data
 - Using SQL Trace
 - Using Transact-SQL
 - Using Dynamic Management Views
 - Using Statistics
 - The Database Performance KPI
 - Repeatable Performance Testing
 - Production Performance Data
 - Scalability Performance Load Testing
- **Maintaining the Database**
 - DBCC Commands
 - Database Integrity
 - Index Maintenance
 - Database File Size
 - Miscellaneous DBCC Commands
 - Managing Database Maintenance
 - Planning Database Maintenance
 - Maintenance Plan Wizard
 - Command-Line Maintenance
 - Monitoring Database Maintenance

➤ **Query Optimization and Index Tuning**

- A Holistic Approach to Index Tuning
- Query Analysis
 - Viewing Query Execution Plans
 - Using the Showplans
 - Interpreting the Query Execution Plan

Day 3

- Index Tuning
 - Missing Indexes
 - Bookmark Lookup
 - Optimizable SARGs
 - Index Selectivity
- Reusing Query Execution Plans
- A Comprehensive Index Strategy
- Using the Database Engine Tuning Advisor

➤ **Managing Transactions, Locking, and Blocking**

- Transactional Basics
- Transactional Integrity
 - The ACID Properties
 - Transactional Faults
 - Isolation Levels
- Transaction-Log Architecture
 - Transaction Log Sequence
 - Transaction-Log Recovery
- Understanding SQL Server Locking
 - Lock Granularity
 - Lock Mode
 - Lock Duration
 - Monitoring Locking and Blocking
 - Using Profiler
- Controlling SQL Server Locking
 - Setting the Connection Isolation Level
 - Using Database Snapshot Isolation
 - Using Locking Hints
 - Index-Level Locking Restrictions
 - Controlling Lock Timeouts
 - Evaluating Database Concurrency Performance
 - Application Locks
- Deadlocks
 - Creating a Deadlock
 - Automatic Deadlock Detection
 - Handling Deadlocks
 - Minimizing Deadlocks
- Application Locking Design
 - Implementing Optimistic Locking
 - Lost Updates
- Transaction Performance Strategies

➤ **Scaling Very Large Databases**

- Optimization Theory and Scalability
 - Scaling Out the Platform
 - Scaling Up the Solution

- Partitioned Tables and Indexes
 - Creating the Partition Function
 - Creating Partition Schemes
 - Creating the Partition Table
 - Querying Partition Tables
 - Altering Partition Tables
 - Switching Tables
 - Rolling Partitions
 - Indexing Partitioned Tables
 - Removing Partitioning
- Working with Indexed Views
 - Indexed Views and Queries
 - Updating Indexed Views
- Module 41: Automating SQL Server
- Duration: 60 Min.
- Dependency modules: <<List of module nos. this is dependent on>>
- Special Software Requirements:
- Special Hardware Requirements:

- Automation Components
- SQL Server Agent Security
- Configuring SQL Server Agent
- Database Mail
- Multiserver Administration

Day 4

➤ **Monitoring SQL Server Performance**

- Using the Performance Monitor Tool
- Monitoring Events with SQL Trace and event notifications
- Monitoring with Dynamic Management Views

➤ **Performance Tuning of T-SQL**

- Gathering Database I/O Information
- Understanding Join Algorithms
- Overview of Index Access Methods
- Understanding DML Query Plans
- Understanding Partitioned Table Query Plans
- Gathering Query Plans for Analysis with SQL Trace
- Queries That use the AND Operator
- Queries That use the OR Operator
- Queries That use Join Operator
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➤ **Improving Query Performance with Indexes**

- Partition Tables and Indexes Considerations
- Index Maintenance
- Using the Database Tuning Advisor

➤ **SQL Server Replication**

- Overview of Replication Types
- Understanding Replication Components
- Setting Up Distribution
- Understanding Snapshot Replication
- Understanding Transactional and Merge Replication
- Understanding Peer-to-Peer Replication

- Snapshot Replication with Immediate Updating
- Snapshot Replication with Queued Updating
- Snapshot Replication with Immediate Updating and Queued Failover
- Snapshot Agent
- Log Reader Agent
- Distribution Agent
- Peer-to-Peer Replication
- Bi-directional Transactional Replication
- Transactional Replication with Immediate Updating
- Transactional Replication with Queued Updating
- Transactional Replication with Immediate Updating and Queued Failover
- Transactional Replication over the Internet
- Restartable Snapshots
- Peer-to-Peer Replication Model
- Replicating All DDL
- Replicating Full-Text Indexes
- Allowing Anonymous Subscriptions for All Publications
- Logical Records in Merge Replication

Day 5

➤ Scalability and Performance Enhancements In 2012

- Columnstore Indexes
- Online Rebuild Indexes
- Online Not Null Columns
- Increased Partition support

➤ SQL Server Database Mirroring

- Overview of Database Mirroring
- Operating Modes of Database Mirroring
- Preparing the Endpoints
- Preparing the Database for Mirroring
- Performing the Initial Synchronization
- Establishing the Mirroring Session
- Using the High Safety Operating Modes
- Recovering damaged or corrupted data
- Improving performance with log stream compression
- Using the Database Mirroring Catalog Views
- Monitoring Using System Monitor
- Monitoring Using Database Mirroring Monitor
- Database Mirroring Overview
- Recovering damaged or corrupted data
- Improving performance with log stream compression

➤ SQL Server Back and Recovery

- Understanding Types of Failures
- Overview of Backup and Restore
- Planning for Recovery
- Developing and Executing a Backup Plan
- Managing Backups
- Performing Recovery
- Archiving Data

- Disaster Recovery Planning

Day 6

- **SQL Server Log Shipping**
 - Log Shipping Architecture
 - Deploying Log Shipping
 - Monitoring Log Shipping Performance
 - Removing Log Shipping
- **Policy Management Framework**
 - Overview of Architecture
 - Creating and Applying Surface Level Policy
 - Creating and Applying Naming Standards Policy
- **Managing Workload with Resource Governor**
 - Resource Governor Concepts
 - Configuring Resource Governor
 - Resource Governor DDL and System Views
- **Transparent Data Encryption**
 - Overview of TDE
 - Implementing TDE
 - Restoring encrypted data
- **Backup Compression**
 - Enabling Backup Compression
 - Backup Compression Considerations
 - Overview of ROW and PAGE compression
 - Estimating Compression Savings
 - Implementing Table/Index Compression
- **Plan Freezing**
 - Attaching query hints with the plan guide
 - Taking advantage of the query plan freeze

Day 7

- **Extended Events**
 - Introduction to Extended Events
 - Overview of Extended Events Architecture
 - Handling Events
- **SQL Audit**
 - Overview of SQL Server Audit
 - Creating SQL Server Audit Objects
 - Implementing Server Audit Specification objects
 - Implementing Database Audit Specification objects
- **Availability Enhancements In 2012**
 - AlwaysOn - Next Version to Mirroring
 - AlwaysOn - SQL Server Failover Cluster Instances
 - AlwaysOn - Availability Groups