

# SQL School™

## Quality Training Assured

*A Unit of Sequelgate Innovative Technologies Pvt. Ltd.*

For Free Demo, Call Us: +91 9666 44 0801 or +1 510.400.4845 (24 X 7)

## SQL DBA (with Server)

Complete Practical & Real-time Training

### SQL DBA Training Highlights:

✓ Job Support	✓ In-depth Performance Tuning
✓ Complete Practical	✓ Always-On - <b>WINDOWS</b> Clusters
✓ Certification Support	✓ Always-On - <b>LINUX</b> RHEL Clusters
✓ Real-time Scenarios, Handouts	✓ Database Repairs, Azure Upgrades
✓ Study Material & Practice Labs	✓ Azure Data Sync, Failover, HA DR

**Trainer 1:** Mr. Sai Phanindra Tholeti is a Database Consultant, Microsoft Certified Trainer with more than 13 years expertise. He is rendering impeccable; highly interactive, friendly and highly technical Trainings on **Microsoft SQL DBA** to our Corporate Clients: **Infosys, MindTree, ADP, Infotech, PrimeHealth** and more. Profile @ <http://www.linkedin.com/in/saiphanindra>

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**ALL OUR TRAINING SESSIONS ARE COMPLETELY REAL-TIME and PRACTICAL.**

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# SQL DBA Training Plans

	PLAN A	PLAN B
DESCRIPTION	SQL DBA (with Server)	SQL DBA + Azure SQL DBA
Real-time Scenarios and Solutions	✓	✓
SQL Server; Database Architecture	✓	✓
Query Tuning and Execution Plans	✓	✓
HA – DR and Troubleshooting	✓	✓
Real-time Issues and Solutions	✓	✓
Migrations, Updates, Upgrades	✓	✓
New Features: SQL 2016,2017, 2019	✓	✓
DB Repairs and Security Management	✓	✓
Always – On in Windows Clusters	✓	✓
Always – On in LINUX Clusters	✓	✓
HA – DR, Clustering, Always-On (AAG)	X	✓
MCSA: 70-764 Certification (SQL DBA)	X	✓
MCSA: 70-765 Certification (SQL DBA)	X	✓
MCSA: 70-473 Certification (Azure DBA)	X	✓
Azure SQL Database Migration (Admin)	X	✓
Azure SQL Database Administration	X	✓
Azure Power Shell and Azure CLI	X	✓
Google Cloud, AWS Cloud @ SQL DBAs	X	✓
<b>TOTAL DURATION</b>	6 Weeks	8.5 Weeks

## Modes of Training:

LIVE Online Training

Classroom Training

Video Training

**\*\* Fast Track, One - One Trainings and Corporate Trainings are also available.**

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# SQL Server DBA (SQL DBA) : Complete Course Plan

	Course Description		Duration
Module 1	Database Basics, SQL Server Architecture & T-SQL	Plan A; B	2 Weeks
Module 2	Basic SQL DBA : Backup- Restores, Jobs, Tuning & Security	Plan A; B	2 Weeks
Module 3	Advanced SQL DBA: Always-On, Repairs, HA DR - Errors	Plan A; B	2 Weeks
Module 4	Azure SQL Database Fundamentals and Azure Tuning	Plan B	1 Week
Module 5	Azure SQL DBA Concepts, HA & DR, Security, Power Shell	Plan B	1.5 Week
		Total Duration : 8.5 W	

\* 5 Classes a Week. Mon – Fri

## MODULE 1 : Database Basics, SQL Server Architecture, T-SQL

<p><b>DAY 1: SQL DBA - JOB ROLES (INTRO)</b></p> <p>Need for Databases &amp; RDBMS Software; OLTP &amp; OLAP; DWH and HTAP Databases; MS SQL Server - Technical Advantages; SQL Server Hosting : OnPremise (non-Cloud); SQL Server Hosting in Cloud: Azure; AWS; Editions and Versions - Licensing Plans; SQL DBA Job Roles and Checklist Plan; Roles &amp; Responsibilities For SQL DBA; SQL DBA Job : Routine DBA Activities; Maintenance and Emergency DBA Activities; Course Plan and Weekly Mock Interviews &amp; Resume; MCSA Certification Guidance and Virtual Labs;</p>
<p><b>DAY 2: SQL SERVER INSTALLATION</b></p> <p><b>SQL Server 2019</b> Installation Guidance; <b>SQL Server 2017</b> and <b>2016</b> Installation; Installation Pre-Requisites; Precautions; SQL Server Management Studio (SSMS); SSMS Tool: Installation; Use; Connections and Instances; Instance Types &amp; Instance IDs; Windows Authentication Type and its Use; Mixed Mode Authentication Type and Use; Default Admin Account in SQL Server : "sa"; SQL Server Services and Service Accounts; File Stream and Collation in SQL Instances; Installation Errors; Config.INI Files @ DAY 30;</p>
<p><b>DAY 3: BASIC SQL QUERIES – 1</b></p> <p>DDL; DML; SELECT; DCL and TCL; Creating SQL Databases and Tables; CREATE; ALTER; DROP Statements; INSERT; UPDATE; DELETE Statements; Data Inserts; Values and Table Scan; INTEGER; CHAR; FLOAT Data Types; INSERT and INSERT INTO Statements; Single Row Inserts; Multi Row Inserts; SELECT Statement for Table Retrieval; WHERE Examples : =; !=; &lt;; &gt;; &lt;=; &gt;=; AND; OR; NOT; IN; NOT IN Conditions; BETWEEN; NOT BETWEEN Conditions;</p>
<p><b>DAY 4: BASIC SQL QUERIES – 2</b></p> <p>CHAR Versus VARCHAR Data Types; VARCHAR &amp; NVARCHAR Data Types; GO Statement; SQL BATCH Concept; BIGINT; BIT; SQL_Variant Data Types; IS NULL; NOT NULL. LIKE; NOT LIKE; ORDER BY with ASC; DESC Options; DISTINCT; TOP and COUNT() Options; FETCH; OFFSET; NEXT ROW Options; UNION; UNION ALL and Sub Queries; Single Quotes; Double Quotes; Aliases; UPDATE : Conditional &amp; Unconditional; DELETE and TRUNCATE Commands; ALTER Command DROP Command;</p>

## **DAY 5: SERVER and DB ARCHITECTURE**

Client Server Architecture; TDS Packets; SNAC and OLE DB Command for TDS; TDS Packets and SQL Query Processing & Protocols; SQL Native Client (SNAC); Query Optimizer (QO) and SQL Manager; Storage Engine; File and DB Manager; Transaction Manager and Lock Manager; Buffer Manager; SQL OS and IO Buffer; DB Data Files (mdf) and Log Files (ldf); Primary/Secondary Files (ndf) and Filegroups; Write Ahead Log (WAL) and Lazy Writer; Logs; Checkpoints; Virtual Log File (VLF); Log Sequence Number (LSN), Mini LSN;

## **DAY 6 : CONSTRAINTS & JOINS**

Constraints; Keys - Table Data Integrity & NULL; NOT NULL Property on Tables; UNIQUE KEY Constraints: Importance; PRIMARY KEY Constraint: Importance; FOREIGN KEY Constraint: Importance; REFERENCES; OLTP Relational Tables; CHECK, DEFAULT and Identity Property; JOINS - Types and Real-time Usage; JOIN Types and JOIN Options in T-SQL; INNER JOIN - Examples, WHERE, ON; OUTER JOIN - LEFT, RIGHT & FULL; CROSS JOIN, "," and CROSS APPLY; MERGE JOIN, LOOP JOIN, HASH JOIN; Query Tuning with JOIN OPTIONS;

## **DAY 7: VIEWS & INDEXES - TUNING 1**

Indexes Architecture and Index Types; Clustered and Non Clustered Indexes; Included and Column Store Indexes; FILTERED and COVERING Indexes; UNIQUE Indexes and Query Optimizer; LIVE Online Indexes; Real-time use; B Tree Structures: Root; IAM Pages; Tuning Joined Queries and Conditions; Views on Tables - SCHEMABINDING; ENCRYPTION and CHECK OPTION; Orphan Views - Real-world Solutions; Cascaded Views and Encrypted Views; Metadata Access with System Views; Indexed Views / Materialized Views;

## **DAY 8: FUNCTIONS & PROCEDURES**

User Defined Functions in SQL Server; Scalar Functions and Inline Table Functions; Multi - Line Table Valued Functions; Table Variables and Table Data Type; Variables & Parameters in SQL Server; OBJECTID; OBJECTNAME Functions; System Functions & Metadata Access; Stored Procedures - Purpose; Usage; IF .. ELSE and ELSE IF Conditions; Using Stored Procs with Parameters; Recompilation of Stored Procedures; Sp\_help; Sp\_helpdb and sp\_helptext; Sp\_recompile and sp\_pkeys System SPs;

## **DAY 9: TRIGGERS & TRANSACTIONS**

Triggers - Purpose and Real-world Usage; FOR/AFTER Triggers - Real time Use; INSTEAD OF Triggers - Real time Use; INSERTED; DELETED Memory Tables; Enable Triggers and Disable Triggers; Database Level DDL Triggers - Usage; Server Level DDL Triggers - Usage; COMMIT and ROLLBACK Statements; EXPLICIT & IMPLICIT Transactions; Auto Commit Transaction; ACID Options; Open Transactions and Query Impact; Query Blocking Scenarios @ Real-time; NOLOCK and READPAST Lock Hints;

## **DAY 10: LINKED SERVERS, CTEs**

Linked Servers - Creation and Tests; sp\_addlinkedserver System Procedures; Linked Server Security, Remote Logins; RPC and RPC Out. Data Access Modes; Four Part Naming Conventions - Options; Using Linked Servers for Remote Joins; Tuning Remote Join Queries, Options; CTEs: Common Table Expressions; Using CTEs for Data SELECT, FETCH; Using CTEs for Insert, Update, Delete; CTEs for In-Memory Data Storage; Overview of Cursors and FETCH; Cursor Types and KEYSET Indexes; SQL Browser Service & SSCM Tool;

## MODULE 2 : Basic SQL DBA : Backup- Restores, Jobs, Tuning, Security

### DAY 11: BACKUPS – DB, File and FileGroup

Database Backups; File group Backups; Log File Backups; COPY\_ONLY Backups; Mirror Backups; Split Backups; FORMAT; Partial Backups and Backup Media Files; UNLOAD; INIT; FORMAT; VERIFY; SKIP; COMPRESSION; CHECKSUM; Retain Days and ContinueOnError and Backup Validations; Backup History Tables in MSDB – Joins; Backup Audits. HOT and COLD Backups; Backup Devices - Creation and Usage; Database Recovery Models - DB Logging; Common Backups Errors and Solutions;

### DAY 12: RESTORES & DB RECOVERY

Restore Phases - COPY; REDO; UNDO; RECOVERY and NORECOVERY Options; STANDBY; REPLACE Options in Restores; File; File Group and Meta Data Restores; Backup Verifications using GUI; Scripts; FileListOnly, VerifyOnly and HeaderOnly; PARTIAL / PIECEMEAL Restores – Use; Tail Log Backups. UNDO; REDO Phases; Restores using GUI and T-SQL Scripts; Point-In-Time Restore; Checkpoint LSN; Standby Restores and Read-Only State; Restores from SQL Server 2017 to 2019;

### DAY 13: JOBS & MAINTENANCE PLANS

SQL Server Agent Service and Agent XPs; SQL Agent Jobs - GUI; Script Creations and Job Steps - Creation; Edits and Parse; Job Schedules and Email Notifications; Job Executions; Disable/Enable Options; Job History Purge. Job Activity Monitor; Database Maintenance - Backup Jobs; Scheduling Database Maintenance Plans; Backup Cleanup & History Clean Up Jobs; Backup Strategies For Minimal Data Loss; DB Mail Configurations and Alert System; DB Mail Profiles; SMTP Agent Operators;

### DAY 14: PERFORMANCE TUNING 2 - AUDITS, PARTITIONS

Audit Long Running Queries : DMVs, DMFs; Activity Monitor Tool, Query Statistics; Logical & Physical I/O, DB IO, Waits; Recent and Active Expensive Queries; Plan Handle Executions, Performance; Resumable Indexes: ONLINE, RESUME; PAUSE, MAX\_DURATION. Query Store; Partition Mechanism : Database Filegroups; Partition Functions & Partition Schemes; Aligned / Indexed Partitions - Importance; Partition SPLIT and MERGE, NextUsed; Partition Compression : ROW, PAGE; Data Archival & SWITCH. Partitioned Views;

### DAY 15: PERFORMANCE TUNING 3 - STATISTICS & FTS

Full Text Search (FTS) - Architecture; StopWords, Stemmer, Thesaurus For FTS; Indexer, Query Processor & Compilation; Full Text Catalogs and Filter Daemon; FDHost.Exe and Daemon Threads for FTI; Full Text Indexes (FTI), Crawler Threads; CONTAINS(), FREETEXT() with SELECT; In-Memory Tables : Creation, Tuning; Memory Snapshots at DB and Table Level; FileStream Files and MOT Filegroups; MEMORY\_OPTIMIZED\_ELEVATE Snapshot; Stats Updates : FullScan, NoRecompute; Temporal Tables Usage & History Tracking; Statistics : Index and Column Statistics;

### DAY 16: PERFORMANCE TUNING 4 - INDEX MANAGEMENT

Index Management : Performance Tuning; Internal and External Fragmentation; Fragmentation Audits : DMFs, Thresholds; Index Reorganization, Index Rebuilds; Database Maintenance Plans (DMP) Jobs; Index Page Count and Index Condition; Fast, Detailed Scans. Statistics Updates; LOCKS : Types, Concurrency Control; X, S, IS, IX, U, MD, Sch-M and Sch-S; Lock Audits : SP\_WHO2, SP\_LOCK; Deadlock Simulation and Prevention; Deadlock Audits & Events in Profiler; Isolation Levels and Query Blocking; Choosing Isolation Levels in Real-time;

### DAY 17: PERFORMANCE TUNING 5 - TUNING TOOLS

Tuning Tools : Workload and Trace Files; SQL Profiler Tool - Tuning Template, Events; DTA

Tool with Profiler : Recommendations; DTA with Procedure Cache & .SQL Files; Execution Plans - Internals. Plan Types; Query Costs : IO Cost and CPU Cost; Query Costs : SubTree Cost and Operator Cost; Numa Nodes, Boost Priority & Thread Count; Perfmon Counters and Real-time Tracking; Processor, Disk, Memory, Database Counters; Perfmon for Big Query Audits. Memory; Longest Running Transactions amd TPS; Log File, Tempdb, Memory Issues. Solutions; Performance Tuning - Final Tuning Checklist;

### **DAY 18: SECURITY MANAGEMENT**

Authentication Types - Windows; SQL Server; Windows Logins and REGEDIT with T-SQL; SQL Server Logins : POLICIES & EXPIRY; Logins, Users, Roles and Schemas Creation; Server Roles and Database Roles – Usage; Password Resets and Security Scripting; Object Level Security; Column Security; Logon Failures and Server Management Logs; Grant, With Grant and Deny; Revoke Settings, CONTROL and OWNERSHIP; Authorization and Keys & Certifications for Data Encryption; Credentials and Proxies for Job Security; DMVs for Security Audits; Orphan Users; Containment Databases – Users and Roles;

### **DAY 19: DB MIGRATIONS, ORPHAN USERS**

Logins and User Mapping Concepts; Detecting / Auditing Orphan Users; Resolving Orphan Users in Databases; sp\_resolve\_login and Logins RPT File; Containment Authentication Type; Creating Users without Logins. Roles; Containment Users - Permissions; Database Migration Options with SSIS; CDW : Copy Database Wizard @ SSMS; Database Detach and Attach Options; FORATTACH, sp\_single\_file\_attach\_db; SMO Method and Database Scripting; CDW SSIS Packages, SSIS Proxies Use; Scheduling Database Migration Jobs;

### **DAY 20: DB HEALTH CHECKS AND REPAIRS**

Database Health Check : DBCC Commands; Allocation Errors, Consistency Errors; DBCC ShowContig, Extent Fragmentation; EstimateOnly, NoInfoMsgs with Tempdb; DDBC Page-GAM, SGAM, PFS, ML, Bitmap; DBCC Shrink, Suspect Pages and Repairs; Repair\_Rebuild, DB States, Page Restores; Resource Governor : Real-time Usage; Resource Pools and Workload Groups; Query Priority and DOP, Grants; Classifier Function : RECONFIGURE; Policy Based Management (PBM); Facets and Conditions for Policies; Database Recovery Model Policies;

## **MODULE 3 : Advanced SQL DBA: Always-On, Repairs, HA DR, Errors**

### **DAY 21: REPLICATION For HA - LEVEL 1**

Replication Architecture and Topology; Publication Types - Purpose; Importance; DB Articles; Publications; Subscriptions; Distribution DB Configuration; Snapshots; Snapshot Replication and Repl Agents; Adding Articles to Existing (LIVE) Replica; PUSH; PULL Subscriptions. N/W Shares; Transactional Replication Configuration; Log Reader Agent - Configuration; Keys; Tracer Tokens Latency; Ranking Options; Replication Monitor - Usage and Options; Replication Warnings and Agent Alerts;

### **DAY 22: REPLICATION For HA - LEVEL 2**

Merge Replication and Merge Agent Job; Replication Conflicts and ROWGUIDCOL; Subscription Reinitialization; Expiry Setting; Server Subscription & Client Subscription; Peer-Peer Replication Connections; Nodes; Replication Conflicts: Options; sp\_MSRepl; MSSQL\_ENGXXXXX Errors & Solutions; sp\_changedbowner; backup initialization; Replication Conflicts and Priority Settings; Replication Verify – Row Count, Checksum; Disabling; Cleaning Replication Topology; Replication Strategies for HA and DR Plan;



### **DAY 23: LOG SHIPPING (HA - DR)**

Log Shipping Topology for HA and DR; Primary and Secondary: Recovery Plan; Log Shipping Monitor; Jobs and Alerts; NORECOVERY Mode – Configuration; STANDBY Mode Configuration & Jobs; Log Shipping Jobs and Manual Failover; Log Shipping Mode Changes – cautions; Re-Restoring Log Backups for Recovery; LS Backup, LS Copy & LS Restore Jobs; TUF Files and Standby Options in LS; Broken Log Shipping Chains & Issues; Log Shipping Jobs - Errors & Solutions;

### **DAY 24: DB MIRRORING (HA - DR)**

DB Mirroring Architecture For HA & DR; Log Shipping Versus Database Mirroring; TCP Endpoints; TCP Network Security; Heartbeat and Polling Concepts in DM; Automatic Fail-Over Procedures; Tests; PARTNER OFFLINE Conditions; Options; DB Mirroring Monitors and Commit Loads; SYNCHRONOUS & ASYNCHRONOUS; Mirroring Monitor; Stop/Resume Options; Need for Always-On & Higher Availability; DB Recovery without Witness. Failover; Mirroring Monitor Jobs - Real-time Usage; Database Mirroring - Errors & Solutions;

### **DAY 25: PATCHES, UPGRADES, CUs**

Establishing Downtime For Maintenance; Precautions for Maintenance Activities; Service Packs and Patch / hotfix Activities; Cumulative Updates (CU); Hotfix Process, Instance Selectivity for Updates; Cautions, Verifications; Smoke Test and Rollbacks; SERVER Upgrades; VERSION Changes; Planning for DB Maintenance Activities; System Database REBUILDS using CMD; Silent Installation & Installation Repairs; SQLCMD Tool and Instance Connections; DAC Dedicated Administration Console & Verifications; Smoke Test, Rollbacks;

### **DAY 26: CLUSTER CONFIGURATION**

Windows Clusters For HA and DR; Domain Controller (DC) Configuration; Active Directory (AD) Accounts; SAN [Storage Area Network] and LUN; Public IP Address; Private IP Address; Windows Level Clusters and MSCS Service; Need for DNS Hosts - Server Manager; SQL Clustering Service & RAID Levels; RAID Levels for Data Files & Log Files; SQL Cluster Groups; Domain Accounts; Active-Active; Active-Passive Clusters; Quorum and MSDTC Disks. LUN Grows; MSCS Service Startup; Drains; Need for Always - On Availability (AAG);

### **DAY 27: ALWAYS-ON AVAILABILITY - 1**

Always On Availability Group [AOAG]; Synchronous and Asynchronous Modes; Replica Recommendations for Always-On; Backup Preferences & Location Options; Synchronization & Automated Seeding; Data Synchronization Settings for AOAG; Port Settings; Backup Strategies in AAG; AOAG Verifications and Dashboards; Adding Availability Replica; Database; Adding Availability Listeners and DNS; Automated Failovers; Manual Failovers; New Hosts and AAA Hosts in AOAG; Forward Lookup Zones - AOAG Domain;

### **DAY 28: ALWAYS-ON AVAILABILITY – 2**

Understanding LINUX OS Environment; LINUX OS Components - Kernel, Daemons; BootLoader, Shell and Desktop Env; SQL Server Options on LINUX Platform; Installing SQL Server on RHEL Cluster; su and sudo Commands in LINUX Cluster; Creating Linux Packages, REPO Files; Installing mssql-server Packages; Service Enable and Activation Options; Firewall Configurations, sa Passwords; Installing SQL Server Tools in LINUX; ms-sqltools Installation: SQLCMD, BCP; UNIXODBC; Packages Installation, Verify; Running Test Connections and Queries;

### **DAY 29: SLA/OLA, RAID, PROCESS**

Routine SQL Server DBA Activities; Maintenance SQL DBA Activities; Emergency SQL DBA Activities; End to End Process for SQL DBAs; Tiers & Levels of Production Support; Real-time Project Plan, Support Terms; Capacity Planning with SQL Server; SLA and OLA Process - Production; RAID Levels for SQL Databases; RAID for SQL Server Data Files; RAID for SQL Server Log Files; Bit Level and Block Level Parities; Speed and Safety Options with RAID; Database Size, RAM Capacity Options;

### **DAY 30: Ticketing Tools, Licenses**

Ticketing Tools - REMEDY (Cloud); IR, CR and SR (Incident Management); SLA - OLA Reports and Tickets; Tickets : Properties, Ownerships; Impact, Urgency and Ticket Priority; Status, Events, Customers, Details; Incident Tickets and Resolutions; SQL Server Licensing Plans, Pricing; Device Type and Core Type Licenses; Device CAL and User CAL : Selections; CORE Licensing : Processor, Core; Multiplexing and Software Assurance; Pricing Options with SQL Server License; Version & Edition Comparisons;

### **DAY 31 & 32: REAL-TIME PROJECT (With Solution, For your Resume)**

Our SQL DBA Online Training Course includes one Real-time Project on E-Commerce Database. This project involves Real-time DBA Issues and Solutions including the usage of Ticketing Tools, 3rd Party Tools. We deal with Routine SQL DBA Activities, Emergency DBA Activities and Maintenance Activities with Solutions. Also include 200+ Errors and Solutions, Database Migrations, Upgrades, Always-On Availability Groups Implementation in a Clustered Environment. This Real-time Project gives greater in-depth insight on Real-world SQL DBA Job Work and can also be used in your Resumes. Very much helpful to clear your Interviews and MCSA Certifications.

#### **PHASE 1 :**

- Auditing Login Failures
- Monitoring Connectivity Issues
- Auditing Long Running Queries
- Memory Issues and Solutions
- PLE (Page Life Expectancy)
- MSDTC and Remote Connections
- Job Monitoring and Precautions
- Monitoring HA & DR Mechanisms
- Database and Schema Refresh
- Creating Dump Files and Audits
- Idle Sessions and Precautions
- Index Management and Integrity
- Deadlock : Monitoring, Prevention
- Monitor Server Health, Dashboards

#### **PHASE 2 :**

- Server Down : Issues, Solutions
- Database Down : Issues, Solutions
- Data Synchronization : Issues, Solutions
- Slow Running Queries : Issues, Solutions
- Database Response : Issues, Solutions
- Slow Replication : Issues, Solutions
- Replication @ HA-DR : Issues, Solutions
- Log Shipping @ HA-DR : Issues
- Important Events and Errors, Solutions
- Hot CPU and Processor Node, Priority
- CPU Thread Counts and Windows Fibers
- Contained Databases and Orphan Users
- Memory Dump Files and Solutions
- Always-On (AAG): Issues and Solutions

## **Module 4: Azure SQL Database Concepts**

Applicable for SQL DBA Plan B

### **Day 33 : AZURE CLOUD & AZURE SQL DATABASE**

Introduction to Cloud. Need for Cloud, Advantages; Cloud Architecture Basics - IaaS, PaaS and SaaS; Advantages of Microsoft Cloud - Azure Platform; Azure Products and Azure Services - Marketplace; Comparing Azure with Google Cloud for SQL Server; Comparing Azure with AWS Cloud for SQL Server; Azure Sources - Types, Microsoft Market Place; SQL Database Implementations in Azure Platform; Logical Servers, Virtual Machines, Managed Instance; Azure SQL Database Architecture Components; Creating Azure SQL Server (Logical Server); Creating Azure SQL Databases and Pricing Tiers; Price Tiers: Basic, Standard, Premium, PremiumRS; DTUs Allocation for Database Size, Cost Models; Firewall Settings for Azure SQL Server (Logical Server); Adding Firewall Rules - IP for Remote Access; Password Resets and Azure SQL Server Name Format;



### **Day 34 : DTU ARCHITECTURE, ELASTIC QUERIES**

DTU : Data Transaction Units : Architecture, Pools; DTU - Memory and IO Resources for Reads & Writes; Bounding Box Model for Optimal Performance; Static Pools (DTU) and Elastic Pools (eDTU); eDTUs and Elastic Pool, per Database Settings; EDTU Cost, eDTU max/min Limits and Performance; Configuring Elastic Pools for Azure SQL Databases; Elastic Pools & Tier Selection - Recommendations; Elastic Scale for Azure SQL Database - Strategies; Vertical Partitioning and Horizontal Partitioning; Elastic Database Tool Libraries for Elastic Queries; Sharding - Topology for Elastic Query Processing; Split-Merge Service for SaaS Software Applications; Elastic Database Features - ShardMap, ShardKey; MultiShard Queries and Elastic Transactions; LOOKUP, HASH and RANGE Strategies for Sharding;

### **Day 35 : AZURE SQL DB MIGRATIONS, AZURE DATA STUDIO**

Data Migration Assistant (DMA) Tool; On-premise to Azure SQL Database Migration; Logical Server, Virtual Machine, Managed Instance; Schema Generation and Compatibility For Migration; Generating Data Scripts and Assessment; Generate and Validate Schemas. Migrations; Migration Scopes : Schema, Data, Schema & Data; Compatibility Checks and Assessment Checks; Resolving Database Migration Compatibility Issues; Azure Data Studio Tool for Database Connections; Azure Data Studio Features - Insights, Metrics; Comparing Azure Data Studio with SQL OPS Tool; SSMS Tool for Azure SQL Database Connections; SQLOPS Tool for Azure SQL Database Connections; SSDT (Visual Studio) for SQL Database Connections; Query Editor for Azure Database Access - in Portal; Azure Database Connections with Other Tools;

### **DAY 36 : Azure SQL DATABASE TUNING, AZURE SEARCH**

Azure SQL Server Level Tuning Options; Azure SQL Database Level Tuning Options; Automated Tuning Options and Peak-Loads; Force Plan, Create Index and Drop Index; Query Performance Insight, Intelligence; Index Recommendations with CPU and IO; IO Metrics, CPU Metrics & Query Statistics; Data File IO, Log File IO, Custom Reports; Identify Long Running Queries, Intensive Queries; Query Level Recommendations and Query Costs; Azure Search Service - Configuration, Pricing Tiers; Azure Search for Data Import and Indexer Options; Suggester and Analyzer Index Modes for Tuning; Retrievable, Facetable, Filterable Indexes; Facetable and Searchable Indexes for Tuning; Change Tracking Options, Watermark Columns;

### **DAY 37 : AZURE SQL DATABASE VERSUS ON-PREMISE, EVENTS**

Azure SQL Server Architecture Differences; Network Protocols and DB Engine Differences; File Structure and Filegroup Allocations; Secondary Files and FileStream Differences; Table Architecture for Partitions, FT Queries; Query Processing Differences with TDS Packets; Query Monitoring and Resources - Dashboards; Unsupported Commands with T-SQL Queries; ; SQL Traces : Creation and Audits. Limitations; SQL Traces : Events, Class, Category, Filter, Conditions; Extended Events and Traces for T-SQL Query Analysis; Extended Events Packages, Targets, Actions, Sessions; Extended Events Architecture and Engine Sessions; TSQL and SP Debug Events with XEL Files for EventInfo; Global Fields and Event Filters with XEL Files @ Traces; XE Objects : Catalog Views, Dynamic Management Views; XE Profiler - Default Templates for Event Profiling;

### **DAY 38 : AZURE SQL DB VERSUS ON-PREMISE, STRETCH DATABASE**

Stretch Databases in Azure SQL Databases; Stretch Databases - Tuning Benefits, Cautions; Table Level Migrations with Azure SQL Databases; Compute Performance Levels and DSU Pricing; Data Storage and Azure Database Snapshots; Geo Backup Of Tables and Hybrid Cloud Settings; Remote Data Archive Configuration in Azure; Database Master Key [DMK], Cold Data Migration; SQL Database Managed Instance; Native Virtual Networks and Scalability; Lift and Shift LOB Applications; Fully Managed PaaS Infrastructure; Frictionless Migration for On-Premise; Managed Instances - Key Features; vCore Purchasing Model for Azure SQL DB; Gen 4 and Gen 5 Logical CPUs, Resource Limits; Key Differences : On-Premise Vs Managed Instances;

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## Module 5 : Azure SQL DBA Concepts, HA & DR, Security, Power Shell

Applicable for SQL DBA Plan B

### DAY 39: AZURE DB BACKUPS, RESTORES

SQL Storage Management (SMB); SMB File Storage and Azure Storage; Manage Storage Pools, Failed Storage Recovery; Space Availability on Data Volumes; Recovery Service Vaults, Policies with RA-GRS; Storage Accounts and Storage Containers in Azure; BLOB Data Storage: LRS, GRS, and "RA - GRS"; Cell Level Encryption and Always-Encrypted; Transparent Data Encryption (TDE); Automated Backups in Azure SQL Database; Long Term Backup Retentions. Backup cost, Frequency; Automated Backups - Retentions, Audits. LTR Policy; Restore Points and Azure SQL Database Recovery; Local Backups, BLOB Storage Backups, Restores; Encrypted Backups in Azure SQL Database; Database Level Exports in Portal, SSMS; Server Level Imports with Portal, Azure Studio;

### DAY 40: AZURE SQL DATABASE - HA and DR

Failover Groups and Active Geo-Replication; Read-Write Failover Policy, Automated Failover; Geo Replication Configurations - Azure Locations; Primary-Secondary and Read / Write Modes; GeoReplication : Monitoring and Forced Failover; Perform Disaster Recovery with (DR) Drills; System Views for Audit of GeoReplication; Backup Errors, Geo Replication Errors - Solutions; SQL Data Sync Service and Sync Groups; HUB, MEMBER and SYNC DATABASE; Sync Direction, Sync Schema and Sync Interval; bi-directional data transfer with Azure SQL DBs; Conflict Resolution Policy with HUB and MEMBER; Cloud to Cloud and Cloud to On-Premise Synchronization; Hub to Member and Member to Hub Sync Policies; Azure DB Sync for Load Balancing and Failover; Common Errors and Solutions - POC;

### DAY 41: SECURITY MANAGEMENT, ROW LEVEL SECURITY

Firewall and Virtual Network Configurations; Server-level Firewall & Database Firewall Rules; System Stored Procedures for Firewall Settings; Logins, Users, Roles and Permissions using T-SQL; Creating Logins without Logins. Containment Users; GRANT, DENY, REVOKE and WITH GRANT using T-SQL; Dynamic Data Masking, Transparent Database Encryptions; Data Masking Functions and Column Level Security; Vulnerability Assessment (VA) and Threat Detections; Implementing RLS - Row Level Security; Creating Users with & without Logins; Using SECURITY Schema for RLS Functions; Creating Security Predicates and Filters; Creating Security Policies for RLS; EXECUTE AS options for RLS. STATE ON/OFF; Data Level Encryption and Connection Encryption; Troubleshoot Encryption Errors in Azure SQL DB;

### DAY 42: AZURE POWER SHELL, AZURE CLI

Azure Cloud Shell - Concepts, Architecture; Azure Power Shell - Install and Configure; Installing and Scripting with Power Shell; PowerShellGet and Version Paths; Cloud Shell to run the Azure Power Shell; Power Shell Scripts for Configurations; Power Shell Scripts for Job Schedules; Power Shell Scripts for Firewall, ARM; Azure CLI - Purpose, Real-time Use; Command Line Interface for Automations; Azure CLI - Downloads and Installations; Azure CLI - Command Prompts, Azure Login; Command Line Interface for Automations; Authorization Code, CLI Communication; Azure telemetry Commands and Usage; Help, Show, Create and Firewall Commands;

### DAY 43: AZURE VIRTUAL MACHINE, OTHER CLOUDS

Plan for IaaS, Azure VM. Install Azure Virtual Machines; Install/Configure Windows Server, Redhat, Ubuntu; SQL Server on Azure VM - Config Settings, Elastic Pools; Resource

Groups, Resource Pools and eDTUs; Verify SQL Instances in Azure VM. sysadmin Account; Azure Storage Blades and Pricing Options; Azure VM - Settings, Power Shell Scripts; Azure SQL Database Creation in Azure VM; Azure Virtual Machines ; Security Options; Azure SQL Database in VM to SQL Cloud; Azure SQL Database in VM to on-Prem; Deployment Automation Process, Automation Scripts; SQL Database in AWS and Google Cloud; Azure Virtual Machine Configuration Settings; Azure SQL Database Advantages in Virtual Machines;

### **DAY 44: AWS, GOOGLE CLOUD For SQL SERVER**

Comparing Azure SQL DB with AWS Cloud; Comparing Azure SQL DB with Google Cloud; RDS Implementation for SQL Server Databases; "License Included" licensing model of AWS; Amazon RDS for SQL Server in the AWS Console; Amazon RDS for SQL Server Pricing; Reserved Instances and Database Storage; Minor and Major Versions of SQL Server; Google Cloud Platform for SQL Server; SQL Server Virtual Machines in Google Cloud; Google Grade Infrastructure, DB Migrations; Data Transfer with in-out Policies; SQL Server Compute Engine in Google Cloud; Setting Up Windows Firewall, SQL Tools; SQL Server Creation and DB Creation, Access; SQL Server Tables Creation, Data Storage; SQL Server Migrations with Google Cloud;

**Guidance for MCSA : 70-764 and 70-765 exams are included in this course**

#### **Reach Us:**

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