

Course Outline



Tel: +44 (0) 118 979 4000 Fax: +44 (0) 118 979 4000

Email: training@ptr.co.uk Web: www.ptr.co.uk

SQL Server Performance & Tuning

Course Description:

The objective of this course is to provide senior database analysts, developers or database administrators with a good understanding of SQL Server Architecture and Query Performance so that applications and their supporting environment can be tuned for optimal performance.

The course will provide delegates with the knowledge required to size, plan, monitor and tune a SQL Server application for either a OLTP or data warehousing environment. Everything from Operating System & SQL Server service tuning through to query and index tuning will be covered. It is a hands on course with performance and analysis tools being put to use throughout.

Pre-requisites:

Delegates should have extensive experience with SQL Server 2000 or later and should have a knowledge level equivalent to that provided by the PTR Advanced SQL, Stored Procedures & Triggers For SQL Server course . Knowledge of basic SQL Server Administration would be beneficial.

Course Content:

- **Performance & Tuning**
 - Sizing & Planning
 - Planning
 - Sizing
 - Sizing & Planning Considerations

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Registered Office: Grenville Court Britwell Road Burnham Bucks SL1 8DF Company Registered No: 2442290 – VAT registration No:532 1929 56

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- **Monitoring Performance**
 - Analyzing Performance Data
 - Tuning & Optimising Performance
 - Application Tuning
 - Database Tuning
 - SQL Server Tuning
 - Hardware Tuning
 - Operating System Tuning
 - Useful Tuning Tips
- **SQL Server Internals**
 - Memory Management
 - SQL Server & Memory Management
 - Viewing Memory Performance
- **Process & Thread Management**
 - Thread Scheduling
 - The Process Queue
- **SQL Server & Threads and Processes**
- **I/O Management**
 - Windows I/O
 - Synchronous I/O
 - Asynchronous I/O
 - Buffered I/O
 - Nonbuffered I/O
 - SQL Server & I/O
 - RAID
 - SQL Server & Disk Performance
- **Networking**
 - Named Pipes
 - Shared Memory
 - TCP/IP (Sockets)
 - Network Performance
- **SQL Server Architecture**
 - The Network Library
 - The Database Engine

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- **SQL Server Architecture**
 - Relational Engine
 - The Storage Engine
 - Data Storage
 - Data Files
 - Transaction Log File
 - Filegroups
 - Units Of Storage
 - Page Types
 - Locating Data
 - Transaction Logging
 - Checkpoint Performance

- **Planning For A SQL Server Database Application**
- **System Performance & Tuning**
 - Capacity Planning
 - What Is Performance?
 - What Is Slow?
 - Bottlenecks
 - Measuring Performance
 - What Is Tuning?
 - Hardware Resource Tuning
 - SQL Server Tuning
 - Database Layout

- **Monitoring Tools**
 - Performance Monitor
 - Performance counters
 - SQL Profiler
 - Trace Events
 - Server Side Tracing
 - Analysing Trace Data
 - Coalescing Performance Logs With Profiler Trace Files
 - Profiler Replay
 - DBCC

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- **Monitoring Tools**
 - **Optimal Database Design**
 - **Indexing**
 - **Locking**
- Dynamic Management Views
 - Database Design
 - Table Design
 - Table Constraints
 - Triggers & Stored Procedures
 - Client Side Programming
 - Index Architecture
 - UNIQUE &-DUPLICATE Index
 - NONCLUSTERED &-CLUSTERED Index
 - Covering & -INCLUDE Index
 - Filtered Indexes
 - The Indexes System Tables & Views
 - Index Tuning
 - Growing Indexes
 - The Index Tuning Wizard
 - Monitoring Index Usage
 - Table Hints
 - Indexed Views
 - Displaying Information About Indexes
 - Index Depth & Density
 - Index Maintenance
 - Dynamic Management Views & Functions for Indexes
 - Locking Granularity
 - Locking Modes & Types
 - Locking Compatibility
 - Transaction isolation Levels
 - READ COMMITTED
 - READ UNCOMMITTED

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- **Locking**
 - REPEATABLE READ
 - SERIALIZABLE
 - SNAPSHOT
 - Deadlocks
 - Avoiding Contention & Deadlock
 - Tools For Monitoring Locks
 - Tracing Locking Information With Profiler
 - Deadlock Graph
 - Locking Dynamic Management Views
 - Tracing Deadlocks With DBCC

- **Query Optimisation**
 - Compilation & Execution
 - Query Optimiser
 - Trivial Plan Optimisation
 - Simplification
 - Statistics Loading
 - Cost-Based Optimisation
 - Query Analysis
 - Index Selection
 - Index Statistics
 - Join Selection
 - Nested Loop, Merge & Hash Join
 - Updating Index Statistics
 - Creating Column Statistics
 - The Query Plan
 - Recompilation
 - Memory Usage
 - Procedure Cache

- **Analysing Queries**
 - Query Execution Plan
 - Graphical Execution Plan
 - Plan Properties

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- **Analysing Queries**
 - Text & XML Execution Plans
 - Logical & Physical Operators
 - Joins
 - RID Lookups & Key Lookups
 - SET STATISTICS IO
 - SET STATISTICS PROFILE

- **Database Application Tuning**
 - SQL Server
 - Database
 - Client Application
 - Network
 - Tuning SQL Statements
 - Guidelines for Efficient Queries
 - Identify Priority Components
 - Comparing Queries
 - SQL Hints
 - Join Hints
 - Table Hints
 - Query Hints
 - Stored Procedures
 - Autoparameterisation
 - Sp_executesql Stored Procedure
 - User-Defined Functions
 - Views
 - Partitioned Tables & Indexes
 - Maintaining Tables & Indexes

- **SQL Server 2008 Performance Monitoring & Tuning Enhancements**
 - Resource Governor
 - Resource Pools & Workload Groups
 - Resource Governor Properties
 - The Classification Function

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- **The Data Collector**
 - Configuring The Data Collection Service
 - Configure Management Data Warehouse
 - Configure Management Data Warehouse Storage
 - Configure Data Collection
 - Viewing The Collected Data
 - Log Viewer
 - Data Collection Properties for Query Statistics
 - Data Collection Properties for Server Activity
 - Data Collection Properties for Disk Usage
 - Data Collection & Upload
 - Queries on msdw Database
 - View Data Collection Reports

- **Plan Freezing**
 - Plan Guides
 - Creating a Plan Guide
 - Managing Plan Guides
 - Plan Freezing – SQL Server 2005
 - Plan Freezing – SQL Server 2008

- **Plan Freezing Maintenance – SQL Server 2005/8**

Course Duration:

4 Days