IT Best Practices Audit™

TCS offers a wide range of IT Best Practices Audit content covering 15 subjects and over 2200 topics, including:

1. IT Cost Containment — 84 topics
2. Cloud Computing Readiness — 225 topics
3. Networks — 185 topics
4. Desktops and Printers — 208 topics
5. Storage — 130 topics
6. Microsoft Servers — 191 topics
7. iSeries Servers — 116 topics
8. Web Servers — 119 topics
9. Unix and Linux Servers — 134 topics
10. Database — 115 topics
11. Software Licensing — 24 topics
12. Telephony — 82 topics
13. Data Center — 253 topics
14. IT Leadership and Governance — 185 topics
15. Compliance and Security — 296 topics

Database Audit Categories and Topics

Category	Audit Topic
General/info	Name(s) of client resources providing data for this subject
General/info	Title(s) of client resources providing data for this subject
General/info	Database products in use
General/Info	Database Documentation
General/Info	Age of database software environment (versions)
General/Info	Use of vendor and/or 3rd party SQL management tools to capture current key performance metrics and monitor health
General/Info	Any ILM Information Life Cycle Management tools or strategy used?
General/Info	Proactive meetings/communication with vendor representatives
Staffing	Database Staffing
Staffing	Staff Training
Reliability	Database issues requiring restart/reboot
Reliability	Occurrences of lost data
Database Design Requirements	Number of simultaneous connections
Database Design Requirements	Number of rows of data and 2 year growth plan
Database Design Requirements	Database type to be used - ISAM, Relational, etc.
Database Design Requirements	Types of queries to be executed - short or complex sorts/grouping, etc.
Database Design Requirements	Data Protection requirements
Database Design Requirements	What data will be accessed most frequently (your working set)
Database Design Requirements	Frequency of data inserts (writes) vs. selects (reads)
Database Design Requirements	Define fill factors during design to minimize bucket splits
Database Design Requirements	Creation and use of Temporary Objects - limit when possible; use large temp table sizes when available to minimize number of tables
Database Design Requirements	What type of row level operations are planned - lookups by index, tables scans, selects, inserts
Database Design Requirements	Planned database parameters
Database Design Requirements	Queries that are designed to perform table scans
Database Design Requirements	Number of full joins planned (these do not use indexes - this should be 0)
Database Design Requirements	Number of queries expected to be very slow
Database Design Requirements	Number of queries expected to require disk based sorts (these are very slow)

Category	Audit Topic
Database Design Requirements	Locking requirements - table or row or none
Database Design Requirements	DB Memory requirements
Database Design Requirements	Use dynamic parameters for unusual queries
Database Design Requirements	Design queries based upon "outcomes" required
Database Design Requirements	All lookups, joins, and sorts are properly indexed
Database Design Requirements	Use matching types (index and field type) to ensure correct query results
Database Design Requirements	Check execution plans to ensure that the database used the index you intended
Database Design Requirements	Minimize size of data elements
Database Design Requirements	Use integers for indexes where possible to speed operations
Database Design Requirements	Use simple character sets where possible
Database Design Requirements	Use of table scans
Database Design Requirements	Careful use of joins
Database Design Requirements	Use covering indexes where practical to avoid reading the data (the data you need is part of an index)
Database Design Requirements	Minimize indexes and use of redundant indexes
Database Design Requirements	Planning of maintenance requirements
Database Design Requirements	All select filtering should be done via the indexes
Database Design Requirements	Use of replication to allow distributed queries and/or data protection
Database Design Requirements	Partition and replicate data
Database Design Requirements	Use of clusters or master-master DB writers
Database Design Requirements	Use of triggers
Database Design Requirements	Use of Views
Database Design Requirements	A defined Data Backup plan
Database Design Requirements	Design minimizes opportunity for deadlocks and database contention (locks, latches, too many queries to the disks, etc.)
Design Standards	Database design during the application development process
Design Standards	Standards followed in table design
Design Standards	Indexing of databases
Design Standards	Use of partitioned data across tables
Design Standards	Logic used in queries
Design Standards	Use of stored procedures
Design Standards	Storage hardware configuration
Design Standards	Keep tables open

Category	Audit Topic
Performance	Typical response time for common business applications (customer lookup, etc.)
Performance	Cache hit ratios
Configuration	DB parameters tuned
Configuration	Indexes tuned
Configuration	Database page file tuned and aligned with file system format and stripe sizes and I/O frame sizes
Configuration	How much RAM is allocated to the database?
Configuration	How much DB buffer space is allocated
Configuration	Fill factors for database files/tables/indexes
Configuration	Indexes – maintenance, etc.
Configuration	Is Replication being used? To where? How often, etc.
Configuration	Do multiple databases exist on same server
Configuration	Are there multiple instances of the same database on the same server- i.e. for different divisions, different customers, etc. - has the database been cloned?
Configuration	Examine the Top queries – are they optimized?
Configuration	Data is most often accessed sequentially
Configuration	Data is most often accessed randomly
Configuration	Use of the production database for multiple purposes - i.e. transactions, ad-hoc, testing?
Configuration	Are all CPU's in use by the database properly licensed?
Configuration	Are other apps sharing on the same server?
Configuration	32 bit or 64 bit database?
Configuration	Where are temp database files located?
Configuration	Where are DB log files stored?
Configuration	When is backup being done?
Configuration	When is maintenance being done?
Configuration	When is the database utilized? Business hours or 24x7 across the world?
Configuration	How are tables and indexes created, maintained, and located?
Configuration	Are tables and indexes fully refreshed each time they are loaded, or when many new records inserted?
Configuration	Use of partitioned tables
Configuration	Is frequently accessed data summarized and stored?
Configuration	Are multiple threads enabled?
Configuration	Is parallelism enabled – to what degree?
Configuration	What type of data quality checking is performed by the application that creates the data?

Category	Audit Topic
Configuration	Data dictionaries/metadata documentation
Configuration	Ad-hoc queries: What type of user training is done?
Configuration	Are ad-hoc queries (for users or troubleshooting/testing) performed on the production databases?
Configuration	Use of timestamps as filenames or index values
MS SQL	Use of .Net 1.1 -has a bug that is a significant cause of MS SQL timeouts
MS SQL	Use of MS SQL TempDB spaces - these are shared by all databases on the same machine
MS SQL	Use of SQL Trace Flags to optimize performance
Foxpro	Database call optimizations – if a null value is used in a database call, this will force a table scan rather than an indexed lookup
Oracle	Use Stats pack to collect configuration and performance data
Oracle	Use Statspack to Identify the top 5 timed events
Oracle	Ensure enough memory has been allocated to SGA
Oracle	Ensure enough memory has been allocated to PGA
Oracle	Examine uses of each tablespace (reads, writes) to identify hot tables
Oracle	Identify top wait events
Oracle	Identify if any rollback activity is occurring and why
Oracle	Examine the number of SQL*Net transactions per second - a high number may indicate that the queries are returning too little data to the clients
MYSQL key parameters	Database address capability in use - 32 or 64 bit
MYSQL key parameters	Database version in use
MYSQL key parameters	Application of current patches to the installed version
MYSQL key parameters	Use of MySQL default parameters
MYSQL key parameters	Key parameters tuned - key buffer size = 128Meg
MYSQL key parameters	Key parameters tuned - table cache = 1000
MYSQL key parameters	Key parameters tuned - thread cache = 50
MYSQL key parameters	Key parameters tuned - query cache = 512M
MYSQL key parameters	Key parameters tuned - anode buffer pool = 256M
MYSQL key parameters	Key parameters tuned - max_connections = 750