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

Storage 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	Storage Documentation
General/Info	Storage Staffing
General/Info	Staff Training
General/Info	Storage Vendor(s)
General/Info	Use of tools to capture current key performance metrics and monitor health of storage systems
Cost Metrics	IT Cost Metrics - Total Annual Cost Per GB
Cost Metrics	IT Cost Metrics - Number of GB supported per Storage Support Staff FTE
Configuration	Does the storage system and operating support hot expansion of RAID volumes?
General/Info	Use of ILM (Information Life Cycle) Management processes, procedures, and tools
General/Info	Proactive meetings/communication with vendor representatives
Hardware	% of storage equipment less than 24 months old
Hardware	% of storage equipment 25 - 48 months old
Hardware	% of storage equipment more than 48 months old
Hardware	Firmware levels of all storage components (HBA, controllers, disks, switches, etc.)
Hardware	SAN or DAS controller capabilities - Interfaces, channels, max drives, RAID levels, cache sizes, battery backup of cache, optimizations, etc.
Hardware	Size of SAN Cache
Hardware	Size of DAS Storage Controller Cache
Hardware	Battery backup of cache or use of flash memory for cache
Hardware	% of data storage disks that are 5400 RPM or 7200 RPM
Hardware	% of data storage disks that are 10K RPM or 15K RPM
Hardware	% of data storage disks that are hybrid (typically 7200 RPM rotating disks combined with significant solid state cache)
Hardware	% of data storage media that are solid state (RAM, flash, etc.)
Hardware	Disk capacity of individual drives
Hardware	Individual disk transfer rates
Hardware	Current drive count as a percent of the maximum drive count per controller.

Category	Audit Topic
Hardware	Current I/O/sec count as a percent of the maximum I/O/sec capacity per controller.
Hardware	Current MB/sec count as a percent of the maximum MB/sec capacity per controller.
Hardware	total # of drives in the data storage subsystems
Hardware	# of drives in a physical RAID group
Hardware	Disk Drive Type
Hardware	# of hot spares per array (depends on total drives in array)
Hardware	Use of solid state disk (SSD)
Hardware	Use of SSD space
Hardware	Type of solid state disk in use
Hardware	Spare storage related hardware (drives, cables, controllers, power supplies, etc.) on hand
Hardware	In-force service contracts (or warranty coverage) on storage components
Reliability	Overall Availability (% of planned uptime)
Reliability	Hardware Failures
Reliability	Software Failures
Reliability	Other failures (unknown)
Utilization	% of Reads vs. Writes
Utilization	Random vs. sequential I/O use
Utilization	Typical size of disk transfers (physical reads and writes)
Utilization	Free space % on volumes
Utilization	Disk utilization (% busy) of major storage arrays
Utilization	Total storage throughput – how many MB/sec typically is served?
Utilization	Average queue depth per volume
Utilization	Average Response time in milliseconds (thousandths) for Data Drives
Utilization	Split IO/sec counter
Utilization	How many files on a volume?
Utilization	# of files per directory
Utilization	Identification of "Hot" files
Utilization	Use of IOMeter or SQLIO to characterize IO subsystem capabilities
Fragmentation	Fragmentation levels of each drive/volume
Fragmentation	Frequency of defragmentation
Fragmentation	Defragmentation method
Fragmentation	Cleanup of old files and old data

Category	Audit Topic
Configuration	Typical Boot Disk location for servers
Configuration	# of logical volumes that share the same physical disks
Configuration	Sector or cluster sizes used on data volumes
Configuration	Aligning the start of disk volumes on physical RAID stripe boundaries
Configuration	Type of Windows file system in use for data volumes
Configuration	Use of a host based logical volume manager (LVM)
Configuration	RAID Level of system volume/drive
Configuration	RAID Level of volumes/drives where page files are located
Configuration	RAID Level of data storage volumes (hardware or software provided RAID)
Configuration	Controller Cache use settings - percent of the cache allocated to buffer reads and writes, respectively
Configuration	Stripe sizes (chunks) for database volumes
Configuration	Stripe sizes (chunks) for file server volumes
Configuration	Stripe width (number of physical drives in a volume)
Configuration	Use of sector/format/strip sizes that are equal to typical request size (i.e. database page size)
Configuration	Use of Multipath I/O to increase available FC or iSCSI bandwidth to a single LUN (volume)
Configuration	Multipath I/O configuration
Configuration	USB storage device cluster/format sizes
NAS	Format/cluster sizes defined by type of use (i.e.. DB or small files, etc.)
NAS	Type of backend storage used for NAS servers
NAS	Use of Network Attached Storage device (NAS) to host database or record oriented type files (not backups of these files)
NAS	NAS Server configurations
NAS	Use of Windows Server System tools setting = set to file serving
NAS	Storage Server NICs
NAS	Daily health check of the disk and tape subsystems for errors, failed devices, etc.
Fibre Channel	What brand/model of HBA's are used?
Fibre Channel	Fibre Channel Switches
Fibre Channel	HBA Execution Throttle
Fibre Channel	HBA Max frame size
Fibre Channel	HBA interrupt collalesce
Fibre Channel	HBA firmware levels
Fibre Channel	HBA Interface type
Fibre Channel	HBA Ports per controller

Category	Audit Topic
Fibre Channel	HBA support for MPIO
Fibre Channel	Use of MPIO (Multipath I/O) for Fiber Channel ports
Fibre Channel	HBA cards/ports per bus
Fibre Channel	HBA Port speed
Fibre Channel	Use of HBA vendor provided utilities to set parameters and monitor status and performance
Backups	Backup philosophy
Backups	Backup methodology
Backups	Use of point in time snapshots to "freeze" view of data
Backups	Backup tools utilized
Backups	Use of specialized storage agents to support email and databases
Backups	Staffing of backups
Backups	Backup interconnect capacity
Backups	Electrical Isolation of Backup Media
Backups	Type of backup media
Backups	Backup retention policies
Backups	Quantity of Backup Media
Backups	Storage location of backup media
Backups	Security of off-site backup media
Backups	Documentation of backups
Backups	Documentation of restore procedures
Backups	Audit trails of backups
Backups	Use of Tiered storage for backups
Backups	Automation of backups
Backups	Age of backup media
Backups	Destruction of media
Backups	Readability of backup formats
Backups	Size of backup window
Backups	Recovery Window for critical data/applications/processing
Backups	Available LAN/WAN/FC bandwidth to support timely backup and restoration
Backups	Available ISP bandwidth to support use of Web/"cloud" backup providers
Backups	Daily monitoring of backup results
Backups	% of organization total data scheduled to be backed up each business day

Category	Audit Topic
Backups	% of scheduled backups (each business day) that were successful for the past month
Backups	Testing of the data recovery plan and procedures against the complete computing environment, assuming all new, "bare metal" hardware.
Backups	Use of data deduplication
Backups	Off-site media storage provider multi tenancy
Backups	Selection of off-site backup providers
Backups	Restore method utilized
Backups	Backup data format conversions