This Cram Sheet contains the distilled, key facts about the SQL Server 2000 Admin exam. Review this information immediately before entering the test room, paying special attention to those areas in which you feel you need the most review. Remember, you can transfer any of these facts that you've crammed into your short-term memory onto a blank piece of paper before beginning the exam.

Overview

1. Data collections: attributes, records, tables, databases, and instances
2. Relational databases create relationships between records in tables using Primary and Foreign keys.

Client/Server

3. Two-tier architecture provides a client-side interface that communicates with the DBMS located on a server.
4. Three-tier architecture places a middle tier between the client and server that handles business logic and transaction services.
5. The n-tier architecture places more than a single middle-tier layer between the client and server. Also called multitier architectures.
6. Collaborative Enterprise architecture considerations include clustered servers, replicated databases, load balancing, distributed transaction processing, and mobile disconnected users.

SQL Server 2000 Databases

7. System databases used by SQL Server: **master**, **modal**, **tempdb**, and **msdb**.
8. User databases contain user data. Samples by default: **Northwind** and **pubs**.
9. Database file types: Primary data file (.mdf), secondary data files (.ndf), and transaction log files (.ldf).
10. Versions of SQL Server 2000: Enterprise, Evaluation, Standard, Personal, Developer, Windows CE, and Desktop Engine.

Planning Installation

11. An instance maintains multiple databases. Multiple instances can be installed on a single server.
12. Only one default instance can exist. SQL Server 6.5 and 7.0 instances are always the default instance.
13. One or more named instances can exist. SQL Server 2000 supports named instances.
14. Multiple versions of SQL Server can run on a single machine using SQL Server 2000 named instances.
15. Components available during installation of SQL Server 2000: Server Components, Management Tools, Development Tools, MDAC SDKs, Client Connectivity Components, SQL Server 2000 Books Online, Code Samples, English Query, and Analysis Services.
16. Network libraries provide network connectivity for database access: Multiprotocol, Named Pipes, NWLink IPX/SPX, TCP/IP Sockets, AppleTalk, and Banyan VINES.
17. Collations define collections of alphabetic character sets and the rules for them including sort order. SQL Server 2000 provides both Unicode and non-Unicode character variable types.

Requirements

18. SQL Server 2000 does not have a hardware compatibility list (HCL) of its own.

    Hardware minimums:

    166MHz CPU, 64MB RAM (128MB for Enterprise Edition), 250MB HDD, VGA monitor, MS-compatible mouse, and CD-ROM.

    Software minimums:

    IE 5.0 and: Enterprise (NT 4.0 Server-SP5, or Windows 2000 Server), Developer (same as Enterprise, plus NT 4.0 Workstation and Windows 2000 Professional), Standard (same as Enterprise), Personal (same as Enterprise and Developer, plus Windows ME and Windows 98).
19. Each instance requires two services for operation: SQL Server and SQL Server Agent. Each service can have a different service account.
20. SQL Server 2000 provides two types of login authentication: Windows Authentication and Mixed-Mode Authentication.

Installation

21. The three installation types: Typical, Minimal, and Custom. Additional components can be added or removed after installation.
22. Remote Installation allows SQL Server 2000 to be installed from a central location. Remote Uninstallation is not supported.
23. Unattended Installation use an unattended installation setup initialization (.iss) file to perform preconfigured installations without user input during installation. Sample .iss and batch files are provided during installation.
24. Registry Rebuild is used to recover from a corrupted registry without requiring a full reinstallation of SQL Server 2000. You must have a record of all of the choices used in the original installation configuration.
25. Failover clustering allows multiple servers to share database processing between several servers (called *nodes*). An SQL Server instance on a clustered server is called a *virtual server*. In the event of the loss of a node, process ownership is automatically changed to another node. If the clustering software fails to detect a node's heartbeat signal, the node is treated as a failed server.

Upgrades

26. SQL Server 6.5 database upgrades use the Upgrade Wizard. You must upgrade earlier versions to SQL Server 6.5 before an upgrade to SQL Server 2000 becomes possible.
27. SQL Server 7.0 database can be upgraded in place or using the Copy Database Wizard.
28. Earlier versions of SQL Server 2000 can be upgraded in place or using the Copy Database Wizard.

Creating Databases

29. The Enterprise Manager is a graphical user interface (GUI) utility for database management.
30. The SQL Query Analyzer is a command-line interface for database management that includes templates for many standard actions.
31. Data files can be grouped into filegroups to allow for detailed allocation and placement of files and tables.
32. Databases can be created using the **CREATE DATABASE** command and deleted using the **DROP DATABASE** command.

Managing Databases

33. Database access can be restricted to a single user, members of the **db_owner**, **dbcreator**, and **sysadmin** roles, or unrestricted.

34. Databases can be set read-only to prevent updates.

35. Detaching a database removes a database from the SQL Server instance but does not delete the data and transaction log files.

36. A detached database can be attached to another instance of SQL Server 2000 to move a database between servers. A database can be attached to only one instance at a time.

37. Databases expand by default if not configured with restrictions. If not restricted, databases can expand to fill all available space on a drive.

38. When shrinking databases, data files reduce in size immediately, but log files will not reduce in size until the next truncation of the log.

39. The **ALTER DATABASE** command-line function can be used for altering a database, including expanding and shrinking the database.

40. Database objects such as tables, view, and stored procedures can be edited after creation.

41. Indexes improve data access time in large tables. A clustered index reorganizes tabular data. A non-clustered index creates an organized reference based on specified criteria, avoiding the need to search the entire table for a specified datum. Indexes can be rebuilt or recreated.

Disaster Recovery

42. Three primary types of data backup: Full, Differential, and Transaction Log.

43. File and filegroup backups are also available if not using the Simple recovery model.

44. Three standard recovery models (the default model is Full): Simple, Full, and Bulk-logged. The recovery model can be changed during SQL Server 2000 operation without restarting the instance.

45. To perform the most up-to-date recovery:

    Restore the most recent Full backup.

    Restore the most recent Differential backup since the last Full backup.

    Restore all Transaction Log backups since the most recent Differential (or Full) backup.

46. A cold standby server can be created using backup and restoration of a primary database to the standby server. A warm standby server utilizes DTS Log Shipping to synchronize transaction logs on the standby server automatically.

Enforcing Integrity

47. Table relationships allow cascading updates to maintain data integrity between tables by avoiding the creation of orphaned records.

48. The UNIQUE constraint prevents the creation of duplicate data in the appropriate field.

49. The Check constraint allows input data to be checked before a record is created or updated.

50. Deadlocking occurs when two processes are mutually holding necessary locks. SQL Server 2000 automatically resolves deadlocks.

Monitoring

51. SQL Server 2000 and Windows 2000 monitoring tools: SQL Profiler, System Monitor, Error logs, Enterprise Manager, Transact-SQL (T-SQL), DBCC statements, and sqldiag.

52. SQL Profiler traces can be saved for later reuse. Each monitored instance requires a separate trace.

53. T-SQL Query analyzer monitoring commands include: **sp_lock**, **sp_monitor**, **sp_spaceused**, and **sp_who**.

54. DBCC statements fall into four categories:

    Maintenance:

    DBCC DBREINDEX, **DBCC DBREPAIR**, **DBCC INDEXDEFRAG**, **DBCC SHRINKDATABASE**, **DBCC SHRINKFILE**, **DBCC UPDATEUSAGE**.

    Status:

    DBCC INPUTBUFFER, **DBCC OPENTRAN**, **DBCC OUTPUTBUFFER**, **DBCC PROCCACHE**, **DBCC SHOWCONTIG**, **DBCC SHOW_STATISTICS**, **DBCC SQLPERF**, **DBCC TRACESTATUS**, **DBCC USEROPTIONS**.

    Validation:

    DBCC CHECKALLOC, **DBCC CHECKCATALOG**, **DBCC CHECKCONSTRAINTS**, **DBCC CHECKDB**, **DBCC CHECKFILEGROUP**, **DBCC CHECKIDENT**, **DBCC CHECKTABLE**, **DBCC NEWALLOC**.

    Miscellaneous:

    DBCC dllname (**FREE**), **DBCC HELP**, **DBCC PINTABLE**, **DBCC ROWLOCK**, **DBCC TRACEOFF**, **DBCC TRACEON**, **DBCC UNPINTABLE**.

Extracting and Transforming Data

55. Transact-SQL (T-SQL) bulk update statements: **INSERT**, **BULK INSERT**, and **SELECT INTO**.

56. The bcp command-line bulk update utility can be called by batch files.

57. Data Transformation Services (DTS) packages can be scheduled for later or recurring operation.

58. Three types of replication are available: Snapshot, Merge, and Transactional.

59. Replication involves three elements: Publishers, Distributors, and Subscribers.

60. Linked servers allow for the use of distributed transactions across multiple remote heterogeneous OLE DB data sources.

Security

61. Authentication involves the establishment of a connection to the database. Two authentication modes are provided: Windows and SQL Server (Mixed-Mode provides both). Access can be granted, not granted (revoked), or denied to Windows users, Windows groups, and SQL users. If denial is assigned or inherited, no other grant of access will allow access.

62. Connection using the guest, dbo, sa, or any other SQL login requires SQL Server authentication. Required for access without a Windows domain user account.

63. Windows logins can be managed using **sp_grantlogin** and **sp_denylogin**.

64. SQL logins can be managed using **sp_addlogin**.

65. Logins grant can be removed using **sp_revokelogin**.

66. Authorization involves the ability to access, update, and delete databases and database objects. Authorization can be granted, not granted (revoked), or denied to logins or roles. If denial is assigned or inherited, no other grant of permission will allow access.

67. Permissions include rights granting or preventing access to functions and database objects. Permissions can be assigned to roles and logins assigned to those roles.

68. There are three types of permissions: Object (**DELETE**, **EXECUTE**, **INSERT**, **SELECT**, and **UPDATE**), Statement (**BACKUP**, **RESTORE**, and **CREATE**), and Implied (inherited through role membership or object ownership).

69. Roles are groupings of permissions that can be assigned to logins. Roles are created at two levels: Server (**bulkadmin**, **dbcreator**, **diskadmin**, **processadmin**, **securityadmin**, **serveradmin**, **setupadmin**, and **sysadmin**) and Database (**db_accessadmin**, **db_backupoperator**, **db_datareader**, **db_datawriter**, **db_denydatareader**, **db_denydatawriter**, **db_ddladmin, db_owner**, and **db_securityadmin**, User-defined).

70. User-defined roles can be created using **sp_addrole** and dropped using **sp_droprole**. Members can be added to and removed from database roles using **sp_addrolemember** and **sp_droprolemember**. Members can be added to and removed from server roles using **sp_addsrvrolemember** and **sp_dropsrvrolemember**.

71. C2 security is a detailed, complex set of security provisions required for some governmental systems.

Automation

72. Automation involves three components: Jobs, Alerts, and Operators. Jobs can be organized into categories. Alerts can notify operators by three methods: email, pager (email), and net send. The fail-safe operator is notified if all pager notification attempts have failed.

73. The SQL Server Agent is required for multiserver administration. Members of the **sysadmin** role can make changes on the master server, but not on the target servers. Multiserver administration involves the creation of a master server, enlistment of target servers, and defection of target servers.

74. Automation depends on three services: SQLServerAgent, SQLAgentMail, and SQL Mail. Both mail services require access to MAPI-compliant mail services.

75. The Database Maintenance Planning Wizard can be used to schedule recurring automated tasks including Log Shipping.