The MCSE™ Exchange 2000 Design Cram Sheet

This Cram Sheet contains the key facts about the Exchange 2000 Design exam. Review this information last thing before entering the test room, paying special attention to those areas where you feel you need the most review. You can transfer any of the facts onto a blank piece of paper before beginning the exam.

ACTIVE DIRECTORY

1. You should know the four basic types of objects: users, contacts, computers, and groups. You should also know there are many objects that are never seen. Most of these objects define settings for programs like Exchange 2000.
2. The following table shows Active Directory group scopes.

Group Scope	Membership	Assigned Permissions For
Global	Users (own domain only)	Any trusted domain
	Global groups (own domain only)*	
Domain Local	Users (any trusted domain)	Own domain only
	Domain local groups (own domain only)*	
	Global groups (any trusted domain)	
	Universal groups (any trusted domain)*	
Universal*	Users (any trusted domain)	Any trusted domain
	Global groups (any trusted domain)	
	Universal groups (any trusted domain)	

** Universal groups are available only in native mode.*

3. In the schema, object classes are definitions of objects and attributes are definitions for the fields in an object.
4. The following table shows Windows 2000 Active Directory administrative groups.

Name	Scope	Member of	Control Over
Administrators	Local*	N/A	Own Computer
Administrators	Domain Local*	N/A	Own Domain
Domain Admins	Global	Administrators (Local)	All Computers in Domain
		Administrators (Domain Local)	Own Domain
Enterprise Admins	Universal**	Administrators (Domain Local)	All Domains in Forest

** Local groups are defined on computers, Domain Local groups are defined in domains.*

*** Enterprise Admins is a Universal group when the forest root is in native mode. In mixed mode, Enterprise Admins is a Global group.*

5. When logging onto a Windows 2000 computer, either a User Principal Name (UPN) or pre-Windows 2000 logon name is used. bill@wrbaldwin.com is an example of a UPN and BALDWIN\bill is an example of a pre-Windows 2000 logon name.

INSTALLING EXCHANGE 2000

6. The following table shows the Exchange 2000 hardware requirements.

Minimum	Recommended
Pentium-compatible 133MHz	Pentium-compatible 300MHz
128MB RAM	256MB RAM
500MB free hard disk space	2GB free hard disk space

7. The following table shows the Exchange 2000 setup.exe switches.

Switch	Description
/DisasterRecovery	Allows recovery of an Exchange 2000 installation after the server configuration has been restored from backup
/ForestPrep	Prepares your Windows 2000 forest for installation of Exchange 2000 by making Schema and configuration modifications. Only members of Schema Admins can run /ForestPrep.
/DomainPrep	Prepares the domain this computer is a member of for installation of Exchange 2000.
/CreateUnattend filename.ini	Create unattend file name filename.ini
/UnattendFile filename.ini	Run in unattended mode with settings in filename.ini
/Password password	Autologon password for current user
/EncryptMode	Run with /CreateUnattend in order to create an unattend file using encryption
/ShowUI	Used in conjunction with /UnattendFile to show the UI even though we are running off of an unattend file
NoEventLog	Used to turn off event logging
/NoErrorLog	Used to turn off error logging
/All	Used to enable all components for install, upgrade or reinstall

8. When Exchange 2000 is in mixed mode, servers can be moved between routing groups, but only if they stay in the same administrative group. In native mode, servers can move between administrative groups.
9. The Exchange System Manager does not display administrative groups and routing groups by default.
10. The Exchange Server 2000 Enterprise edition adds the chat service, unlimited store sizes, and multiple mailbox stores. The Exchange Server 2000 Standard edition only allows stores up to 16GB.
11. Before installing the Exchange System Management Tools on a computer, you should install the Windows 2000 Administrative Tools. These domain administration tools will be extended when the Exchange System Management Tools are installed. If the Windows 2000 Administrative Tools are installed after the Exchange System Management Tools, the Windows 2000 Administrative Tools will not be extended. Windows 2000 tools are installed using adminpak.msi.

EXCHANGE ADMINISTRATION

12. You should be able to categorize a company in a case study into one of these administrative models: centralized, distributed, or hybrid.
13. When a user or group is granted permission to an administrative group, the user or group has permissions to all objects in that administrative group. This inheritance is configured by default and can be modified.
14. To configure administrative groups prior to Exchange 2000 installation, run ForestPrep, and then install the Exchange System Management tools only. You can then use Exchange System Manager to create administrative groups.
15. When you delegate control of an administrative group to a user or group, you must also assign that user or group as Exchange View Only Administrator of the organization.

STORAGE

16. Each pre-Exchange 2000 server contains a single mailbox store. This store is called the *private information store*. Each pre-Exchange 2000 server contains a single public folder store. This store is called the *public information store*
17. The *rich text database file* (.edb) contains the headers of all messages saved in the store. This database will store all data of a message's store using Microsoft Outlook and *Messaging Application Programming Interface (MAPI).*

18. The *streaming database file* (.stm) contains the headers and data of all non-MAPI messages. This would include, but is not limited to, HTTP, NNTP, IMAP4, and POP3 messages. These messages are often formatted using *Messaging Internet Mail Extensions (MIME)*.
19. The process of converting, but not changing, data for clients in memory is referred to as *on-demand, in-memory content conversion* by Microsoft.
20. Non-MAPI messages stored in the streaming database file always have their header information duplicated in the rich text database file. This information is provided to improve the performance when a MAPI client views the non-MAPI files in a list.
21. Each Exchange 2000 server can have a maximum of four storage groups. Each storage group can contain six stores. One store in each storage group is reserved for the system, so the maximum user-creatable store in a storage group is five. This gives a maximum of twenty stores per Exchange 2000 server.
22. Circular logging is disabled by default; Microsoft recommends enabling it only if recovery to the point of failure is not required in the design.
23. Transaction logs should be placed on a separate hard disk spindle whenever possible. A spindle refers to a physical disk, not a disk partition
24. Know your RAID levels.
    - *RAID 0*—Also known as *striping*, RAID 0 combines two or more disks into a single logical unit. RAID 0 provided great read and write performance but does not provide fault tolerance.
    - *RAID 1*—Also known as *mirroring*, RAID 1 duplicates the entire contents of one drive to another. Because of this, the amount of usable disk space is half the total disk space. RAID 1 provides good read and write performance and provides fault tolerance in the event of any single spindle failure.
    - *RAID 5*—Also known as *striping with parity*, RAID 5 combines three or more disks into a single logical unit. RAID 5 uses parity to provide redundancy, reducing usable disk space by the size of one of the drives. RAID 5 provides good read performance but writes are slowed by the overhead of writing parity. RAID 5 provides fault tolerance in the event of any single spindle failure.
    - *RAID 10*—Also known as RAID 1 plus RAID 0, RAID 10 combines two or more disks into a single logical unit, and then mirrors them to an equal number of disks. RAID 10 requires a minimum of four spindles and the amount of usable disk space is half the total disk space. RAID 10 provides excellent read and great write performance.
25. The following table shows Exchange backup types for stores.

Type	Description	Delete Transaction Logs?
Full Backup	Backs up all the database files for the store and the transaction logs for the storage group	No
Copy Backup	Backs up all the database files for the store and the transaction logs for the storage group	No
Incremental	Backs up transaction logs that have changed since the last full or incremental backup	No
Differential	Backs up transaction logs than have changed since the last full backup	No

MESSAGE ROUTING

26. Pre-Exchange 2000 servers use Remote Procedure Call to communicate with other servers in the same site. This will include communications with both pre-Exchange 2000 computers and Exchange 2000 computers.
27. The following table shows common protocols and their ports. Note when using Secure Sockets Layer (SSL) some protocols use an additional port.

Protocol	Description	TCP port
SMTP	Simple Message Transfer Protocol	25 (with or without SSL)
POP3	Post Office Protocol version 3	110 (and 995 if using SSL)
IMAP4	Internet Message Access Protocol version 4	143 (and 993 if using SSL)
NNTP	Network News Transfer Protocol	119 (and 563 is using SSL)
HTTP	Hypertext Transfer Protocol	80 (and 443 is using SSL)
LDAP	Lightweight Directory Access Protocol	389

28. A routing group connector can specify zero or more local bridgehead servers.
29. The routing group connector can specify one or more remote bridgehead servers.
30. Routing group connectors use SMTP when communicating with Exchange 2000 servers and RPC when communicating with pre-Exchange 2000 servers.
31. SMTP connectors use SMTP and X.400 connectors use RPC.
32. When the front-end server is relaying HTTP traffic for Outlook Web Access, it is not necessary to contact Active Directory servers
33. When a front-end server communicates with Active Directory servers through the firewall, it will use the ports shown in the following table.

Protocol	TCP Port	UDP Port
LDAP (domain controller)	389	none
LDAP (Global Catalog server)	3268	
Kerberos	88	88
DNS	53	53
RPC ports	135 & 1024*	
Netlogon	445	

** The first RPC service use TCP port 1024, additional RPC services will use 1025, then 1026 and so on.*

MIGRATION

34. The Active Directory Migration Tool (ADMT) is used to migrate pre-Windows 2000 domains to Windows 2000 Active Directory.
35. If ADMT is run from another computer and not installed on the PDC, the following registry change must be made on the PDC in the source domain. Add the value TcpipClientSupport to the HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\LSA key. Set the data in TcpipClientSupport to 1.
36. The Active Directory Connector (ADC) service must be installed on a computer running Windows 2000 and only members of the Enterprise Admins group can install the ADC.
37. The Exchange 2000 version of the ADC has additional features such as public folder and configuration synchronization. The Exchange 2000 version of the ADC must be installed in an Exchange 5.5 organization before an Exchange 2000 server can join the Exchange 5.5 organization.
38. The following table shows the ADC object mapping.

Exchange 5.5 Object	Active Directory Object
Mailbox	Mailbox-enabled user
Custom recipient (with a domain account)	Mail-enabled user
Custom recipient (without a domain account)	Mail-enabled contact
Distribution list	Universal security group*

** When Windows 2000 is in mixed mode, Distribution lists are associated with Global Groups.*

39. Before upgrading a pre-Exchange 2000 server make sure it's running Windows 2000 Server or Advanced Server with Service Pack 1 or higher and Exchange 5.5 Server with Service Pack 3 or higher.
40. Exchange 2000 does not support customized Outlook Web Access (OWA) deployments that used active server pages (.asp).
41. The Site Replication Service (SRS) is an Exchange 2000 service that emulates the Exchange 5.5 directory service.

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