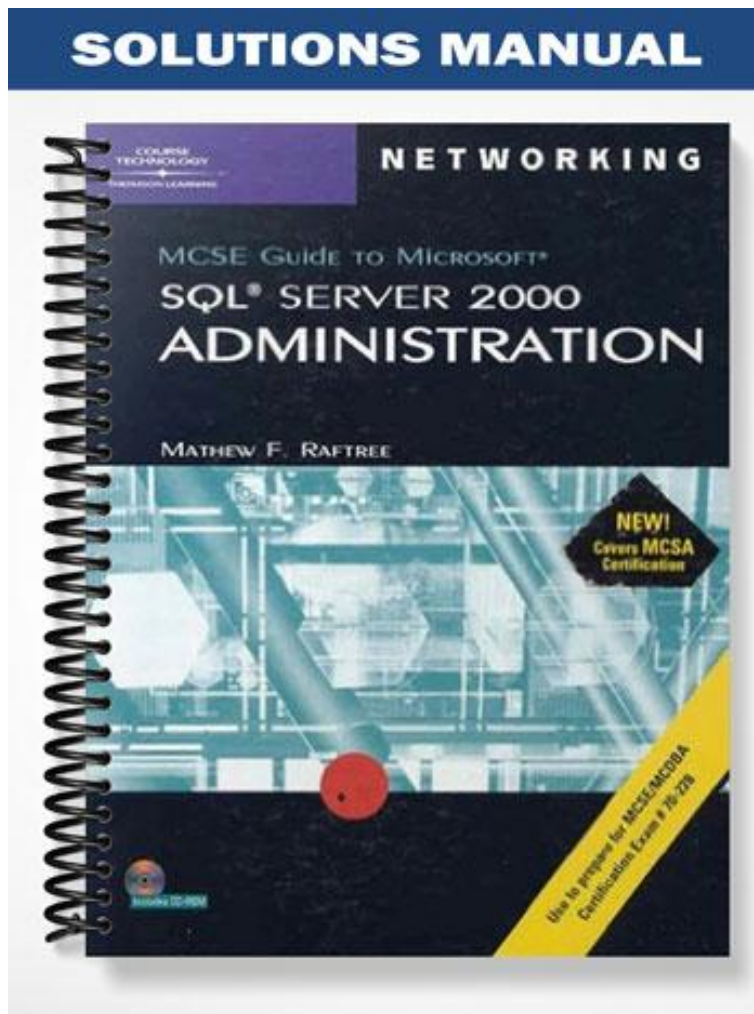
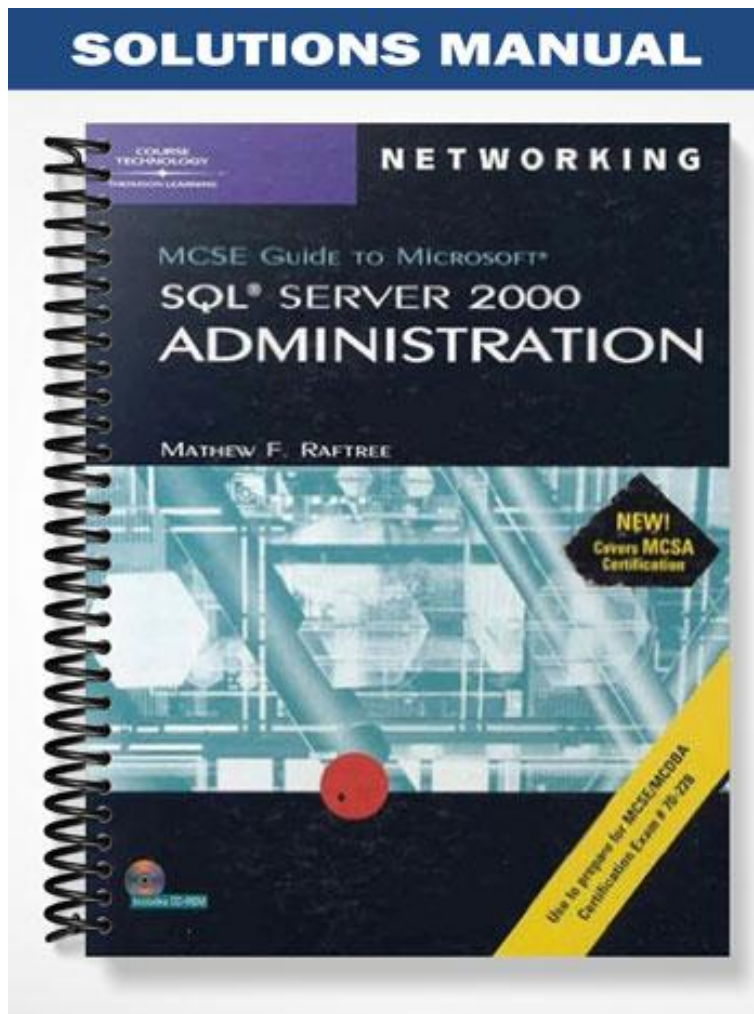


# SOLUTIONS MANUAL



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# Chapter 2: Installing and Upgrading SQL Server 2000

## Objectives

After reading this chapter and completing the exercises, students will be able to:

- Understand hardware and software requirements before installing or upgrading SQL Server 2000
- Install SQL Server 2000
- Upgrade an existing installation of SQL Server 2000
- Troubleshoot installations and upgrades

## Teaching Tips

### Hardware and Software Requirements of SQL Server 2000

1. Discuss with the class the hardware requirements necessary to begin a successful installation. Point out that these are the minimum requirements and that each deployment of SQL Server 2000 will have different hardware requirements to meet storage and performance needs.
2. Mention that in a typical production environment, a server with at least two Pentium processors and 256 MB or RAM is a good rule of thumb to use.
3. Review Table 2-2 pointing out the various operating systems that the different editions of SQL Server 2000 can run on.

### Additional Software Requirements

1. Describe some of the additional software requirements for SQL Server 2000 installations:
  - Internet Explorer 5 must be installed
  - If Windows NT Server is the operating system, Service Pack 5 or higher must be installed prior to SQL Server 2000 installation
  - If XML is going to be used, Internet Information Services must be installed prior to a SQL Server 2000 installation

### Installing SQL Server 2000

1. Consider installing SQL Server 2000 in a location where you have a projector and smartboard. The smartboard allows you to use it as a touch screen so the class can see each step of the process and you can point out each option or component as it is displayed.
2. Explain the assumptions being made about this installation:
  - The SQL Server will be used by a large-scale Web site for storing catalog information and processing transactions
  - The target computer will be running Windows 2000 Advanced Server and it has two processors
  - The target computer has a single hard drive (designated C:\)
3. Review with the class any other requirements that are necessary prior to beginning the setup process such as logging on as the local administrator, shutting down the Event Viewer and Registry Editor, and shutting down any services that are dependent on SQL Server.

## Running the Setup Program

1. Demonstrate and explain each of the options on the installation screen. Ground the students in each option.
2. Click the SQL Server 2000 Components menu item to bring up the next screen. Then click on Install Database Server option to begin the installation process. Now click the Next button on the Welcome screen. This will bring up the Computer Name screen.

## Installing SQL Server on a Local Computer

1. Explain to the class each step of the installation process as it is displayed on the screen. Emphasize the options they will encounter and why certain options are being chosen.
2. Depending on the services running there may be different options installed. Be sure to point these out to the class and discuss what is happening with each choice.

## Collation Considerations

1. Share with the students that collations control the physical storage of character data in SQL Server 2000. The default collation is based on the Windows locale of the computer on which SQL Server 2000 is being installed.
2. Talk about the components that make up a collation including single-byte characters, code pages, double-byte pages and Unicode.
3. Emphasize that when determining the appropriate collation, the first place to look is to the group of people who will use the system. If they all speak the same language then choose the specific collation for that language. If they speak multiple languages, then choose the collation that will support all of the languages.
4. Describe the various network library options and explain when they should or should not be installed.
5. Introduce the two licensing options for SQL Server 2000. Per Seat licensing is based on the number of devices that will connect to SQL Server 2000 and Processor Licensing is calculated on the number of processors (CPUs) that the SQL Server computer has.

## Failover Clustering Considerations

1. Talk about failover clustering and how it is implemented where there is a high availability requirement for a deployment. Illustrate how nodes, cluster groups, and heartbeats work together to keep database processing going without the end user noticing any disruption.

## Advanced Installation Options

1. Share with the students the concept of unattended installation by using the “Record Unattended .ISS file” option. All the prompts for an installation are provided but the selections are used to build an unattended installation file instead of actually installing SQL Server 2000. Once this file has been created, one can run the setup program with this .ISS file in an unattended install.

## SQL Server 2000 Upgrades

1. Discuss the upgrade options available from previous versions of SQL Server to SQL Server 2000 as well as upgrading from Standard Edition to Enterprise Edition.
2. Illustrate that they only have to select the “Upgrade, remove, or add components to an existing instance of SQL Server” option to trigger SQL Server 2000 Setup to detect the current version of SQL Server that is running and present a list of upgrade options
3. Stress that the Setup program has built-in recovery processes that resume an upgrade automatically in the event of a failure.

### Upgrading from SQL Server 7.0

1. Explain that there are two ways to upgrade databases to SQL Server 2000 from version 7.0. The first option is to upgrade all of the underlying components and the existing database by using the SQL Server 2000 Setup program. The second option is to use the Copy Database Wizard to move databases from a version 7.0 installation to an existing version 2000 instance.

### Upgrading from SQL Server 6.5

1. Remind the students that the differences between version 6.5 and 7.0 are so great that a straight upgrade cannot be performed from version 6.5 to 2000.
2. Go over each upgrade step and using a projector, demonstrate the procedure to upgrade from version 6.5 to 2000 using the SQL Server Upgrade Wizard.
3. Emphasize that once the upgrade is complete, the computer will have both a SQL Server 2000 instance and the preexisting SQL Server 6.5 installation. Both will be fully operational and can be managed from unique sets of the graphical administrative tools.

### Upgrading Editions of SQL Server 2000

1. Point out that upgrading editions or functionality of SQL Server 2000 is easily accomplished by running the Setup program and selecting the “Upgrade, remove, or add components to an existing SQL Server” option. They will then be prompted to either upgrade the current edition or to add components that are not already installed.

## Troubleshooting Installations and Upgrades

1. Stress that even with all of the automation and detection facilities of the Setup program, things can still go wrong. If a problem occurs that is not documented in the Books Online, one can access the Troubleshooters Web site at [HTTP://support.microsoft.com/support/tshoot/](http://support.microsoft.com/support/tshoot/).

### Useful Files for Diagnosing Problems

1. Explain that SQL Server Setup creates three files that can provide information about problems that occur during an installation or upgrade. These files are:
  - Sqlstp.log which records any errors that occur during the configuration portion of Setup
  - Setup.log is located in the \WINNT folder on the system drive of the target machine
  - Error.log contains the most recent error log for SQL Server 2000

## Quick Quiz

1. In a typical production environment, how many processors and how much RAM will be in the server?  
Answer: There will be at least two Pentium processors and 256 MB of RAM.
2. Will Netscape Communicator work with SQL Server 2000?  
Answer: There may be some times that it will work, but Microsoft requires Internet Explorer 5 to be loaded.
3. What is the default collation based on?  
Answer: The default collation is based on the Windows locale of the computer on which SQL Server 2000 is being installed.
4. While running the Setup program, where should one turn if there are problems?  
Answer: Books Online should be the first place one turns and next the Microsoft Troubleshooters web site, [HTTP://support.microsoft.com/support/tshoot/](http://support.microsoft.com/support/tshoot/), should be accessed.

## Class Discussion Topics

1. Take some time and discuss the installation process and review and steps the students find to be confusing.
2. Discuss the different option screens and why you would choose one option over another.

## Further Readings

1. Review the Microsoft Troubleshooters web site and determine possible problems that might arise during an installation and the recommended solutions to those problems. This site can be found at the following location [HTTP://support.microsoft.com/support/tshoot/](http://support.microsoft.com/support/tshoot/).

## Technical Notes for the Hands-On Projects

The lab setup for the Chapter 2 hands-on projects includes the following elements (see the table):

- Computer with Windows 2000 Advanced Server installed
- Microsoft SQL Server 2000 installed

HANDS-ON PROJECT	NETWORK DEVICES REQUIRED	WORKSTATION OR SERVER OPERATING SYSTEMS REQUIRED	OTHER RESOURCES REQUIRED
2-1: Determine if computer meets minimum hardware requirements		Computer with Windows 2000 Advanced Server installed	
2-2: Verify the SQL services have been setup properly		Computer with Windows 2000 Advanced Server installed	Microsoft SQL Server 2000 installed

<b>HANDS-ON PROJECT</b>	<b>NETWORK DEVICES REQUIRED</b>	<b>WORKSTATION OR SERVER OPERATING SYSTEMS REQUIRED</b>	<b>OTHER RESOURCES REQUIRED</b>
2-3: Review the directories created by the installation scenario		Computer with Windows 2000 Advanced Server installed	Microsoft SQL Server 2000 installed
2-4: Inspect registry entries created by the installation scenario		Computer with Windows 2000 Advanced Server installed	Microsoft SQL Server 2000 installed
2-5: Verify the installation with the Query Analyzer Tool		Computer with Windows 2000 Advanced Server installed	Microsoft SQL Server 2000 installed
2-6: Use SQL Server Licensing tool to change licensing information		Computer with Windows 2000 Advanced Server installed	Microsoft SQL Server 2000 installed

## Solutions

### Answers to the Chapter Review Questions

1. What is the recommended amount of RAM for SQL Server 2000 Enterprise Edition?  
*Answer: c. 128 MB*
2. What defines the set of rules for how characters are sorted and evaluated by comparison operations?  
*Answer: a. sort order*
3. Single-byte code pages support how many unique characters?  
*Answer: a. 256*
4. What is used to upgrade a version 7.0 installation to a version 2000 installation?  
*Answer: d. SQL Server 2000 Setup program*
5. In a high-volume Web site scenario, which licensing option is typically chosen?  
*Answer: a. Processor Licensing*
6. What is the default installation folder for SQL Server 2000?  
*Answer: b. C:\Program Files\Microsoft SQL Server\*
7. When multiple instances of SQL Server 2000 are installed on a single computer, which of the following is one of the resources that is shared across instances?  
*Answer: c. MS Search service*
8. Which of the following features is not affected by setting up the SQL Server service to log on using the local system account?  
*Answer: c. exporting data using Data Transformation Services (DTS)*

9. What software do the graphic administration tools and SQL Server Books Online require?  
*Answer: c. Internet Explorer 5*
10. Which of the following cannot be accomplished with the SQL Server 2000 Setup program?  
*Answer: c. upgrade a version 6.5 installation to version 2000*
11. What is the name of the log file containing errors that occurred during the Setup program?  
*Answer: c. Sqlstp.log*
12. The default collation for a new installation of SQL Server 2000 is based on?  
*Answer: b. the windows locale of the local machine*
13. What application must be installed on a computer prior to installing SQL Server 2000 if the XML features are going to be used?  
*Answer: a. Internet Information Server 5 (IIS 5.0)*
14. Which of the following is not an option on the Installation Definition screen of the Setup program?  
*Answer: c. OLAP Tools*
15. What is the file extension for an unattended installation file?  
*Answer: c. .iss*
16. Which feature of SQL Server 2000 is especially important to Application Service Provider (ASP) companies?  
*Answer: b. multiple instances*
17. A company uses SQL Server 7.0 to manage research information. Each of the users has access to SQL Server through a logon and password that are managed by SQL Server. The IT department wants to upgrade to SQL Server 2000 and it wants to continue to use the logons provided by the previous SQL Server 7.0 installation. Which authentication mode should you choose when upgrading their version 7.0 installation?  
*Answer: a. Mixed Mode*
18. A company wants to install SQL Server 2000 Standard Edition on three separate computers in three different countries. The three installations will not interact with each other, and each one will have users that speak a different language (requiring a different collation. However, all three of the computers will reside in a single hosted facility and have the same Windows locale. Which installation strategy should be used in this situation?  
*Answer: c. perform a custom installation on each computer*

## Case Projects

### Case 1

In this case each machine will have very different requirements. The development and testing computer should probably be installed with SQL Server 2000 Developer Edition because it provides all the features of the Enterprise Edition, but at a reduced price. Since there is only a small number of developers working on the HR application, it probably makes the most sense to use a per seat licensing scheme.

The computer that will house the live application is an entirely different story. To support such a large user population (1000), SQL Server 2000 Enterprise Edition should be installed. The most cost effective licensing would be per processor licensing in this situation as well.



## Case 2

The potential client has very reasonable requirements that are easily met by SQL Server 2000. In order to support multiple languages various collations can be used to store extended character information properly. SQL Server 2000 provides full support for unicode data so even languages like Chinese and Japanese (each with a large set of unique characters). Another powerful multilingual feature of SQL Server 2000 is the ability to specify collations all the way down to the field level in database tables.

Scalability is another common concern with all large, mission critical applications. SQL Server 2000 can scale to support a very large database by using federations of servers. This allows data to be distributed across multiple computers but still act as a single database. Distributed partition views would be developed to aggregate data on separate machines into a single queryable object. With true support for Windows 2000 Datacenter Server, a single instance of SQL Server 2000 can utilize 32 processors simultaneously.

In order to prevent system downtime in the event of a hardware or software error, SQL Server 2000 supports failover clustering through Microsoft Clustering Service. This allows a hot standby server to turn on automatically in the event of a failure on the production server. Other options to improve availability concern using hard drive arrays (RAID) as discussed in chapter 6.

## Case 3

The simplest solution to the problem is to install SQL Server 2000 at the headquarters office and be sure to record an unattended installation file (ISS). This file can then be distributed to the IT workers in the other offices so that they can simply run the SQL Server 2000 setup program and specify the ISS file. This will ensure that all of the instances installed will be identical. This is a good solution because it does not require a trip around the country for you to install SQL Server 2000 at each and every office. The IT workers in the other offices will not gain any familiarity with SQL Server 2000 if you use this strategy though. It could be more valuable to have them install an instance themselves based on a script you prepare for them. At least this way, IT workers in the satellite offices will gain some exposure to the product