3
NETWORK PROTOCOLS

PROJECTS

Project 3.1	Understanding Key Concepts
Overview	Because term definitions can sometimes vary on the context in which they are used, being able to recognize terms and how they are used in the context of network protocols is important. Even the use of the term protocol can somewhat vary, depending on the context. The terms presented in this project focus on two types of protocols, **access protocols** (also called **access methods**) and **network protocols.** Access protocols operate at the first two layers of the OSI model. Network protocols, even though most do not map directly to the OSI model, can be considered as operating through the Network layer of the OSI model. During this project, you match protocol-related terms to the definitions and descriptions of how they are used.
Outcomes	After completing this project, you will know how to: ▲ identify key terms and concepts related to access protocols and network protocols
What you'll need	To complete this project, you will need: ▲ the following worksheet
Completion time	20 minutes
Precautions	None

The worksheet includes a list of network protocol terms on the left and descriptions on the right. Match each term with the description that it most closely matches. You will *not* use all descriptions. Each description can be used only once.

___	Access protocol	A. TCP/IP suite protocol that provides connection-oriented packet delivery services
___	TCP/IP	B. How data is represented on the network for digital transmission as voltage levels or current changes
___	IPX/SPX	C. Bipolar signaling method that always returns to 0V after each +5V or −5V level representing a data bit
___	NWLink	D. IPX/SPX protocol that provides services supporting client/server connections
___	UDP	E. Protocol that operates at the Data Link layer of the OSI model and defines physical media access
___	TCP	F. Dynamically assigned unique computer addresses in an AppleTalk network

___	Encoding method	G. Network protocol used by Novell NetWare 4.0 and earlier
___	XNS	H. Values used with an IP address to identify the network and host portions of the IP address
___	NCP	I. Protocol in the TCP/IP protocol suite that provides connectionless packet delivery services without guarantee of delivery
___	Subnet mask	J. Fixed-size packet
___	Protocol stack	K. Early network protocol used as the basis for the development of many current network protocols
___	Cell	L. Address used to identify a network segment for routing purposes
___	Host address	M. Microsoft equivalent to the IPX/SPX protocol
___	Network address	N. Unique computer address on a network segment in a TCP/IP network
		O. The protocols installed on a computer as a protocol suite
		P. Network protocol required for Internet access

Project 3.2	Recognizing IEEE Standards
Overview	The network access methods used on PC networks are defined through the IEEE 802 standards. You need to be able to recognize these standards and how each applies to network access requirements. All of the 802 standards are compatible and work together through the Data Link layer of the OSI model. During this project you will match some of the most commonly used 802 standards to their descriptions.
Outcomes	After completing this project, you will know how to: ▲ identify IEEE 802.x access standards
What you'll need	To complete this project, you will need: ▲ the following worksheet
Completion time	15 minutes
Precautions	None

The following worksheet lists commonly used 802.x standards. Match each standard to its best description. You will use all of the descriptions.

___	802.2	A. Standard that defines the use of fiber-optic media in local and metropolitan area networks
___	802.3	B. Defines the upper portion of the Data Link layer, known as the Logical Link Control (LLC) sublayer
___	802.5	C. Set of standards defining support for wireless technologies and wireless networking with support for communication between two wireless clients and between a client and an access point
___	802.7	D. Standard created to define the Token Ring standard developed and trademarked by IBM
___	802.8	E. Standard defining support for 100-Mbps transmissions using the Demand Priority Access Method
___	802.11	F. Standard specifying the design, installation, and testing necessary for broadband transmissions in a full-duplex medium supporting multiplexing
___	802.12	G. Access method that is the standard for Ethernet, based on carrier sense with multiple access and collision detection

Project 3.3	Comparing Protocols
Overview	Understanding the various protocols that might be used on a PC network is important. The protocols include **network access protocols,** which are implemented through the Data Link level of the OSI model, and **network protocols,** which are implemented through the Network layer. Even though each term is the same, *protocol,* they support different features and functionality. During this project, you will identify access and network protocols by their descriptions and features.
Outcomes	After completing this project, you will know how to: ▲ identify network access protocols ▲ identify network communication protocols

What you'll need	To complete this project, you will need: ▲ the following worksheet
Completion time	20 minutes
Precautions	None

■ Part A: Identify Network Access Protocols

Part A includes Table 3-1 with common access protocols and a list of statements that describe one or more of them. Check the boxes for the letters that best describe each access protocol. Each statement applies to at least one access protocol. Some statements may apply to multiple protocols.

A. Determinant access method
B. Based on 802.11 standards
C. Uses CSMA/CD
D. Used in a logical or physical bus topology
E. Used in a logical or physical ring topology
F. Based on an IBM trademarked protocol
G. Most common implementation supports 100 Mbps
H. By default, can allow unauthorized connections from outside your network
I. Wired topology access method
J. Transmission control includes a backoff time

Table 3-1: Access Protocols

Access protocols	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Token Ring										
Ethernet										
Wireless										

■ Part B: Identify Network Communication Protocols

Part B includes Table 3-2 with common network protocols and a list of statements that describe one or more of them. Check the boxes for the letters that best describe each network protocol. Each statement applies to at least one network protocol. Some statements may apply to multiple protocols.

A. Includes routing support
B. Required for Internet access
C. Protocol on which Microsoft's NWLink is based
D. Also known as DoD protcol suite
E. Includes a suite of protocols performing various functions
F. Has two versions known as Phase 1 and Phase 2
G. Proprietary to Novell
H. Assembles devices into logical zones
I. Network and host address are differentiated by a subnet mask
J. Supports dynamic addressing through DHCP

Table 3-2: Network Protocols

Network protocols	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
TCP/IP										
IPX/SPX										
AppleTalk										

Project 3.4	Installing Network Protocols
Overview	Many operating systems, including Microsoft Windows, give you the option of installing multiple protocol stacks. This expands your options for communicating with different network devices, but at a cost. Each additional protocol stack requires additional memory and processor resources. Currently, most PC networks use TCP/IP as their only protocol. Support for other protocols is implemented either by installing one or more additional protocol stacks or by installing a bridge or gateway that translates between different protocols. When multiple protocols are installed, their relative priority is set through their binding order. During this project you will install additional protocol support for Windows 7 Professional or Windows 7 Enterprise and Windows Server 2008.
Outcomes	After completing this project, you will know how to: ▲ install multiple protocols ▲ configure the primary protocol
What you'll need	To complete this project, you will need: ▲ a computer running Windows 7 Professional or Windows 7 Enterprise ▲ a computer running Windows Server 2008 ▲ the following worksheet
Completion time	30 minutes

Precautions	If you are doing this project on an existing network, you must review the project steps with your network administrator. Your network administrator may need to make changes or additions to the installation instructions. This project assumes that Control Panel is configured for classic view.

■ Part A: Explore Windows 7 Professional or Windows 7 Enterprise Protocol Options

Complete this part of the project on the computer running Windows 7 Professional or Windows 7 Enterprise.

1. Open the **Control Panel,** select **Network and Internet,** and then double-click **View Network Status and Tasks**.
2. Open **Change Adapter Settings** in the upper left-hand window, as in Figure 3-1.

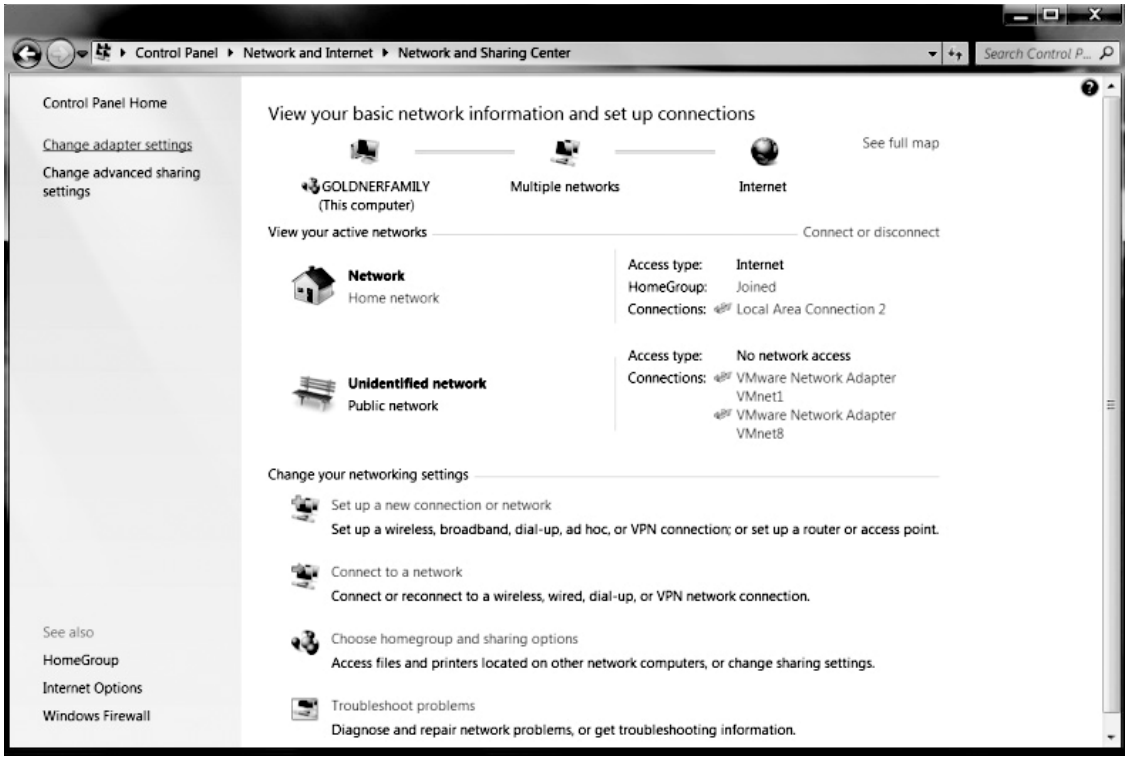

Figure 3-1: Change adapter settings

3. Double-click **Local Area Connection** (or double-click **Wireless Connection** if you have a wireless adapter).

4. Click **Properties** to open the **Local Area Connection Properties** dialog box. Because of the increased security built into Windows 7 Professional or Windows 7 Enterprise, you will be prompted for the administrator password. Refer to Figure 3-2.

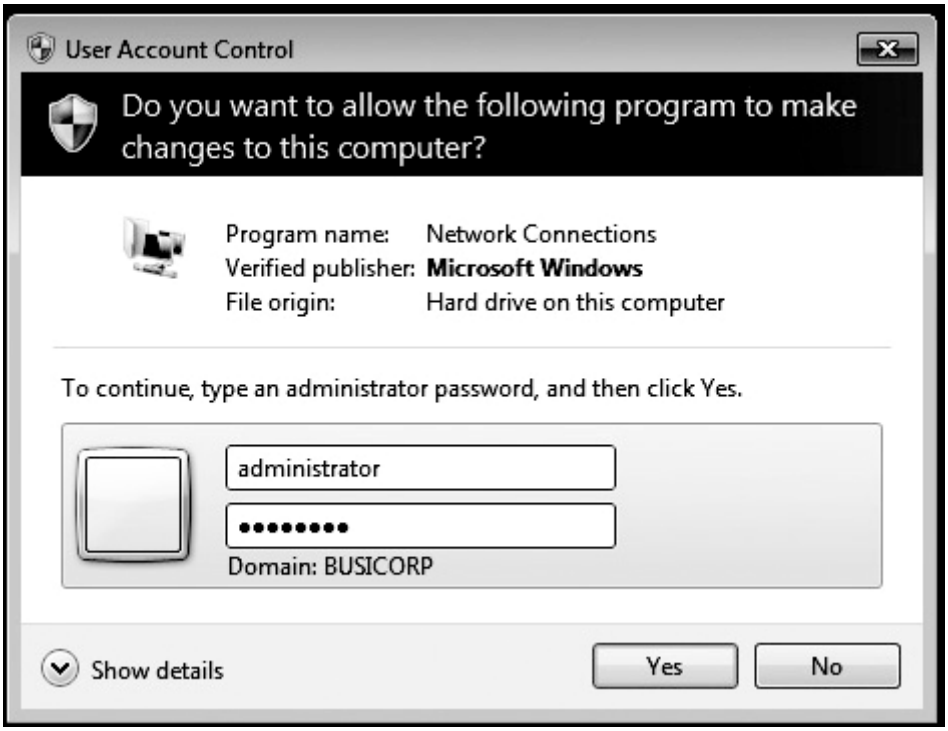

Figure 3-2: Administrative privilege access

5. The **Local Area Connection Properties** dialog box will open similar to Figure 3-3.

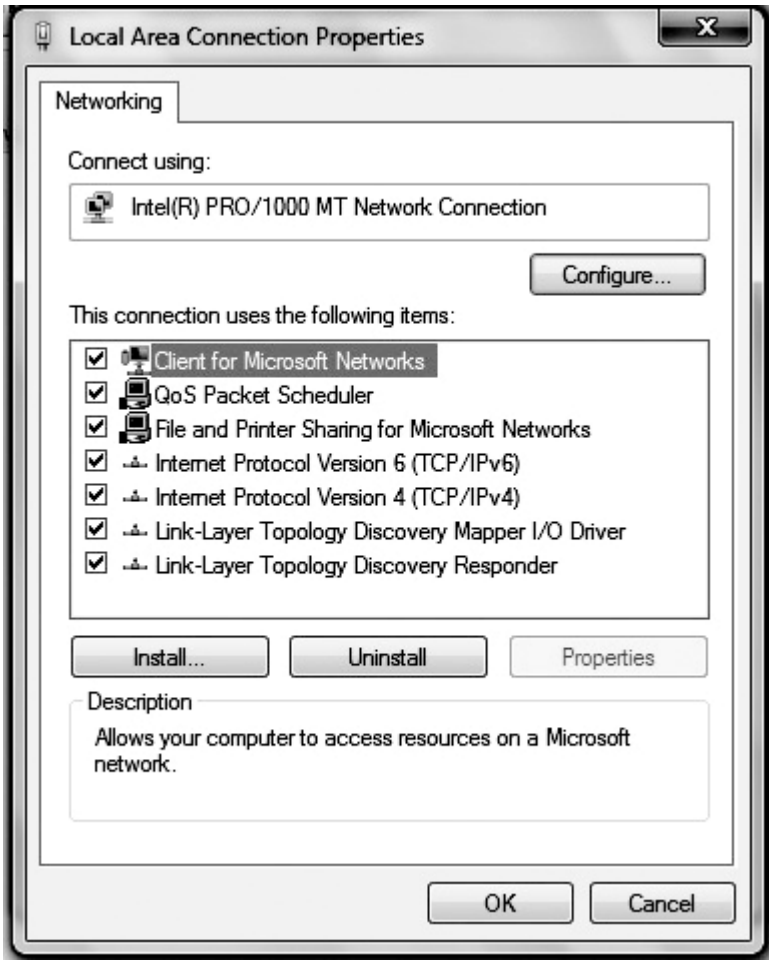

Figure 3-3: Local Area Connection Properties dialog box

6. Review the properties shown on the **General** tab. What protocol stack is currently installed?

_____

_____

7. Click **Install** to display a network component list similar to the one shown in Figure 3-4.

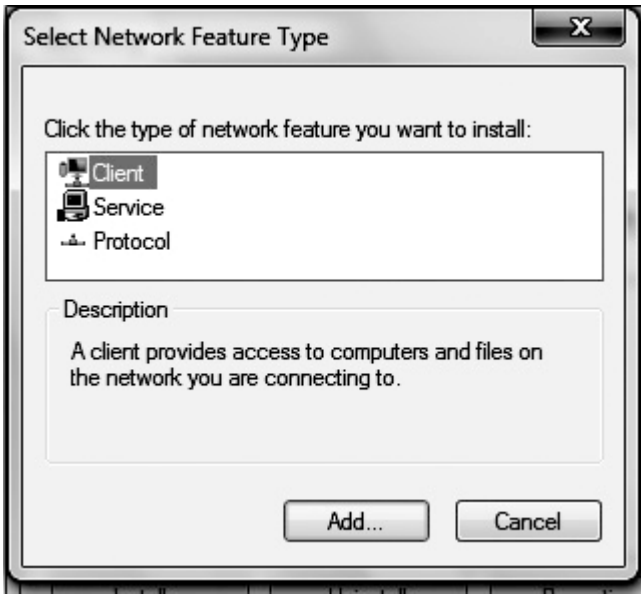

Figure 3-4: Network component list

8. Select **Protocol** and click **Add.** What options are supported?

_____

_____

_____

9. Select **Reliable Multicast Protocol** and click *OK.* What items are added to the local area connection properties?

_____

_____

10. Click *OK* to close the **Local Area Connection Properties** dialog box.
11. Click *Close.*

■ Part B: View Windows Server 2008 Protocol Options

Complete this part of the project on the computer running Windows Server 2008.

1. Open the **Control Panel**, select **Network and Internet**, and then double-click **View Network Status and Tasks**.
2. Open **Change Adapter Settings** in the upper left-hand window.
3. Double-click **Local Area Connection** (or double-click **Wireless Connection** if you have a wireless adapter).
4. Click **Properties** to open the **Local Area Connection Properties** dialog box.

5. Review the properties shown on the **Local Area Connection Properties** tab. What protocol stack is currently installed?

   _____

   _____

6. Click **Install** to display a network component list.
7. Select **Protocol** and click **Add.** What options are supported?

   _____

   _____

   _____

8. Select **Reliable Multicast Protocol** and click *OK*. What items are added to the local area connection properties?

   _____

   _____

9. Click *OK* to close the **Local Area Connection Properties** dialog box.
10. Click *Close.*