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8.1.4 The clients that best serve specific network operating systems and their resources
8.1.5 The directory services of the major network operating systems
8.1.6 IP, IPX, and NetBEUI and associate them with their functions
8.1.7 Mirroring, duplexing, striping, volumes, tape backup
8.1.8 The OSI model and the protocols, services, functions that pertain to each layer
8.1.9 Cat 3, Cat 5, fiber optic, UTP, and STP
8.1.10 10BASE2, 10BASE5, 10BASE-T, 100BASE-T, 100BASE-TX, 100BASEVG-AnyLAN
8.1.11 Full and Half-Duplexing, WAN and LAN; server, workstation, and host; server-based networking and peer-to-peer networking; cable, NIC, and router; broadband and baseband; Gateway (as both a default IP router and as a method to connect dissimilar systems or protocols)

8.2 Understand Physical Layer
8.2.1 Troubleshooting the physical layer when you have network problems after installing or replacing a NIC
8.2.2 Hubs, MAUs, switching hubs (switches), repeaters, transceivers

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8.6 TCP/IP Fundamentals
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8.6.2 DHCP, DNS, WINS, and host files
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8.6.5 The purpose and function of internet domain name server hierarchies (how email arrives in another country)
8.6.6 Class A, B, and C addresses and their default subnet mask numbers
8.6.7 The port numbers used (for example HTTP, FTP, SMTP) for a given service
8.6.8 Proxy and why it is used
8.6.9 IP address, DNS, default gateway, IP proxy, WINS, DHCP, host name, and internet domain name

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8.7.6 How and when to use IPCONFIG/WINIPCONFIG to test, validate, and troubleshoot IP connectivity
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8.8 Remote Connectivity
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8.8.2 The purpose and function of PPTP and the conditions under which it is useful
8.8.3 The attributes, advantages and disadvantages of ISDN and PSTN (POTS)
8.8.4 The modem configuration parameters which must be set (serial port IRQ, I/O address, maximum port speed) for dial-up networking to function
8.8.5 The requirements for a remote connection

8.9 Security
8.9.1 Selection of a security model (user and share levels) as a good practice to ensure network security
8.9.2 The use of standard password practices and procedures as a good practice to ensure network security
8.9.3 The need to employ data encryption to protect network data as a good practice to ensure network security
8.9.4 The use of a firewall as a good practice to ensure network connectivity

8.10 Implementing Installation of the Network
8.10.1 Administrative and test accounts, passwords, IP addresses, IP configurations, and relevant SOPs
8.10.2 The impact of environmental factors on computer networks
8.10.3 Common peripheral ports, external SCSI connections (esp. DB-25), print servers, hubs, routers, brouters, bridges, patch panels, UPSs, NICs, and token ring media filters
8.10.4 The consequences of trying to install an analog modem into a digital jack
8.10.5 The uses of RJ-45 connectors may differ greatly depending on the cabling
8.10.6 Patch cables contribute to the overall length of the cabling segment

8.11 Maintaining and Supporting the Network
8.11.1 The kinds of test documentation that are usually available regarding a vendors patches, fixes, upgrades, etc.
8.11.2 Demonstrate awareness of standard backup procedures back up media storage practices
8.11.3 The need for periodic application of software patches and other fixes to the network
8.11.4 The need to install anti-virus software on the server and workstation
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- **8.12.1** Troubleshooting approach
- **8.12.2** Distinguish whether a problem is attributable to the operator or the system
- **8.12.3** A second method for determining whether a problem is attributable to the operator or the system
- **8.12.4** The need to check the following as physical and logical indicators of trouble: link lights, power lights, error displays, error logs and displays, and performance monitors
- **8.12.5** Given a network problem scenario, determine the problem.
- **8.12.6** The purpose and function of common network tools including: a crossover cable, hardware loopback, tone generator, tone locator (fox and hound)

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- **9.1.1** Layer functions
- **9.1.2** The application layer
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- **9.4.2** Ethernet Frame
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- **9.5.2** Switches and Buffering
- **9.5.3** A " Flat Network "
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9.9 Spanning Tree Protocol
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9.10 Skills Based Sample Scenario - Lab Test
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