

Introduction to Networking 1B: Network Oversight

Network administrators are responsible for the oversight of an organization's computer network. This includes installing hardware and software but also relies on considerable technical skills to resolve network issues. Discover how to set up a network, troubleshoot problems, monitor network security, infrastructure, performance, and contribute to creating policies and procedures. As a network admin, you'll help keep businesses safe and running correctly.

Companion courses listed at the bottom.

Unit 1: Internet Protocol Fundamentals

We have all come to rely on the internet for instant answers to questions, as well as research, education, and entertainment. Exactly how do our devices access the internet, and how does the internet know where to send the requests for data? The answer is by the Internet Protocol *IP* address of the device. IP addressing provides a base for all other network and user services, making it the core of network design, even a network as large as the internet.

What will you learn in this unit?

1. Compare and contrast static, dynamic, public, and private IP addresses
2. Differentiate between classful and classless addressing
3. Explain TCP/IP protocols and ports
4. Identify IPv4 address classes and subnet masks, and develop addressing scheme with subnet chart

Unit 2: Networking Services

How do the words that we enter into a Google search actually travel across the internet? How does your computer know how to "find" another computer when sending data? You'll learn about how the domain name system resolves computer names to IP addresses, how the dynamic host configuration protocol ensures that each device on a network has a unique address, and how that data actually moves from point A to point B.

What will you learn in this unit?

1. Describe how the Domain Name System *DNS* functions
2. Explain the operation of the Dynamic Host Configuration Protocol *DHCP*
3. Compare and contrast VPNs and remote access
4. Differentiate between the internet, intranet, and extranet

Unit 3: Network Design

A company's computer network is more than likely the most important aspect of its business; it connects devices, provides for secure data storage, and enables employees to work efficiently. For most businesses, it is essential that the network is correctly set up not only to meet their current needs but also with the capability to grow. This introduction to network design brings previously learned concepts together as the elements of design are examined and put into practice.

What will you learn in this unit?

1. Design a network completing the seven steps of the engineering design process
2. Discuss different types of network documents
3. Compare and contrast network storage technologies
4. Explain the principles, benefits, and functions of virtualization
5. Identify common backup strategies and procedures

Unit 4: Network Monitoring

Believe it or not, creating a new network is the easy part! After it is up and running, the challenge becomes maintaining and monitoring the network to ensure that it is working efficiently, and the data is secured. And once people begin using the devices, there will be problems as the devices malfunction, fail, or otherwise do not work properly. Maintenance and monitoring are conducted daily and, in larger networks, might be a network technician's only responsibility.

What will you learn in this unit?

1. Describe tools used to monitor network security, infrastructure, and performance
2. Explain the purpose of establishing baselines
3. Elaborate on various ways to ensure system integrity
4. Summarize possible printer errors and troubleshooting methods

Unit 5: Network Troubleshooting

The ability to troubleshoot is an essential skill one needs when working as, or when trying to obtain a job as, a network technician or administrator. Network troubleshooting requires a good methodology and an understanding of connectivity, infrastructure issues, and the tools needed to address them. There are many ways to develop these skills, such as tinkering with your own network at home and volunteering at churches, Boys and Girls Clubs, and recreation centers that have a computer lab. You cannot put a price on practical experience.

What will you learn in this unit?

1. Summarize the network troubleshooting method
2. Discuss ways to troubleshoot various wired and wireless transmission issues
3. Explain how to address infrastructure issues, including hardware failures and bottlenecks
4. Identify hand tools and software tools used in troubleshooting network problems

Unit 6: Network Security: Threats and Mitigation

There are many threats to network security, and most security breaches are caused by people, not devices. Network administrators must secure the network against both outside and inside threats. And a hacker only needs to find and exploit one vulnerability in the system, so a network administrator has to try to eliminate them all! Understanding these types of attacks and how to prevent and mitigate them is key to keeping the network protected.

What will you learn in this unit?

1. Distinguish between network vulnerabilities and exploits
2. Compare and contrast common network security threats
3. Explain the concept of device hardening and discuss methods
4. Identify and explain data protection techniques

5. List physical security devices and summarize their uses

Unit 7: Network Security: Policies and Procedures

Years ago, when computers and networks were not in widespread use in the work environment, network administrators lost their jobs if unauthorized access occurred. Today, it isn't a question of if but when. Networks will be attacked and unauthorized access is likely to occur. In today's networked world, the goal is to be proactive, not reactive, and continue to find ways to make it more difficult for a hacker to gain access. Logon, disposal, and forensic procedures must be secure, and there should be policies in place to protect all data and equipment.

What will you learn in this unit?

1. Explain user logon procedures, including authentication, authorization, and accounting
2. Compare and contrast authentication types
3. Identify and discuss recommended elements of a password policy
4. Describe proper disposal procedures for data and electronic equipment
5. Summarize forensics procedures

Unit 8: Success in Networking: Other Skills and Duties

Network administrators develop numerous technical skills to troubleshoot and resolve network issues. However, these are not the only abilities that are needed to be successful in the job. Soft skills, such as interpersonal and communication skills, attitude, ethics, problem solving, and thinking critically are more important to employers than technical abilities. Employers can train employees to perform the technical aspects of their jobs. Developing employees' soft skills, which are based on behavior and personality, is much harder to do.

What will you learn in this unit?

1. Employ effective verbal and nonverbal communication skills
2. Solve problems and think critically
3. Demonstrate an understanding of legal, ethical and safety responsibilities in relation to the IT field
4. Identify potential benefits and problems for the future of telecommunications and data networking

Companion courses:

Network Security Fundamentals

Web Development