

DATA COMMUNICATION AND NETWORKING

INFT-1104-07



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Date: 16/4/2024

Journal Entry: Networking Essentials: Modules 8-17

In my journal, I will summarize the important concepts and valuable information I gained from Modules 8 to 17 of my networking classes. These modules have provided me with a comprehensive grasp of device setup, network security protocols, problem-solving techniques, and networking fundamentals.

Module 8: Network Layer

I learned about the key concepts of the network layer, focusing on topics like IP addressing, routing, and the role of routers in directing traffic between different networks. Understanding the structure of IPv4 and IPv6 headers, subnetting, and default gateways has been crucial in comprehending how data is transmitted across networks.

Module 9: Address Resolution

In this lesson we learned about the techniques used to translate IP addresses to MAC addresses, a crucial step for data transmission at the data link layer. Understanding ICMPv6 Neighbor Discovery for IPv6 and ARP for IPv4 gave me insight into how devices communicate and link up in a network.

Module 10: Basic Router Configuration

I gained valuable practical knowledge about router configuration by setting up default gateways, interfaces, and security settings on routers. Understanding the importance of password security, legal notifications, and configuration storage has significantly improved the integrity and dependability of router setups.

Module 11: IPv4 Addressing

I learned about subnetting strategies, the hierarchical structure of IPv4 addressing, and the importance of reducing broadcast domains for better network performance. Understanding Variable Length Subnet Masking has helped me improve my skills in optimizing network resources and creating efficient addressing schemes.

Module 12: IPv6 Addressing

I have learned a lot about IPv6, including its address structure, several types of addresses, and the Neighbor Discovery Protocol. The module highlighted the advantages of IPv6 compared to IPv4 and emphasized the importance of transitioning to IPv6 to keep up with the growing need for IP addresses and to support the expanding requirements of networks.

Module 13: ICMP

I have found it extremely beneficial to understand the role of ICMP in network troubleshooting and diagnostics. Learning about common ICMP messages and how they help detect network issues has equipped me with essential skills to maintain network performance and reliability.

Module 14: Transport Layer

Through our exploration of the transport layer, specifically TCP and UDP, we have gained a deeper understanding of how data is reliably transmitted between applications. Enhancing network performance has involved a thorough comprehension of port numbers, strategies for flow control, and the importance of efficiently controlling traffic.

Module 15: Application Layer

In this module, we learned about the services and protocols used at the application layer to facilitate communication between networked devices. Through studying client/server and peer-to-peer networking architectures, along with common

application layer protocols such as SMTP, DNS, and HTTP, I have gained a deeper understanding of how apps interact within a network setting.

Module 16: Network Security Fundamentals

I learned more about network security principles, including threat categories, vulnerability assessments, and mitigation methods. To ensure the protection of network assets and data, it is important to understand the importance of defense-in-depth strategies, implement security tools and services, and adhere to best practices for securing network devices.

Module 17: Practical Network Setup and Troubleshooting

In this module, I gained valuable skills for setting up and overseeing small networks, including IP addressing, planning for redundancy, and troubleshooting methods. Learning about diagnostic tools and commands like show, traceroute, and ping has equipped me with the capability to promptly and efficiently diagnose and resolve network issues.

Reflections:

I found Modules 8 through 17 to be both interesting and enriching. Each session has improved my skills as a network professional by teaching me the basics of networking and providing me with practical skills for network setup and troubleshooting. I now have more confidence in my ability to create, deploy, and maintain secure and reliable networks, and I am excited to put these skills into practice.

Commands	Purpose
show interfaces	Provides detailed statistics for all interfaces on the device, including information about data transmission. <i>Router# show interfaces GigabitEthernet0/1</i>

show version	<p>Displays device hardware and software information briefly.</p> <p><i>Router# show version</i></p>
show protocols	<p>Displays information about the configured routing protocols and their operational status.</p> <p><i>Router# show protocols</i></p>
transport input ssh	<p>Disables Telnet and allows only secure remote access via SSH.</p> <p><i>Router>enable</i></p> <p><i>Router# configure terminal</i></p> <p><i>Router(config)# line vty 0 14</i></p> <p><i>Router(config-line)# transport input ssh</i></p> <p><i>Router(config-line)# end</i></p>
show ipv6 route	<p>Displays the IPv6 routing table stored in RAM, which contains information about known IPv6 routes.</p> <p><i>Router# show ipv6 route</i></p>
exec-timeout	<p>Allows us to configure the timeout for the configuration command in minutes and seconds controlling user session duration.</p> <p><i>Router# configure terminal</i></p> <p><i>Router(config)# line console 0</i></p> <p><i>Router(config-line)# exec-timeout 10 30</i></p> <p><i>Router(config-line)# exit</i></p>

	<i>Router(config)# exit</i>
show ipv6 interface	Displays information about IPv6 interfaces. <i>Router# show ipv6 interfaces</i>
login block-for 120 attempts 3 within 60	Implements a security feature that blocks vty login attempts for a specified duration after a certain number of failed attempts within a specified time interval. <i>Router# configure terminal</i> <i>Router(config)# login block-for 120 attempts 3 within 60</i> <i>Router(config-line)# exit</i>
no cdp run	Globally disables Cisco Discovery Protocol (CDP) on the entire device. <i>Router# configure terminal</i> <i>Router(config)# no cdp run</i> <i>Router(config-line)# exit</i>
security passwords min-length 8	Enforces a minimum length for all configured passwords. <i>Router# configure terminal</i> <i>Router(config)# security passwords min-length 8</i>
terminal monitor	To enable the real-time display of log messages on the terminal. <i>Router# configure terminal</i> <i>Router(config)# terminal no monitor</i>

