Name _____ Date _____

Module 9 – QOS Concepts
Study Guide

Tips for success: While answering the questions read Module 9, review the summary, and complete the practice Quiz.

After completion of this chapter, you should be able to:

- Explain how network transmission characteristics impact quality.
- Describe minimum network requirements for voice, video, and data traffic.
- Describe the queuing algorithms used by networking devices.
- Describe the different QoS models.
- Explain how QoS uses mechanisms to ensure transmission quality.

9.1 Network Transmission Quality

9.1.1 Video Tutorial – The Purpose of QOS

9.1.2 Prioritizing Traffic

1. How does congestion occur?

    a.

    b.

2. What happens when the memory space used to que packet fills up?

8.1.3 Bandwidth, Congestion, Delay, and Jitter

3. What are the 2 types of delay and a definition of each:

    1. _____ -

    2. _____ -

4. What is jitter?

9.1.4 Packet Loss

5. How is playout-delay buffer used? What is the need?

6. What causes jitter?

7. What is DSP used for?

8. Define RTP. What is it used for?

9.1.5 Check Your Understanding – VPN Technology

9.2 Traffic Characteristics

9.2.1 Video Tutorial - Traffic Characteristics

9.2.2 Network Traffic Trends

9. What percentage of video traffic will encompass all Internet traffic is 2022?

9.2.3 Voice

10. What is the RTP port range used for prioritizing voice data?

11. For voice communications, latency should be no more than _____ ms, jitter should be no more than _____ ms, and voice packet loss should be no more than _____ %. Voice traffic requires at least _____ Kbps of bandwidth.

9.2.4 Video

12. What is RSTP?

13. For video communications, latency should be no more than _____ ms, jitter should be no more than _____ ms, and video packet loss should be no more than _____ %. Video traffic requires at least _____ Kbps of bandwidth.

9.2.5 Data

14. Data uses one or both of these layer 4 protocols:

    a. _____

    b. _____

15. What is the acronym QOE?

9.2.6 Check Your Understanding – Traffic Characteristics

8.3 Queuing Algorithms

8.3.1 Video Tutorial - QoS Algorithms

8.3.2 Queuing Overview

16. List the queuing algorithms available:

1.	
2.	
3.	
4.	

9.3.3 First In First Out

17. What is FIFO, how does it work?

18. When would be the best time to use FIFO queuing?

9.3.4 Weighted Fair Queuing (WFQ)

19. What is WQF, how does it work ?

20. How does WFQ classify traffic into different flows?

9.3.5 Class-Based Weighted Fair Queuing (CBWFQ)

21. What is CBWFQ, how does it work?

9.3.6 Low Latency Queuing (LLQ)

22. What is LLQ, how does it work?

9.3.7 Check Your Understanding - Queuing Algorithms

9.4 QoS Models

9.4.1 Video Tutorial - QoS Models

9.4.2 Selecting an Appropriate QoS Policy Model

23. List the three models and their benefits:

9.4.3 Best Effort

24. List the benefits and drawbacks of the best-effort model

9.4.4 Integrated Services

25. What is the IntServ architecture model and how does it work?

9.4.5 Differentiated Services

26. What is the DiffServ architecture model and how does it work?

9.4.6 Check Your Understanding - QoS Models

9.5 QoS Implementation Techniques

9.5.1 Video Tutorial - QoS Implementation Techniques

9.5.2 Avoiding Packet Loss

27. What is usually the reason for packet loss?

28. What can be done to prevent drops in sensitive applications?

a.

b.

c.

9.5.3 QoS Tools

29. List the three categories of QoS tools:

9.5.4 Classification and Marking

30. How does packet classification work?

9.5.5 Marking at Layer 2

31. What two fields are inserted into the Ethernet frame following the source MAC address field?

9.5.6 Marking at Layer 3

32. What two fields are given values in the IPv4 and IPv6 packet header?

9.5.7 Type of Service and Traffic Class Field

33. How many classes of service are enabled by the DSCP field??

9.5.8 DSCP Values

34. What are the three categories of DSCP values?

    a.

    b.

    c.

9.5.9 Class Selector Bits

35. What are the first 3 most significant bits of the DSCP field indicate?

36. What are these bits called?

9.5.10 Trust Boundaries

37. Where should the markings occur?

9.5.11 Congestion Avoidance

38. What is congestion management?

9.5.12 Shaping and Policing

39. What are traffic shaping and traffic policing?

40. What is the CIR?

41. What is bursting?

9.5.13 QoS Policy Guidelines

42. What are the three guidelines to ensure the best user experience?

    a.

    b.

    c.

9.5.14 Check Your Understanding - QoS Implementation Techniques

9.6 Module Practice and Quiz

9.6.1 What did I learn in this module?

9.6.2 Module Quiz - QoS Concepts