Chapter 11: Network Management

Answers to End-of-Chapter Questions

1. What are some cultural differences between LAN and WAN managers?
2. What is "firefighting?"
3. Why is combining voice and data a major organizational challenge?
4. Describe what configuration management encompasses.
5. People tend to think of software when documentation is mentioned. What is documentation in a network situation?
6. What is electronic software delivery and why is it important?
7. What is performance and fault management?
8. What does a help desk do?
9. What do trouble tickets report?
10. Several important statistics related to network uptime and downtime are discussed in this chapter. What are they and why are they important?
11. What is a service level agreement?
12. How is network availability calculated?
13. What is problem escalation?
14. What are the primary functions of end user support?
15. What is total cost of ownership?
16. Why is the total cost of ownership so high?
17. How can network costs be reduced?
18. What do network management software systems do and why are they important?
19. Discuss three types of network management software.
20. What is the Simple Network Management Protocol (SNMP)?
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21. What is RMON?

21. What is the name of SNMP's OSI competitor and how are they distinguished from one another?

23. What are the five categories of network test equipment?

24. What is the purpose of a fiber identifier?

25. How is a cable analyzer used?

26. What is a protocol analyzer?

TRUE/FALSE

The following are possible True/False questions for tests. The statement is given and the answer is provided in square brackets. The level of difficulty (easy, moderate, difficult) is also furnished.

1. Network managers manage the day-to-day operations of existing networks as one of their key tasks.  
   Easy

2. Network management is the process to operating, monitoring, and controlling the network to ensure it works as intended and provides value to its users.  
   Easy

3. If managers do not pay enough attention to planning and organizing the network, they are going to end up being proactive vs. reactive in solving network problems.  
   Moderate

4. The future of network management lies in the management of LANs, BNs, and Internet resources instead of concentrating on mainframe resources.  
   Moderate

5. Today, the critical issue of network management is managing the mainframe’s network.  
   Moderate

6. WAN managers often accuse LAN managers of being long-term planners who take a long time to get things done.  
   Moderate

7. One key to integrating diverse networks in an organization is for the individual network managers to realize that they no longer wield the same amount of power.  
   Moderate
8. Due to changing communication technologies, most companies have combined voice and data communications functions.  
*Moderate*

9. One of the least common configuration activities is adding and deleting user accounts.  
*Moderate*

10. One common configuration activity is updating the software on the client computers in the network.  
*Easy*

11. In many organizations, configuration documentation takes the form of a large set of network maps.  
*Easy*

12. User profiles should enable the network manager to identify to which files and directories each user has access.  
*Easy*

13. Mission-critical networks means that even a small network problem can cause serious business problems in an organization.  
*Moderate*

14. Failure control requires developing a decentralized control philosophy for problem reporting.  
*Moderate*

15. Because some problems tend to be forgotten during hectic schedules, problem tracking is important for letting the network manager determine who is responsible for correcting any outstanding problems.  
*Moderate*

16. Problem statistics are not helpful in determining whether vendors are meeting contractual maintenance commitments.  
*Moderate*

17. To ensure that critical problems get priority over less important ones, problem prioritizing is needed in a network.  
*Moderate*

18. Management reports can be helpful in determining network availability statistics.  
*Moderate*

19. Quality control charts are a simple tool that can be used by network managers to monitor network conditions.  
*Easy*
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20. When users receive training about fundamentals of network use, they become confident about what they need to do when working on a network.
_Moderate_

21. Network management software is designed primarily to provide manual support for at least some of the network management functions.
_Moderate_

22. RMON refers to Radical Management Optical Network.
_Easy_

**MULTIPLE CHOICE**

The following are possible multiple choice questions for tests. The question is posed and the answer is provided under the choices. The level of difficulty (easy, moderate, difficult) is also furnished.

1. ___________ is when network managers deal with network breakdowns and immediate problems, instead of performing tasks according to a well-laid-out plan.
   a. Multiplexing
   b. Multitasking
   c. Firefighting
   d. Fireflying
   e. Panicking

2. Which of the following is not a basic function of a network manager?
   a. cost management
   b. performance and fault management
   c. configuration management
   d. Web surfing
   e. end user support

3. One reason behind the technical network integration management issue is the fact that:
   a. Internet protocols are very similar to traditional mainframe protocols
   b. each LAN was developed by a centralized group
   c. the more different types of network technology used, the more complex network management becomes
   d. LANs can always be easily connected, via simple devices like a hub, to other networks in the organization
   e. all LANs used in an organization use the same type of technology
4. One reason behind the cultural network management issue is the fact that:
   a. WAN managers tend to have the same management styles as LAN managers
   b. LAN managers prefer standardized processes and procedures
   c. LAN managers tend to be slow to implement changes
   d. WAN managers tend to have very different management styles from LAN managers
   e. WAN managers like laissez faire management styles

5. To help integrate its network management, a central data communication organization should have a ___________ that defines its purpose and operational philosophy.
   a. LAN manual
   b. written charter
   c. wish list requirements
   d. corporate vision
   e. troubleshooting log

6. ___________ refers to managing and documenting the network’s hardware and software configuration.
   a. Troubleshooting
   b. Firefighting
   c. Configuration management
   d. Visioning
   e. Implementation

7. ___________ is also called automatic software distribution.
   a. Electronic Software Delivery
   b. Electronic Data Interchange
   c. Software architecture
   d. Automatic configuration management
   e. Email Software Uploading

8. Automatic software distribution:
   a. increases the cost of configuration management over the long term
   b. automatically produces documentation of software installed on each client computer
   c. can not maintain documentation of software installed on each client computer
   d. decreases costs in the short term
   e. has many standards today

9. Which of the following is typically not a part of configuration documentation?
   a. hardware documentation
   b. user profiles
   c. network documentation
   d. sales brochures for new hardware products being considered by the organization
   e. software documentation
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10. Documentation for network software:
   a. usually does not include information about the network operating system
   b. usually does not include information about any special purpose network software
   c. can help in negotiating site licenses for software
   d. is not generally needed since networks are comprised of hardware only
   e. is not important for monitoring adherence to software license rules

11. Auxiliary network documentation:
   a. need not include details about performance management
   b. need not include details about fault management
   c. includes vendor contracts and agreements and software licenses
   d. need not include legal requirements
   e. need not include vendor support telephone numbers

12. _________ ensures that the network is operating as efficiently as possible.
   a. Fault tolerance
   b. Fault management
   c. Firefighting
   d. Performance management
   e. Troubleshooting

13. _________ refers to preventing, detecting, and correcting faults in the network circuits, hardware, and software.
   a. Fault tolerance
   b. Fault management
   c. Firefighting
   d. Performance management
   e. Troubleshooting

14. ____________ refers to keeping track of the operation of network devices and circuits to make sure they are working properly.
   a. Fault tolerance
   b. Fault management
   c. Firefighting
   d. Performance management
   e. Network monitoring

15. ___________ are used by many large and small organizations to monitor and control their networks today.
   a. Multiplexers
   b. Modems
   c. Network management software
   d. Fault toleraters
   e. Concentrators
16. A __________ is an organizational department which is responsible for monitoring and fixing overall network problems.
   a. network control center
   b. mission critical area
   c. fault tolerance department
   d. mullion delimiter agency
   e. Web surfing guru headquarters

17. Which of the following would not be included as part of the physical network parameter statistics monitored by a NMS?
   a. stats on multiplexers
   b. stats on user response times
   c. stats on modems
   d. stats on circuits in the network
   e. stats on malfunctioning devices

18. Logical network parameter monitoring:
   a. operates actively
   b. includes performance measurement data on traffic volume on a particular circuit
   c. can not track the destination of data routed across the networks
   d. can not provide information about the levels of service provided by the network
   e. can not keep data about user response times

19. A _____ is a name given to customer service and problem resolution personnel who are part of the network support group.
   a. network control center
   b. mission critical area
   c. fault tolerance department
   d. mullion delimiter agency
   e. help desk

20. _______ network devices record data on the messages they process as well as performing their “normal” message processing functions.
   a. Faulty
   b. Bursty
   c. Smart
   d. Voice-activated
   e. Captain’s log-supporting

21. ____________ are reports produced by numerous network software packages for recording fault information.
   a. Trouble tickets
   b. Smart hub lists
   c. Bursty router printouts
   d. Roger systems checks
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e. Wish list documentation

22. _______ is an indicator of the efficiency of testing and problem management personnel.
   a. MTTD
   b. MTTRespond
   c. MTTRepair
   d. MTTFix
   e. MTTRate

23. _____ is a criteria that keeps track of how long it takes personnel to react to a network problem.
   a. MTTD
   b. MTTRespond
   c. MTTRepair
   d. MTTFix
   e. MTBF

24. ______ is a statistic which measures how quickly the staff could correct a network problem.
   a. MTTD
   b. MTTRespond
   c. MTBF
   d. MTTFix
   e. MTTRate

25. _____ is a statistic which indicates the reliability of a network component.
   a. MTTD
   b. MTTRespond
   c. MTTRepair
   d. MTTFix
   e. MTBF

26. _____________ is the percentage of time the network is usable by users.
   a. Availability
   b. MTTD
   c. MTBF
   d. MTTFix
   e. Retransmission rate

27. ___________ that are negotiated with providers, such as common carriers, specify the exact type of performance and fault conditions that an organization will accept.
   a. Trouble tickets
   b. Smart hub lists
   c. Bursty router printouts
   d. Service level agreements
   e. Wish list documentation
28. Which of the following is not a main function within end user support?
   a. resolving software problems
   b. training
   c. spin control
   d. resolving network faults
   e. none of the above is an appropriate answer

29. Which of the following is not a major source of a network problem that can be solved by network support?
   a. lack of user knowledge
   b. incompatibility between user software and network hardware and software
   c. failed hardware device
   d. use of the CD-ROM as a cup holder
   e. none of the above is an appropriate answer

30. When a user problem cannot be solved by the help desk at the first level of resolution, the problem is __________ to the second level of problem resolution.
   a. spun
   b. escalated
   c. burst
   d. firefought
   e. delimited

31. A new term for Web surfing is:
   a. Web sailing
   b. Web gardening
   c. Web spinning
   d. Web goofing
   e. Web blocking

32. _______ is a measure of how much it costs per year to keep one computer operating.
   a. Web gardening
   b. Total cost of ownership
   c. Software installation cost
   d. Hardware upgrade cost
   e. Support staff cost

33. __________ policies attempt to allocate costs associated with a WAN to specific users.
   a. Web spinning
   b. Internet access fees
   c. Support staff billing
   d. Charge-back
   e. ESD
34. Which of the following is not an important step in reducing network costs?
   a. automating as much of the network management process as possible
   b. developing standards for computers on the network
   c. reducing the time spent installing new software
   d. moving to fat client architectures
   e. centralizing help desks

35. __________ provides information about specific devices on a network.
   a. Device management software
   b. System management software
   c. Application management software
   d. Circuit management software
   e. Staff management software

36. When one failure in a device generates dozens of reports, that is known as a(n) ________,
   which can make it difficult to pinpoint the true source of the failure.
   a. alarm storm
   b. trouble ticket
   c. bursty printout
   d. mullion delimiter
   e. written charter

37. SNMP:
   a. refers to Systems Network Multiplexing Parameters
   b. was originally developed to control and monitor SNA network devices
   c. stores detailed information about each SNMP device in a MIB database
   d. is not an important network management software protocol
   e. has an extensive number of functions

38. CMIP:
   a. refers to Common Management Interface Protocol
   b. is exactly the same as SNMP
   c. is older than SNMP
   d. is more widely used than SNMP
   e. was developed by IBM

39. __________ focuses on testing the content of packets or frames and other items related to
    software protocols.
   a. Analog testing
   b. Digital testing
   c. Protocol testing
   d. Monitor testing
   e. Analyzer testing
40. ________ provide electrical connection to all parts of the network.
   a. Analog and digital test sets
   b. Monitors
   c. Analyzers
   d. Patch panels
   e. Data recorders

41. ________ are the least expensive and simplest type of network testing equipment.
   a. Analog and digital test sets
   b. Handheld test sets
   c. Analyzers
   d. Patch panels
   e. Data recorders

42. The ______ is a handheld device that can be plugged into a modem’s digital side to determine the voltage values for the circuit.
   a. bit-error rate tester
   b. breakout box
   c. patch panel
   d. data recorder
   e. monitor

43. The ____ is to locate a particular non-working fiber without interrupting service on a fiber optic network.
   a. bit-error rate tester
   b. breakout box
   c. patch panel
   d. bundle data recorder
   e. fiber identifier

44. A _____ checks LAN cabling for excessive noise in the data stream.
   a. bit-error rate tester
   b. cable analyzer
   c. patch panel
   d. bundle data recorder
   e. fiber identifier

45. ____________ decode messages on the circuit so you can see the content of a frame or packet during its transmission.
   a. Bit-error rate testers
   b. Cable analyzers
   c. Protocol analyzers
   d. Frame data recorders
   e. Cell identifiers
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46. ________ analyzers/monitors monitor and collect data which will be examined at a later time.
   a. Active
   b. Passive
   c. Trapping
   d. Polling
   e. Counting

47. ____________ have built-in microprocessor chips and programmable testing features for centralized or remote monitoring of equipment.
   a. Automated test equipment
   b. Bundle data recorders
   c. Mullion delimiters
   d. Frame data recorders
   e. Cell identifiers

**Short Answer Questions**

1. End user support is one area of responsibility that network managers have in the ongoing day-to-day operations of networks. Describe two other areas of responsibility.

2. Why do usage policies sometimes differ between LANs and WANs?

3. Explain how electronic software delivery can reduce the total cost of ownership.

4. Is configuration management important? Why?

5. Describe two ways to reduce the total cost of ownership.

6. How does a “managed” hub (e.g., an SNMP hub) differ from a “dumb” hub?

7. What does SNMP enable network managers to do, and why is this important?

8. How does SNMP with RMON differ from the previous version of SNMP without RMON?

9. Thought question: Some experts argue that the use of thin clients can reduce the total cost of ownership. Others argue that this does not have a significant impact. What factors do you think could cause this disagreement?

10. Thought question: What are the two most important aspects of network management? Justify your choices.
Next Day Air Service Case Study

1. If the responsibilities for managing communications were to be consolidated into one department, which one would you choose, and why? Base your answer on your knowledge of the communication management responsibilities exercised by both the Human Resources and Information Services Departments.

2. Review the organization chart for NDAS, as shown in Figure 1-8, and then develop an organization chart that reflects a realignment of the responsibilities for communications. Show separate organizational entities for both data processing and communications. Consider the pros and cons of creating a new communication manager position. Discuss the reasons why Next Day Air Service should promote someone from within the company to fill this new position. Now discuss the contrary reasons why NDAS should hire someone from outside the organization for this position. Which position will you take? Why?

3. Sketch out a simple network management system for NDAS. What software and hardware support would you recommend? Be sure you can justify the information items collected and reported for this system, as well as your software and hardware recommendations.