Multiple Choice Q&A

1. Which layer of the OSI model is responsible for logical addressing and routing?

A. Physical Layer

B. Data Link Layer

C. Network Layer

D. Transport Layer

Answer: C) Network Layer

2. In the TCP/IP reference model, what layer is responsible for host-to-host communication and data segmentation?

A. Network Layer

B. Transport Layer

C. Data Link Layer

D. Application Layer

Answer: B) Transport Layer

3. What is the primary function of the Data Link Layer in the OSI model?

A. Logical addressing

B. Error detection and correction

C. Physical medium access control

D. Data encryption

Answer: C) Physical medium access control

4. Which example network played a significant role in the development of the ARPANET?

   A. Ethernet

   B. Token Ring

   C. CSMA/CD

   D. NPL network

   Answer: D) NPL network

5. What does the acronym TCP/IP stand for?

   A. Transport Control Protocol/Internet Protocol

   B. The Computer Protocol/Internet Transmission

   C. Technical Control Process/Internet Transfer Protocol

   D. Transmission Control Protocol/Internet Protocol

   Answer: D) Transmission Control Protocol/Internet Protocol

6. Which transmission medium is known for its ability to carry data using light signals?

   A. Twisted pairs

   B. Coaxial cable

   C. Fiber optics

   D. Radio waves

   Answer: C) Fiber optics

7. What does the term "ARPANET" stand for?

   A. Advanced Research Projects Agency Network

   B. Automated Resource Planning and Networking

   C. Association of Regional Public Access Networks

   D. American Research and Project Network

   Answer: A) Advanced Research Projects Agency Network

8. In the OSI model, which layer is responsible for flow control and error detection at the transport level?

   A. Data Link Layer

   B. Network Layer

   C. Transport Layer

   D. Presentation Layer

   Answer: C) Transport Layer

9. Which reference model is commonly used in the design of modern computer networks and the internet?

   A. OSI model

   B. TCP/IP model

   C. ARPANET model

   D. Ethernet model

   Answer: B) TCP/IP model

10. Which transmission medium is commonly used for short-range wireless communication between devices like smartphones and headphones?

A. Twisted pairs

B. Coaxial cable

C. Infrared

D. Fiber optics

Answer: C) Infrared

11. What is the primary responsibility of the Data Link Layer in the OSI model?

A. Data encryption

B. Error detection and correction

C. Logical addressing

D. Physical medium access control

Answer: D) Physical medium access control

12. Which transmission medium is known for its immunity to electromagnetic interference and high bandwidth capabilities?

A. Twisted pairs

B. Coaxial cable

C. Fiber optics

D. Wireless transmission

Answer: C) Fiber optics

13. ARPANET, one of the earliest packet-switching networks, was developed by:

A. IBM

B. Microsoft

C. DARPA

D. Cisco

Answer: C) DARPA

14. Which of the following is an example of guided transmission media?

A. Wi-Fi

B. Fiber optics

C. Bluetooth

D. Infrared

Answer: B) Fiber optics

15. What does the OSI model stand for?

A. Open Systems Interface

B. Online System Integration

C. Open Systems Interconnection

D. Operational Systems Interface

Answer: C) Open Systems Interconnection

16. In the OSI model, which layer is responsible for routing and forwarding data between networks?

A. Data Link Layer

B. Network Layer

C. Transport Layer

D. Application Layer

Answer: B) Network Layer

17. In the TCP/IP model, which layer is responsible for ensuring data integrity and error recovery?

A. Network Layer

B. Transport Layer

C. Data Link Layer

D. Physical Layer

Answer: B) Transport Layer

18. What is the primary purpose of the Data Link Layer in the OSI model?

A. Data encryption

B. Logical addressing

C. Error detection and correction

D. Physical medium access control

Answer: D) Physical medium access control

19. Which reference model is widely used in the field of computer networking and is based on the internet's architecture?

A. OSI model

B. TCP/IP model

C. ARPANET model

D. Ethernet model

Answer: B) TCP/IP model

20. What is the primary responsibility of the Data Link Layer in the OSI model?

A. Data encryption

B. Error detection and correction

C. Logical addressing

D. Physical medium access control

Answer: D) Physical medium access control

21. In the TCP/IP reference model, what layer is responsible for host-to-host communication and data segmentation?

A. Network Layer

B. Transport Layer

C. Data Link Layer

D. Application Layer

Answer: B) Transport Layer

22. Which example network played a significant role in the development of the modern internet?

A. Ethernet

B. Token Ring

C. ARPANET

D. Bluetooth

Answer: C) ARPANET

23. Which transmission medium is known for its resistance to eavesdropping due to its use of light signals?

A. Twisted pairs

B. Coaxial cable

C. Fiber optics

D. Wireless transmission

Answer: C) Fiber optics

24. Which reference model divides networking tasks into seven layers?

A. OSI model

B. TCP/IP model

C. ARPANET model

D. Ethernet model

Answer: A) OSI model

25. What does the acronym TCP/IP stand for?

A. Transport Control Protocol/Internet Protocol

B. The Computer Protocol/Internet Transmission

C. Technical Control Process/Internet Transfer Protocol

D. Transmission Control Protocol/Internet Protocol

Answer: D) Transmission Control Protocol/Internet Protocol

26. Which layer of the OSI model is responsible for ensuring end-to-end communication between applications on different devices?

A. Data Link Layer

B. Transport Layer

C. Network Layer

D. Application Layer

Answer: D) Application Layer

27. What is the primary function of the Transport Layer in the OSI model?

A. Logical addressing

B. Data encryption

C. End-to-end communication

D. Physical medium access control

Answer: C) End-to-end communication

28. In the TCP/IP reference model, which layer is responsible for addressing and routing data packets?

A. Network Layer

B. Transport Layer

C. Data Link Layer

D. Physical Layer

Answer: A) Network Layer

29. Which example network played a significant role in the development of Ethernet technology?

A. ARPANET

B. Token Ring

C. NPL network

D. X.25 network

Answer: A) ARPANET

30. What is the primary purpose of the Data Link Layer in the OSI model?

A. Logical addressing

B. Error detection and correction

C. End-to-end communication

D. Physical medium access control

Answer: D) Physical medium access control

31. In the OSI model, which layer is responsible for flow control and error detection at the data link level?

A. Network Layer

B. Transport Layer

C. Data Link Layer

D. Presentation Layer

Answer: C) Data Link Layer

32. What does the term "ARPANET" stand for?

a. Advanced Research Projects Agency Network

b. Automated Resource Planning and Networking

c. Association of Regional Public Access Networks

d. American Research and Project Network

Answer: A) Advanced Research Projects Agency Network

33. In the TCP/IP model, what layer is responsible for host-to-host communication and data segmentation?

A. Network Layer

B. Transport Layer

C. Data Link Layer

D. Application Layer

Answer: B) Transport Layer

34. Which reference model is commonly used in the design of modern computer networks and the internet?

A. OSI model

B. TCP/IP model

C. ARPANET model

D. Ethernet model

Answer: B) TCP/IP model

35. Which transmission medium is commonly used for short-range wireless communication between devices like smartphones and headphones?

A. Twisted pairs

B. Coaxial cable

C. Infrared

D. Fiber optics

Answer: C) Infrared

36. What is the primary responsibility of the Presentation Layer in the OSI model?

A. Data encryption

B. Error detection and correction

C. Logical addressing

D. Data translation and formatting

Answer: D) Data translation and formatting

37. Which transmission medium is known for its ability to carry data using light signals?

A. Twisted pairs

B. Coaxial cable

C. Fiber optics

D. Radio waves

Answer: C) Fiber optics

38. ARPANET, one of the earliest packet-switching networks, was developed by:

A. IBM

B. Microsoft

C. DARPA

D. Cisco

Answer: C) DARPA

39. In the OSI model, which layer is responsible for addressing and routing data between networks?

A. Data Link Layer

B. Network Layer

C. Transport Layer

D. Presentation Layer

Answer: B) Network Layer

40. In the TCP/IP model, which layer is responsible for ensuring data integrity and error recovery?

A. Network Layer

B. Transport Layer

C. Data Link Layer

D. Physical Layer

Answer: B) Transport Layer

41. What is the primary purpose of the Data Link Layer in the OSI model?

A. Data encryption

B. Logical addressing

C. Error detection and correction

D. Physical medium access control

Answer: D) Physical medium access control

42. Which reference model is widely used in the field of computer networking and is based on the internet's architecture?

A. OSI model

B. TCP/IP model

C. ARPANET model

D. Ethernet model

Answer: B) TCP/IP model

43. In the OSI model, which layer is responsible for managing logical addresses, routing, and forwarding?

A. Physical Layer

B. Data Link Layer

C. Network Layer

D. Transport Layer

Answer: C) Network Layer

44. What is the primary responsibility of the Data Link Layer in the OSI model?

A. Data encryption

B. Error detection and correction

C. Logical addressing

D. Physical medium access control

Answer: D) Physical medium access control

45. Which transmission medium is commonly used for long-distance communication using electrical signals?

A. Twisted pairs

B. Coaxial cable

C. Fiber optics

D. Infrared

Answer: A) Twisted pairs

46. What is the primary responsibility of the Presentation Layer in the OSI model?

A. Data encryption

B. Error detection and correction

C. Logical addressing

D. Data translation and formatting

Answer: D) Data translation and formatting

47. Which reference model is widely used in the field of computer networking and is based on the internet's architecture?

A. OSI model

B. TCP/IP model

C. ARPANET model

D. Ethernet model

Answer: B) TCP/IP model

48. In the OSI model, which layer is responsible for flow control and error detection at the data link level?

A. Network Layer

B. Transport Layer

C. Data Link Layer

D. Presentation Layer

Answer: C) Data Link Layer

49. Which transmission medium is commonly used for long-distance communication using electrical signals?

A. Twisted pairs

B. Coaxial cable

C. Fiber optics

D. Infrared

Answer: A) Twisted pairs

50. What is the primary function of the Transport Layer in the OSI model?

A. Logical addressing

B. Data encryption

C. End-to-end communication

D. Physical medium access control

Answer: C) End-to-end communication

51. What is the primary goal of the Network Layer in the OSI model?

A. Data link establishment

B. Logical addressing

C. Error detection

D. Physical medium access

Answer: B) Logical addressing

52. Which routing algorithm selects the path with the least total cost?

A. Flooding

B. Hierarchical routing

C. Shortest path routing

D. Distance vector routing

Answer: C) Shortest path routing

53. What is the main disadvantage of the flooding routing algorithm?

A. Lack of scalability

B. Slow convergence

C. High redundancy

D. Lack of acknowledgment

Answer: C) High redundancy

54. In hierarchical routing, what is the purpose of dividing networks into levels or hierarchies?

A. To increase data redundancy

B. To reduce routing table size

C. To improve data encryption

D. To increase broadcast traffic

Answer: B) To reduce routing table size

55. What type of communication sends data from one source to all network destinations?

A. Unicast

B. Broadcast

C. Multicast

D. Anycast

Answer: B) Broadcast

56. Multicast communication is used for:

A. One-to-one communication

B. One-to-all communication

C. One-to-many or many-to-many communication

D. One-to-the-closest neighbor communication

Answer: C) One-to-many or many-to-many communication

57. Which routing algorithm periodically exchanges routing information with neighboring routers?

A. Flooding

B. Hierarchical routing

C. Distance vector routing

D. Shortest path routing

Answer: C) Distance vector routing

58. What is the primary role of a routing table in a router?

A. To determine the source IP address

B. To filter incoming packets

C. To identify the next hop for packet forwarding

D. To perform encryption of data packets

Answer: C) To identify the next hop for packet forwarding

59. Forwarding in the Network Layer refers to:

A. Determining the best path for routing

B. Sending data from one source to all network destinations

C. Managing congestion control

D. Error correction in data packets

Answer: B) Sending data from one source to all network destinations

60. Which routing algorithm relies on periodically exchanging routing tables with neighbors to update routes?

A. Distance vector routing

B. Hierarchical routing

C. Shortest path routing

D. Flooding

Answer: A) Distance vector routing

61. What is the advantage of hierarchical routing in large networks?

A. Reduced routing complexity

B. Faster data transmission

C. Increased redundancy

D. Improved encryption

Answer: A) Reduced routing complexity

62. What type of communication sends data from one source to a selected group of network destinations?

A. Unicast

B. Broadcast

C. Multicast

D. Anycast

Answer: C) Multicast

63. Which metric is commonly used in distance vector routing to determine the best path?

A. Hop count

B. Link bandwidth

C. Latency

D. Broadcast address

Answer: A) Hop count

64. How does a router use a routing table for forwarding decisions?

A. By selecting the path with the highest cost

B. By selecting the path with the lowest delay

C. By matching the destination IP address in the packet to the routing table entry

D. By choosing the shortest path based on link bandwidth

Answer: C) By matching the destination IP address in the packet to the routing table entry

65. What is the primary disadvantage of the flooding routing algorithm?

A. High bandwidth usage

B. Slow convergence

C. Limited scalability

D. Lack of acknowledgment

Answer: A) High bandwidth usage

66. In the OSI model, which layer is responsible for end-to-end communication between different networks?

A. Transport Layer

B. Network Layer

C. Data Link Layer

D. Application Layer

Answer: B) Network Layer

67. What is the primary advantage of multicast communication for group communication?

A. Reduced network latency

B. Decreased network congestion

C. Improved security

D. Efficient bandwidth usage

Answer: D) Efficient bandwidth usage

68. How does distance vector routing differ from link-state routing?

A. Distance vector routing uses a complete network topology.

B. Link-state routing periodically exchanges routing tables.

C. Distance vector routing is less efficient.

D. Link-state routing relies on hop count.

Answer: A) Distance vector routing uses a complete network topology.

69. What is the purpose of the Network Layer in the internet architecture?

A. Error detection

B. Logical addressing

C. Physical medium access

D. Data encryption

Answer: B) Logical addressing

70. Which type of routing is used for efficient one-to-many or many-to-many communication?

A. Unicast

B. Broadcast

C. Multicast

D. Anycast

Answer: C) Multicast

71. What does the routing metric in distance vector routing represent?

A. Latency

B. Cost of the path

C. Data size

D. Network address

Answer: B) Cost of the path

72. What is the primary role of hierarchical routing in network design?

A. To reduce network latency

B. To increase network encryption

C. To reduce routing table size

D. To improve network security

Answer: C) To reduce routing table size

73. In multicast communication, data is sent to:

A. One specific recipient

B. All network destinations

C. A selected group of recipients

D. The closest neighbor

Answer: C) A selected group of recipients

74. What is the main function of a routing algorithm?

A. Data encryption

B. Determining the best path for data transmission

C. Physical medium access control

D. Error correction

Answer: B) Determining the best path for data transmission

75. How does broadcast routing affect network scalability?

A. Improves scalability

B. Has no impact on scalability

C. Reduces scalability

D. Increases network redundancy

Answer: C) Reduces scalability

76. What is the primary function of the Data Link Layer?

A. Logical addressing

B. Data encryption

C. Error detection and correction

D. Flow control

Answer: C) Error detection and correction

77. What is the purpose of framing in the Data Link Layer?

A. To encrypt data

B. To divide data into manageable frames

C. To route data to its destination

D. To perform channel allocation

Answer: B) To divide data into manageable frames

78. Which error detection technique uses an extra bit to make the total number of 1's either even or odd?

A. Checksum

B. Parity checking

C. CRC (Cyclic Redundancy Check)

D. Hamming code

Answer: B) Parity checking

79. In a simplex communication protocol, data flows:

A. Bidirectionally

B. Only from sender to receiver

C. Only from receiver to sender

D. In both directions simultaneously

Answer: B) Only from sender to receiver

80. What does a stop-and-wait protocol do in an error-free channel?

A. Discards data packets

B. Retransmits data packets

C. Waits for acknowledgment

D. Sends data continuously

Answer: C) Waits for acknowledgment

81. In a noisy channel, what does a simplex stop-and-wait protocol do upon detecting an error?

A. Discards the frame

B. Continues sending without acknowledgment

C. Requests retransmission

D. Changes the communication medium

Answer: C) Requests retransmission

82. What advantage does a sliding window protocol offer over stop-and-wait in terms of efficiency?

A. Lower complexity

B. Higher bandwidth usage

C. Fewer acknowledgments

D. Simpler error detection

Answer: B) Higher bandwidth usage

83. How many frames can be in transit at the same time in a one-bit sliding window protocol?

A. One

B. Two

C. Three

D. Four

Answer: A) One

84. What is the main drawback of Go-Back-N ARQ protocol?

A. Inefficient use of bandwidth

B. Complexity in implementation

C. Slow acknowledgment process

D. Inability to recover from multiple lost frames

Answer: D) Inability to recover from multiple lost frames

85. How does the Selective Repeat ARQ protocol differ from Go-Back-N?

A. Selective Repeat retransmits all frames.

B. Selective Repeat does not use acknowledgments.

C. Selective Repeat retransmits only the lost frames.

D. Selective Repeat has a larger window size.

Answer: C) Selective Repeat retransmits only the lost frames.

86. What is the primary concern addressed by the Medium Access Control (MAC) sublayer?

A. Data encryption

B. Logical addressing

C. Channel allocation problem

D. Error correction

Answer: C) Channel allocation problem

87. Which multiple access protocol allows stations to send data whenever they want without sensing the channel?

A. ALOHA

B. CSMA/CD

C. Token passing

D. Polling

Answer: A) ALOHA

88. In Carrier Sense Multiple Access (CSMA), what does a station do before transmitting data?

A. It immediately transmits data.

B. It waits for a fixed time period.

C. It listens to the channel to check if it is busy.

D. It sends a token to the receiver.

Answer: C) It listens to the channel to check if it is busy.

89. What is the primary advantage of collision-free multiple access protocols?

A. Efficient bandwidth utilization

B. High data transmission speed

C. Low complexity

D. Reduced network latency

Answer: A) Efficient bandwidth utilization

90. How do wireless LANs handle the variable signal strength in their communication?

A. By using optical fiber cables

B. By adjusting transmission power

C. By relying on satellite communication

D. By using directional antennas

Answer: B) By adjusting transmission power

91. What is the primary function of a data link layer switch in a network?

A. Data encryption

B. Logical addressing

C. Error detection and correction

D. Efficient frame forwarding

Answer: D) Efficient frame forwarding

92. What is the purpose of error detection techniques in the Data Link Layer?

A. To prevent data collisions

B. To correct errors in the data

C. To identify errors in received frames

D. To encrypt data for security

Answer: C) To identify errors in received frames

93. Which of the following is an example of an error detection technique used in the Data Link Layer?

A. Flow control

B. Parity checking

C. Encryption

D. Logical addressing

Answer: B) Parity checking

94. In a simplex communication protocol, data flows:

A. Bidirectionally

B. Only from sender to receiver

C. Only from receiver to sender

D. In both directions simultaneously

Answer: B) Only from sender to receiver

95. What does a stop-and-wait protocol do in an error-free channel?

A. Discards data packets

B. Retransmits data packets

C. Waits for acknowledgment

D. Sends data continuously

Answer: C) Waits for acknowledgment

96. In a noisy channel, what does a simplex stop-and-wait protocol do upon detecting an error?

A. Discards the frame

B. Continues sending without acknowledgment

C. Requests retransmission

D. Changes the communication medium

Answer: C) Requests retransmission

97. What advantage does a sliding window protocol offer over stop-and-wait in terms of efficiency?

A. Lower complexity

B. Higher bandwidth usage

C. Fewer acknowledgments

D. Simpler error detection

Answer: B) Higher bandwidth usage

98. How many frames can be in transit at the same time in a one-bit sliding window protocol?

A. One

B. Two

C. Three

D. Four

Answer: A) One

99. What is the main drawback of Go-Back-N ARQ protocol?

A. Inefficient use of bandwidth

B. Complexity in implementation

C. Slow acknowledgment process

D. Inability to recover from multiple lost frames

Answer: D) Inability to recover from multiple lost frames

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D. Selective Repeat has a larger window size.

Answer: C) Selective Repeat retransmits only the lost frames.

101. What is the primary responsibility of the Data Link Layer in the OSI model?

A. Logical addressing

B. Error detection and correction

C. Data encryption

D. Physical medium access

Answer: B) Error detection and correction

102. What is the purpose of framing in data link layer protocols?

A. To create logical addresses

B. To divide data into smaller units called frames

C. To encrypt data for security

D. To perform routing

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A. Checksum

B. Parity checking

C. CRC (Cyclic Redundancy Check)

D. Hamming code

Answer: B) Parity checking

104. In a simplex communication protocol, data flows in which direction?

A. Only from sender to receiver

B. Only from receiver to sender

C. Bidirectionally

D. In a circular pattern

Answer: A) Only from sender to receiver

105. In an error-free channel, what does a stop-and-wait protocol do after sending a frame?

A. Discard the frame

B. Wait for an acknowledgment

C. Continue sending without waiting

D. Send the next frame immediately

Answer: B) Wait for an acknowledgment

106. In a noisy channel, what does a simplex stop-and-wait protocol do upon detecting an error?

A. Discard the frame

B. Continue sending without acknowledgment

C. Request retransmission

D. Increase the transmission power

Answer: C) Request retransmission

107. What advantage does a sliding window protocol offer over stop-and-wait in terms of efficiency?

A. Lower complexity

B. Higher bandwidth usage

C. Fewer acknowledgments

D. Simpler error detection

Answer: B) Higher bandwidth usage

108. In a one-bit sliding window protocol, how many frames can be in transit at the same time?

A. One

B. Two

C. Three

D. Four

Answer: A) One

109. What is the primary drawback of the Go-Back-N ARQ protocol?

A. Inefficient use of bandwidth

B. Complexity in implementation

C. Slow acknowledgment process

D. Inability to recover from multiple lost frames

Answer: D) Inability to recover from multiple lost frames

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D. Selective Repeat has a larger window size.

Answer: C) Selective Repeat retransmits only the lost frames.

111. What does the Medium Access Control (MAC) sublayer primarily address?

A. Data encryption

B. Logical addressing

C. Channel allocation problem

D. Error detection

Answer: C) Channel allocation problem

112. Which multiple access protocol allows stations to transmit data without sensing the channel?

A. ALOHA

B. CSMA/CD

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Answer: A) ALOHA

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C. Low complexity

D. Reduced network latency

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C. By relying on satellite communication

D. By using directional antennas

Answer: B) By adjusting transmission power

116. What is the primary function of a data link layer switch in a network?

A. Data encryption

B. Logical addressing

C. Error detection and correction

D. Efficient frame forwarding

Answer: D) Efficient frame forwarding

117. Which of the following is an example of an error detection technique used in the Data Link Layer?

A. Flow control

B. Parity checking

C. Encryption

D. Logical addressing

Answer: B) Parity checking

118. In a simplex communication protocol, data flows in which direction?

A. Only from sender to receiver

B. Only from receiver to sender

C. Bidirectionally

D. In a circular pattern

Answer: A) Only from sender to receiver

119. In an error-free channel, what does a stop-and-wait protocol do after sending a frame?

A. Discard the frame

B. Wait for an acknowledgment

C. Continue sending without waiting

D. Send the next frame immediately

Answer: B) Wait for an acknowledgment

120. In a noisy channel, what does a simplex stop-and-wait protocol do upon detecting an error?

A. Discard the frame

B. Continue sending without acknowledgment

C. Request retransmission

D. Increase the transmission power

Answer: C) Request retransmission

121. What advantage does a sliding window protocol offer over stop-and-wait in terms of efficiency?

A. Lower complexity

B. Higher bandwidth usage

C. Fewer acknowledgments

D. Simpler error detection

Answer: B) Higher bandwidth usage

122. In a one-bit sliding window protocol, how many frames can be in transit at the same time?

A. One

B. Two

C. Three

D. Four

Answer: A) One

123. What is the main drawback of the Go-Back-N ARQ protocol?

A. Inefficient use of bandwidth

B. Complexity in implementation

C. Slow acknowledgment process

D. Inability to recover from multiple lost frames

Answer: D) Inability to recover from multiple lost frames

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Answer: C) Selective Repeat retransmits only the lost frames.

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A. Data encryption

B. Logical addressing

C. Channel allocation problem

D. Error detection

Answer: C) Channel allocation problem