Chapter 2
Application Layer

True-False Questions

The following are possible True/False questions for tests. The statement is given and the answer is provided. The level of difficulty (easy, medium, hard), the reference section relevant to the topic, and learning objective are also furnished.

1. An application architecture is the way in which the functions of the application layer are performed solely by the clients in the network.

   Answer: **False**
   Difficulty: **Medium**
   Reference: **Application Architectures**
   L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

2. The four general functions of any application program are: data storage, data access logic, application logic and presentation logic.

   Answer: **True**
   Difficulty: **Easy**
   Reference: **Application Architectures**
   L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

3. A server farm is a group of computers that are linked together so they act as a one computer.

   Answer: **True**
   Difficulty: **Easy**
   Reference: **Application Architectures**
   L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

4. Host-based and client-based networks are similar in that the client computer performs most of the work.

   Answer: **False**
   Difficulty: **Easy**
   Reference: **Application Architectures**
   L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

5. The earliest data communications networks were client-server networks.

Answer: **False**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

6. As the demand for more and more network applications grow; host-based computing becomes the best solution.

Answer: **False**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

7. One major drawback to a client-server network lies in the fact that client-server networks enable software and hardware from different vendors to be used together.Your typical web browsing scenario where a person using a web browser accesses a web page from a server on the Internet is a good example of a client-server application architecture.

Answer: **True**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

8. In a client-server network, the presentation logic is the responsibility of the client computer.

Answer: **True**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

9. The two functions of middleware are to: 1) provide a standard way of communicating that can translate between software from different vendors, and 2) manage the message transfer between clients and servers so that clients do not need to ‘know’ which server contains the application’s data.

Answer: **True**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

10. Middleware is the software that sits between the application software on the client and the application software on the server.

Answer: **True**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

11. In the three-tier architecture, the software on the client computer is responsible for the presentation logic, an application server is responsible for the application logic and a separate database server is responsible for the data access logic and data storage.

Answer: **True**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

12. A "thin client" approach places most of the application logic on the client.

Answer: **False**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

13. The application architecture called the distributed computing model uses the "thick" client approach.

Answer: **False**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

14. Scalability refers to the ability to increase or decrease the capacity of the computing infrastructure in response to changing capacity needs.

Answer: **True**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

15. To use the Web, each client computer requires a data link layer software package called a Web browser.

Answer: **False**
Difficulty: **Easy**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

16. The standard protocol for communication between a Web browser and a Web server is the web protocol.

Answer: **False**
Difficulty: **Medium**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

17. The World Wide Web was conceived at University of Utah as part of the development of the Internet.

Answer: **False**
Difficulty: **Easy**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

18. A request header for an HTTP request starts with a command, such as GET, and ends with the HTTP version number that the browser understands.

Answer: **False**
Difficulty: **Easy**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

19. All three parts (request line, request header, request body) of an HTTP request from a web browser to a web server are required when a request is made.

Answer: **False**
Difficulty: **Medium**
Reference: **Electronic Mail**
L.O.: **Understand how email works**

20. The Simple Mail Transfer Protocol is the least commonly used e-mail standard.

Answer: **False**
Difficulty: **Easy**
Reference: **Electronic Mail**
L.O.: **Understand how email works**

21. The two-tier e-mail architecture does not require any application software on the client computer.

Answer: **False**
Difficulty: **Easy**
Reference: **Electronic Mail**
L.O.: **Understand how email works**

22. Using the POP standard for client to server e-mail communication, the e-mail messages remain on the server computer.

Answer: **False**
Difficulty: **Easy**
Reference: **Electronic Mail**
L.O.: **Understand how email works**

23. Web-based e-mail like Hotmail is an example of three-tier client-server architecture that provides access to e-mail messages.

Answer: **True**
Difficulty: **Medium**
Reference: **Electronic Mail**
L.O.: **Understand how email works**

24. The fundamental problem in client-based networks is that all data on the server must travel to the client for processing

Answer: **True**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

25. Cloud-hosted virtual desktops are now available through a service called DaaS allowing users to access the same client computer (virtual desktop) from any computer and any location.

Answer: **True**
Difficulty: **Medium**
Reference: **Other Applications**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

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, medium, hard), the reference section relevant to the topic, and learning objective are also furnished.

1. A(n) _____ is the way in which the functions of the application layer software are spread among the clients and servers in the network.
   a. anonymous FTP
   b. data access logic
   c. fat client
   d. application architecture
   e. response status architecture

   Answer: **D**
   Difficulty: **Easy**
   Reference: **Application Architectures**
   L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

2. A _____ is a very large general-purpose computer that is capable of performing *very many* functions as if these are done simultaneously, and storing *extremely large* amounts of data.
   a. workstation
   b. transaction terminal
   c. cluster
   d. mainframe
   e. personal computer

   Answer: **D**
   Difficulty: **Easy**
   Reference: **Application Architectures**
   L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

3. A _____ is a group of computers linked together so that they act as one computer.
   a. workstation
   b. transaction terminal
   c. server farm
   d. network computer
   e. transaction terminal

   Answer: **C**
   Difficulty: **Easy**
   Reference: **Application Architectures**
   L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

4. With the two-tier client-server architecture, the server is responsible for the _____ logic.

a. application
b. presentation
c. data access
d. session
e. physical

Answer: **C**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

5. Which of the following is **not** a general function by any application program?

a. data storage
b. data access logic
c. application logic
d. presentation logic
e. application access storage

Answer: **E**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

6. _____ is an application program function that deals with storing and retrieving data.

a. data storage
b. data access logic
c. application logic
d. presentation logic
e. application access storage

Answer: **A**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

7. An application program function is _____, or the processing required to access data.
    a. data storage
    b. data access logic
    c. application logic
    d. presentation logic
    e. application access storage

Answer: **B**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

8. _____, or the algorithms or business logic programmed into the application, can be simple or complex depending on the application.
    a. data storage
    b. data access logic
    c. application logic
    d. presentation logic
    e. application access storage

Answer: **C**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

9. _____ is the presentation of information to the user and the acceptance of the user's commands.
    a. data storage
    b. data access logic
    c. application logic
    d. presentation logic
    e. application access storage

Answer: **D**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

10. One underlying problem with a host-based network is that:
    a. there are economies of scale because all computer resources are centralized
    b. the server can get overloaded since it must process all messages
    c. the architecture is relatively simple and works well
    d. the server is the one point of control which simplifies security
    e. clients (terminals) do not require sophisticated hardware/software because they do not perform most of the work in this type of architecture

Answer: **B**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

11. With a client-based network, one fundamental problem is that:
    a. the clients each must store all the data
    b. the server does not have any data storage capability
    c. the host or server must perform presentation logic, application logic, and data access logic at the same time
    d. all data on the server must travel to the client for processing
    e. the clients must perform the data storage logic

Answer: **D**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

12. With the two-tier client-server architecture, the client is responsible for the _____ logic.

    a. session
    b. presentation
    c. data access
    d. data storage
    e. networking

Answer: **B**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

13. Client-server architectures:
    a. cannot connect computers that use different hardware
    b. are one of the least used network architectures today
    c. can use middleware to provide a standard way of communicating between software from more than one vendor
    d. assign the responsibility for the presentation logic to the server
    e. were the earliest type of network architectures

Answer: **C**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

14. How are the application architecture functions split up in a client-server network?
    a. the presentation logic and data storage are on the client, while the data access logic is on the server
    b. the data storage, data access, and presentation logic are on the client
    c. the presentation logic is on the client, while the data storage and data access logic are on the server
    d. the data storage and data access logic are on the client, while the presentation logic are on the server
    e. the presentation logic and data access logic are on the client, and the data storage is on the server

Answer: **C**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

15. In a client-server network, _____ gets software from different vendors to work together.
    a. a front-end processor
    b. serverware
    c. middleware
    d. centerware
    e. programmer

Answer: **C**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

16. _____ is **not** an important middleware standard.
    a. CORBA (Common Object Request Broker Architecture
    b. Distributed Computed Environment (DCE)
    c. Asynchronous Transfer Mode (ATM)
    d. Open Database Connectivity (ODBC)
    e. none of the above is an appropriate answer

    Answer: **C**
    Difficulty: **Medium**
    Reference: **Application Architectures**
    L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

17. A(n) _____-tiered architecture uses only two sets of computers: one set of clients and one set of servers.
    a. one
    b. two
    c. three
    d. five
    e. n

    Answer: **B**
    Difficulty: **Easy**
    Reference: **Application Architectures**
    L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

18. In the three tier architecture, the software on the client computer is responsible for the _____.

    a. presentation logic
    b. application logic
    c. data access logic
    d. data storage
    e. application storage

    Answer: **A**
    Difficulty: **Easy**
    Reference: **Application Architectures**
    L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

19. An N-tiered architecture:
    a. is generally more "scalable" than a three-tiered architecture
    b. is generally less "scalable" than a three-tiered architecture
    c. uses only two sets of computers in which the clients are responsible for the application and presentation logic, and the servers are responsible for the data
    d. uses exactly three sets of computers in which the client is responsible for presentation, one set of servers is responsible for data access logic and data storage, and application logic is spread across two or more different sets of servers
    e. puts less load on a network than a two-tiered architecture because there tends to be less communication among the servers

Answer: **A**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

20. One disadvantage of the _____ architecture is that places a greater load on the network.

    a. two-tier
    b. three tier
    c. one-tier
    d. n-tier
    e. layered

Answer: **D**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

21. A "thin client" architecture approach:
    a. always is a two-tier network architecture
    b. always is an n-tiered architecture
    c. places all or almost all of the application logic on the client
    d. places all or almost all of the application logic on the server
    e. refers to the size of the cable connecting the clients to the network

Answer: **D**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

22. A “thick client” architecture approach:
    a. always is a two-tier network architecture
    b. always is an n-tiered architecture
    c. places all or almost all of the application logic on the client
    d. places all or almost all of the application logic on the server
    e. refers to the size of the cable connecting the clients to the network

Answer: **C**
Difficulty: **Easy**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

23. With the “thin client” architecture, when an application changes, only the _____ with the application logic needs to be updated.
    a. client
    b. server
    c. middleware
    d. hardware
    e. software

Answer: **B**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

24. The idea for a special hypertext network, called the World Wide Web, was conceived of by:
    a. Microsoft in 1994 as part of the Windows 95 project
    b. Tim Berners-Lee at the European Laboratory for Particle Physics (CERN) in 1989
    c. Vinton Cerf, for the U.S. Department of Defense in 1969 as a network of four computers called ARPANET
    d. Howard Flieshman of IBM in 1982 as part of the development of the IBM PC
    e. the University of Minnesota as an extension of Gopher

Answer: **B**
Difficulty: **Easy**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

25. Marc Andreessen led a team that developed the first graphical Web browser, which was called:
    a. Internet Explorer
    b. Mosaic
    c. Firebird
    d. Netscape Navigator
    e. Mozilla

Answer: **B**
Difficulty: **Easy**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

26. To interact with the World Wide Web, a client computer needs an application layer software package called a:
    a. Web browser
    b. Web server
    c. Telnet package
    d. Uniform Resource Locator package
    e. Router package

Answer: **A**
Difficulty: **Easy**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

27. Each server on a network that needs to act as a web server needs an application layer software package called a (n) _____.

    a. browser
    b. application web
    c. web server
    d. operating system
    e. none of the above

Answer: **C**
Difficulty: **Easy**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

28. To get a page from the Web, a user must type in a URL, which stands for:
    a. Unknown Resource Locator
    b. Unknown Router Location
    c. Uniform Router Location
    d. Uniform Resource Locator
    e. Uniform Resource Library

Answer: **D**
Difficulty: **Easy**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

29. The protocol that makes it possible for a Macintosh web browser to be able to retrieve a Web page from a Microsoft Web server is called the _____.

    a. Hypertext Transfer Protocol
    b. File Transfer Protocol
    c. Simple Mail Transfer Protocol
    d. Internet Message Access Protocol
    e. Hyperlink Transfer Protocol.

Answer: **A**
Difficulty: **Medium**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

30. There are optional and required parts of an HTTP request. They are:
    a. request address, request body
    b. request address, request header, request body
    c. request line, request header
    d. request line, request body
    e. request line, request header, request body

Answer: **E**
Difficulty: **Medium**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

31. There are required and optional parts of an HTTP response. They are:
    a. response status, response header, response body
    b. response address, response header, response body
    c. response status, response body
    d. response address, response header
    e. response status, response header

Answer: **A**
Difficulty: **Medium**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

32. A response status code of 404 means:

a. the requested page was not found
b. the server is currently unavailable
c. the sever is currently busy
d. your browser is incompatible with the Web server software.
e. your browser needs to be updated to the latest version.

Answer: **A**
Difficulty: **Easy**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

33. The acronym, HTML, refers to:

a. Header Markup Language
b. Hypertext Markup Locator
c. Hypertext Markup Language
d. Hypertext Markup Library
e. Hypertext Modulating Language

Answer: **C**
Difficulty: **Easy**
Reference: **World Wide Web**
L.O.: **Understand how the Web works**

34. Which of the following is **not** an advantage of instant messaging?

a. It usually takes days for an IM message to be delivered to the recipient.
b. It allows real time typed messages to be exchanged.
c. Some products are ICQ and AOL Instant Messenger.
d. It is generally faster than snail-mail.
e. It helps people avoid telephone tag.

Answer: **A**
Difficulty: **Easy**
Reference: **Other Applications**
L.O.: **Be aware of how Telnet and instant messaging works**

35. The most commonly used e-mail standard is:

a. Simple Mail Transfer Protocol
b. X.400
c. CMC
d. Post Office Protocol
e. Telnet

Answer: **A**
Difficulty: **Easy**
Reference: **Electronic Mail**
L.O.: **Understand how email works**

36. In a two-tier client-server architecture, a client computer needs to use an application layer software package called a _____ to send e-mail:
    a. message transfer agent
    b. router agent
    c. mail user agent
    d. Webcast package
    e. gateway agent

Answer: **C**
Difficulty: **Medium**
Reference: **Electronic Mail**
L.O.: **Understand how email works**

37. Which of the following is **not** an example of a mail user agent software package?

    a. Outlook Express
    b. Microsoft Word
    c. Eudora
    d. Microsoft Outlook
    e. All of these are mail user agent packages

Answer: **B**
Difficulty: **Medium**
Reference: **Electronic Mail**
L.O.: **Understand how email works**

38. Another term for a mail user agent is:
    a. message transfer agent
    b. router agent
    c. e-mail client
    d. Webcast package
    e. Web client

Answer: **C**
Difficulty: **Easy**
Reference: **Electronic Mail**
L.O.: **Understand how email works**

39. IMAP (Internet Message Access Protocol):
    a. is a set of standards that define how email is to be processed between mail servers
    b. is exactly the same as SMTP
    c. copies an e-mail message from the client computer's hard disk, deletes it from the client, and stores it on the mail server
    d. is exactly the same as POP
    e. permits an e-mail message to remain stored on the mail server even after they have been read by a client computer

Answer: **E**
Difficulty: **Easy**
Reference: **Electronic Mail**
L.O.: **Understand how email works**

40. In a _____ architecture, computers are both client and server, thus sharing the work.
    a. Host-based
    b. Client-based
    c. Client-server
    d. Peer-to-peer
    e. Network

Answer: **D**
Difficulty: **Medium**
Reference: **Application Architectures**
L.O.: **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

41. The acronym, MIME, refers to:
    a. Multimedia Internet Mail Enterprise
    b. Multiple Internet Media Extension
    c. Multipurpose Internet Mail Extension
    d. Media Internet Mail Extension
    e. Multimedia Internet Mime Extension

Answer: **C**
Difficulty: **Easy**
Reference: **Electronic Mail**
L.O.: **Understand how email works**

42. One of the most frequently used Telnet applications is
    a. WS-FTP
    b. PuTTY
    c. Outlook
    d. Word
    e. FTP

Answer: **B**
Difficulty: **Medium**
Reference: **Other Applications**
L.O.: **Be aware of how Telnet and instant messaging works**

43. What technique is used by most videoconferencing applications to reduce the amount of data being transmitted?
    a. hashing
    b. encryption
    c. authentication
    d. identification
    e. compression

Answer: **E**
Difficulty: **Medium**
Reference: **Other Applications**
L.O.: **Be aware of how Telnet and instant messaging works**

44. Which of the following is **not** true about Telnet?
    a. Telnet requires an application layer program on the client computer and an application layer program on the server or host computer.
    b. Telnet poses no security threat.
    c. Telnet was designed in the early days of the Internet.
    d. Keystrokes are sent over the network in clear text.
    e. One program that conforms to the Telnet standard is PuTTY.

Answer: **B**
Difficulty: **Medium**
Reference: **Other Applications**
L.O.: **Be aware of how Telnet and instant messaging works**

45. _____ is a special type of one directional; videoconferencing in which content is sent from the server to the user.

    a. broadcasting
    b. instant messaging
    c. webcasting
    d. H.323
    e. Net Meeting.

Answer: **C**
Difficulty: **Medium**
Reference: **Other Applications**
L.O.: **Be aware of how Telnet and instant messaging works**

46. In a host-based system with a mainframe, upgrades to the host are _____.
    a. Small
    b. Cheap
    c. Lumpy
    d. Never going to happen
    e. Always performed annually

Answer: **C**
Difficulty: **Easy**
Reference: **Application Architecture**

L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

47. The software that runs on the mail server is referred to as the _____
    a. Mail transfer agent
    b. Mail user agent
    c. Microsoft Outlook
    d. Web server
    e. SMTP

Answer: **A**
Difficulty: **Easy**
Reference: **Electronic Mail**
L.O.: **Understand how email works**

48. The standards H.320, H.323, and MPEG-2 are commonly used with
    a. Telnet
    b. Videoconferencing
    c. Email
    d. IM
    e. Microsoft Office

Answer: **B**
Difficulty: **Medium**
Reference: **Other Applications**
L.O.: **Be aware of how Telnet and instant messaging works**

50. The _____ cloud deployment model provides the highest levels of control, privacy and security.
    a. private
    b. public
    c. community
    d. hybrid

Answer: **A**
Difficulty: **Easy**
Reference: **Application Architecture**
L.O. : **Understand host-based, client-based, client-server, cloud-based, and peer-to-peer application architectures**

51. The _____ clouds realize the benefits from cloud infrastructure (such as speed of deployment) with the added level of privacy and security that private clouds offer.
    a. private
    b. public
    c. community
    d. hybrid

Answer: **C**
Difficulty: **Easy**
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52. With _____, the cloud provider manages the hardware including servers, storage, and networking components. The organization is responsible for all the software, including operating system (and virtualization software), database software, and its applications and data.

a. private clouds
b. hardware clouds
c. storage services
d. IaaS

Answer: **D**
Difficulty: **Easy**
Reference: **Application Architecture**
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Essay and Short Answer Questions

1. Describe the history of the Internet and the Web (part of this is in Chapter 1, part in Chapter 2). Where do you forsee the future evolution of the Internet heading, and why?

2. What do the following tools enable you to do: the Web, email, Telnet, IM?

3. How can the Internet be used for competitive advantage in business? Describe three firms which are using the Internet for conducting business, and speculate as to the underlying technologies which might be in use in these firms. Will the Internet become an essential business tool like the telephone or will it go the way of the dinosaurs? What do you envision the Internet and web becoming in the future for businesses? Discuss.

4. For what is HTTP used? What are its major parts? Are all required?

5. For what is HTML used? What are its major parts? Are all required?

6. Describe how a Web browser and Web server work together to send a web page to a user.

7. Describe how mail user agents and message transfer agents work together to transfer mail messages, including a diagram.

8. Describe the difference between a two tier and three tier email message transfer, using diagrams and discussing how this approach differs from the two layer email transfer. Do users always require the same architecture for email? Why or why not? Discuss.

9. What is MIME? What does it stand for? Why was it developed?

10. What are the standards SMTP, POP, and IMAP? What roles do SMTP, POP, and IMAP play in sending and receiving email on the Internet? What do these acronyms stand for?

11. What are the major parts of an email message?

12. What is X.400 and CMC?

13. What is cloud computing and how is it useful?

14. What is Telnet and why is it useful?

15. What is IM? How does it work?

17. Discuss the functions of a web browser. Describe two web browsers. What was the first graphical Web browser? What are three search engines that you might use to find information on the Internet?

18. What are the three major parts of an HTTP request and what information does each part contain? Why does HTTP include a version number as part of the packet?

19. What do a user agent and message transfer agent do in an SMTP/IMAP email system? What are some examples of user agent packages?

20. Describe a two-tier, three-tier and n-tier architecture. What is a network architecture? Compare and contrast two-tiered, three-tiered, and n-tiered client server architectures. What are the technical differences and what advantages and disadvantages do each offer? How does a two-tier client server network differ from an n-tier client server network. Describe one advantage and one disadvantage that a three-tier architecture has compared to a two-tier architecture.

21. What are the advantages and disadvantages of host-based networks versus client-server networks? Explain two major benefits and/or limitations of client-server networks compared to host-based networks.

22. What is middleware and what does it do?

23. Suppose your organization was contemplating switching from a host-based architecture to client-server. What problems would you foresee?

24. Compare private, public, and community cloud architectures.