## Multiple Choice

1. Designing an architecture can be what?
   1. Tedious and therefore younger members of the team are usually urged to take the lead.
   2. Easy and therefore more experienced members of the department take the lead.
   3. Easy and therefore outside consultants are often sourced to do the task.
   4. Easy and therefore experienced internal members are sourced to the task.
   5. Difficult and therefore, many organizations use the skills of experienced, expert system architects (consultants or employees) who specialize in the task.

Ans: e

Reference: Introduction

Difficulty: Medium

1. The objective of architecture design is to determine what?
   1. How aesthetically pleasing the server system will be
   2. What parts of the application software will be assigned to what hardware
   3. How the computers will be arranged to provide ample storage
   4. Where the mainframe will be situated
   5. None of these

Ans: b

Reference: Elements of an Architecture Design

Difficulty: Medium

1. The major architectural components of any system are the what?
   1. IT Department
   2. Hardware
   3. Software
   4. IT Department and Hardware
   5. Hardware and Software

Ans: e

Reference: Architectural Components

Difficulty: Medium

1. Software systems can be divided into how many basic functions?
   1. 1
   2. 2
   3. 3
   4. 4
   5. 5

Ans: d

Reference: Architectural Components

Difficulty: Medium

1. There are \_\_\_\_\_ primary hardware components of a system.
   1. 1
   2. 2
   3. 3
   4. 4
   5. 5

Ans: c

Reference: Architectural Components

Difficulty: Medium

1. The primary hardware components of a system consist of:
   1. Client Computers
   2. Servers
   3. Network
   4. Client Computers and Servers
   5. Client Computers, Servers, and Network

Ans: e

Reference: Architectural Components

Difficulty: Medium

1. Form(s) of network connection(s) in a system include:
   1. ATM
   2. T2
   3. DSL
   4. ATM and DSL
   5. T2 and DSL

Ans: d

Reference: Architectural Components

Difficulty: Medium

1. Server-based architecture is:
   1. When the clients capture keystrokes
   2. The very first architecture system
   3. Outdated and never used
   4. When the clients capture keystrokes and the very first architecture system
   5. When the clients capture keystrokes, the very first architecture system and outdated and never used

Ans: d

Reference: Server Based Architecture

Difficulty: Medium

1. Mobile application architectures are where the:
   1. Client devise is responsible for presentation logic
   2. Client devise is responsible for business logic
   3. The server is responsible for data access logic
   4. The server stores the data
   5. All of these

Ans: e

Reference: Mobile Application Architecture

Difficulty: Medium

1. Client-server architecture holds the client responsible for\_\_\_\_\_ and server is only responsible for \_\_\_\_\_.
   1. Application Logic; Presentation Logic
   2. Presentation Logic; Data Access Logic and Data Storage
   3. Data Access Logic and Presentation Logic; Data Storage
   4. Application Logic; Data Storage
   5. Data Storage; Application Logic

Ans: b

Reference: Client-Server Architecture

Difficulty: Hard

1. Thick clients contain what?
   1. Enormous storage abilities
   2. Almost all or most of the application logic
   3. Almost none or less than half of the application logic
   4. Almost all of the data logic
   5. None of these

Ans: b

Reference: Client-Server Architecture

Difficulty: Medium

1. Which of the following is an advantage of client-server architectures?
   1. They are scalable
   2. They can support different types of systems
   3. It is easy to separate different logic functions
   4. Reliability
   5. All of these

Ans: e

Reference: Client-Server Architecture

Difficulty: Medium

1. How many advantages are client-server based architectures known for?
   1. 2
   2. 3
   3. 4
   4. 5
   5. 7

Ans: c

Reference: Client-Server Architecture

Difficulty: Medium

1. An n-tiered architecture is distinguished by:
   1. The number of drives installed
   2. The number of logics on the local server
   3. The number of terminals on the network
   4. The number of specialized server computers
   5. None of these

Ans: d

Reference: Client-Server Tiers

Difficulty: Medium

1. What is/are the disadvantage(s) associated with n-tiered architecture?
   1. Great load on the network
   2. When the clients capture keystrokes and the very first architecture system
   3. They are always slower
   4. When the clients capture keystrokes and the very first architecture system and they are always slower
   5. Great load on the network and it is more difficult to program and test software

Ans: e

Reference: Client-Server Tiers

Difficulty: Medium

1. The cost of development associated with Client-Based systems is:
   1. Low
   2. Low-Medium
   3. High-medium
   4. High
   5. Very High

Ans: a

Reference: Comparing Architecture Options

Difficulty: Medium

1. The scalability associated with Client-Server systems is:
   1. Low
   2. Low-Medium
   3. High-medium
   4. High
   5. Very High

Ans: d

Reference: Comparing Architecture Options

Difficulty: Medium

1. Project teams often \_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_ associated with creating secure, efficient client-server applications.
   1. Overestimate; Difficulty
   2. Overestimate; Simplicity
   3. Underestimate; Difficulty
   4. Underestimate; Simplicity
   5. None of these

Ans: c

Reference: Comparing Architecture Options

Difficulty: Medium

1. An example of a capacity requirement would be:
   1. Transmissions require 300K of data
   2. The systems uptime will be 99%
   3. Response time must be <2.8 seconds for any transactions
   4. The inventory database will be updated in real time
   5. None of these

Ans: a

Reference: Performance Requirements

Difficulty: Medium

1. A sample access control requirement would be what?
   1. Customer service reps can modify customer files but not delete them
   2. Data will be encrypted for secure ordering
   3. All uploaded files will be checked for viruses
   4. The system will cost $38,900 per minute of downtime in lost revenues
   5. None of these

Ans: a

Reference: Security Requirements

Difficulty: Medium

1. DES is an example of what?
   1. Asymmetric Encryption Algorithm
   2. Symmetric Encryption Algorithm
   3. Bi-Adjusted Encryption Algorithm
   4. Dynamic Encryption System
   5. Alternative Systems Security Algorithms

Ans: b

Reference: Security Requirements

Difficulty: hard

1. The term in the computing domain which refers to the creation of devices or storage with the use of software and not hardware is what?
   1. Encryption
   2. Virtualization
   3. Dynamic Creation
   4. Alternative Devises
   5. None of these

Ans: b

Reference: Advances in Architecture Configuration

Difficulty: medium

1. Server virtualization involves what?
   1. Partitioning a physical server into smaller virtual servers
   2. Stacking blade servers
   3. Using a laptop as a server
   4. All of these

Ans: a

Reference: Advances in Architecture Configuration

Difficulty: easy

1. An example of a multilingual requirement is what?
   1. The system will operate in English, French and Spanish
   2. Country managers can define custom fields
   3. All date fields will be presented in a uniform format
   4. Personal information about English customers cannot be sent to Chinese systems
   5. Country managers are able to change telephone number formats

Ans: a

Reference: Cultural and Political Requirements

Difficulty: easy

1. Operational requirements of a system include all of the following, except:
   1. System Integration Requirements
   2. Technical Environment Requirements
   3. Portability Requirements
   4. Scalability Requirements
   5. Maintainability Requirements

Ans: d

Reference: Operational Requirements (Figure 7-5)

Difficulty: medium

1. Special hardware, software, and network requirements imposed by business requirements.
   1. System Integration Requirements
   2. Technical Environment Requirements
   3. Portability Requirements
   4. Scalability Requirements
   5. Maintainability Requirements

Ans: b

Reference: Operational Requirements (Figure 7-5)

Difficulty: medium

1. The extent to which the system will operate with other systems.
   1. System Integration Requirements
   2. Technical Environment Requirements
   3. Portability Requirements
   4. Scalability Requirements
   5. Maintainability Requirements

Ans: a

Reference: Operational Requirements (Figure 7-5)

Difficulty: medium

1. The extent to which the system will need to operate in other environments.
   1. System Integration Requirements
   2. Technical Environment Requirements
   3. Portability Requirements
   4. Scalability Requirements
   5. Maintainability Requirements

Ans: c

Reference: Operational Requirements (Figure 7-5)

Difficulty: medium

1. Expected business changes to which the system should be able to adapt.
   1. System Integration Requirements
   2. Technical Environment Requirements
   3. Portability Requirements
   4. Scalability Requirements
   5. Maintainability Requirements

Ans: e

Reference: Operational Requirements (Figure 7-5)

Difficulty: medium

## True/False

1. The objective of architecture design is to determine how the software components of the information system will be assigned to the hardware devices of the system.

Ans: True

Reference: Elements of an Architecture Design

Difficulty: easy

1. The architectural components of any system are the network and the hardware.

Ans: False

Reference: Architectural Components

Difficulty: Medium

1. Data storage, Data Access Logic, Application Logic and Presentation Logic are the four basic functions of software systems.

Ans: True

Response: Architectural Components

Difficulty: easy

1. Client computers, Servers, and Networks are the three primary hardware components of a system.

Ans: True

Response: Architectural Components

Difficulty: easy

1. An ATM dialing a network provides the IT department with a quick cash withdrawal for emergency purposes.

Ans: False

Response: Architectural Components

Difficulty: Medium

1. Client-based architecture is complex and there is minimal chance of network circuits being overloaded due to growing network applications.

Ans: False

Reference: Client-Server Architectures

Difficulty: Medium

1. There are three advantages associated with client-server architecture.

Ans: False

Reference: Client-Server Architecture

Difficulty: Medium

1. There are four advantages associated with client-server architecture.

Ans: True

Response: Client-Server Architecture

Difficulty: Medium

1. Server-based architecture is more secure than client-based architecture.

Ans: True

Reference: Designing the Architecture

Difficulty: hard

1. Server-based architecture is not more secure than client-based architecture.

Ans: False

Reference: Designing the Architecture

Difficulty: hard

1. Client-server scalability is less than server-based scalability.

Ans: False

Reference: Designing the Architecture

Difficulty: hard

1. Client-server scalability is greater than server-based scalability.

Ans: True

Reference: Designing the Architecture

Difficulty: hard

1. An example of an asymmetric encryption algorithm is public key encryption.

Ans: True

Reference: Security Requirements

Difficulty: Medium

1. An example of a cultural requirement would be offering the system in English and Spanish.

Ans: True

Reference: Cultural and Political Requirements

Difficulty: easy

1. An example of making an unstated norm explicit would be to make a field modifiable by a manager to represent the local format.

Ans: False

Reference: Cultural and Political Requirements

Difficulty: Medium

1. An example of making an unstated norm explicit would be to make an input field explicitly defined, such as a date will use month-day-year format.

Ans: True

Reference: Cultural and Political Requirements

Difficulty: Medium

1. It is not uncommon for the cost of a power disruption to be hundreds or thousands of times the cost of failed components.

Ans: True

Reference: Concepts in Action: 8D Power Outage Costs A Million Dollars

Difficulty: Medium

1. The design phase is the time to select the specific software that will operate the hardware.

Ans: True

Reference: Introduction

Difficulty: easy

1. Technical Environment Requirements can be defined as special hardware, software, and network requirements imposed by business requirements

Ans: True

Reference: Operational Requirements (Figure 7-5)

Difficulty: easy

1. System Integration Requirements can be defined as the extent to which the system will need to operate in other environments.

Ans: False

Reference: Operational Requirements (Figure 7-5)

Difficulty: easy

1. Portability Requirements can be defined as the extent to which the system will need to operate in other environments.

Ans: True

Reference: Operational Requirements (Figure 7-5)

Difficulty: easy

1. Maintainability Requirements can be defined as the extent to which the system will need to operate in other environments.

Ans: False

Reference: Operational Requirements (Figure 7-5)

Difficulty: easy

1. Maintainability Requirements can be defined as expected business changes to which the system should be able to adapt.

Ans: True

Reference: Operational Requirement (Figure 7-5)

Difficulty: easy

1. System Integration Requirements can be defined as the extent to which the system will operate with other systems.

Ans: True

Reference: Operational Requirement (Figure 7-5)

Difficulty: easy

## Short Answer/Essay

1. There are three basic application architectures discussed in the chapter, each one having its distinctive attributes. Identify the four types of architectures that emerge from these three application architectures and provide a short explanation of each, along with key advantages and disadvantages. The four general architectures commonly utilized are server-based, client-based, client-server, and client-server tier architectures.

Answer

The server-based architecture is the original and most basic of the four. It allows a server to handle all four functions of software systems which are data storage, data access logic, application logic and presentation logic. The shortcoming of this architecture design is its lack of scalability and high network demands on the central mainframe.

The client-based architecture is another simple architecture that is quite stable. This system handles the distribution of data access, application, and presentation logic by distributing the responsibilities amongst the client and server computers. The client computer (terminal) handles the presentation logic, application logic and the data access logic. The server is simply a storage unit where data is dumped and accessed. The shortcoming with this system is as the network demands grow, network circuits can become quite overburdened and slowed dramatically as the traffic increases.

The client-server architecture is a step ahead of the previous examples in that it distributes the processing responsibilities amongst the systems to minimize the resources each individual process takes up. The client computer (terminal) is responsible for managing the presentation logic and sometimes the application logic while the server handles data access logic, storage logic and occasionally (when not handled by the terminal) the application logic. While these server systems are advanced, they are also complex and difficult to maintain. Client-server architecture systems require a vast knowledge of both the terminal systems and the server systems, often times requiring outside resources to be utilized in the maintenance of the system.

Client-server tiers represent an extension of the client-server architecture by further separating the responsibility for system functions amongst multiple, specialized servers. For instance, many current generation web-based e-commerce solutions utilize a client to handle the presentation logic (web browser), a web server to handle the web-related business logic, an application server to handle order processing logic, and a database server to handle database-related tasks. The primary advantage of such n-tiered architectures is the promise of better load balancing amongst the various system components. However, the n-tiered architecture places a greater load on the network and is more difficult to program and test.

1. Describe the difference between a thick and a thin client.

Answer

Thick and thin clients are found in client-server applications and they are categorized as thick or thin based on the proportion of application logic stored on the client terminal. Thick, or sometimes referred to as fat, clients are those that house a majority of the application logic. Thin clients are those where the majority of the systems’ application logic is stored on the server.

1. Anthony is an entrepreneur of the e-commerce sort. He has asked Computers International, Inc. to develop a functional and fundamental system that will enable him to conduct business within the confines of the United States. He has asked CI, Inc. to develop a system where he wishes to: avoid opening a bricks-and-mortar storefront (incidentally that means solely internet based), be able to export files and data to Microsoft Excel spreadsheets where he can create presentations for future investors, access his files from his PDA or Blackberry from the road and have a rather stable maintenance record for minimal downtime and his avid anticipation for growth. What operational requirements are needed and why?

Answer

Computers International should reply to Anthony by offering him a system that will operate off of a client-server architecture which will allow the computing needs of his whole firm to be run by both the client and the customer terminals. Additionally, his technical requirements are such that his system can present the data to a multitude of operating systems and web browsers. Anthony also has integration requirements with Microsoft Excel where he will be able to offload data in the form of a comma-separated values (CSV) document or the like to maintain compatibility with a multitude of bundled software packages. His portability requirements specify that he will need to access his data from the road via a portable web browser and his maintainability requirements specify that he wishes to minimize downtime and allow for his anticipated growth not to outpace his initial investment.

1. Joseph is an IT director at a large multinational, multibillion dollar-a-year corporation that is responsible for the distribution of highly specialized and often times custom parts. He has been charged with creating a hardware profile to dictate the performance requirements of the company’s next mainframe system. Acting as a consultant to Joe, what kinds of performance requirements are important to develop an appropriate hardware profile? What are the key issues for each of these requirements that could be recommended to the corporation’s CTO.

Answer

Joe should primarily be concerned with speed, capacity, availability, and reliability requirements.

He should be concerned with the speed of his network due to the international order fulfillment aspect of the firm. Also, due to the nature of the manufacturing system (custom and unique parts), there will be a tremendous number of orders generated which will further add to the bandwidth usage that will need to be handled by the system. Additionally, Joe needs to take into account the number of order transmissions made internally to the machining shop and automated machinery.

In so far as capacity, Joe should also be concerned with server space available to store the individual orders for whatever specific period of time the company sees fit. In addition, he needs to consider the total number of users needing to log in and access the ERP system at any given moment. If he does not consider the number of individuals and terminals logging into the system, he will end up with a bandwidth shortage as well as interrupted usage due to server overuse.

Finally, availability and reliability will be determined by the service hours offered by the sales team to the firm’s customers. However, there must also be a certain number of hours allowed for maintenance and upgrades each month. Due to the international time zones, most likely downtime will take place at odd hours of the morning on days that do not normally incur tremendous call volume and order processing.

1. BioFoods International is concerned with providing low cost foods to nations that cannot afford the wholesome and nutritional foods that are so common in more developed countries. BioFoods International is adopting a new computer system that will enable our international managers to place orders with us directly, ensuring accurate and fulfilling orders to each of our constituents. What types of cultural requirements should be considered in acquiring this new system?

Answer

BioFoods International should consider having a system that is multilingual, customizable, and meets legal requirements in the countries where they operate. Additionally, they should make unstated norms explicit within their system as to maintain order and to remain within the acquisition ability of the firm to avoid erroneous orders.