Tribhuvan University | Faculty of Management
BIM / Eighth Semester / IT 309: Client Server Computing
Year: 2014 (2071)

Full Marks: 40
Time: 2 hrs.

Candidates are required to answer all the questions in their own words as far as practicable.

Group "A" –

1. Brief Answer Questions: [10 X 1 = 10]

i. Define 2-tier architecture with suitable example.
ii. List the components of client server computing.
iii. What is the effect of bandwidth on client/server computing?
iv. What is socket address?
v. List the services provided by Operating system.
vi. What is critical section?
vii. List the challenges faced while conducting Business Process Re-engineering.
viii. Define DBMS protocol and DBMS language.
ix. How physical security for clients and server is maintained?
x. Define Network Management System.

Group "B"

Long Answer Questions: [5 X 6 = 30]

2. Define Remote Procedure Call (RPC). Explain distributed computing architecture.
3. Define middleware. Make distinction between ODBC (Open Database Connectivity) and JDBC (java Database Connectivity).
4. How index fine tune performance of database server? Explain DSS (Decision Support System) and EIS (Executive Information System) in brief.
5. Define UDP with its operational characteristics and application.
6. Write short notes on:
   a. ATM and Wireless LAN
   b. Processes and its states

Tribhuvan University
Faculty of Management
Office of the Dean
Aug-Sep 2017(2074)
BIM / Eighth Semester / IT 309: Client Server Computing

Full Marks: 40
Time: 2 hrs.

Candidates are required to answer all the questions in their own words as far as practicable.

Group "A"

1. Brief Answer Questions: ***[10 X 1 = 10]***

i. Define groupware and groupware server.
ii. Differentiate between logical topology and physical topology.
iii. List the advantages of IPv6 over IPv4.
iv. Define Remote Procedure Call (RPC).
v. Define the term forwarding and routing.
vi. Define connection oriented service.
vii. Define throughput.
viii. What is Object Management Architecture?
ix. What is congestion?
x. How does Data rate differ from Bandwidth

Group "B"

Exercise Problems : ***[5 X 4 = 20]***

2. Define Middleware. Describe ODBC architecture with its components and figure.
3. Explain various Client/ Server model in brief.
4. "Unguided media has advantages over Guided media." Justify this statement.
5. How can you improve the performance of client, server and network? Explain.
6. Write short notes on:
   a. Distributed Computing Architecture
   b. Network Security

Group "C"

Comprehensive Questions: ***[2 X 5 = 10]***

7. Write Java Code for demonstrating TCP socket programming.
8. Write steps for Setting up ODBC for connecting database in Oracle.

1) Compare stored procedures with staic and dynamic SQL.
2) Define API.
3) What is meant by FAP?
4) Define Embedded SQL.
5) Compare Embedded SQL and Call-Level Interface.
6) Define JDBC.
7) What is the use of DRDA and write the features of DRDA?
8) Define Data warehouse.
9) Define data marts and data cubes.
10) What are the elements of data warehousing?
11) Define OLAP and OLTP.
12) Compare OLAP and OLTP.
13) What is meant by data mining?
14) What are the applications of data mining?
15) Define groupware.
16) What are the components of groupware?
17) Define workflow.
18) What is the difference between groupware an SQL database server?

PART – B

1) Briefly explain about Client server and internet?
2) Discuss about Web client server.3.Briefly explain about 3 tier client server web style?
3) Briefly explain about CGI and State?
4) Discuss SQL database servers.
5) Discuss merits and demerits Middleware and federated databases.
6) Briefly explain about Data warehouses?
7) Explain EIS/DSS to data mining?
8) Briefly explain about GroupWare Server?
9) Explain Components of GroupWare?

- **What is congestion?**
  Network congestion in data networking and queueing theory is the reduced quality of service that occurs when a network node or link is carrying more data than it can handle. Typical effects include queueing delay, packet loss or the blocking of new connections.
- **How congestion occurs?**
  - Too many hosts in broadcast domain
  - Broadcast Storms
  - Low Bandwidth
  - Low buffer
  - Slow routing processing
  - Adding Retransmitting Hubs
  - Multicasting
  - Outdated Hardware
  - Bad Configuration Management
- **What is Object Management Architecture?**
  A standard object model from the Object Management Group (OMG) for the behavior of component software in a distributed environment. An enhanced version of the Object Management Architecture (OMA) is the Model Driven Architecture (MDA). The communications interface of the OMA is the Common Object Request Broker (CORBA), and the CORBA architecture is more widely referenced in articles than the OMA
- **Define Groupware and Groupware server.**

A class of software that helps groups of colleagues (*workgroups*) attached to a local-area network organize their activities. Groupware is sometimes called *workgroup productivity software*. Typically, groupware supports the following operations:

- scheduling meetings and allocating resources

- e-mail
- password protection for documents
- telephone utilities
- electronic newsletters
- file distribution

What is Groupware server?

- Groupware server is software that allows the collaboration of users, irrespective of location through the internet or intranet to work together in an atmosphere which is virtual.
- The number of clients that need to be connected to this server mostly depends on the scope and nature of the project.
- Here a software is installed on various client computers so that better communication takes place between the clients and access to the server.
- This server helps to reduce the unnecessary or repetitive communication between the team members which also helps to increase the productivity.

- **What is Bandwidth?**
  Bandwidth is the measurement of the ability of an electronic communications device or system to send and receive information
- **What is Throughput?**
  Throughput is the amount of data that enters and goes through a system
- **What is Data Rate?**
  Data rate is the speed at which data is transferred between two devices, measured in mega bits per second (Mbps or mbps)
- **What is Physical topology and Logical topology?**
  - In the field of networking, when you use the word physical topology, you refer to the real arrangement of the elements in your network, i.e. the situation of every computer, switch, router and any other electronic system, using real measures of distance between them, and also their real position.
  - On the other hand, logical refers to the arrangement of elements, but using an abstraction of the reality, using a graph without measures which establish relations between them, or weights in the links between them to indicate additional information.
- **What is forwarding and routing?**
  - Routing is determining which way the packet will use to reach its destination easily and effectively, While forwarding refers to when the information enters the router and it defines when it will be sent!
  - A definition is that routing it the stage were a decision is made on which interface to forward a particular packet. Forwarding is the act of pushing a packet through a particular interface.
  - Routing answers the question of what next hop IP to send a packet based on the destination prefix. Forwarding functions determine which exit interface to use to send the packet to its next hop.
  - Forwarding does not know about where destination is. It just just longest prefix and consider as there might be destination. Where routing is sure that route to specific network and there is destination network. route will be select on different with different protocol.

Benefits of IPv6 over IPv4

- **Huge number of IP addresses** IPv6 has 128 bit addresses when compared to 32 bit addresses of IPv4 which results in a very large increase in the availability of IP addresses and creates a lot of advantages
- **End to End Connectivity** IPv6 eliminates the need for NAT which results in better connectivity in peer-peer networks.
- **Built-in Security IPv6** promotes interoperability between different IPv6 implementations.
- **More Efficient Routing** : IPv6 reduces the size of routing tables and makes routing more efficient and hierarchical. IPv6 allows ISPs to aggregate the prefixes of their customers' networks into a single prefix and announce this one prefix to the IPv6 Internet. In addition, in IPv6 networks, fragmentation is handled by the source device, rather than the router, using a protocol for discovery of the path's maximum transmission unit (MTU).
- **More Efficient Packet Processing** : IPv6's simplified packet header makes packet processing more efficient. Compared with IPv4, IPv6 contains no IP-level checksum, so the checksum does not need to be recalculated

at every router hop. Getting rid of the IP-level checksum was possible because most link-layer technologies already contain checksum and error-control capabilities. In addition, most transport layers, which handle end-to-end connectivity, have a checksum that enables error detection.

- **Directed Data Flows** : IPv6 supports multicast rather than broadcast. Multicast allows bandwidth-intensive packet flows (like multimedia streams) to be sent to multiple destinations simultaneously, saving network bandwidth. Disinterested hosts no longer must process broadcast packets. In addition, the IPv6 header has a new field, named Flow Label, that can identify packets belonging to the same flow.
- **Simplified Network Configuration** : Address auto-configuration (address assignment) is built in to IPv6. A router will send the prefix of the local link in its router advertisements. A host can generate its own IP address by appending its link-layer (MAC) address, converted into Extended Universal Identifier (EUI) 64-bit format, to the 64 bits of the local link prefix.
- **Support For New Services** : By eliminating Network Address Translation (NAT), true end-to-end connectivity at the IP layer is restored, enabling new and valuable services. Peer-to-peer networks are easier to create and maintain, and services such as VoIP and Quality of Service (QoS) become more robust.
- **Security** : IPSec, which provides confidentiality, authentication and data integrity, is baked into in IPv6. Because of their potential to carry malware, IPv4 ICMP packets are often blocked by corporate firewalls, but ICMPv6, the implementation of the Internet Control Message Protocol for IPv6, may be permitted because IPSec can be applied to the ICMPv6 packets.

1. What is client/server computing?

The client/server computing is that server software accepts requests for data from client software and returns the results to the client.

2. Where the applications processing is done/performed?

•Application processing performed on more than one m/c in a network may be either distributed computing or co-operative processing.

•Distributed computing partitions the data between two or more computer, which may begeographically dispersed.

•Co-operative processing splits an application's function (processing) between two or more computers in a peer to peer relationship.

3. What is the client?

The client is a process (program) that sends a message to a server process, requestingthat the server perform a task (services).

4. What is the server?

A server process fulfills the client request by performing the task required. server programs receive requests from clien t programs execute database retrieval and updates anddispatch responses to client requests.

5. What are the application tasks available in client server computing?

•User interface
•Presentation logic
•Application logic
•Data request and result acceptance
•Data integrity
•Physical Data Management

6. Explain the variation in Rightsizing

Three variations are:
•Downsizing
•Upsizing
•Smart sizing

DOWNSIZING:

When it is re-engineered to run in a smaller/LAN based environment.

UPSIZING:

Run in the larger environment.

SMART SIZING:

It affects the entire organizational structure & involves re-engineering, redesigningthe business process.

7. Benefits of CSC:
•Dollar saving
•Increased Productivity
•Flexibility & Scalability
•Resource utilization
•Centralized Control
•Open Systems
8. What is the use of open system?
•Userfriendly.
•Software can easy to download..
•Any one can access.
•Secure.
9. Describe the evolution of CSC?
•Hardware trends
•Software trends
HARDWARE TRENDS:
•Power
•Chips
•Memory
SOFTWARE TRENDS:
•Relational database
•GUIs
•Multithreaded processing.
•Continuing evolution.
10. Define GUIs.
GUIs platforms do more than provide a presentation layer to the application layer. They provide an operating environment on top of the operating system of the desktop machine. A GUI presents its user with information in windows, which are rectangular areas on a screen.
11. What is the multithreaded?
Multithreaded is the more than one thread will be processed /accessed. A thread is aProcess or an execution. It supports multiple threads of execution and allows the thread tocommunicate with each other.
12. Write down the components of CSC?
There are three components:
•Client
•Server
• Network
13. List the classes of CSC?

Three classes:
•Host-Based Processing
•Co-operative Processing
•Client-Based Processing
14. Difference between CSC and mainframe environments:

MAINFRAME
•Costly to maintain
•H/W ,S/W & staff required to maintain& develop application are veryexpensive
•Maintenance cost of a server is higher
•Main-frame base application can bedeveloped in more-time
CSC
•Easier to maintain
•Inexpensive to maintain &developapplication.

•Maintenance cost of a server isnegligible
•Client-based application can bedeveloped in less time

15. Why client-based processing applications do some cooperative processing?

Client-based processing applications do some cooperative processing. Because datavalidation, stored procedure, triggers executed on the server.

16. What is Presentation logic?

Presentation logic is that, what happens when the user interacts with the form on thescreen.

17. List out the categories of client server application.

•Office system.
•Frond-ends to existing system.
•Database access.
•Transaction processing applications.
•Investigative applications.

18. What are the two LAN Mail products?

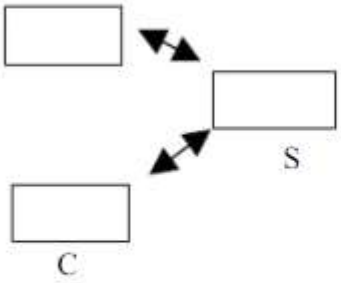
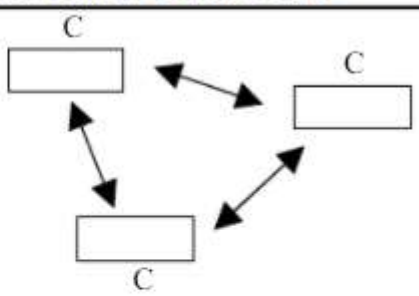
The two LAN Mail products
•MS Mail 3.0
•Lotus's cc:Mail

MS uses its own system-level messaging application programming interface(MAPI).Lotus support vendor independent messaging (VIM), application programminginterface (API).

19. Define flexibility.

As new client join the system, the old clients and server remain unaffected. Anapplication does not have to be redesigning to use new interface software or be moved to a new platform.

20. Difference between peer-to-peer and CS computing

CLIENT SERVER COMPUTING	PEER-TO-PEER COMPUTING
 1. Client initiates communications. 2. Client issues request to a server. 3.Server replies/perform some	 1. Any participant can communication. 2. Any devices can generate a request. 3. Any devices may provide a response.

21. What is the client-based processing?

Client-based processing puts all the application logic on the client m/c with theexception of data validation routines, which are coded into the DBMS on server.

22. What are the major activities of a cooperative processing?

•It uses a fully-cooperative peer-to-peer processing approach
•The processing is performed, whenever computing resources are available
•Data manipulating is performed on both client and server

23. What is the need of Host-Based Processing?

.It has less functionality than other classes
•It provide increased productivity
•The presentation layer provides the user with an easy-to-use interface

15. Define striping.

Data is actually broken into chunks and simultaneously written to multiple disks a process called striping.

16. What is the use of RAID and 5 levels?USE:

It is for data protection and error connection.

5 levels:

•RAID-1: uses mirrored disks

RAID-2: provide multiple parity

RAID-3: used to maintain ECC(error correction code)

RAID-4: uses ECC drives to provide data integrity and stripesfiles in blocks.

RAID-5: perform simultaneous read by allowing multiplesimultaneous write question.

17. Two version of RAID-1:

•Disk mirroring: uses two devices attached to the same disk controller.

•Disk duplexing: uses individual driller of each drive.

18. How to prevent corruption of data traveling within the server.

By using ECC memory and parity checking.

19. Classes of Server Machine:

•Micro/server

•Super server

•DB server m/c

•Midrange computer/fault-tolerant m/c.

20. Advantage over a micro/server

•Increase processing power

•Increase I/O capability

•Increase disk capacity

•Improved reliability.

•Increase maintainability and memory management.

21. Two popular super server:

IBM server 295

COMPAQ systempro

22. Eight layer of software in server environment:

• Network management environment

• Network computing environment

• Network OS

•Server OS

•Loadable modules

•DB manager

•DB gateways

•Application

23. What are the products available in n/w management environment?

•Distributed management environment(DME)

•Object management architecture(OMA)

•UI-Atlas

24. Define DME

DME provides a framework for a vendor-neutral object-oriented, cost-effectiveenvironment that can be used by hardware and software vendors to develop products.

25. Four components of OME:

ORB

Object services

Common facilities

Application objects

26. What are the two set of services provided in DCC.

•Basic distributed services

•Data-sharing services

27. What are the tools provided by DCE?

- RPC
- Distributed directory service
- Threads service
- Time service
- Security service

29. DCE and sunsoft's open n/w computing architecture are similar, their majordifferences are:

- Data translation
- Location transparency
- Transport independence
- Multithreading
- Security

30. Difference between DCE and ONCDCE

1.independent of any OS
2.support same OSI standards andgreater OSI compliance, ONC
1.Relies on UNIX SVR4
2.It was not designed to be an open std'snot OSI compliant.

31. What are the server requirements?

- Platform independence
- Transaction processing
- Connectivity

32. ACID property:

- Atomicity
- Consistency
- Isolation
- Durability

33. Draw the diagram for 2PC

---

34. What are the locks is available in locking schemes.

- Unlocked
- Shared lock
- Exclusive lock

1. Categories of server
2. Features of server m/c
3. Classes of server m/c.
4. Explain network management environment.
5. Explain network computing environment
6. Explain server requirements.