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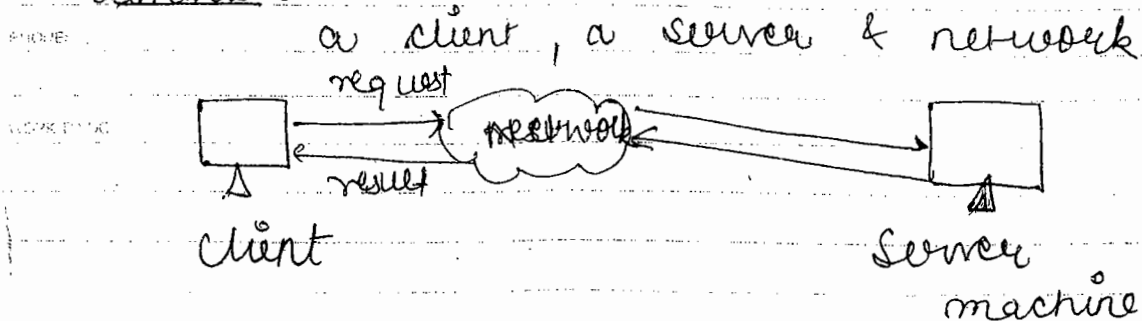27 28

JANUARY | THURSDAY | 13
2005 | WEEK-02 013-352

Visual Basic - Ist unit

CS : server software accepts requests for data from client s/w & returns result to client.

→ Client server computing is logical extension of modular programming with fundamental assump^n that separa^n of huge program into its constituent parts can create possibility for further modifica^n, easier development & better maintainability.

→ Main emphasis of client server architecture is to allow large applic^n to be split into ~~smaller~~ ~~task~~ & to perform task among host & desktop in network.

→ elements :
  a client, a server & network

client   Server
                                          machine

client server Architecture!

8 A.M.

client server architec developed as response to limita^n of file sharing architecture which require tons of bandwidth & can often stall or jam a network causing it to crash.

11

→ They require low shared usage & low volume of data to be transferred

→ Data is sent over network from client to server. Client & server may be involved in protocol where command & meta info is sent along with data

→ Client server archi allows for data to be san at one server locan while access of data to be distributed on many clients

→ Basic client server:

Network
|
client   server

PHONES

WORK TO DO

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JANUARY | SATURDAY | 15
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In usual client server model, one server sometime called daemon, is activated & accepts client requests.

→ Database Eng: back end Dbms S/W runs on server to provide database processing & shared access for clients

→ Client : front end s/w provide UI & data manipula^n func^n

→ Worksta^n that request & uses a service
→ Client is defined as requester of service

→ client is defined as request of services One piece running on local user machine is called client Client concentrates on presenta^n layer of GUI.

→ func^n of client.

A.M.

1) handle UI

2) translate User request into desired protocol

3) send request to user

4) wait for server response

5) translate response into human readable result.

6) Present result to user.

PM

Server: Computer (PC | mini | mainframe) that provide service.

Other running on potentially another machine is called server.

Server is defined as provider of service

- Server provides computational power or database engine.

func^n of Server:

1) listen for client query

2) process query

3) Return result back to client

4) support all basic things func^n

5) monitor all his client

6) maintain security & privacy

Catogry of server:

1) File server
   - file sharing & file processing

2) Database Server:
   - prowssing file result
   eg: Query in Dbms Server.
   - Typically one single request/reply

3) Transacⁿ server:
   - include Dbms & transacⁿ monitoring
   - server has remote procedure run online by client

4) Web Server:
   - Super fat server thin client
   - use http protocol
   - Java was first to introduce interactive c/s forms.

→ Client/Server Interacⁿ:

   - user runs client s/w to create query.
   - client connect to server
   - client send query to server
   - server analyze query.
   - server compute result of query
   - Server send result to client
   - client respresent result to user
   - repeat as necessary

8 A.M. client

← response.

query →

Server   Search

data

+ Applica^n logic in client / Server

Presenta^n logic   GUI
   I/P — Keyb/ mouse   interface
   O/t — monitor /printer

Processing logic   Procedure
   I/O processing   func^n,
   business rule   program
   Data mngt
Storage logic   Dbms
                                            activities
   Data Storage / retrieval

PHONES

WORK TO DO

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JANUARY | THURSDAY | 20
2005 | WEEK-03 020-345

eg: 1) client r often neeb browser
- Server include neeb server,
database / mail server

- Online gaming is client server too
- most transacⁿ that occur on internet are client / server based

eg: FTP, WWW, email

→ Char of CS

- Its implemented over computer network
- CS architecture is scalable:

a) horizontally (more client added)
b) vertically (more server

→ Server is centrally manipulated where as client are independent of each other
- Client is considered as customer requesting service

- Server service can be shared among no of client,

- Client must request or initiate service

- locaⁿ of server in network is transp arent to client.

Goal of CS :

- Goal of CS computing are to allow every networked workstan. & host to be accessible, as needed by applica'n, & to allow all existing s/w & h/w component from various vendor to work together.

- When these 2 condi'n are met, benefits of CS computing such as cost saving, inc productivity, flexibility & resource utiliza'n, can be realized.

- Advantage of CS Computing :

t) <u>Centraliza'n</u> - Access resource & data security are controlled through serice.

2) <u>Scalability</u> : any element can be upgraded when needed.

3) <u>flexibility</u> : new tech can be easily integrated into system

4) <u>Interoprability</u> : all component work together

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5) Accessibility: Server can be accessed remotely & across mul platforms

6) ease of applica^n development

7) lower total cost & user friendly.

Disadvantage of 4S:

1) Dependability : when server goes down, opera^n cease.

2) lack of mature tool - Its relatively new technology & needed tools are lack
   eg: automated client s/w distribu^n

3) lack of scalability - network OS is not very scalable

4) higher than anticipated cost

5) can cause network congestion

Types of 4S:

1. File Server   Architecture

2 Database Server   "

3 Three tier   "

24 MONDAY JANUARY
024-341 WEEK-04 2005

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FEBRUARY

File Server:

1. Device that manages file oper^n & is shared by each of client PC

2. Fat client : does most processing

3. File server is connected to several workstan across network

4. database reside on file server

5. Dbms & applican run on each workstan.

entire file sent to , client

client request for data
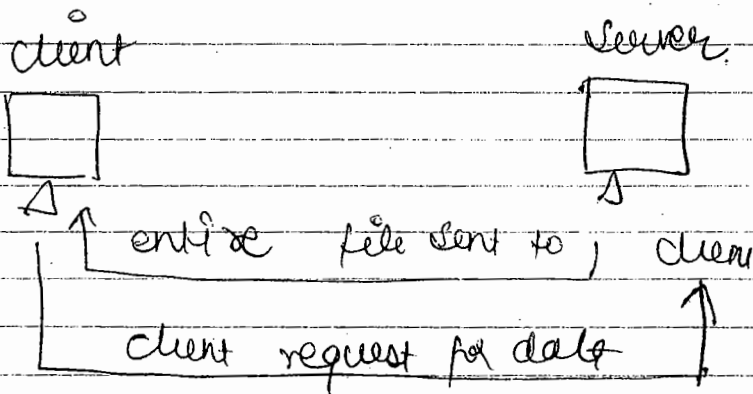
All processing is done at PC that requested data.

- entire files or tables are transformed fm server to client for processing.

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JANUARY | TUESDAY
2005 | WEEK-04 025-340 | 25

Problems:

1) huge amount of data transfer on network.

2) Each client must contain full Dbms
   - heavy resource demand on client
   - client Dbms must recognize shared locks, integrity checks etc

3) Significant network traffic

4) copy of dbms on each WS

5) Concurrency, recovery & integrity cntrol more complex

Archi:

client

client

LAN

client

- request
- request to lock data

- entire file of data
- lock status

file server

data

Storage, record locking
Significant LAN traffic

2 tier c/s archi :

A.M.

1. ~~Database~~ server replaced file server

→ relational database mngt system answered user queries directly. Since only specific query were being answered & only that data was transferred instead of entire files that slow down network

— also improved consistency in data b/w user, since all user had access to same updated info.

P.M.

3 — Thin Client : do less processing

User http request

response to http req

client   server

7 → processing of html code take place on client side & web page request is processed on server side

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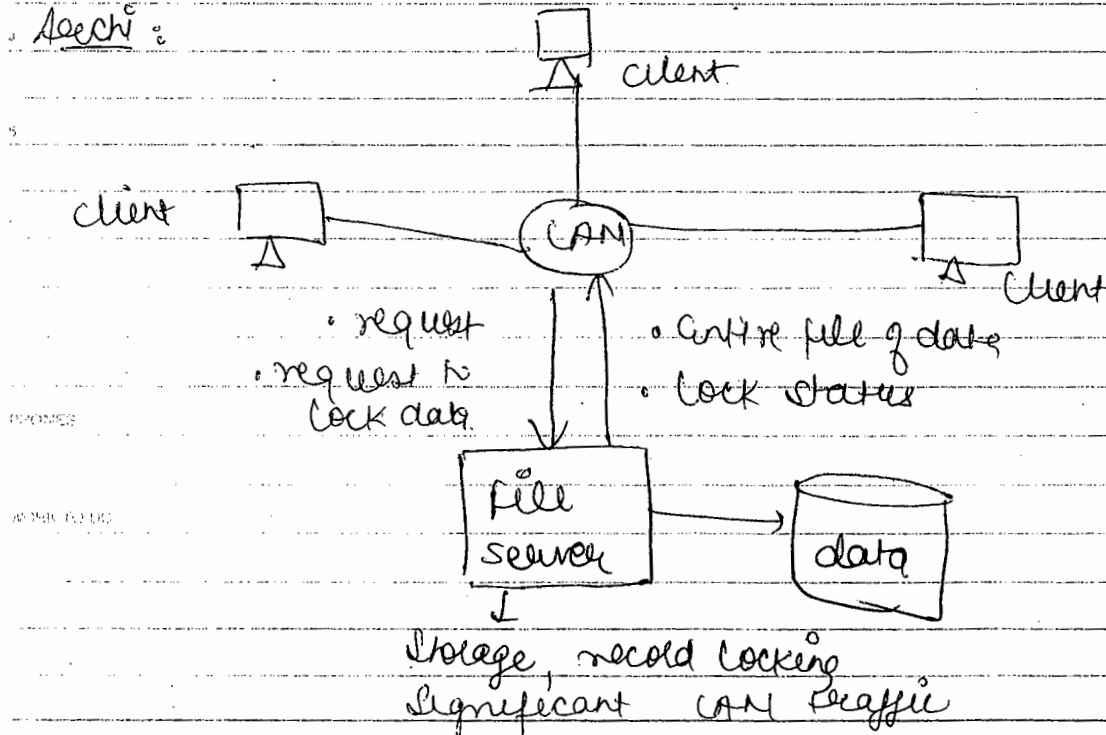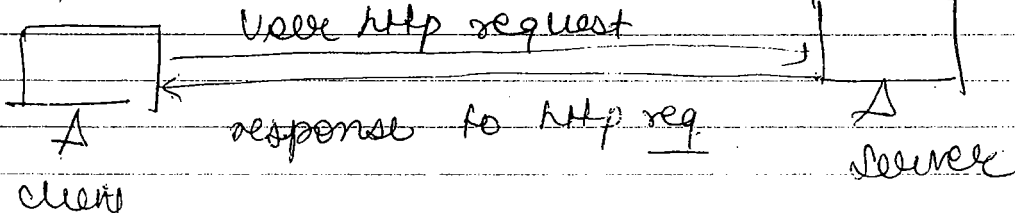13 14 15 16 17 18 19
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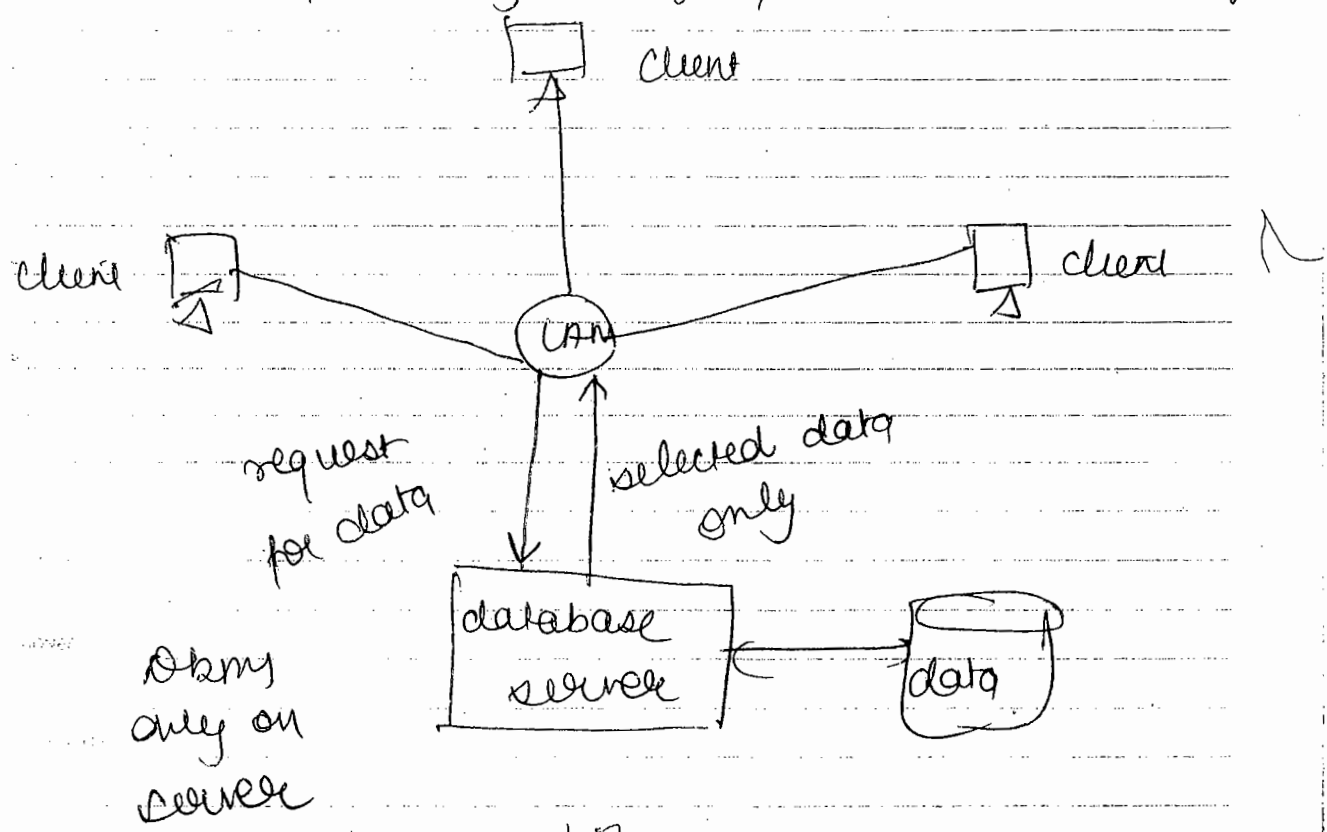
- Client is responsible for:
  - IO processing logic
  - Some business rules logic

- Server perform all data storage & access processing.

→ Dbms is only on server

→ Client workstan:
    user interface, presentan logic,
    data processing logic, business rule logic

request for data

selected data only

client

client

Client

LAN

database server

data

Dbms only on server

Stored procedures: first use of business logic at database server

Advantage of Stored Procedure:

- Compiled SQL statement
- reduced network traffic
- improved security
- thinner client

Database Server:
- database storage, access & processing

- 2 tier consist of 3 compo:

1) user system interface
2) processing mngt
3) Database mngt

1) USI: is component of an organizaᵗⁿ decision (DSS), which include human decision maker. USI include features like display mngt service, session, text HP & dialog.

2) Processing mngt: includes process development, process implementation, process monitoring & process resource service.

3) Database Mngt: include database & file service.

Advantage of 2 tier:

- client do not have to be as powerful
- Greatly reduce data traffic on network
- Improved data integrity since it is all processed centrally.

- Improve usability through user friendly, form based interface.

- Improve scalability becoz 2 tier system can hold upto 100 user, whereas file server architecture can accomodate only 12.

- best suited to homogeneous environment for processing non complex, non time sensitive info

- les traffic, more crtol over data

→ 3 tier

8 A.M. → also called as multi tier architecture

9 → middle tier is added b/w client
10 environment & Dbm server environment

11 → variety of ways to implement:
   1) Transac^n processing monitors
12
   2) Message Server
1 P.M. 3) Applica^n Server

2 4) Applica^n server is add^n to client
   & database server

3
   5) Applica^n server contain "std
4   program"

5

6

7 neeb client   Applica^n   database
                 Server   server

PHONES

WORK TO DO

In 3 tier, we can replace our database mngt system or applicaⁿ s/w on diff prossing zone or tier than web server.

Client   web server   Dbms

Client	GUI	browser
web/applicaⁿ server	Business rules	web Server
database Server	data storage	Dbms
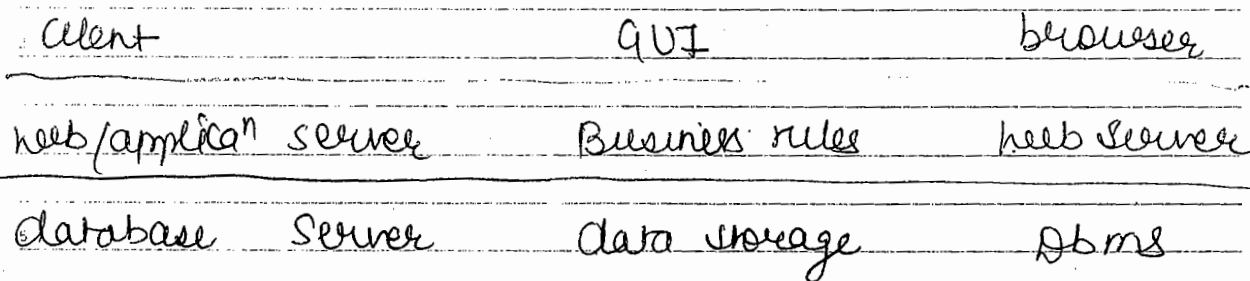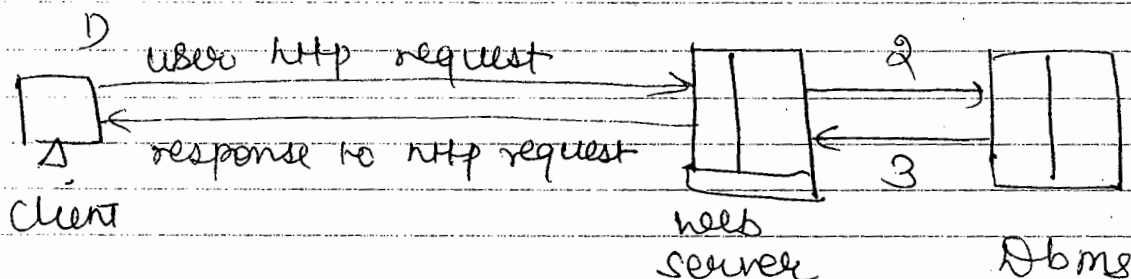
3 layer
1. Client
2. Middle server
3. data source server

1) Client tier :

Local computer on which either a web browser displays on web page that can display & manipulate data from a remote data source, or stand alone compiled front end applicaⁿ

2) Middle tier :

→ A server computer that hosts component which encapsulate an organizaⁿ bus rules

→ Middle tier component can either be Active Server Page scripts executed on Internet Info Server or compiled executables

3) Data source tier

A computer hosting database mgt system (Dbms) such as microsoft SQL server database.

→ In 2 tier, middle tier & data source tier are combined

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Advantage of 3 tier :

→ Scalability

→ centralize applicaⁿ logic
→ relieves client from having to load
up on applicaⁿ logic

→ frees up dbms server to efficiently
process transacⁿ

- technology flexible
- long term cost reducⁿ
- better match of system to business
needs
- Improved customer service
- competitive advantage
- reduced risk

2 tier Vs 3 tier
- same basic idea fat client Vs
fat server

- Depend on how applicaⁿ is divided
b/w server & client

→ 2 tier server

eg:- file server & database server
In this case process is buried
neither client or server

3 teir server:

eg: web & distributed object

- In this, process is run on middle teir
- They can interchange data from mul sources

- More robust & more scable.

	files	c/s
Processing	client only	both c & s
Concurrent data acces	low - mnged by client	high - mnged by server
Network usage	large file & data transfer	efficient data transfer
DB Security	low	high
S/w maintnce	low - S/w change jsut on server	Mixed - some new paces must be delivered to each client
S/w flexibity	client & server decoupled & can be mixed	Need for greater coordinan b/w client & server