Lesson 8: Client technologies, languages and tools

The client is any process that requests services from the server process. The client is proactive and will, therefore, always initiate the conversation with the server. The client includes the software and hardware components.

Role of the client and its services

1. In client/server applications, functions are provided by a combination of resources using both the client workstation processor and the server processor.
2. Like a database server provides data in response to an SQL request issued by the client application. The local processing by the client might calculate the invoice amount and format the response to the workstation screen.
3. The client workstation can provide business functions using a mixture of personal productivity products blended with a custom application.
4. The capability to cut and paste input from several different sources is one of the most powerful aspect of a client workstation.
5. In the client/server model, the client is primarily a consumer of services provided by one or more server processors. Whereas the server acting a service provider responding to the client's request.
6. The client provides presentation services. The user input and final output are presentation at the client workstation. The current technology provides full support for GUI's. The functions like field edits, context sensitive help, navigation, training, personal data storage and manipulation frequently execute on the client workstation. All of them use the GUI and Windowing functionality.
7. The client workstation can use or uses local operating system to support both basic services and the network OS interfaces.

Request for Services

A client workstation requests services form the attached server; whatever may be the type of processor the format of request is the same. It is the job if the NOS software to translate or add the necessary details as required by the targeted requester to the application request. OS also provides the redirection service.

Redirection service

This service intercepts client workstation operating system calls and redirects them to the server operating system. Thus in this way the request for disk directories or disk files, printers, printer, queues, serial devices, application programs and named pipes are trapped by the redirection software and redirected to the correct server location.

How does this redirection work?

Let the local disk driver be labeled A: and C: and the remote drivers labeled D: , E: and F:

1. Any request for drive A: of C: is passed through to the local file system by the redirection software. Then the request is sent to the server OS.
2. The NOS requester software constructs the remote procedure call (RPC) to include the Application Programming Interface (API) call to the NOS server.
3. The NOS server then processes the request as if it was executed locally and ships the response back to the application.

Remote Services

Client invokes an application that is executed on a remote server. NOS provide software, which runs on the client workstation to initiate these remote applications.

Utility Services

The operating system facilitates some local functions which are very often used to perform actions like edit, copy, move, compare and help which works on the client end**.**

Message Services

Messages can be sent and received to or from the network synchronously. The message services provide the buffering, scheduling and arbitration services to support this function.

Network Services

The client workstation communicates with the network through protocol, some set of service and API's that creates, send and receive and format network messages.

Application Services

In addition to the remote execution services that the NOS provide, custom applications will use their own API's embedded in an RPC to invoke specialized services form a remote server.

Database Services

Database requests are made using the SQL syntax. Because the language uses a standard form, the same application may be run on multiple platforms.

Languages and tools

Language

Dynamic Data Exchange

Microsoft Windows provides several methods for transferring data between applications. DDE protocol is one of these methods. DDE protocol is a set of messages and guidelines. It sends messages between applications that share data and uses shared memory to exchange data between applications.

DDE can be used to construct **hot links** between applications in which data can be fed from window to window interruption and intervention.

Eg: **A hot link** can be created between a 3270-screen session and a word processing document. Data is linked form the 3270 window into the word processing document. Whenever the key of the data in the screen changes, the data linked into the document also changes.

DDE also supports **warm links** created so the server application notifies the client that the data has changed and the client can issue an explicit request to receive it. This information is attractive when the volume of changes to the server data is so great that the client prefers not to be burdened with repetitive processing.

DDE also facilitates the feature of extending applications. These facilities, available to the desktop user, considerably expand the opportunity for application enhancement by the user owner.

OLE (Object Linking and Embedding)

OLE is an extension to DDE. OLE is designed to let users to focus on data encompassing rather than on the software required to manipulate the data. OLE allows users to integrate data from different applications. It allows users to share a single source of data for a particular object.

Here the documents are collection of objects, rather than a file, each object remembers the software that maintains it.

The document contains the name of the file containing the data, along with the picture of the data. When the source is updated all the documents using the data are updated as well.

Tools

GUI Clients

GUI Clients: These are applications, where occasional requests to the server result from a human interacting with a GUI.e.g windows, unix e.t.c

Non-GUI Clients

Non-GUI Client: These are applications; generate server requests with a minimal amount of human interaction.

OOUI (Object Oriented User Interface) Client

OOUI clients: These are applications, which are highly-iconic, Object-oriented user interface that provides seamless access to Information is in visual formats.

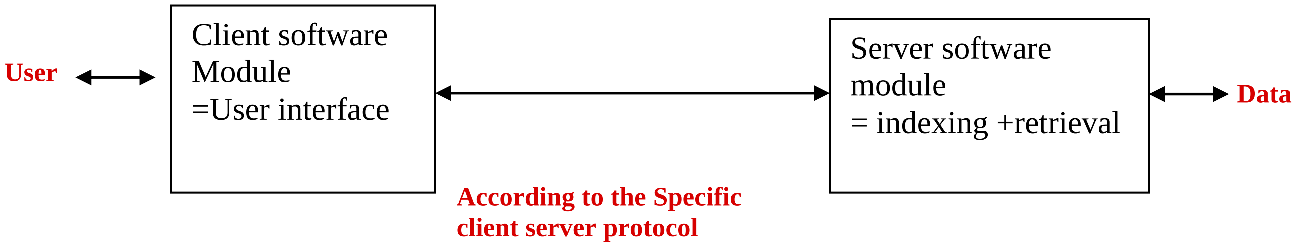
Lesson 9: Client/Server User Interface

A "client" is a program that runs on the computer which you access in the first place (often your desktop PC or an online access computer).• Each client provides an interface to each of the "services"(databases, online files, e-mail, …) that are made available by other systems, which are called "servers."

Client-server database systems: description

- The user specifies which database(s) to query and formulates a query, using the client software
- The client software then connects to the database(s) and submits the query, in a structure suitable for communication between client and server
- The server retrieves data from the database, orders these and returns these to the client.
- The client processes the incoming data, and presents them to the user.

Client-server database systems: software involved


User
Client software
Module
=User interface
Server software
module
= indexing +retrieval
Data
According to the Specific
client server protocol