A Brief Discussion About Client-Server System

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Abstract-Client-server is a system which can perform the functions of both client and server at the same time to promote the sharing of information between them. In the client-server system, lots of users access the same database at the same time. This paper will provide the information about the applications, architecture, Issues and challenges and recent development in the client-server system.This paper also discuss the field in which client-server is used.

Keyword: Client-Server, 2-tier, 3-tier,IaaS, PaaS, SaaS.

I. INTRODUCTION

With the advancement of technology, the web is becoming important in our daily lives. In which we do virtual things based on the use of the web. It is not only limited to the computers but it contains the different kinds of digital devices such as mobile. Client-Server model is also a part of the web in which communication play an important role between the client and server [1]. Client-server divide a load of application development time by dividing the functionalities. In this client is the requester and server are used as a service provider. In the client-server system, the data processing is handled by the server and the response is provided to the client.

II. WHAT IS CLIENT SERVER SYSTEM?

In today's life client-server phenomena is becoming so popular so that it used in all Fused by the client server system is Hypertext transfer protocol (HTTP), Simple mail transfer protocol (SMTP), and File transfer protocol (FTP). It is a software architecture where client always send request and server is the service provider [2]. It provides an inter-process communication between client and server because it involves the exchange of data from both the side that is client and server [2].
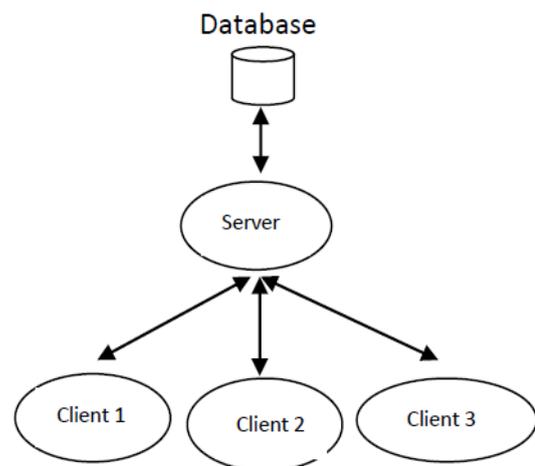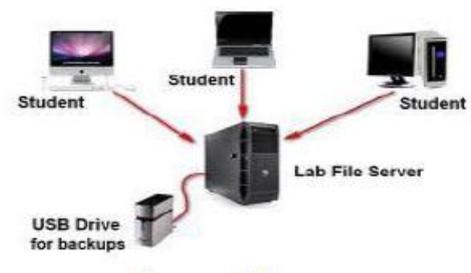

Figure 1.1: Inter-process Communication among Client and Server

A. Applications Using Client-Server System

1. File Transfer

File transfer protocol (FTP) is used for transmission of the file between client and server. It allows storing of files on the server. Files include such as movies, music, and images [3].

Figure 1.2: File Transfer

2. Mail Transfer

Client-server system is used for transfer of mail to each other using the mail transfer protocol.The POP protocol is used for mail transfer.

3. Hypertext Transfer Protocol

It is used as transferring of media files such as image, video between the client and server. It plays the role of request-response protocol and improves the communication between the client and server.

III. CLIENT SERVER ARCHITECTURE

Client-Server is mainly of two type 2-tier Client-Server architecture and 3-tier client-server architecture system

A. 2-Tier Client-Server Architecture

The two-tier architecture is based on Client Server architecture. It is like client server application. The direct communication takes place between the client and server. There is no intermediate present between the client and server system. Because of the tight coupling application will run faster. The two-tier architecture divide in two parts:Client Application and Database

The Client sends the request to the server and server response the request and returns to the client with data. The main problem with this architecture is that server can't respond the multiple requests of the client as result cause a data integrity issue into the system.
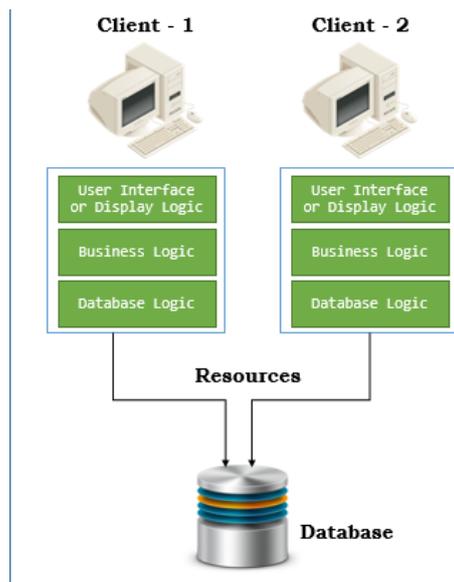

Figure 3.1-Tier Client Server Architecture

B. 3-Tier Client-Server Architecture

The three-tier client-server architecture is comprised of three layers

1. Client Layer
2. Business Layer
3. Data Layer

1. Data Layer

The Client layer represents web browser, java application etc. The client sends the request to the web server if the web server has static content it responds the request otherwise it forwards the request to application servlet or JSP in the application server for either static or dynamic content.

2. Business Layer

It provides the business services. It provides the business logic. It plays the role of interface between the client layer and the data layer. This layer contains all the business logics such as validation of data, insertion, calculations etc. It also helps to make communication faster between client and server.
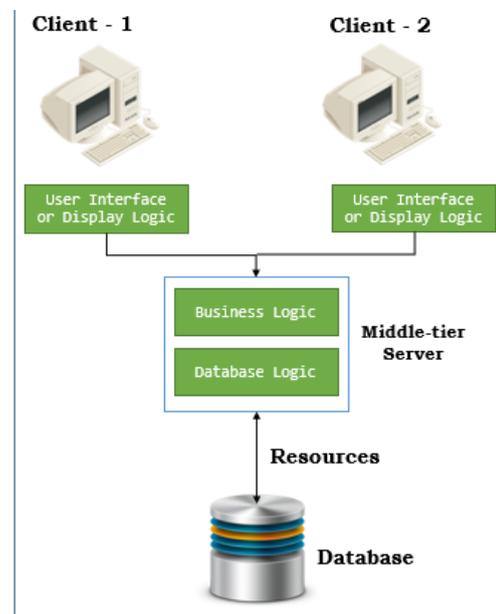

Figure 3.2-Tier Client Server Architecture

3. Data Layer

This layer is responsible for storing the data. This layer knows the method to connect with database

and other resources to perform insert, update and delete operations.

C. Middleware

In 3-tier architecture business layer play the role of middleware between the client layer and data layer. It is a separate software that running on a separate machine.

IV. RECENT DEVELOPMENT

Client-server system gains more popularity because lots of company moved to the cloud. Market growth is increased in the field of distributed and cloud computing [4].

A. Cloud Computing

People used different terms to define the cloud computing, but most common are that it is a set of distributed computers which provide services and resources to the user through the internet [5]. It is the development of parallel computing, grid computing and distributed computing [6]. Cloud computing provides different services to the user on the internet such as:

1. Software as a Service(SaaS)

In this service, you do not have any need to install any software or maintain it the applications is provided through the internet by the cloud consumers [6]. An Example of SaaS includes Google Mail, Google Docs, and SalesForce.com.

2. Platform as a Service (PaaS)

It is the platform that provided to the cloud consumers to develop cloud services and applications on the PaaS cloud. The main difference between SaaS and PaaS is that Saas only host completed computer applications where PaaS host the completed and in-progress applications. An example of PaaS is Google AppEngine.

3. Infrastructure as a Service (IaaS)

The cloud consumers directly use the IT infrastructure which is provided by the IaaS. Virtualization is mostly used in IaaS cloud in order to decompose the resources in an ad-hoc manner and complete the demand of thegrowing users [6]. An example of IaaS is Amazon's EC2.

4. Data as a Service (DaaS)

It is a special type of IaaS. In Daas, the consumers have to pay for what they are actually using rather than the site license for the entire database. It provides the table style abstraction of large database like RDBMS in a very less time. An example of DaaS isAmazon S3, Google Big Table.

So there is no field in the recent time where cloud computing can't be used. It used by all the social networking sites such as Facebook, Twitter and WhatsApp and the entertainment sites such as Youtube, Netflix used the cloud computing services.

B. Mobile Agent

The Mobile agent is an entity which is run at a remote site with the help of the network gather results, search results and after the completion of the task it backs to its original site [7]. They are called mobile agents because in this they have the ability to move from one computer to the other network through the network. It is the advancement of the client-server system. Each entity has played a specific role such as server played the role of providing the service where the client is the requester. The Mobile agent has the advancement of the client-server system now it has following benefits

1. Fault Tolerance

In the client-server system when the server is down connection is lost. But in the case of Mobile Agent, we were able to continue our work if one node is not responding.

2. Persistence

When the mobile agent is created which is not an easy task it has the ability to work on its own in any situation/ when another node in the system fails.

3. Communication

In the client-server system, Server do not have any ability to communicate other server but a mobile agent is a work as a peer to peer entity and act either as a client or server.

V. ISSUES AND CHALLENGES IN CLIENT-SERVER SYSTEM

There are some issues in the client-server system which includes

A. Number of People

A client-server system is very difficult to set up if the number of people using the system is less in the count. So our system remains useless and all the resources are not properly used. So we have a fair number of people in our client server system.

B. Server Down

If the server has a problem or network is down and not responding properly so no one is able to do their work. So this is the reason we why make our server reliable so no problem occurs in the network and our work is going on.

C. Expertise Required

Setting up the server is a complex technical task and maintaining and sorting out the technical problem is also pose a big challenge. So we need a network manager to maintain our system solve all the technical issues arises. So this, of course, is quite expensive.

D. Security

The most basic problem arises in client server system is security issue [3]. The client operating system is easy to access for the servers and it produces the number of problems for the client system. The communication between client and server sometimes increase the number of security issues. So they harm our system by a virus attack and physical damage [3]. So we have a secure client-server system we have to follow some basic rules which are given as

1. Audit Network

2. Object Reuse

3. Using of Firewall

4. VPN and Private Networking

5. SSH Keys

6. File Auditing and Intrusion Detection System.

VI. CONCLUSION

The online quiz system and examination system are the examples of the client-server system. In this system admin of the system can load a number of questions of thedifferent subject with a right answer. So after taking the test the result of every student saved in the database. So assume the world without this system so it saves manpower and time. In the recent time, all the applications worked on the client server system.

In conclusion, the client server system covers both areas of networking and management due to its flexibility in structure. So it is very necessary for us to know the advantage of this technology in the IT world and different areas where client-server system working because if we do not know how this technology will be used so we are not able to take the full advantage of its functionalities. So without knowing the application of this technology, it is very difficult for us to execute the process.

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