Data Communication between Computers using MATLAB Program

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Abstract

This article does the research about data communication between computers using MATLAB program. The benefit of this research is we know how to create connections so communication between computers using Client and Server system based on MATLAB program. Data communication by using MATLAB program needs internet connection and known IP Address from client and server computers. Client can ask for data communication service, and Server can give information from data communication which Client asked. This research has succeeded for give information that step by step to build program using MATLAB in connecting between Computers with client and server system, and build the communication data.

Keywords: MATLAB, Data communication, Client-Server

1. Introduction

The science progress today is growing rapidly. Many research conducted in computer science field, from the simple application until various kind of complex application. Many computer networks that already open, it will make easier to exchange information digitally. Conventional methods would be even abandoned, because with the online connection many benefits that we can get like shorter time in the exchange the information, and more economical.

Many ways to perform data communication, one common way is with client and server system. This common way system for calling database which Server will be share to Client. This research is done based on it, and do using program from MATLAB. And discuss how to build a Client and Server program using MATLAB language to succeed in doing data communication and create relationship Client and Server.

1.1. Client-Server

Client-Server can be defined as the ability of computer system to ask the services for request data from other Computer. Every instance is requesting the services referred to as a Client, while every instance providing the services referred to as a Server. With Client-Server system, user from various location can access the same data. So the architecture of Client –Server is the design of an application consists of client and server communicates with each other when accessing a server in a network.

Function Client-Server in the context of the data base, Client set interfaces serves as a workstation running a database application. Server receives user requests, check the syntax and generate in need of data base by using variation programming language.

1.2. Data Communication

So the notion of communication data can be interpreted a process of sending and receiving electronic data from two or more instruments are connected in a network via a media. So that, the data can be communicated from one place to another, needed third important elements that to be available,
that is data source, the transmission and receiver. Media transmission will bring data from the source to receiver.

Figure 1. Communication illustration between the Computers

2. Research Methode

This research conducted with process as illustrated to following Flow chart (Fig.2). First step this research from development MATLAB programming until make the connection between two computers, and transfer data from Server computer to Client computer.

Gain Indicator:
Understanding to MATLAB characteristic programming
Output:
References for research (book, paper, or international journal)

Gain Indicator:
Availability new programming to make a computer connection with MATLAB
Output:
Constructed of the new program

Gain Indicator:
Program can work properly.
Output:
Programming task with Client and Server system
3. **Data communication with MATLAB programming**

   In this case we will transfer data image from Plot program MATLAB with Line Balancing project. The example Data can be viewed in Figure 3.

   ![Figure 3](image_url)

   **Figure 3.** The Data will be transfer from Server to Client

   Step in communicating Data between computer, first we must find IP address and Port available for Client computer and Server computer with help from command prompt. Having obtained the information in “Listening” mode from the IP address and port available, it will be used as the IP address and port of the Server and Client computers.
3.1 Program Language in MATLAB application for Computer Server:

```matlab
%SERVER PROGRAM

clear all
close all
clc
data = imread('C:\Users\AJ\Documents\MATLAB\Balancing.jpg');
s = whos('data')
s.size
s.bytes
tcipserver = tcpip('0.0.0.0', 5500, 'NetworkRole', 'Server')
set(tcipserver, 'OutputBufferSize', s.bytes);
fopen(tcipserver)
fwrite(tcipserver, data(:, 'uint8'));
```

3.2 Program Language in MATLAB application for Computer Client:

```matlab
%CLIENT PROGRAM

clear all
close all
clc
tcipclient = tcpip('192.168.1.100', 5500, 'NetworkRole', 'Client')
set(tcipclient, 'InputBufferSize', 307470);
set(tcipclient, 'Timeout', 360);
fopen(tcipclient);
rawData = fread(tcipclient, 307470, 'double');
fclose(tcipclient);
reshapedData = uint8(reshape(rawData, 277, 370, 3));
imwrite(reshapedData, 'D:\Data Paper Matlab\Linebalancing.jpg');
```
Check the Established connection using the Command Prompt application of computer server and client before continuing the program, if the connection already established continue to run the program with Server program beforehand, and continued running the client program on another computer.

Figure 5. Check the ESTABLISHED connection with Command Prompt

Data communication can be done and the Client can pull data from the Server to provide information to the user, and it can be stored according to the destination directory.

4. Result of Research and Discussion

Data communication using MATLAB programs can be done with Client-Server system between computers. This method requires internet connection and has an IP address that remains, particularly for the Client. If there is interference on the Internet network, the processes of data communication between computers cannot be done.

The Server is not only serve requests from the client, but also can collect the information provided by the Client. In the process of data communications can be carried out according to the time required by the method of Real Time System. The following flow chart process of the research that has been done (see Figure.6):
Figure 6. Flow chart connection with Client-Server method in MATLAB programming
5. Conclusion

This research has been successfully done in the case of data communication between computers using the system Client-Server with the program and language in MATLAB. The Clients can pull the data from the Server to obtain information from data requested to the Server.

This research can be continued for a connection between a server with more than one client using MATLAB programs and data exchange with many methods like the Real Time System with data requests from the client to the server adjusted to the time required.

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References