CPRE 550 - RPC **Eranda Sooriyarachchi**

System Design

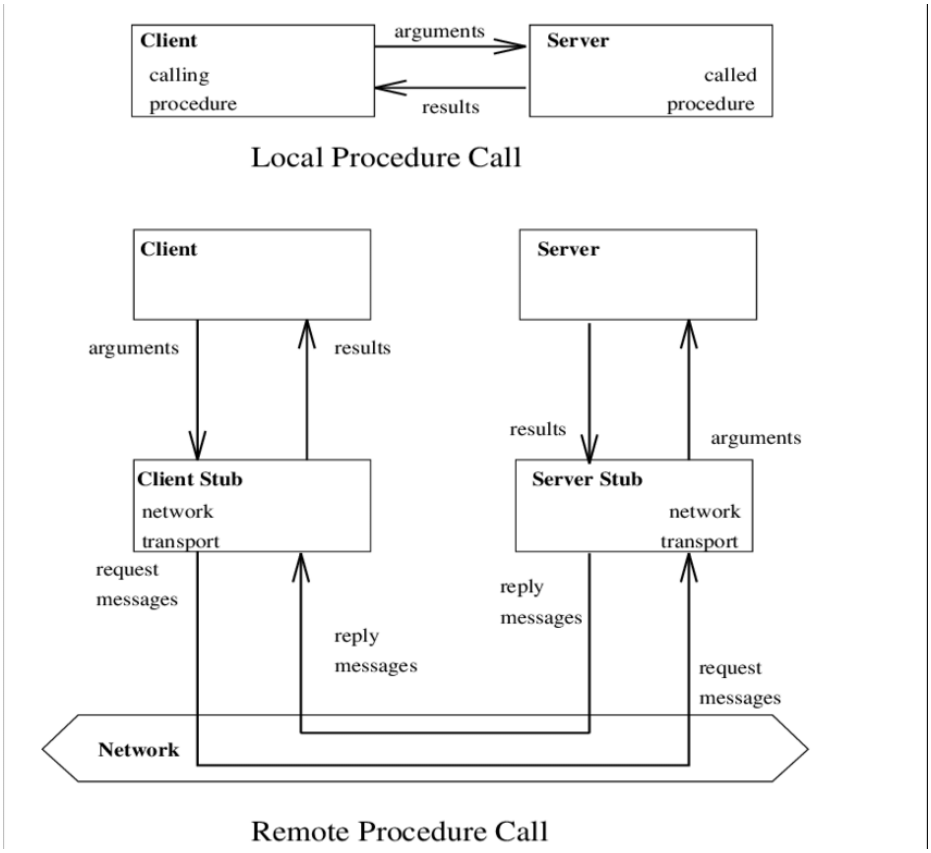
RPC (Remote Procedure Call) is a communication protocol that enables the communication between two processes or systems over a network. It is a way for a program to call a function or procedure in another program, which is running on a remote machine as if it were a local function call.

When an RPC call is made, the calling program sends a request message to the remote program, which executes the requested function and returns a response message to the calling program. The calling program can then use the results of the function to continue its execution.

RPC typically uses a client-server model, where the client makes a request to the server, which then processes the request and sends a response back to the client. The client and server are implemented in C and run on a Linux virtual machine.

One of the key benefits of RPC is that it allows programmers to develop distributed applications without worrying about the low-level details of network communication. This makes it easier to write, test, and debug distributed applications.

In this project we need to calculate the CPU usage, Memory usage, and Load procs per minute on the server. Hence, the client will call the respective functions. RPC will generate the client stub, which contains the code requesting the information from the server side. The client-side OS transports these instructions to the server side OS. The server-side OS unpacks the code for the server stub. The server stub gets processed, and the instructions are run. Then the output is sent back to the client in a similar fashion following the same path. The figure provided depicts this pathway clearly.



For CPU usage, we can do the following:

Calculate the total CPU time used by the system and the user processes. This is the sum of the system and user CPU time.

Calculate the CPU usage percentage by dividing the total CPU time used by the number of CPU cores and the total time elapsed. The total time elapsed is usually measured in seconds. The formula for calculating CPU usage is as follows:

CPU usage = (total CPU time used / number of CPU cores / total time elapsed) x 100%

Next, we have to calculate the memory usage, which can be done as follows:

Calculate the memory usage percentage by dividing the total memory used by the total physical memory and multiplying it by 100%. The formula for calculating memory usage is as follows:

Memory usage = (total memory used / total physical memory) x 100%

Finally, we need to calculate Load procs per min:

The number of processes running on a system within a minute. This can be calculated using system monitoring tools that track the number of processes running on the system at any given time.