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STUDY OF REMOTE PROCEDURE CALL- XMLRPC

AIM:

To study the concepts of Remote Procedure Call-XML RPC.

What is RPC programming?

Remote Procedure Call (RPC) programming allows a program to call procedures outside its

current address space. A program can execute a procedure on a remote machine, pass data to it,

and retrieve the result. Using RPC, you can write a distributed

INTRODUCTION TO RPC: ☐ Remote Procedure Call (RPC) is a model that specifies how cooperating processes on

different nodes in a heterogeneous computing environment can communicate and

coordinate activities. ☐ The paradigm of RPC is based on the concept of a procedure call in a higher level

programming language. ☐ The semantics of RPC are almost identical to the semantics of the traditional procedure

call. ☐ The major difference is that while a normal procedure call takes place between

procedures of a single process in the same memory space on a single system, RPC takes

place between processes on clients and servers in a heterogeneous computing

environment. ☐ The remote procedure call act like a procedure call, but act across the network. ☐ The process makes a remote procedure call by pushing its parameters and a return

address onto the stack, and jumping to the start of the procedure. The procedure itself is

responsible for accessing and using the network. ☐ After the remote execution is over, the procedure jumps back to the return address. The

calling process then continues.

1. The client calls the client stub. The call is a local procedure call, with parameters pushed

on to the stack in the normal way.

2. The client stub packs the parameters into a message and makes a system call to send the

message. Packing the parameters is called marshaling.

3. The client's local operating system sends the message from the client machine to the

server machine.

4. The local operating system on the server machine passes the incoming packets to the

server stub.

5. The server stub unpacks the parameters from the message. Unpacking the parameters is

called unmarshalling.

6. Finally, the server stub calls the server procedure. The reply traces the same steps in the

reverse direction. • When the calling process calls a procedure, the action performed by that procedure will

not be the actual code as written, but code that begins network communication. It has to

connect to the remote machine, send all the parameters down to it, wait for replies, do the

right thing to the stack and return. This is the client side stub. • The server side stub has to wait for messages asking for a procedure to run. It has to

read the parameters, and present them in a suitable form to execute the procedure locally.

After execution, it has to send the results back to the calling process.

BASIC PROCESS OF A SERVER:

RPC BINDING

• Server program defines the server's interface using an interface definition language(IDL) • The IDL specifies the names, params, and type for all server procedures

• A stub compiler reads the IDL and produces two stub procedures for each server

procedure: a client-side stub and a server-side stub

• The server writer writes the server and links it with the server-side stubs; the client writes

the program and links it with the client-side stubs.

RPC STUBBING

• A client-side stub looks to the client as if it were a callable server procedure

• A server-side stub looks to the server as if it were a calling client • The client program thinks it is calling the server, in fact it calling the client stub

• The server program thinks it is called by client, in fact, it is called by the server stub

• The stubs send messages to each other to make the RPC happen.

RPC MARSHALING

• Marshalling is the packing of procedure parameters into a message packet. • The RPC stubs call procedures to marshal (or unmarshal) all parameters. • On the client side, the client stub marshals the parameters into the call packet; on the

server side the server stub unmarshals the parameters in order to call the server's

procedure

• On the return, the server stub marshals return parameters into the return packet; the client

stub unmarshals return parameters and returns to the client.

XML-RPC METHOD IN PYTHON

INTRODUCTION:

XML-RPC is a lightweight remote procedure call protocol built on top of HTTP and XML. With

it, a client can call methods with parameters on a remote server (the server is named by a URI)

and get back structured data.

In PYTHON, xmlrpc is a package that collects server and client modules implementing XML-

RPC. The modules are: □ xmlrpc.client □ xmlrpc.server

xmlrpc.client:This module supports writing XML-RPC client code; it handles all the details of

translating between conformable Python objects and XML on the wire.

METHODS:

class xmlrpc.client.ServerProxy(uri, transport=None, encoding=None, verbose=False, allow_

none=False, use_datetime=False, use_builtin_types=False, *, context=None) □ ServerProxy instance is an object that manages communication with a remote XML-RPC

server. □ The required first argument is a URI (Uniform Resource Indicator), and will normally be

the URL of the server. All other arguments are optional. ☐ The returned instance is a proxy object with methods that can be used to invoke

corresponding RPC calls on the remote server.

RESULT:

The remote procedure call-Xmlrpc has been studied