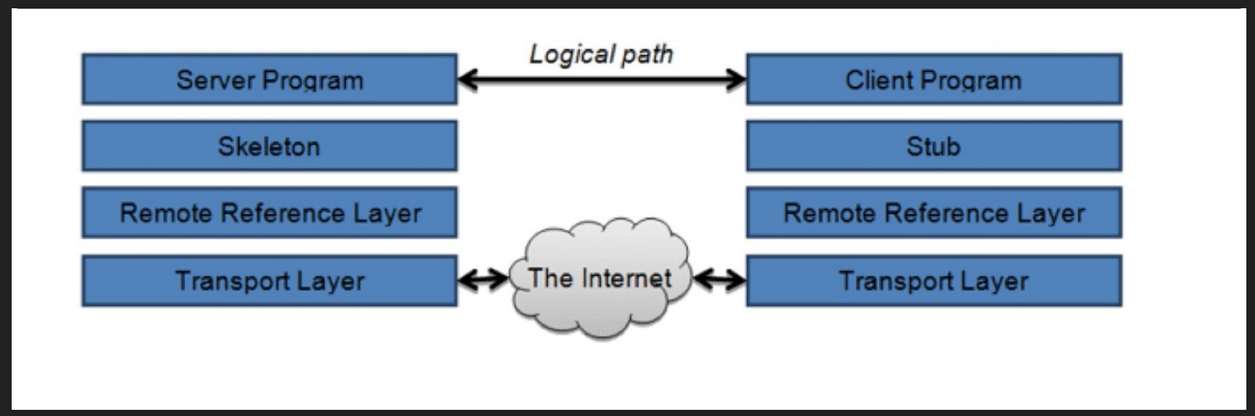
RMI

Nayden Gochev

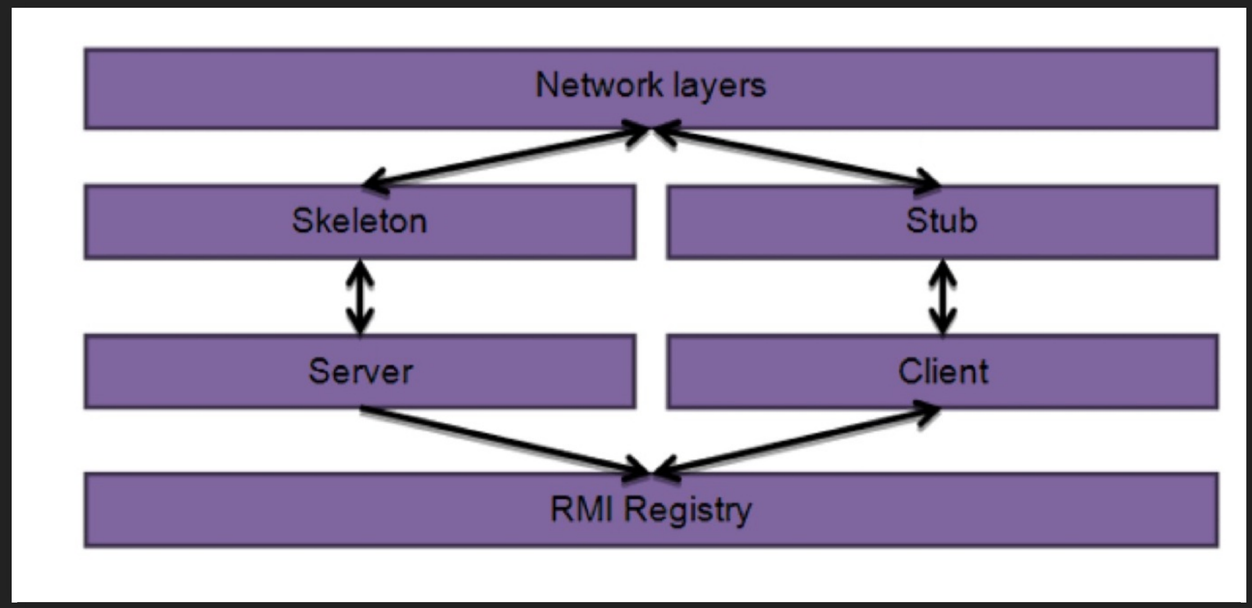
RMI

- RMI (Remote Method Invocation) is an architecture to support distributed computing.
- In RMI architecture, a POJO can be designated as a remote object.

RMI LAYER MODEL



ARCHITECTURAL OVERVIEW



THE KEY POINTS OF RMI ARCHITECTURE ARE:

- The server binds the remote reference to the RMI registry with an unique name.
- The client looks up the RMI registry to get the stub of the remote object.
- Remote method calls in Java are similar to local method calls.
- Remote objects from the server can also return a stub to a remote client. As a result, the RMI registry looks up once at the beginning by the client can improve performance considerably.

IMPLEMENTING AN RMI APPLICATION

1. Create a remote interface.
2. Implement the remote interface. This class will define methods that will be called remotely.
3. Create a server program. The server class registers the remote class with the RMI registry.
4. Create a client program that will access the server object remotely.

1. CREATING A REMOTE INTERFACE

```
public interface RemoteUtil extends Remote{

public String getMessage() throws RemoteException;
public int getFibonacci(int num)
    throws RemoteException;
}
```

2. IMPLEMENTING A REMOTE INTERFACE

```
public class RemoteUtilImpl
    extends UnicastRemoteObject implements RemoteUtil{
        ....
```

3. CREATING A SERVER PROGRAM

```
...
main
...
try {
    RemoteUtilImpl impl=new RemoteUtilImpl();
    Naming.rebind("RMIServer", impl);
}catch(Exception e) {
    System.out.println("Exception: " + e);
}
```

4. CREATING A CLIENT PROGRAM

```
String serverURL="rmi://"+args[0]+"/RMIServer";
RemoteUtil remoteServer=
(RemoteUtil)Naming.lookup(serverURL);

System.out.println(remoteServer.getMessage());
System.out.println(remoteServer.getFibonacci(5));
```

THATS ALL CODING !

- however the starting is a bit tricky.
- we need to:
  - javac *.java
  - rmic RemoteUtilImpl
  - mv *.class ../bin
  - rmiregistry
  - java RMIServer
  - java RMIClient localhost

THINGS WE HAVE OVERLOOKED

- Security is an issue when working with Java RMI.
- In a real life application, we need to make sure that the server program runs under a security manager.
- Development we may need to create AllSecurity.policy file like this one:

```
grant{
    permission java.security.AllPermission
};
```

use -Djava.security.policy=AllSecurity.policy