

Communications

Chapter : 4

Outlines

Background

- Foundations
- RPC(Remote Procedure Call)
- Message-Oriented Communication
- Multicast Communication
- Case Study : java RMI and message passing interface(MPI)

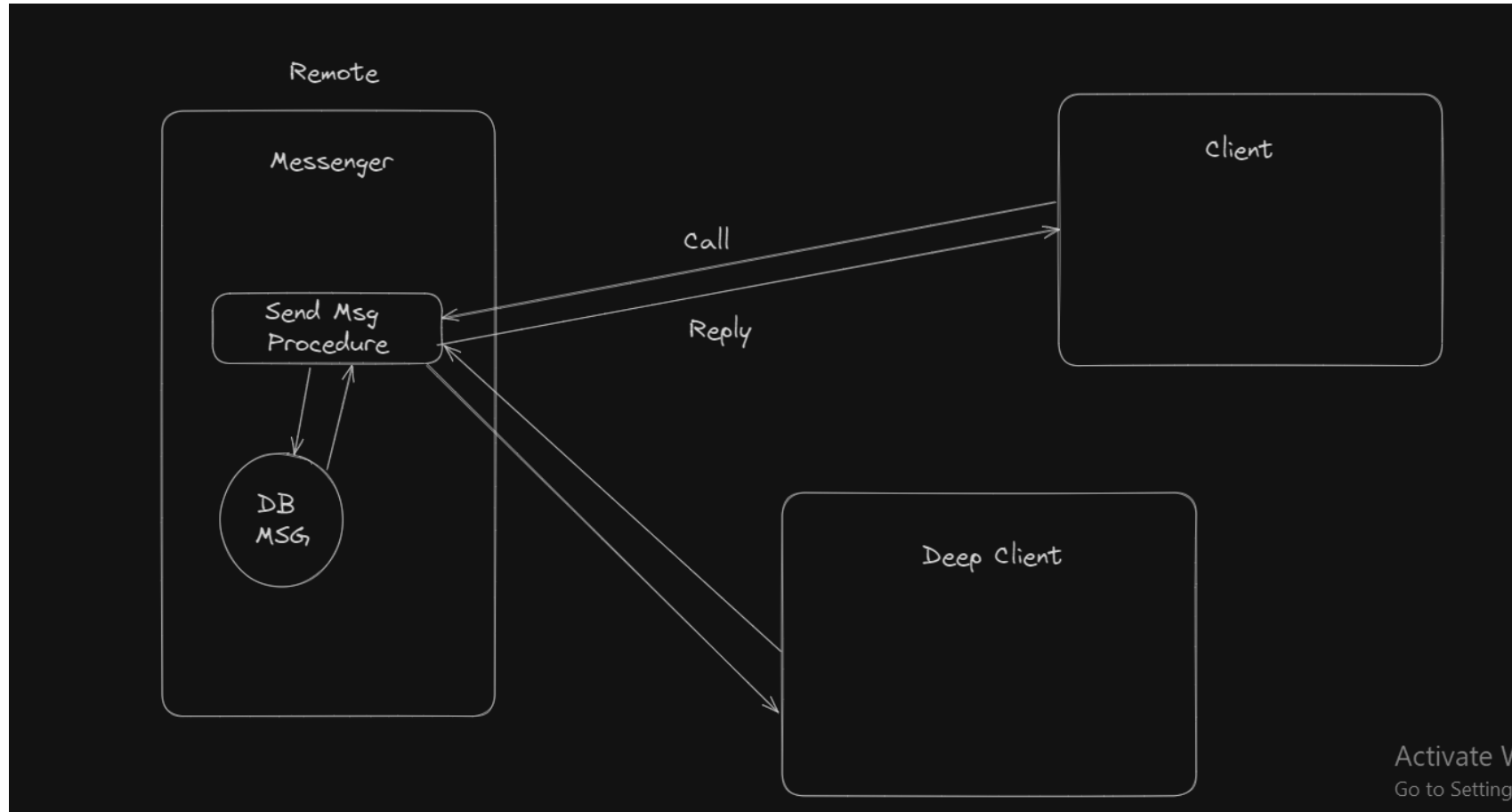
Background

- Inter-process communication is at the systems..
- Communication in distributed systems is always based on low-level message passing as offered by the underlying network.
- Modern distributed systems often consist of thousands or even millions of processes scattered across a network with unreliable communication such as the (Internet).

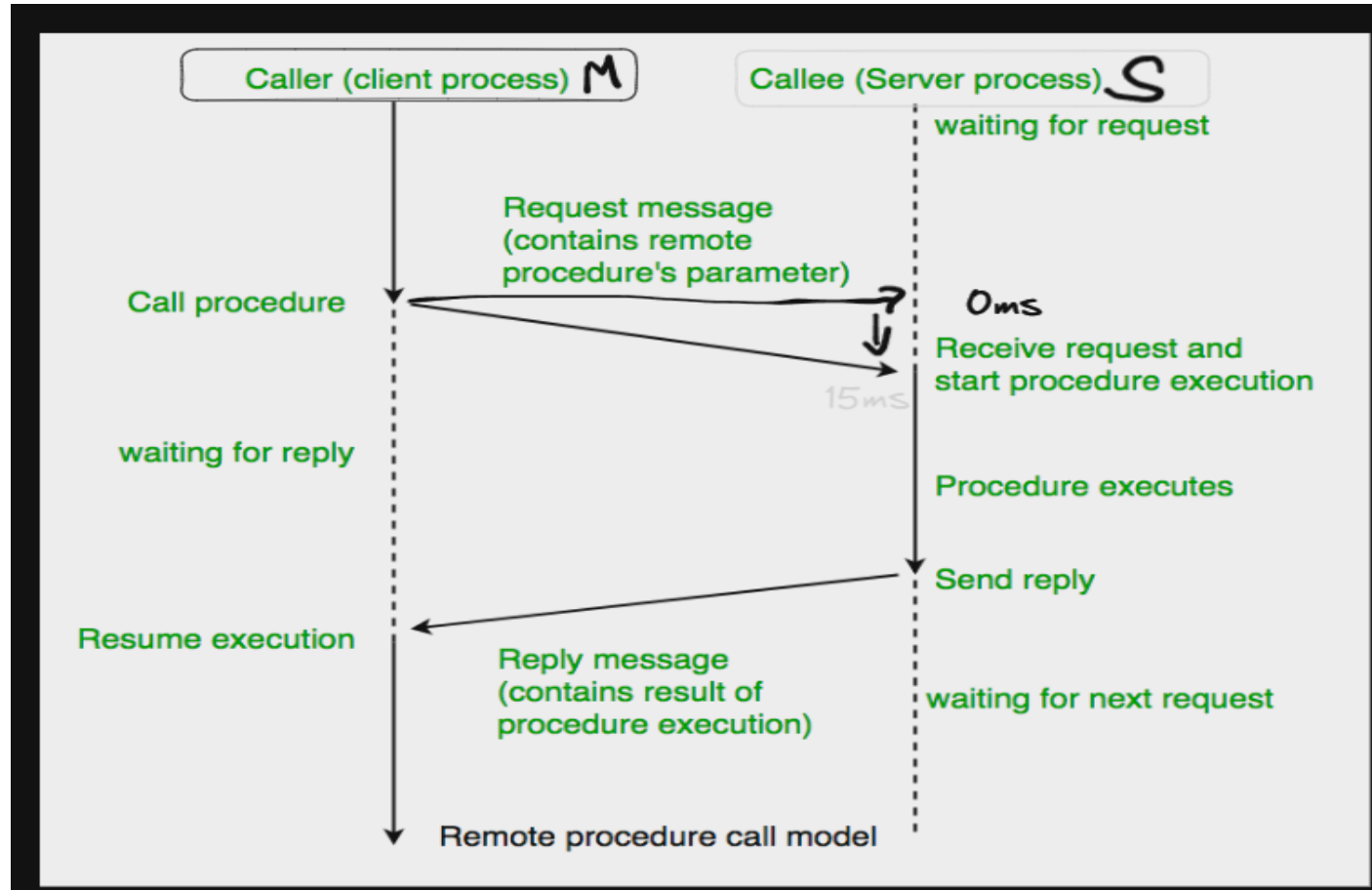
Communication Protocol

- Protocol : Set of rules on communication.
- To allow a group of computers devices to communicate over a networks , must all agree on the protocols to be used.
- Protocols can be connectionless and connection oriented
- Before exchanging data the sender and receiver first explicitly establish a connection (hand shaking)

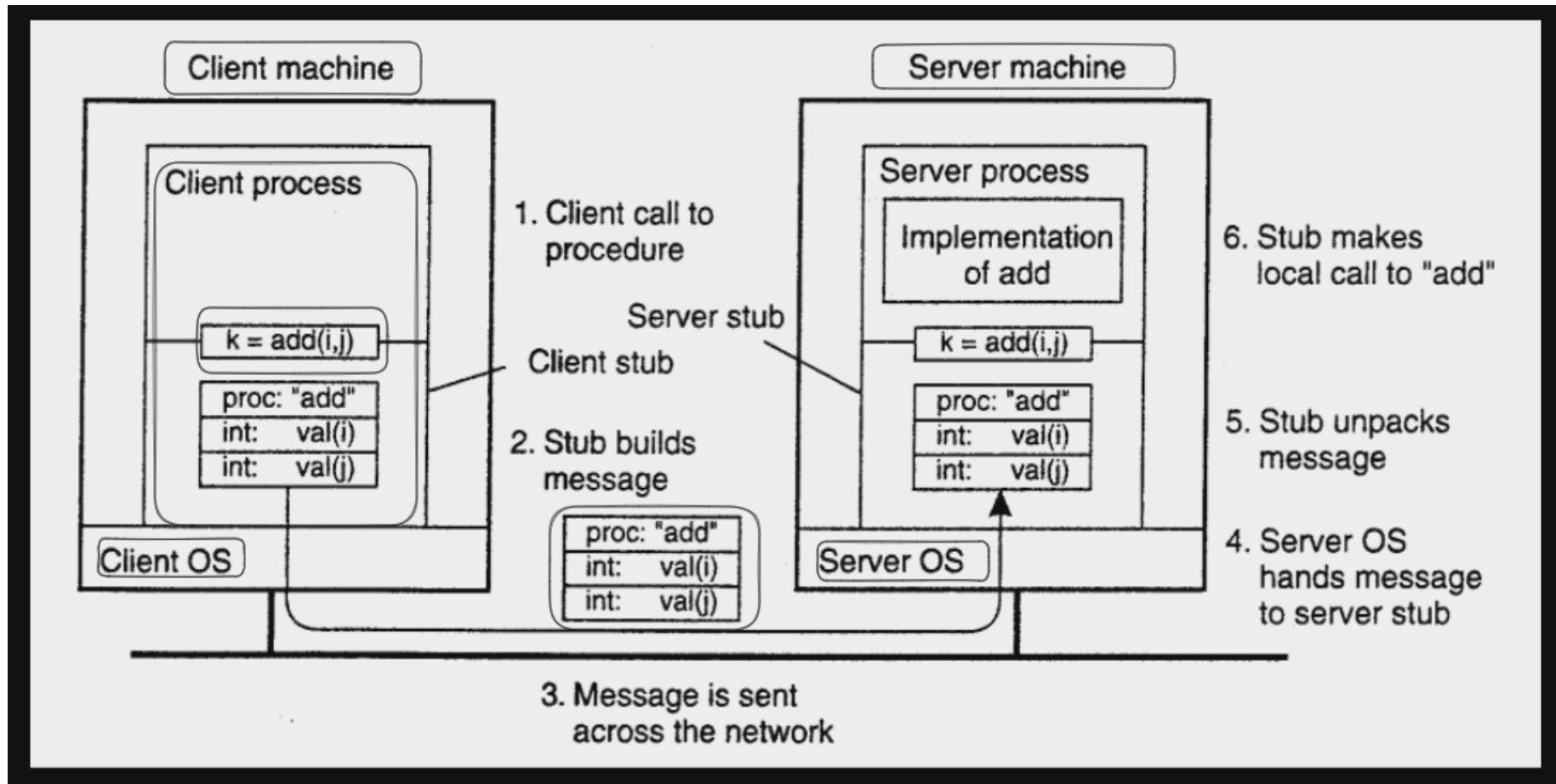
Remote Procedure call Over view



Process of RPC

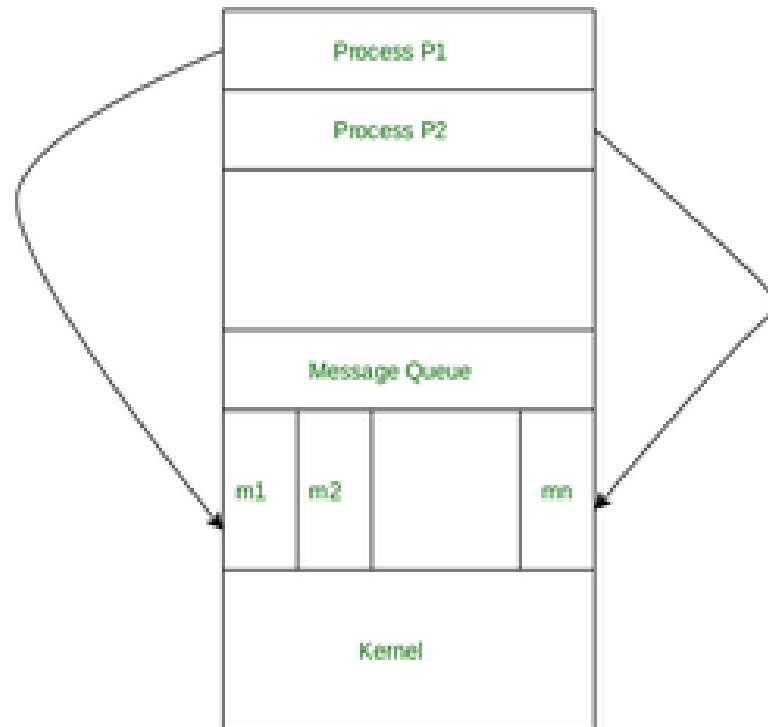


RPC Architecture

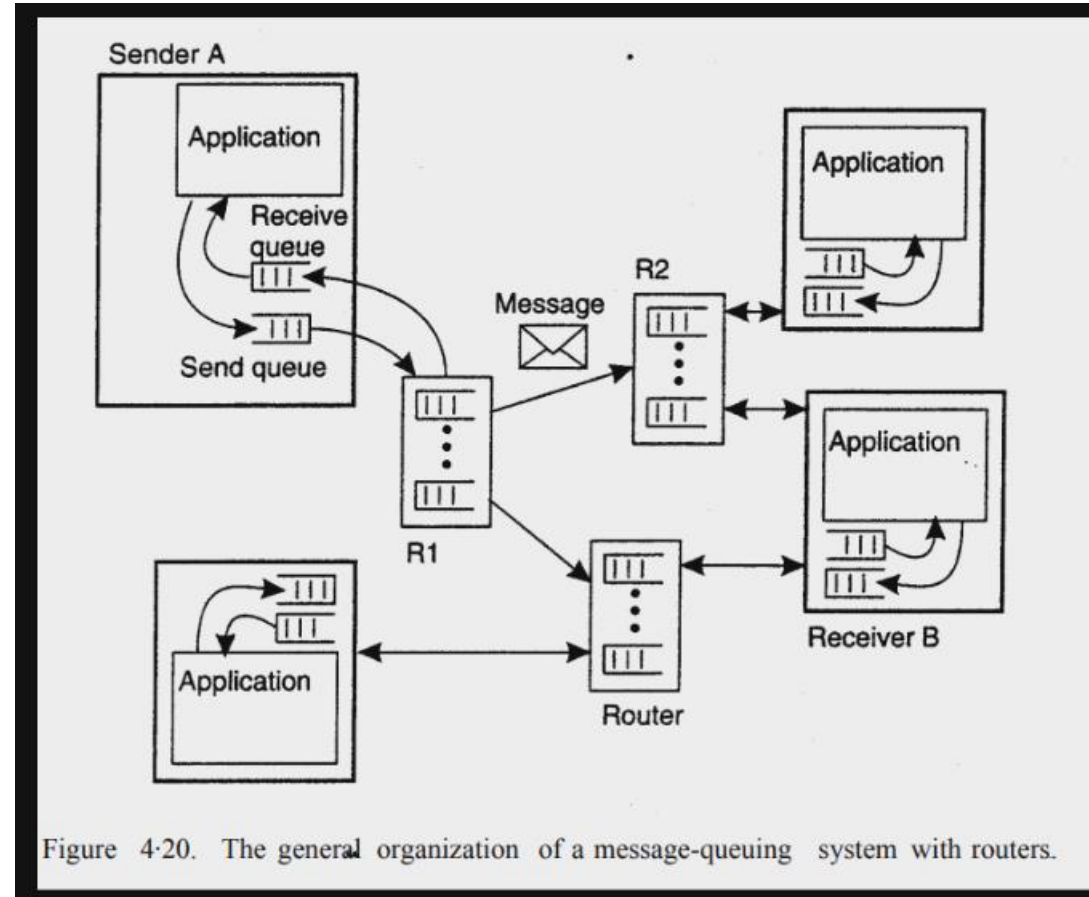


Message-Oriented Communication

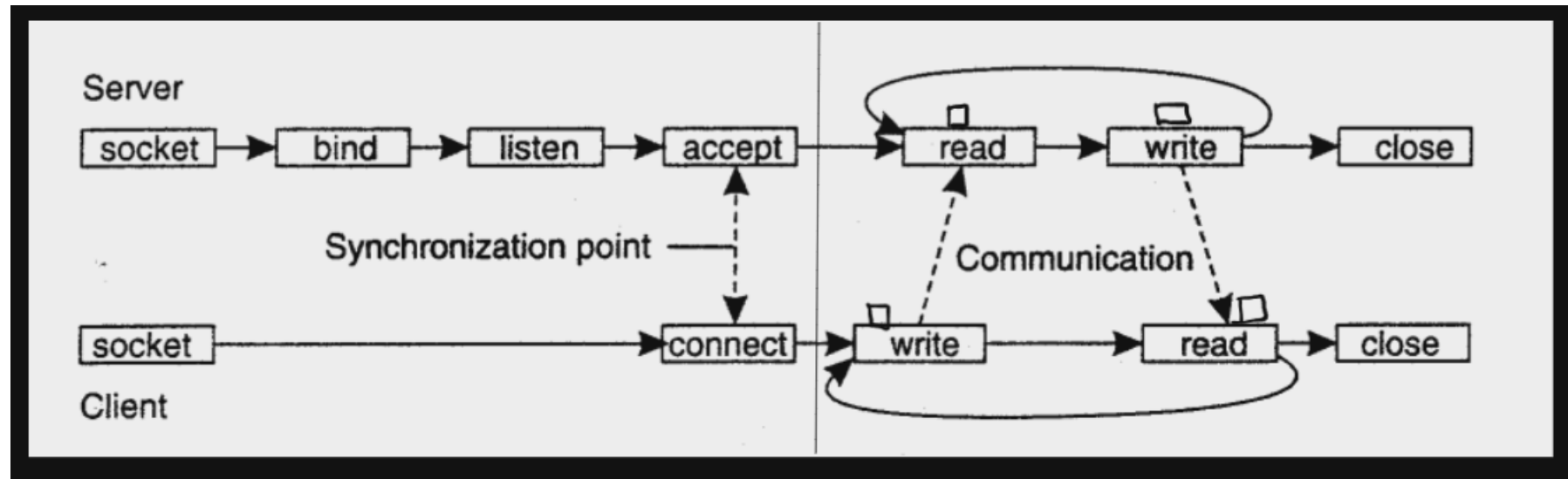
- Communication between processes within the device.



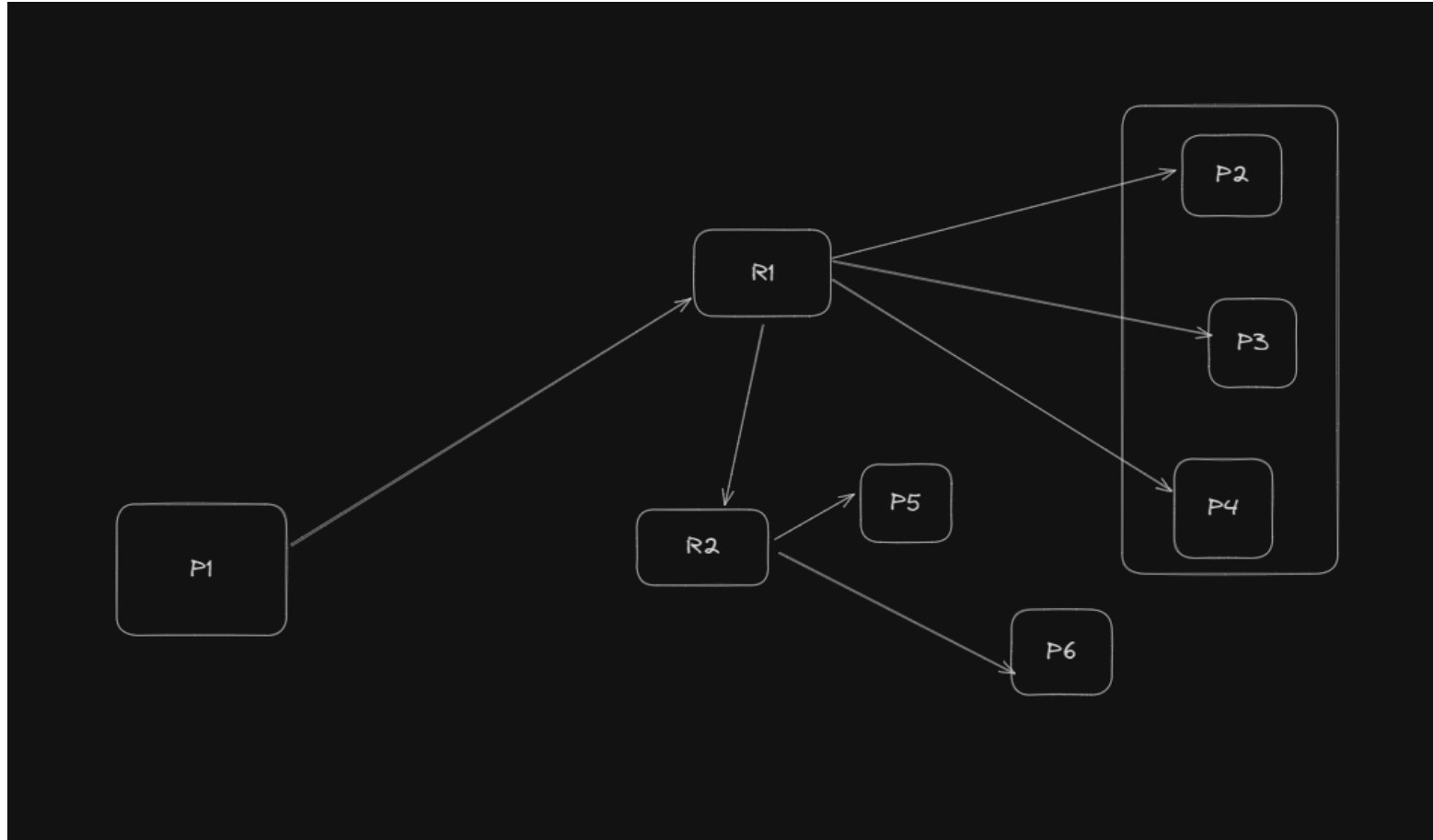
Message Queuing in Distributed System



Message Passing through Sockets



Multi-casting in Distributed System



Java RMI and Message Passing Interface (MN)

Stub Object: The stub object on the client machine builds an information block and sends this information to the server.

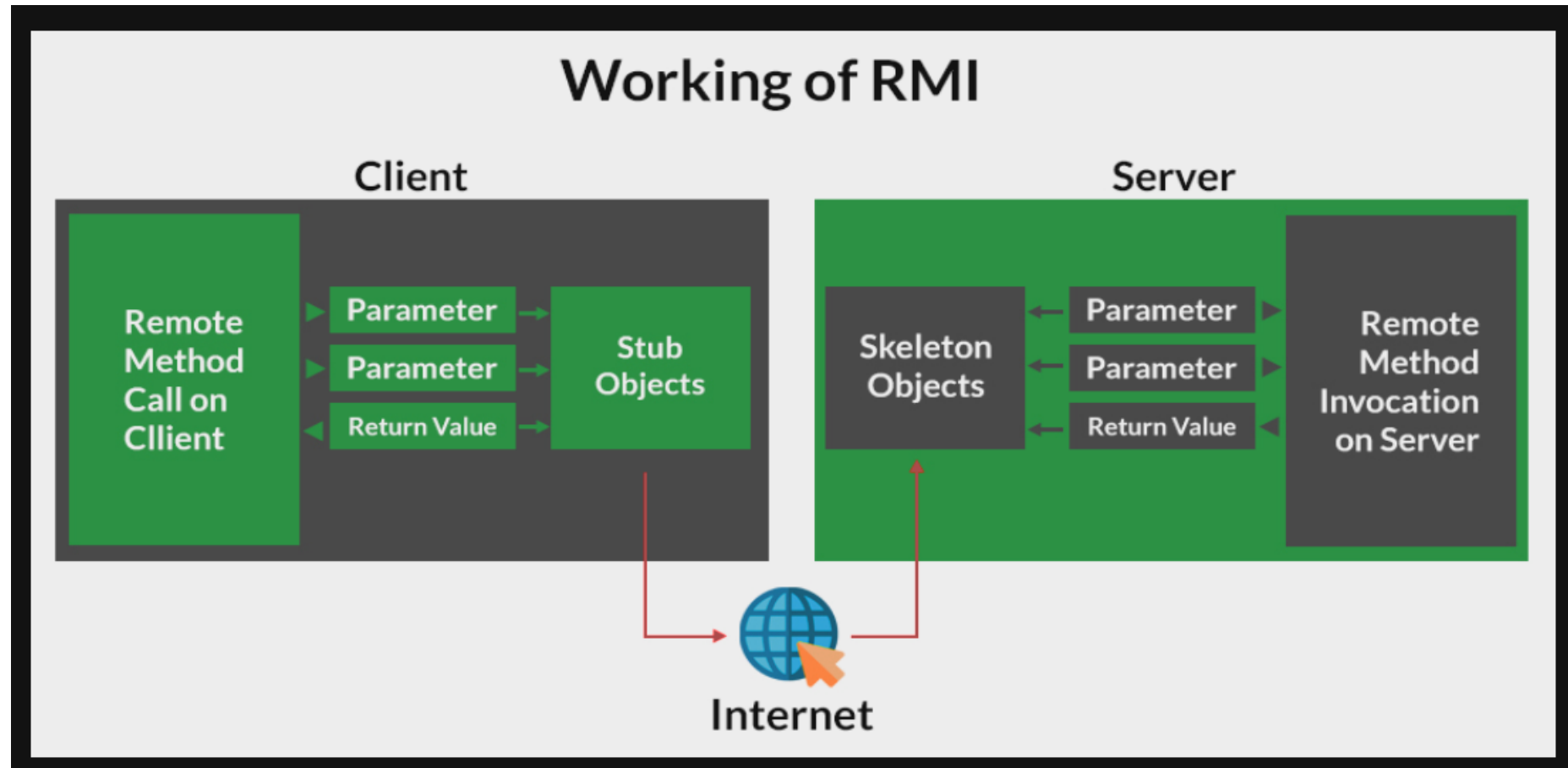
The block consists of:

- An identifier of the remote object to be used
- Method name which is to be invoked
- Parameters to the remote JVM
- Packing

Skeleton Object: The skeleton object passes the request from the stub object to the remote object. It performs the following tasks:

- It calls the desired method on the real object present on the server.
- It forwards the parameters received from the stub object to the method.
- Unpacking

Working of Remote Method Invocation



Message Passing Interface

- Message Passing Interface (MPI) is a standardized and portable message-passing system developed for distributed and parallel computing.

The End