

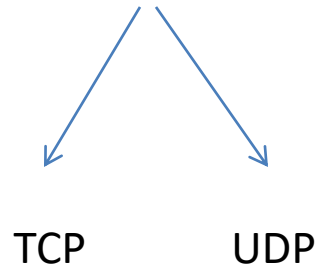
Introduction

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Definition

- Network programming is a concept of connecting two or more computing devices together so that we can share resources
- Network programming refers to writing programs that execute across multiple devices, in which all devices are connected to each other using a network
- Socket programming provides facility to share data between different computing devices

- Java.net package is used



TCP	UDP
Transmission Control Protocol	User Datagram Protocol
Connection- oriented	Connection-less
reliable	Un-reliable

```
import java.net.*;
import java.io.*;

public class ParseURL {
    public static void main(String[] args) throws Exception {

        URL aURL = new URL("http://example.com:80/docs/books/tutorial"
            + "/index.html?name=networking#DOWNLOADING");

        System.out.println("protocol = " + aURL.getProtocol());
        System.out.println("authority = " + aURL.getAuthority());
        System.out.println("host = " + aURL.getHost());
        System.out.println("port = " + aURL.getPort());
        System.out.println("path = " + aURL.getPath());
        System.out.println("query = " + aURL.getQuery());
        System.out.println("filename = " + aURL.getFile());
        System.out.println("ref = " + aURL.getRef());
    }
}
```

Here is the output displayed by the program:

```
protocol = http
authority = example.com:80
host = example.com
port = 80
path = /docs/books/tutorial/index.html
query = name=networking
filename = /docs/books/tutorial/index.html?name=networking
ref = DOWNLOADING
```

Feature and Scope of NP

- Sharing resources
- Centralize software management

Feature and Scope of NP

- Text editors like BBEdit save and open files directly from FTP servers.
- IDEs like Eclipse and IntelliJ IDEA communicate with source code repositories like GitHub and Sourceforge.
- Word processors like Microsoft Word open files from URLs.
- Antivirus programs like Norton AntiVirus check for new virus definitions by connecting to the vendor's website every time the computer is started.
- Music players like Winamp and iTunes upload CD track lengths to CDDb and download the corresponding track titles.
- Gamers playing multiplayer first-person shooters like Halo gleefully frag each other in real time.
- Supermarket cash registers running IBM SurePOS ACE communicate with their store's server in real time with each transaction. The server uploads its daily receipts to the chain's central computers each night.
- Schedule applications like Microsoft Outlook automatically synchronize calendars among employees in a company

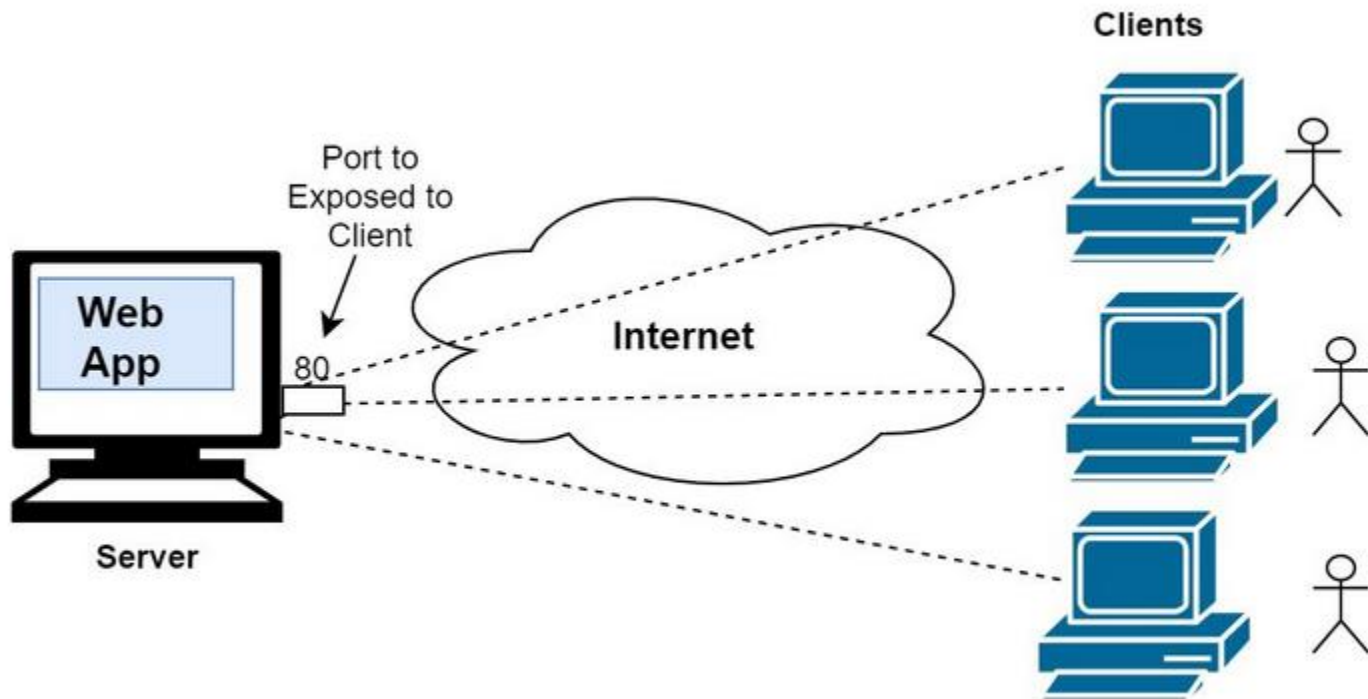
Network Terminologies

- IP Address
- Protocol
- Port Number
- MAC Address
- Connection Oriented (eg. TCP) and connection-less (eg. UDP) protocol

Networking Programming Tools & Platforms

- Wireshark
- Nmap
- iPerf3
- Cisco Packet Tracer
- Putty
- NetStat
- Angry IP Scanner
- PingPlotter
- cURL
- PRTG Wifi Monitor

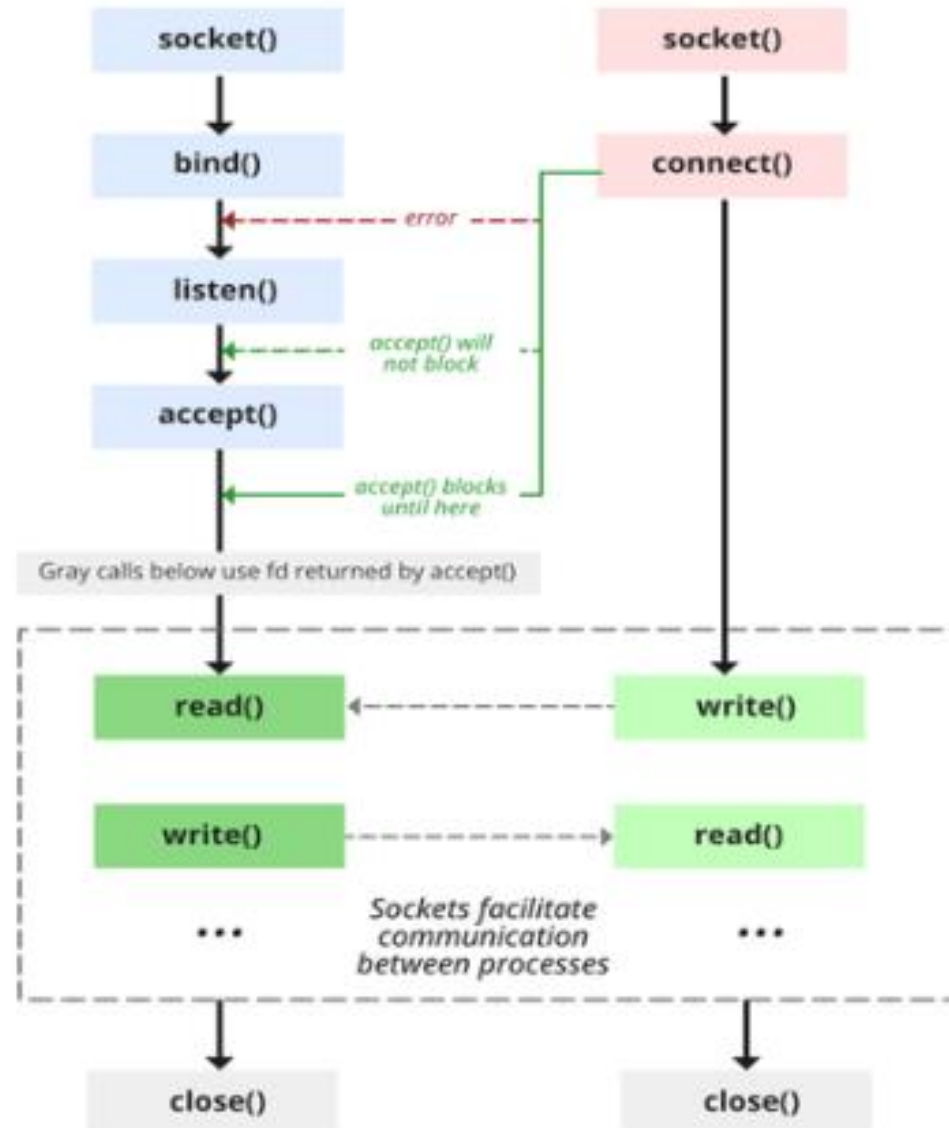
Client Server Architecture



Client-server Architecture example

Server Process

Client Process



Software Design

- Software design is a mechanism to transform user requirements into some suitable form, which helps the programmer in software coding and implementation
- Objectives
 - Correctness
 - Completeness
 - Efficiency
 - Flexibility
 - Consistency
 - Maintainability

Thank You