Networking and Communication Basics

There and Back Again

Overview

Communication

Basic concepts

Definition

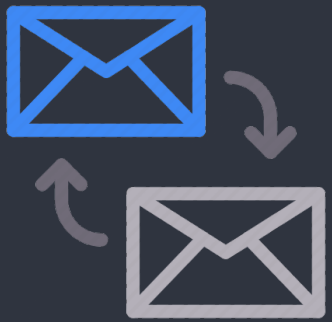
Communication is the act of developing meaning among entities or groups through the use of sufficiently mutually understood signs, symbols, and semiotic conventions.

Message

Basic concepts

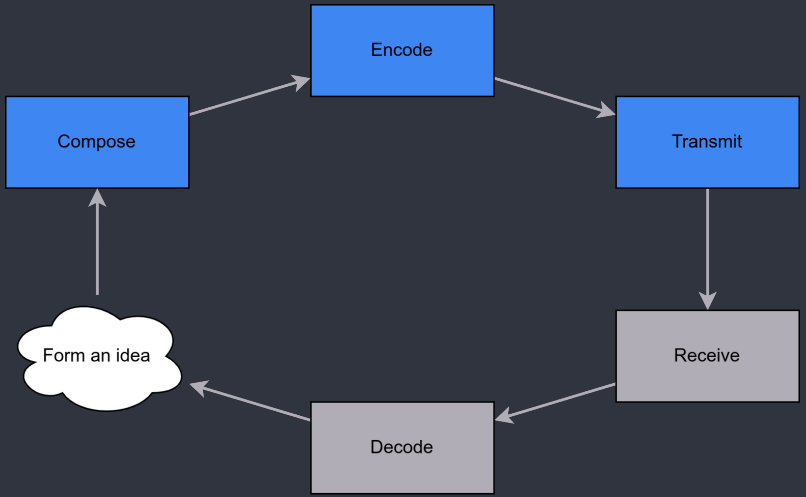
Definition

Message is a discrete unit of communication intended by the source for consumption by some recipient or group of recipients.



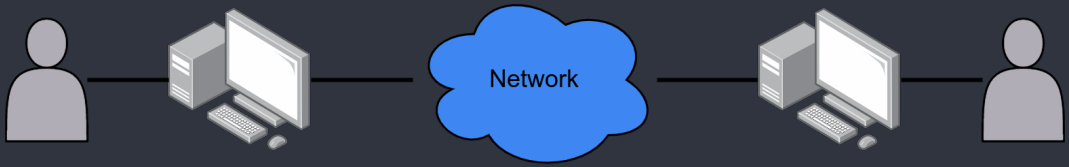
Communication loop

Basic concepts



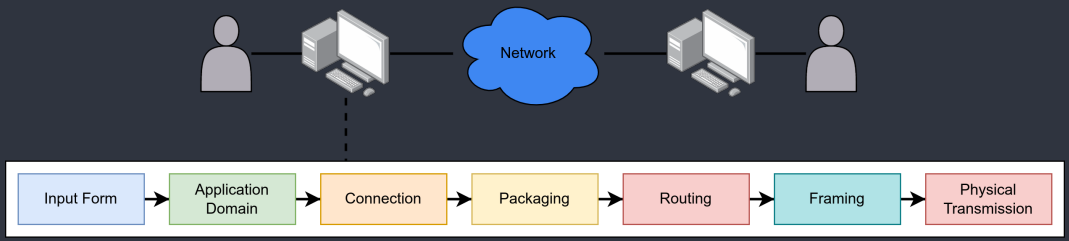
Premise

Networking



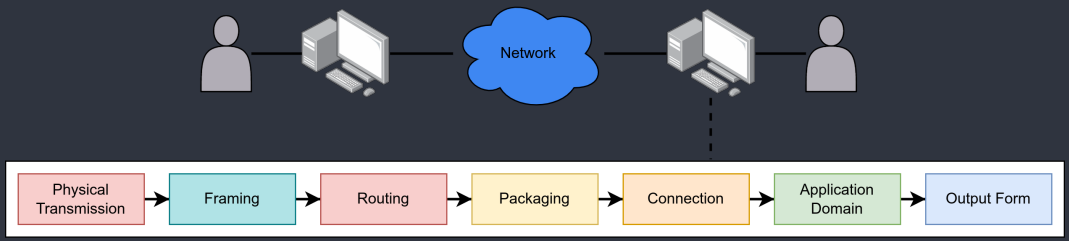
Outbound

Networking



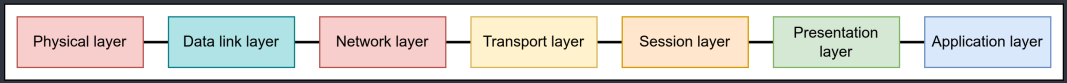
Inbound

Networking



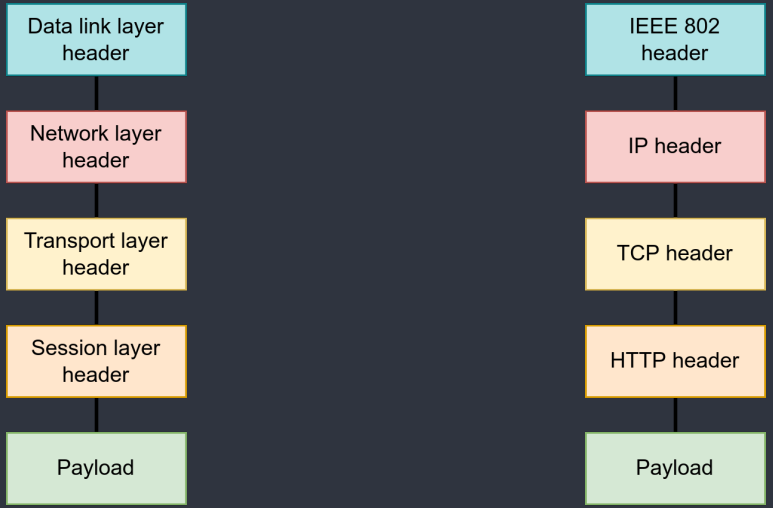
OSI model

Networking



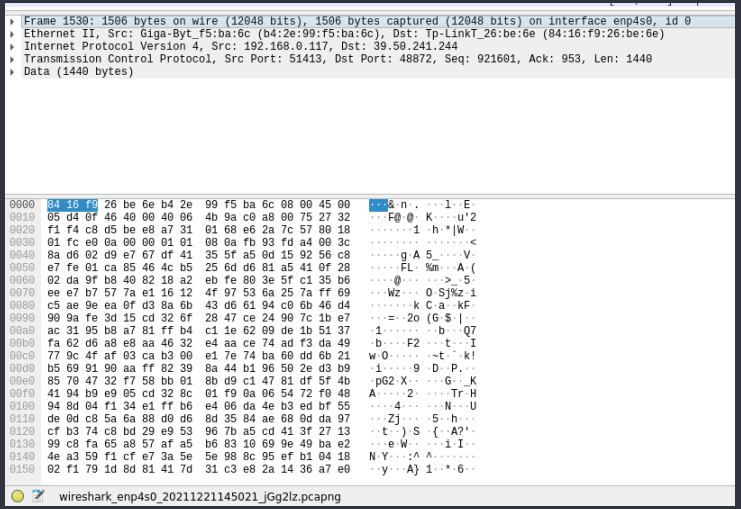
Headers

Networking



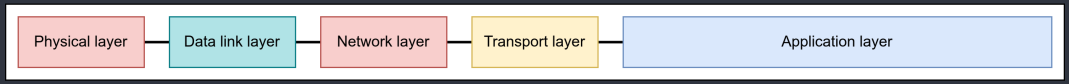
Real life packet

Networking



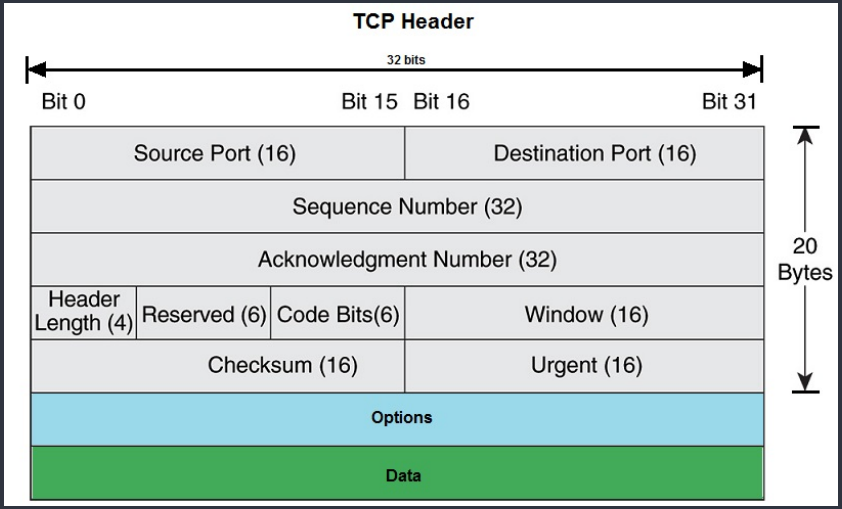
TCP/IP model

Networking



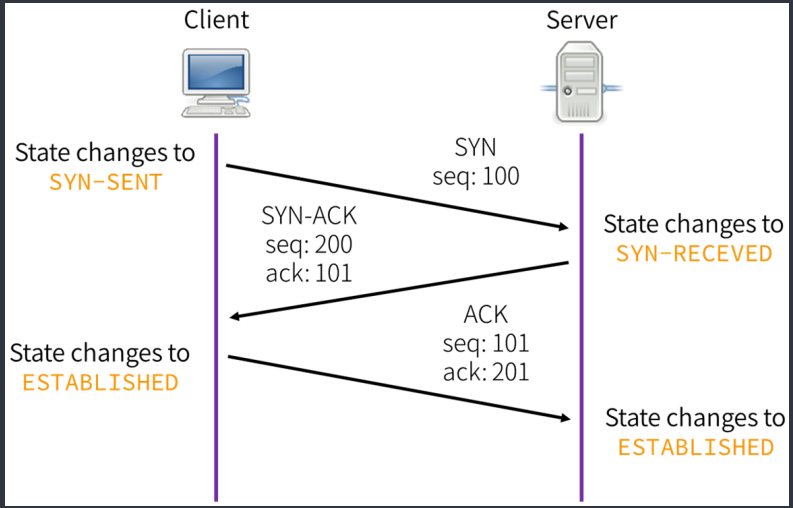
Transmission Control Protocol

Networking



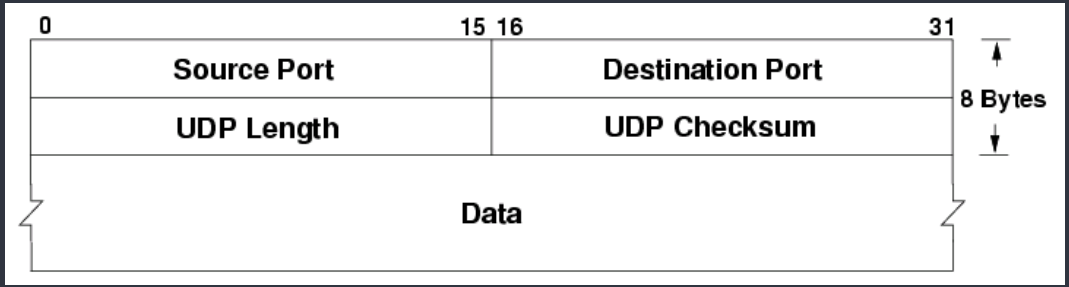
Transmission Control Protocol

Networking



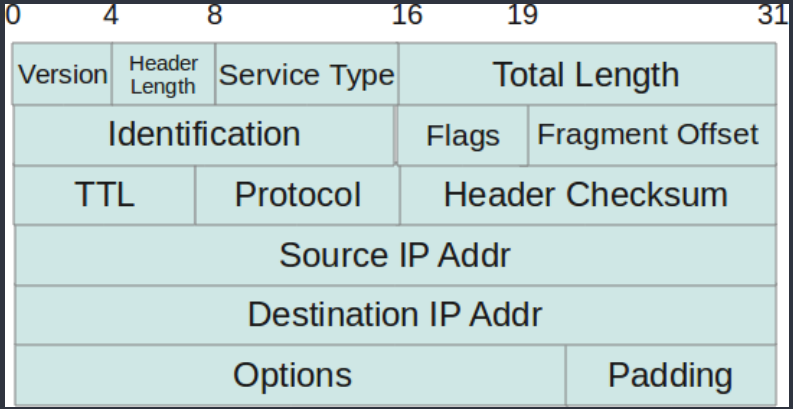
User Datagram Protocol

Networking



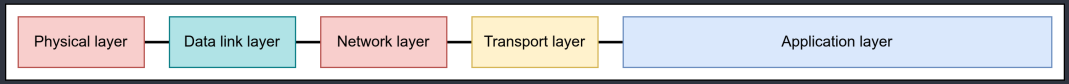
Internet protocol

Networking



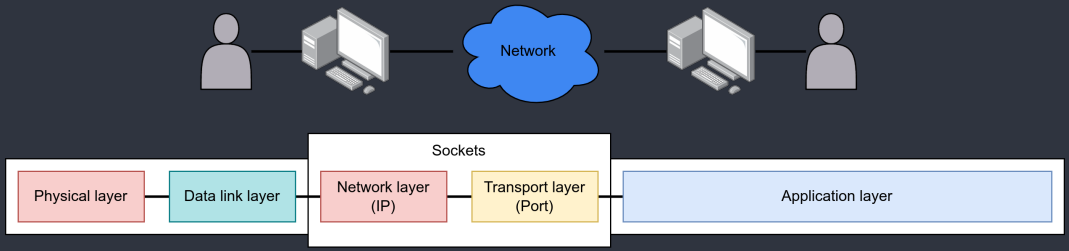
TCP/IP model

Networking



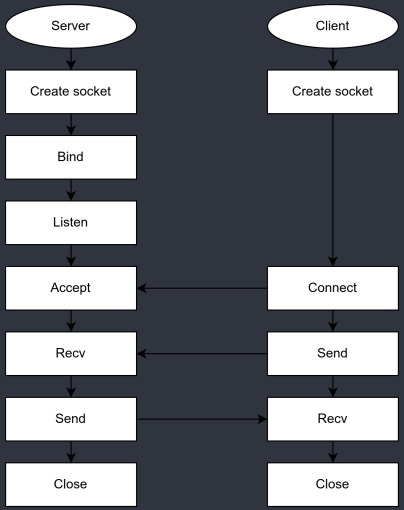
Sockets

Networking



Sockets

Networking



Sockets

Networking

```
#include <sys/socket.h>
int socket(int domain, int type, int protocol);
```

- Domain
  - `AF_INET`
  - `AF_INET6`
  - `AF_UNIX`
- Type
  - `SOCK_STREAM`
  - `SOCK_DGRAM`
  - `SOCK_RAW`
- Protocol
  - 0

Sockets

Networking

```
#include <sys/socket.h>
int bind(
    int socket,
    const struct sockaddr *address,
    socklen_t address_len
);
```

Sockets

Networking

```
#include <sys/socket.h>
int listen(int socket, int backlog);
```

Sockets

Networking

```
#include <sys/socket.h>
int accept(
    int socket,
    struct sockaddr *__restrict__ address,
    socklen_t *__restrict__address_len
);
```

Sockets

Networking

```
#include <sys/socket.h>
int connect(
    int socket,
    const struct sockaddr *address,
    socklen_t address_len
);
```

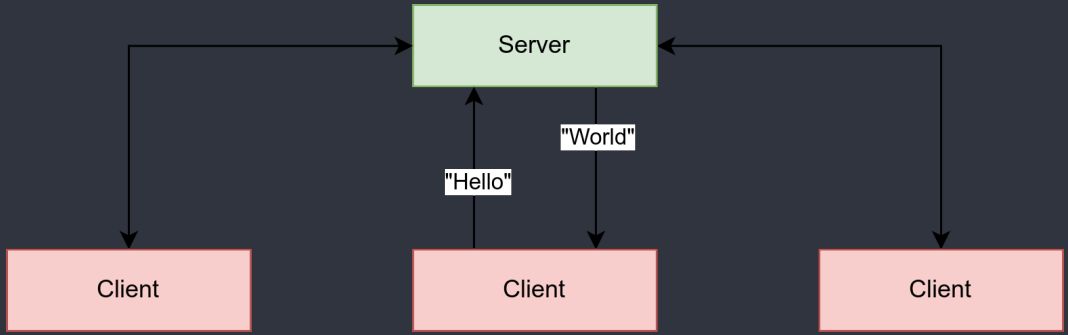
Sockets

Networking

```
#include <unistd.h>
ssize_t read(int fs, void *buf, size_t N);
```

Homework

Echo World



The end

Thank you for your time!