

컴퓨터 네트워크 – 2 주차

Jong-Kyou Kim, PhD

2016-10-06

기본적인 Layer 구성

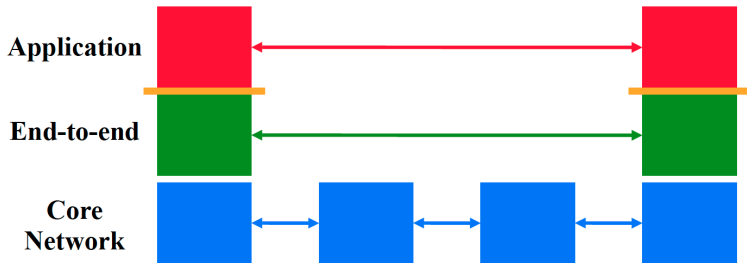


그림: Service Levels

파발망

컴퓨터 네트워크 - 2주차

Jong-Kyou Kim,
PhD



그림: 조선후기 파발망

주파수와 파장

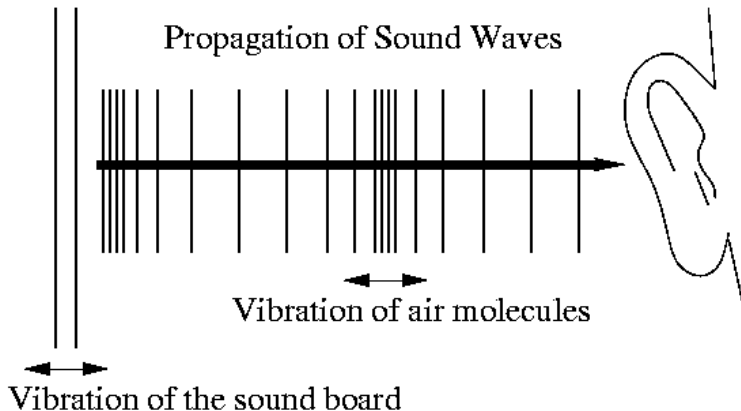


그림: 공기중에서 소리의 전파

주파수와 파장

- ▶ 주파수 f
- ▶ 파장 λ
- ▶ 속도 $v = f\lambda$

주파수와 비트전송률



그림: 음파

여러가지 네트워크 구성요소

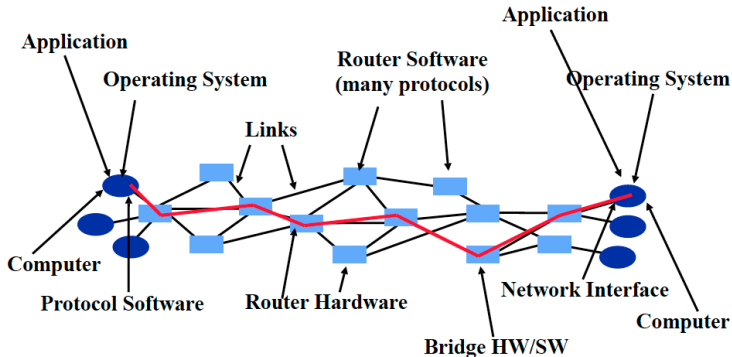


그림: 여러가지 구성요소

Inter-networking

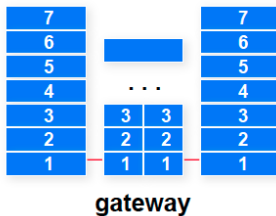
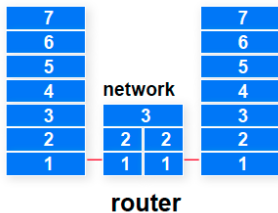
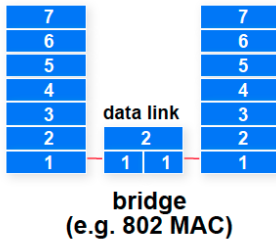
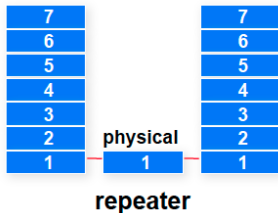


그림: Internetworking

Repeater

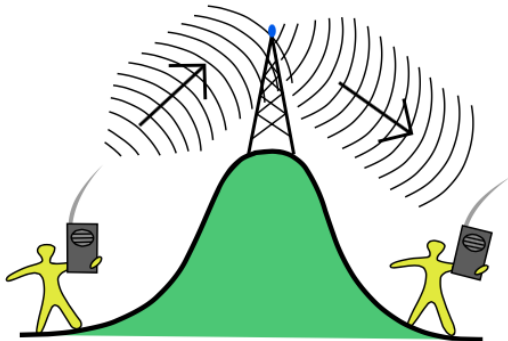


그림: Repeater

Bridge

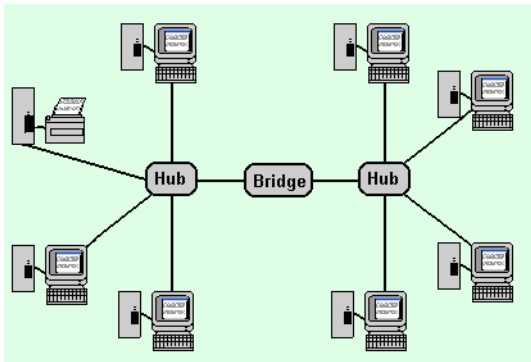


그림: Bridge

Router/Gateway

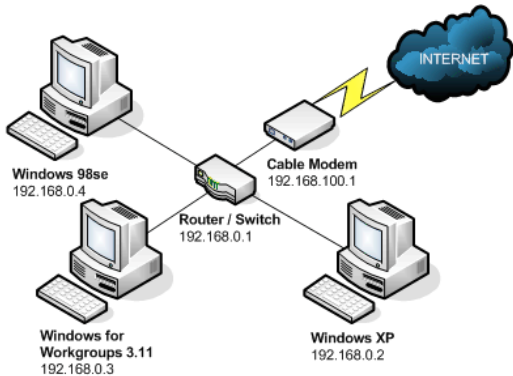


그림: Router

OSI (Open System Interconnect)

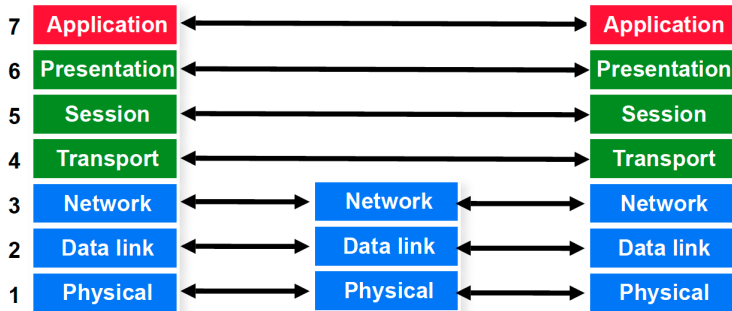


그림: OSI 7 Layer

Modern computers

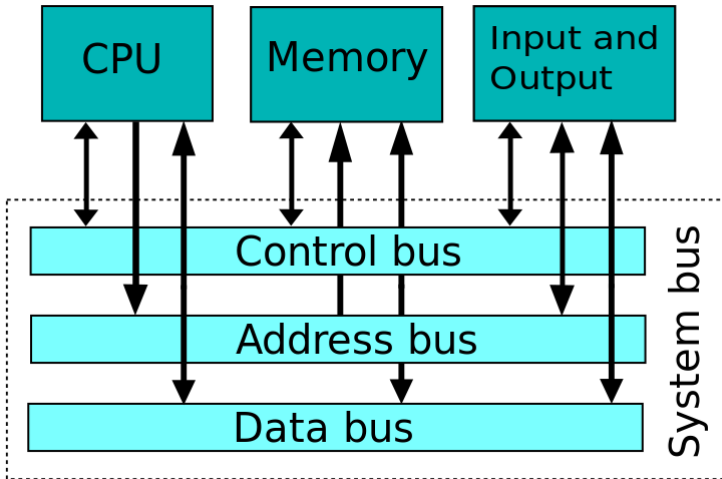


그림: von Neumann architecture

Automatic switch

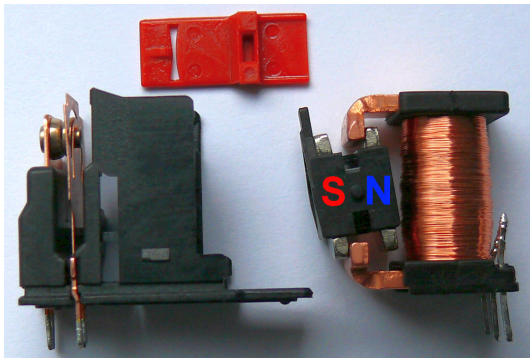


그림: Solenoid

Inverter



그림: Inverter

OR gate



그림: OR gate

AND gate

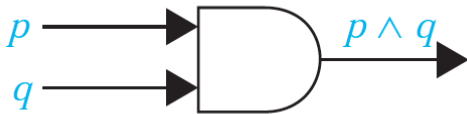


그림: AND gate

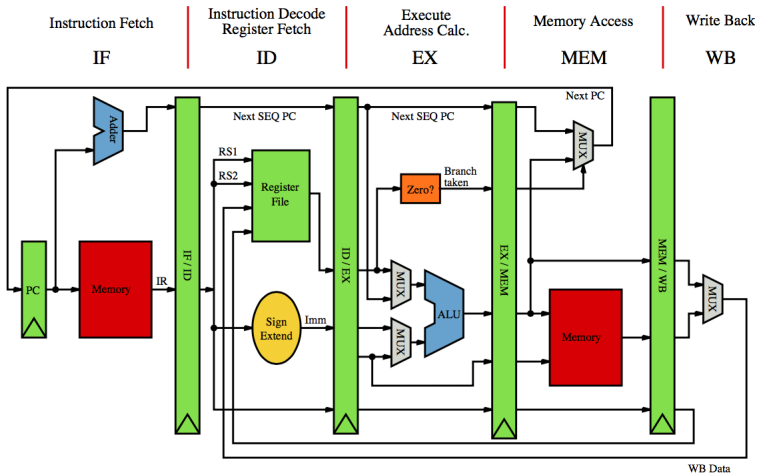


그림: CPU

Network programming

- ▶ OS: **Linux**
- ▶ Programming Language: C
- Other OS and other languages. Python, Java etc.

Linux: update

- ▶ `sudo apt-get update`
 - ▶ ubuntu server 에서 최신 package 목록을 가져온다
- ▶ `sudo apt-get upgrade`
 - ▶ 현재 설치된 패키지보다 더 높은 version 이 있으면 설치한다
 - ▶ 커널은 제외한다
 - ▶ ubuntu server 에서 패키지를 가져온다
 - ▶ 가져온 패키지를 설치한다
- ▶ `reboot`
 - ▶ `reboot`: Need to be root
- ▶ `sudo reboot`
- ▶ 달라진 점은?

Linux: upgrade

- ▶ `sudo apt-get dist-upgrade`
 - ▶ 커널 도 upgrade 한다
 - ▶ `apt-get update` 는 필요 없나? → 방금 했음
- ▶ `reboot`
- ▶ 달라진 점은?

Linux: apply kernel addition

- ▶ `/etc/init.d/vboxadd setup`
- ▶ `reboot`

- ▶ `https://leansys.com/downloads/networks`
- ▶ `ex01.c`

```
#include <sys/types.h>
#include <arpa/inet.h>
#include <sys/socket.h>
#include <string.h>
#include <stdio.h>
#include <stdlib.h>
```



```
int main (int ac, char* av[]) {  
    int socket_handle;  
    struct sockaddr_in socket_details; /* arpa/inet.h  
    char* input_buffer malloc(20000);  
    char httpget[] = "GET / HTTP/1.1\r\n\r\n";
```

```
/*  
 * Socket address, internet style.  
 */  
struct sockaddr_in {  
    __uint8_t    sin_len;  
    sa_family_t  sin_family; /* __uint8_t */  
    in_port_t    sin_port;   /* __uint16_t */  
    struct       in_addr sin_addr; /* __uint32_t */  
    char        sin_zero[8];  
};
```

```
socket_handle  /* int */  
    = socket (AF_INET, SOCK_STREAM, 0);  
/* sockaddr_in */  
socket_details.sin_family = AF_INET;  
socket_details.sin_addr.s_addr  
    = inet_addr("74.125.128.106");  
socket_details.sin_port = htons(80);
```

```
connect (socket_handle,  
        (struct sockaddr*)&socket_details,  
        sizeof (struct sockaddr));
```

```
send (socket_handle,  
      httpget, /* "GET / ..... " */  
      strlen(httpget),  
      0);  
  
recv (socket_handle,  
      input_buffer,  
      20000,  
      0);
```

```
printf ( "%s\n", input_buffer );  
return 0 ;  
}
```