CS341 #38 – System Concepts & Review. UDP sendto/recvfrom tips.

> What are Linux Containers?

> Warmup: Is the following code threadsafe?

void\* func(void\*ptr) {

sleep(1);

puts((char\*)ptr);

return ptr;

}

void run() {

pthread\_t t1;

char data[8];

strcpy(data,"1234567");

pthread\_create(&t1, NULL, func, data+4);

puts("p\_created called!");

pthread\_join(t1, NULL);

}

> Virtual Memory Concepts:

What is working set and thrashing?

How large is the working set of your mmap binary search 'advert price' process if your data file is 4GB and search requests are random? Always the same?

What is demand paging?

> Brain Teaser

Why does calling calloc(200000) actually take the same time as malloc(200000) !?

> Context Switch

What is a context switch?

Why are context switches “expensive”?

> EPoll

Give a network example why you might call epoll\_ctl with EPOLL\_CTL\_DEL, after epoll\_wait returns.

> Traffic Filtering

Name two ways an Internet provider can prevent BitTorrent traffic

> HTTP Protocols

Explain why do web pages display faster if the client and server use HTTP/1.1 instead of HTTP/1.0

Give two performance advantages of HTTP2.0 over HTTP1.1

> Domain Name System

What is DNS? How does it work?

> UDP using sendto and recvfrom.

How do I make a simple UDP client and server?

Client Server

ssize\_t sendto(int fd,void\* buf, size\_t len,

int flags,

struct sockaddr \*dest,

socklen\_t dest\_len);

ssize\_t recvfrom(int fd,void\* buf,size\_t len,

int flags,

struct sockaddr \* address,

socklen\_t \* address\_len);

struct sockaddr

struct sockaddr\_in

struct sockaddr\_in6

struct sockaddr\_storage

> Protip: Use connect and send if you want to send data to the same endpoint (host & port).

send(int socket, void \*buff, size\_t length, int flags);... So what is different using connect compared to using connect with a TCP socket?

> Underhanded C Challenge

#define N (20)

int admin, debug;

int histogram[N];

static int hash(char\* str) {

int c, h = 0; // sdbm hash

while (c = \*str++)

h = c + (h << 6) + (h << 16) - h;

return h;

}

int main(int argc, char\*\*argv){

while(argc>1) {

char\*word= argv[ --argc];

int h = hash(word);

histogram[ (h<0?-h:h) % N ] ++;

}

if(admin || debug) puts("Admin/Debug");

return;

}