UCS1511 - COMPUTER NETWORKS

Simulation of ARP

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OBJECTIVE :

To be proficient in developing an application to simulate the functionality of ARP protocol using socket programming in C

CODE :

CLIENT :

```c
#include <sys/socket.h>
#include <sys/types.h>
#include <netinet/in.h>
#include <netdb.h>
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <unistd.h>
#include <errno.h>
#include <arpa/inet.h>
#include <sys/ioctl.h>
#include <net/if.h>

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

```
    int cli = socket(AF_INET, SOCK_STREAM, 0);

    struct sockaddr_in caddr;

    caddr.sin_family = AF_INET;
    caddr.sin_port = htons(atoi(argv[1]));
    caddr.sin_addr.s_addr = INADDR_ANY;

    connect(cli, (struct sockaddr *)&caddr, sizeof(caddr));

    char IP[20];

    int n;
    struct ifreq ifr;
    char array[] = "eth0";
    n = socket(AF_INET, SOCK_DGRAM, 0);

    ifr.ifr_addr.sa_family = AF_INET;

    strncpy(ifr.ifr_name, array, IFNAMSIZ - 1);

    ioctl(n, SIOCGIFADDR, &ifr);

    close(n);

    recv(cli, IP, sizeof(IP), 0);
    printf("%s\n", IP);
    IP[sizeof(IP)] = '\0';
    char *myIP = inet_ntoa(((struct sockaddr_in
*)&ifr.ifr_addr)->sin_addr);
    printf("%s\n", inet_ntoa(((struct sockaddr_in
*)&ifr.ifr_addr)->sin_addr));

    int flag = 1;

    for (int i = 0; i < strlen(myIP); i++)
    {
        if (myIP[i] != IP[i])
        {
            flag = 0;
```

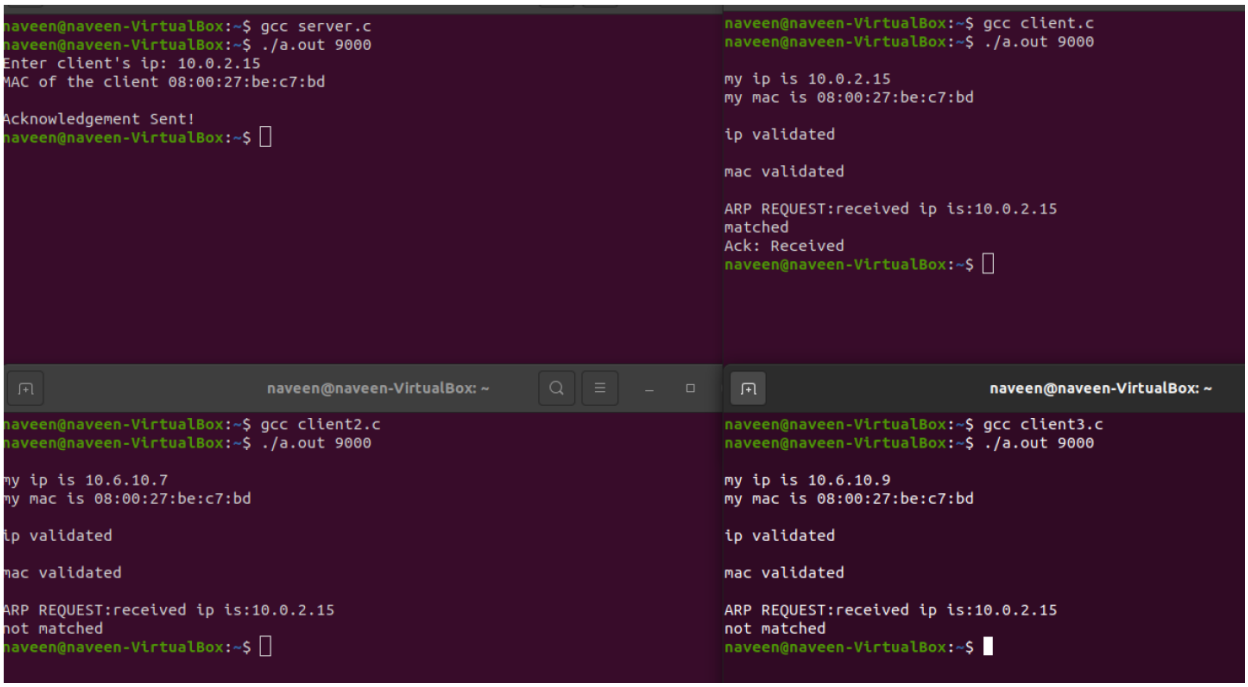
```
            break;
        }
    }

    if (flag)
    {
        send(cli, "WORKS!!!", 8, 0);
    }
    else
    {
        send(cli, "NOPE!!!", 7, 0);
    }

    close(cli);

    return 0;
}
```

SERVER :

```
#include <sys/socket.h>
#include <netinet/in.h>
#include <arpa/inet.h>
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <errno.h>
#include <string.h>
#include <sys/types.h>
#include <time.h>
#include <ctype.h>
#include <pthread.h>

int main(int argc, char **argv)
{
    int serv = socket(AF_INET, SOCK_STREAM, 0);
```

```
    struct sockaddr_in saddr;

    saddr.sin_family = AF_INET;
    saddr.sin_port = htons(atoi(argv[1]));
    saddr.sin_addr.s_addr = inet_addr("127.0.0.1");

    bind(serv, (struct sockaddr *)&saddr, sizeof(saddr));

    listen(serv, 5);
    int i = 0;
    int sockets[10];

    while (1)
    {
        sockets[i++] = accept(serv, NULL, NULL);
        if (i == atoi(argv[3]))
            break;
    }
    for (int i = 0; i < atoi(argv[3]); i++)
    {
        send(sockets[i], argv[2], strlen(argv[2]), 0);
        char IP[20];
        recv(sockets[i], IP, sizeof(IP), 0);
        printf("%d => %s\n", i + 1, IP);
    }
    close(serv);
    return 0;
}
```

OUTPUT :


naveen@naveen-VirtualBox:~$ gcc server.c
naveen@naveen-VirtualBox:~$ ./a.out 9000
Enter client's ip: 10.0.2.15
MAC of the client 08:00:27:be:c7:bd
Acknowledgement Sent!
naveen@naveen-VirtualBox:~$
naveen@naveen-VirtualBox:~$ gcc client.c
naveen@naveen-VirtualBox:~$ ./a.out 9000
my ip is 10.0.2.15
my mac is 08:00:27:be:c7:bd
ip validated
mac validated
ARP REQUEST:received ip is:10.0.2.15
matched
Ack: Received
naveen@naveen-VirtualBox:~$
naveen@naveen-VirtualBox: ~
naveen@naveen-VirtualBox:~$ gcc client2.c
naveen@naveen-VirtualBox:~$ ./a.out 9000
my ip is 10.6.10.7
my mac is 08:00:27:be:c7:bd
ip validated
mac validated
ARP REQUEST:received ip is:10.0.2.15
not matched
naveen@naveen-VirtualBox:~$
naveen@naveen-VirtualBox: ~
naveen@naveen-VirtualBox:~$ gcc client3.c
naveen@naveen-VirtualBox:~$ ./a.out 9000
my ip is 10.6.10.9
my mac is 08:00:27:be:c7:bd
ip validated
mac validated
ARP REQUEST:received ip is:10.0.2.15
not matched
naveen@naveen-VirtualBox:~$