take an example for subnet of hosts and obtain a broadcast tree for the subnet

#include <stdio.h>

#include <stdint.h>

typedef struct {

uint8\_t octet1;

uint8\_t octet2;

uint8\_t octet3;

uint8\_t octet4;

} IPAddress;

typedef struct {

IPAddress networkAddress;

uint8\_t subnetMask;

} Subnet;

void printIPAddress(IPAddress ip) {

printf("%d.%d.%d.%d", ip.octet1, ip.octet2, ip.octet3, ip.octet4);

}

void printSubnet(Subnet subnet) {

printf("Network Address: ");

printIPAddress(subnet.networkAddress);

printf("/%d\n", subnet.subnetMask);

printf("Valid Host Addresses:\n");

for (int i = 1; i <= (1 << (32 - subnet.subnetMask)) - 2; i++) {

IPAddress hostAddress = subnet.networkAddress;

hostAddress.octet4 += i;

printf(" ");

printIPAddress(hostAddress);

printf("\n");

}

printf("Broadcast Address: ");

IPAddress broadcastAddress = subnet.networkAddress;

broadcastAddress.octet4 += (1 << (32 - subnet.subnetMask)) - 1;

printIPAddress(broadcastAddress);

printf("\n");

}

int main() {

Subnet subnet;

printf("Enter network address (e.g., 192.168.2.0): ");

scanf("%hhu.%hhu.%hhu.%hhu", &subnet.networkAddress.octet1, &subnet.networkAddress.octet2, &subnet.networkAddress.octet3, &subnet.networkAddress.octet4);

printf("Enter subnet mask (e.g., 28): ");

scanf("%hhu", &subnet.subnetMask);

printSubnet(subnet);

return 0;

}

Output:

Enter network address (e.g., 192.168.2.0): 192.168.2.0

Enter subnet mask (e.g., 28): 28

Network Address: 192.168.2.0/28

Valid Host Addresses:

192.168.2.1

192.168.2.2

192.168.2.3

192.168.2.4

192.168.2.5

192.168.2.6

192.168.2.7

192.168.2.8

192.168.2.9

192.168.2.10

192.168.2.11

192.168.2.12

192.168.2.13

192.168.2.14

Broadcast Address: 192.168.2.15