

For Detecting Active Hosts :

1. Send UDP Packet on a random port for all hosts in the subnet, and start a timer.
2. After the timer expires, if we get ICMP type ICMP_DEST_UNREACH and ICMP code ICMP_HOST_UNREACH as a reply, we conclude that host is down.
3. All the other hosts for which no reply is received are assumed to be alive.

For Detecting TCP Ports of Active Hosts :

1. We try to connect for all ports using non blocking connect and start a timer.
2. When the timer expires we check the socket error using SO_ERROR option. If error is zero the port is active otherwise it is inactive.

For Detecting UDP ports of Active Hosts :

1. We try to send UDP datagram on each port and set a timer.
2. For receiving ICMP responses we have spawned a new thread, and ports for which ICMP_PORT_UNREACH messages are received are declared inactive, the other ports for which ICMP messages are not received are assumed to be active.

Screenshot of Implementation

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anand@anand-Inspiron-5537:~/NetworkProgrammingAssignment/Assignment3$ gcc -o server copy.c -lpthread -lm
anand@anand-Inspiron-5537:~/NetworkProgrammingAssignment/Assignment3$ sudo ./server 192.168.0.9/29
SubnetMask is 255.255.255.248
Network Id is 192.168.0.9
Hosts In The Network Are
192.168.0.9      192.168.0.10      192.168.0.11      192.168.0.12
192.168.0.13    192.168.0.14      192.168.0.15

Network Size Is 6
bind: Success
alarm generated
Active Hosts
192.168.0.9
alarm generated

UDP Active Ports
192.168.0.9 Port 1      192.168.0.9 Port 15
192.168.0.9 Port 18

TCP Active Ports
192.168.0.9 Port 17      192.168.0.9 Port 18
192.168.0.9 Port 22
anand@anand-Inspiron-5537:~/NetworkProgrammingAssignment/Assignment3$
```