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