

Brief Design(P2)

multicast.c is a program to count the number of members present in a multicast group.

In this program, we have turned on the IP_LOOPBACK option so that the sender receives a copy of the packets sent. This is done so that we can join the group with the same IP and PORT from multiple terminal windows and test the program.

->The basic design is poll based along with timers.

->Whenever the program starts, two timers are created t1 and t2.

Timer t1 expires every 15s and t2 is the 5s timer which is to keep track of received replied within 5s of sending hello+time().

->The main program then enters an infinite while loop and blocks on recvfrom().

Two kinds of events can occur:

Case 1: t1 times out, SIGALRM is sent and handler is invoked. Here the hello+time() msg is created and sent on the multicast group. Each packet also include the sender pid and last modifier pid. This is done to differentiate between the programs running on different terminals on the same IP and PORT. Once the hello+time() is sent, t2 is started and the program again blocks on recvfrom() also the timer t1 is restarted.

Case 2: A message has arrived. In this case, the message could be a response to the hello msg sent or a new hello msg from another user. To distinguish between the two, whenever a user sends hello+time() a flag five is set. If a msg is a hello request from another user, simply echo back the message. If the message is a reponse to the sent hello+time(), increment the count. If the message is a bye+time(), simply print it. Drop any other packet because it is of no use.

When t2 times out, the program simply prints the value of count, and resets the count value to zero as well as reset the flag five to 0.

After a while again t1 will time out and the same process will continue.

If a SIGINT is received, bye+time() is printed and sent on the multicast group and the program exits.