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#include<iostream>
#include <time.h>
#include <cstdlib>
#include<ctime>
#include <unistd.h>
using namespace std;
class timer {
private:
    unsigned long begTime;
public:
    void start() {
        begTime = clock();
    }
    unsigned long elapsedTime() {
        return ((unsigned long) clock() - begTime) / CLOCKS_PER_SEC;
    }
    bool isTimeout(unsigned long seconds) {
        return seconds >= elapsedTime();
    }
};
int main()
{
    int frames[] = {1,2,3,4,5,6,7,8,9,10};
    unsigned long seconds = 5;
    srand(time(NULL));
    timer t;
    cout<<"Sender has to send frames : ";
    for(int i=0;i<10;i++)
        cout<<frames[i]<<" ";
    cout<<endl;
    int count = 0;
    bool delay = false;
    cout<<endl<<"Sender\t\t\t\t\tReceiver"<<endl;
    do
    {
        bool timeout = false;
        cout<<"Sending Frame : "<<frames[count];
        cout.flush();
        cout<<"\t\t";
        t.start();
        if(rand()%2)
        {
            int to = 24600 + rand()%(64000 - 24600) + 1;
            for(int i=0;i<64000;i++)

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        for(int j=0;j<to;j++) {}
    }
    if(t.elapsedTime() <= seconds)
    {
        cout<<"Received Frame : "<<frames[count]<<" ";
        if(delay)
        {
            cout<<"Duplicate";
            delay = false;
        }
        cout<<endl;
        count++;
    }
    else
    {
        cout<<"---"<<endl;
        cout<<"Timeout"<<endl;
        timeout = true;
    }
    t.start();
    if(rand()%2 || !timeout)
    {
        int to = 24600 + rand()%(64000 - 24600) + 1;
        for(int i=0;i<64000;i++)
            for(int j=0;j<to;j++) {}
        if(t.elapsedTime() > seconds )
        {
            cout<<"Delayed Ack"<<endl;
            count--;
            delay = true;
        }
        else if(!timeout)
            cout<<"Acknowledgement : "<<frames[count]-1<<endl;
    }
}while(count!=10);
return 0;
}

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