Lab6 (100 points)

Important: We will demo in class or online. For in class demos, we will go around the room. Be prepared to demo at the start of class. The submitted code will be used only to verify that you did not copy from others, to compile and re-run your program, to make sure you were indeed demonstrating your own code, and to grade for documentation of your code.

In this program we will start with Lab5. We are going to introduce 2 new concepts. First, we will have the receiver (destination) of the message ACK the message. This implies that we will have to have a sequence number in the message. The first time the receiver gets a message, it will print out the message like in lab 5. It will then send an ACK back to the sender. If the receiver gets the message again, it will print out the sequence number, fromPort and a message saying “duplicate”. It will then ACK the message again. This implies that we have a new message TYPE called ACK.

The second concept we will introduce is the concept of tracking the nodes (port numbers) from sender to receiver. This will be included in **every** message (whether it is an ACK or not). We will call this the “send-path”. Every hop along the way will add its portNumber to the sendpath, separated by a comma. The destination will print out the send-path along with the message.

We will assume the following for this lab:

* Each toPort-fromPort will start at seq number 1
* There will be a maximum of 100 messages between any toPort-fromPort pair (don’t have to check for this, it will help when creating data structures)
* The maximum message length will be 200 bytes (this includes all fields in the message)

The fields that MUST be included in the ACK are: send-path, toPort, fromPort, SeqNumber (that it is acking), type:ACK, location, version.

The output on the receiver will look something like (NOTE that we may have more fields in our version of the protocol)

sending an ack for seqNum 1 partner # 0, fromPort 20001

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Name Value

msg "hello 20015"

version 6

toPort 20015

location 7

fromPort 20001

TTL 2

seqNumber 1

send-path 20001,20007

myLocation 15

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The output on the sender (when they get an ACK) will look something like:

received an ACK for SeqNum 1 fromPort 20015

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Name Value

send-path 20015,20007

TTL 2

version 6

toPort 20001

fromPort 20015

seqNumber 1

type ACK

location 7

myLocation 1

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Everything else will stay the same from Lab 5.

Submit well-documented and well indented code along with a README file explaining how to run

the program, and a makefile. Submit it using GitHub

The grading rubric is as follows:

• Program correctness and robustness (what happens if I give garbage input): 80%

• Coding style (comments, indentations, README, Makefile): 20%