Abstract

This is my abstract.

Omnet Simulation Setup:

I utilized the provided FIFO queue sample project as my starting point. I needed to make the following changes to ensure I had a working simulation for the task:

1. **FifoNet.ned**

   This file defines the "FifoNet" setup. I created three identical queues consisting of a source node, a FIFO server, and a sink node, in which all traffic flows through the three nodes. When a packet arrives at the sink, it generates a packet delay data point as defined in Eq. #1

   $$Packet\,Delay = time_{arrival} - time_{created} \tag{1}$$

2. **omnetpp.ini**

   The modifications to this file specified each queue's individual parameters. Each queue had a **service time** of $t_s = 0.75\,seconds$. I differentiated the arrival rates of each queue by specifying the interarrival time from each generator/source. These times are shown below:

Queue #:	Interarrival Time (seconds)
1	1.0
2	0.50
3	0.25

   The final change was to set the **sim-time-limit** to one hour.

Appendix A: Edited Files

```
// FifoNet.ned:
network FifoNet
{
    submodules:
        gen1: Source {
            parameters:
                @display("p=81,77");
        }
        gen2: Source {
            parameters:
                @display("p=81,157");
        }
        gen3: Source {
            parameters:
                @display("p=81,227");
        }
        fifo1: Fifo {
            parameters:
                @display("p=209,77");
        }
        fifo2: Fifo {
            parameters:
                @display("p=209,157");
        }
        fifo3: Fifo {
            parameters:
                @display("p=209,227");
        }
        sink1: Sink {
            parameters:
                @display("p=329,77");
        }
        sink2: Sink {
            parameters:
                @display("p=329,157");
        }
        sink3: Sink {
            parameters:
                @display("p=329,227");
        }
    connections:
        gen1.out --> fifo1.in;
        fifo1.out --> sink1.in;

        gen2.out --> fifo2.in;
        fifo2.out --> sink2.in;

        gen3.out --> fifo3.in;
        fifo3.out --> sink3.in;
}
```

Figure 1: Defining the network in FifoNet.ned

```
// omnetpp.ini
[General]
description = "3 Seperate Arrival times, same service times"
network = FifoNet
sim-time-limit = 1h
cpu-time-limit = 300s
#debug-on-errors = true
#record-eventlog = true
**.gen1.sendIaTime = 1s
**.fifo1.serviceTime = 0.75s

**.gen2.sendIaTime = 0.50s
**.fifo2.serviceTime = 0.75s

**.gen3.sendIaTime = 0.25s
**.fifo3.serviceTime = 0.75s
```

Figure 2: Omnetpp.ini edited to run the three queues with separate parameters