SN 706 WIRELESS SECURITY

PROJECT 1- Analyzing WiFi Performance

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1. Simple Wifi

Step 1:
Write the .tcl script to create 11 nodes n0 - n10, one out of which is an Access Point, all the data packets have to be send to this AP(n0). After running the script we can see the following output on the Network Animator given in Fig.1. In Fig.1 multiple nodes transmit data to the same AP at the same time, traffic is created.

```
sailee@dalvi: ~/Desktop/Project 1/NS- Simple WiFi
sailee@dalvi:~/Desktop/Project 1/NS- Simple WiFi$ ns ns_simulator_1.tcl
num_nodes is set 11
INITIALIZE THE LIST xListHead
channel.cc:sendUp - Calc highestAntennaZ_ and distCST_
highestAntennaZ_ = 1.5,  distCST_ = 550.0
SORTING LISTS ...DONE!
sailee@dalvi:~/Desktop/Project 1/NS- Simple WiFi$
```

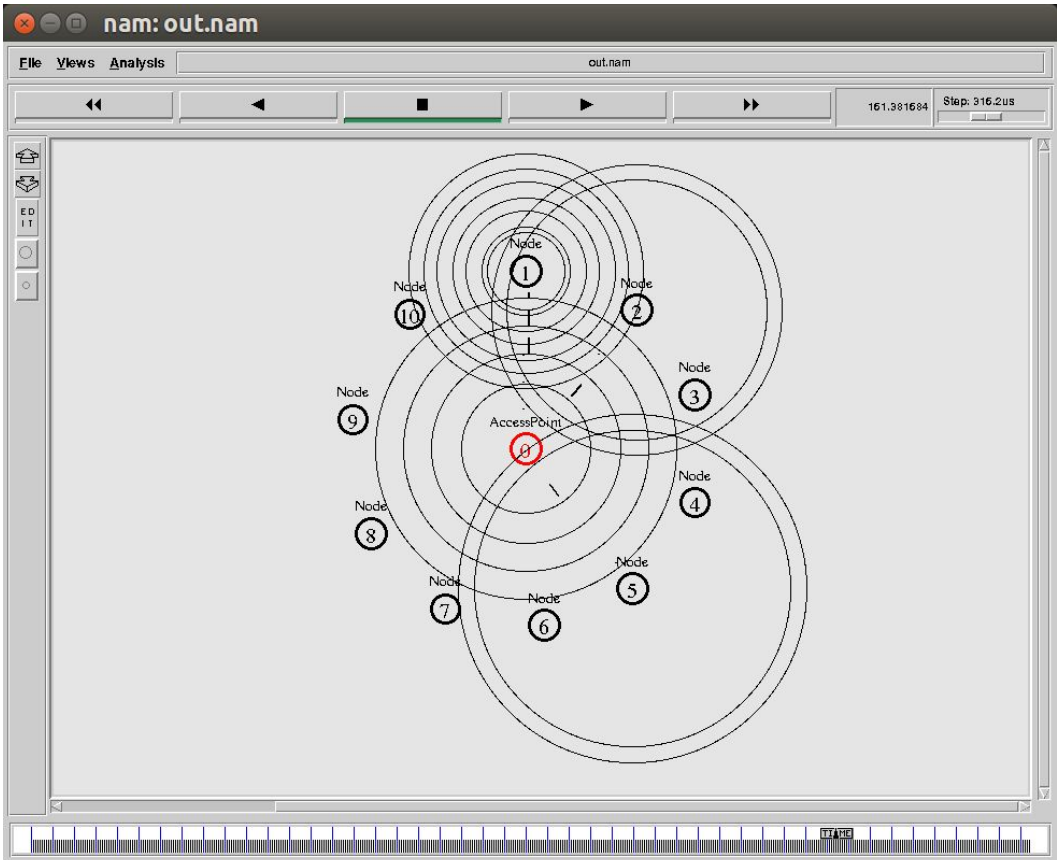

Fig.1

Step 2: We use *AWK* scripts in processing the data from the log (trace file) which we get from *NS2*. From the trace file we get the throughput for all nodes.

```
sailee@dalvi: ~/Desktop/Project 1/NS- Simple WiFi
sailee@dalvi:~/Desktop/Project 1/NS- Simple WiFi$ awk -f s.awk out.tr
The Throughput from n1 to n0: 16.206019 Mbps
The Throughput from n2 to n0: 5.676846 Mbps
The Throughput from n3 to n0: 3.457229 Mbps
The Throughput from n4 to n0: 2.187766 Mbps
The Throughput from n5 to n0: 1.060684 Mbps
The Throughput from n6 to n0: 0.512701 Mbps
The Throughput from n7 to n0: 0.234737 Mbps
The Throughput from n8 to n0: 0.221489 Mbps
The Throughput from n9 to n0: 0.058733 Mbps
The Throughput from n10 to n0: 0.004186 Mbps
sailee@dalvi:~/Desktop/Project 1/NS- Simple WiFi$
```

Step 3: We use gnuplot to draw graphs of the particular throughputs generated using *AWK* script which we got from *NS2*. From the gnuplot we get the graph such that X axis has number of clients and Y axis has average number of bytes, refer Fig.3.

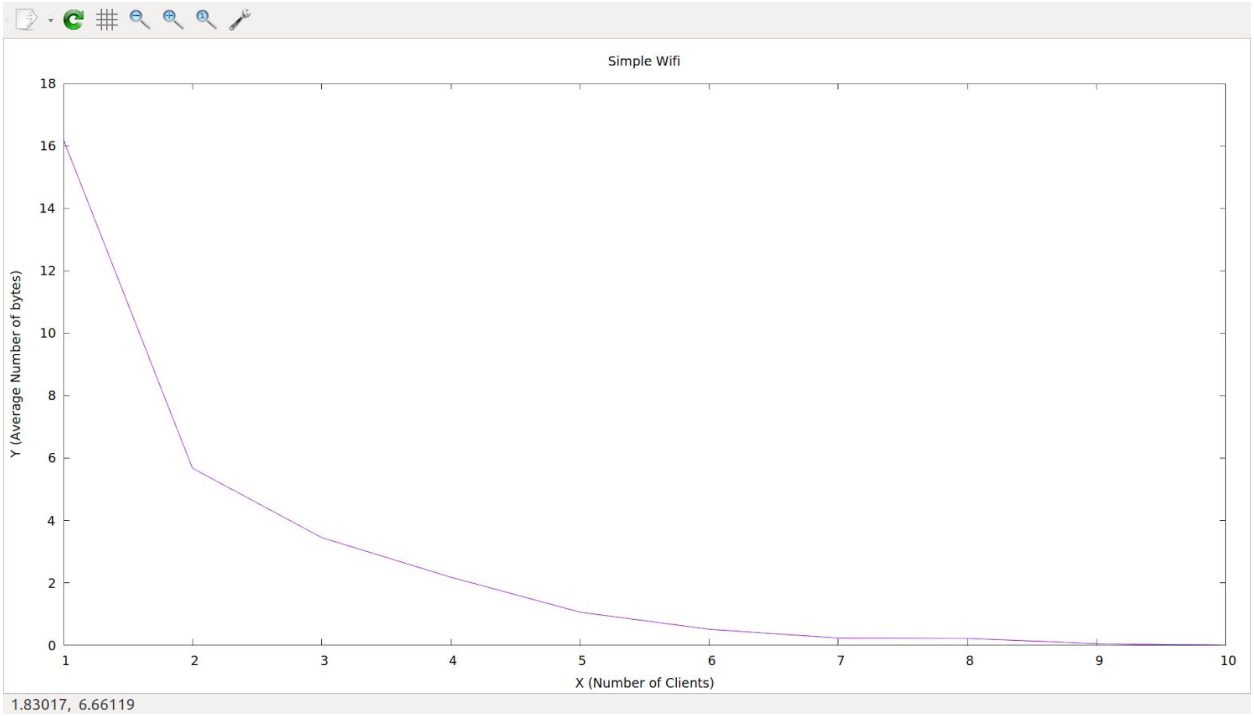

Fig.3

Observation: There is a change in the graph according to the change in packet loss and increasing and decreasing throughput value.

2. Apartment Wifi

Step 1:

Write the .tcl script to create 50 mobile nodes and 5 Access Points n0 - n55, Five out of which are Access Points, all the data packets have to send data to their respective AP's. In an Apartment style WiFi, Access Points are distant, and cannot communicate with each other. A person on the first floor cannot connect to the WiFi on the 2nd floor. Similarly the nodes that are granted access to Wifi on the n0 cannot connect or send data to access points n1 n2 n3 n4, viceversa. After running the script we can see the following output on the Network Animator given in Fig.4.

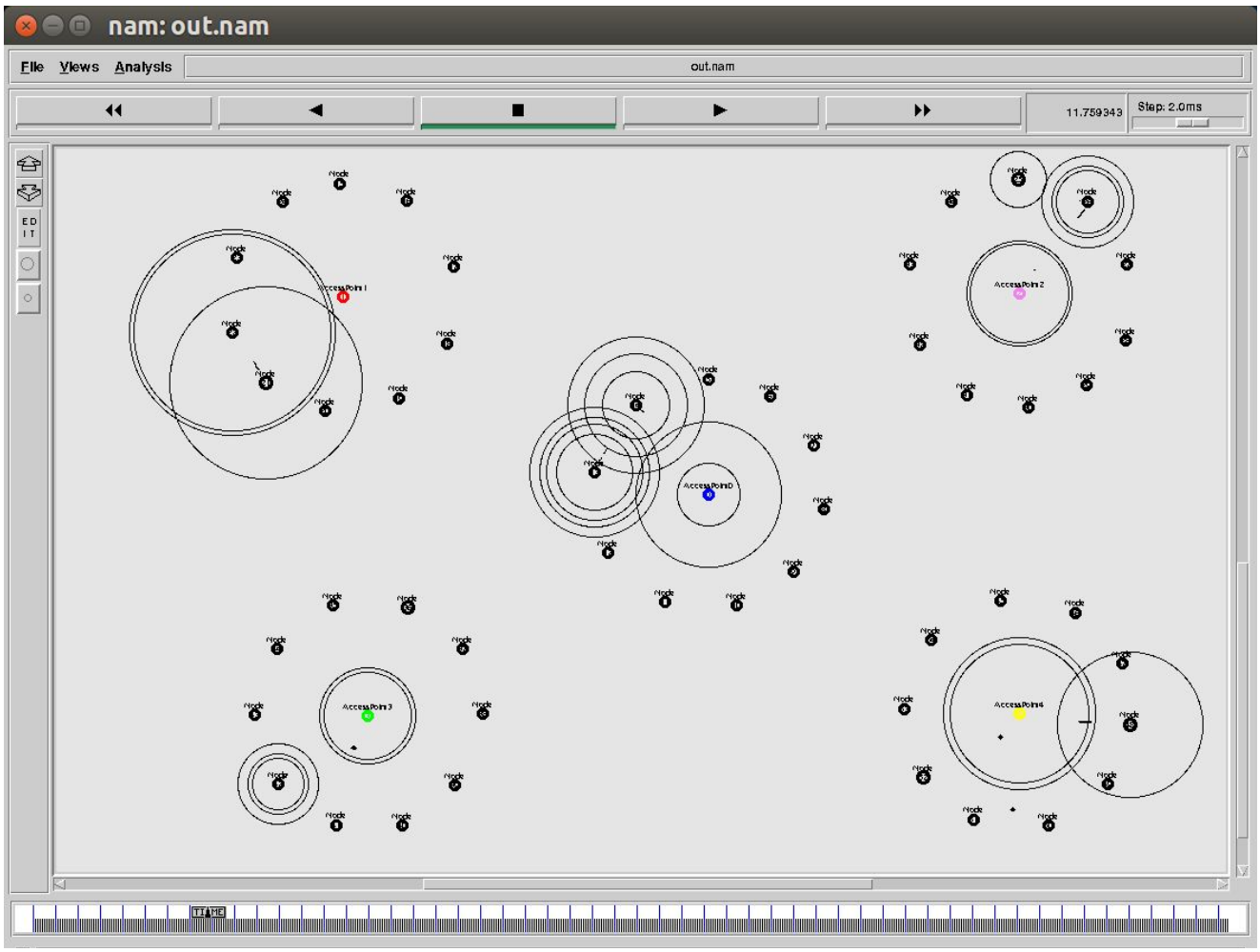

Fig.4

Step 2:
We get different Density values for different Access Points shown in figure Fig.5

```
sailee@dalvi: ~/Desktop/Project 1/NS-Apartment WiFi
sailee@dalvi:~/Desktop/Project 1/NS-Apartment WiFi$ awk -f a.awk out.tr
Density for n0 : 8.219868
Density for n1 : 27.398780
Density for n2 : 86.679573
Density for n3 : 84.284651
Density for n4 : 76.528780
sailee@dalvi:~/Desktop/Project 1/NS-Apartment WiFi$
```

Fig.5

Step 3:

We use gnuplot to draw graphs of the particular throughputs generated using *AWK* script which we got from *NS2*. From the gnuplot we get the graph such that X axis has number of clients and Y axis has average number of bytes, refer Fig.6.

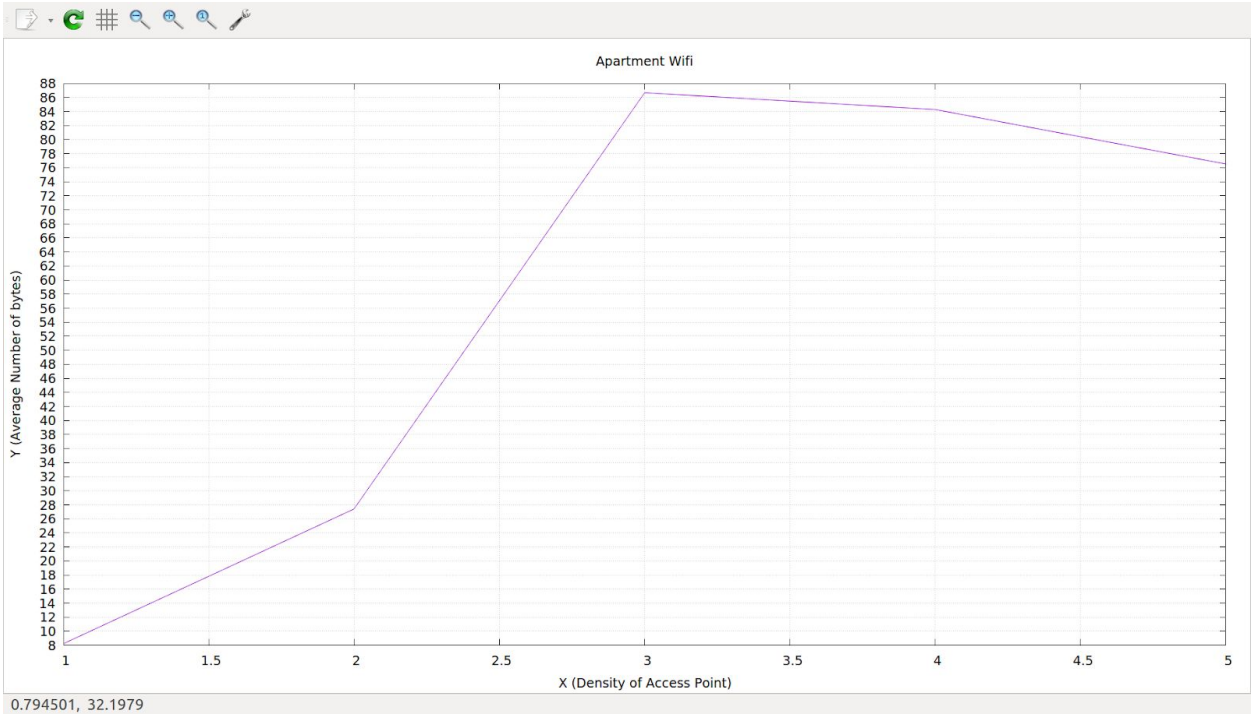

Fig.6

Observation: There is a change in the graph according to the changes in packet delivered which causes congestion at a particular access point.