**Objectives:**

1. Get familiar with Riverbed Modeller
2. Learn to use Modeller to perform simple network simulations
3. Collect simulation results and analyze them.

**Due:** 5:30pm, 03-02-2017

**Project Specification:**

This is an individual project.

In Riverbed Modeller, set up a wireless LAN network using the wireless LAN station advanced node (without any IP or above layers). This way we can isolate your simulation to be solely for wireless LAN MAC protocol.

Make sure the data rate is set to be 32 Mbps in WLAN parameters before you perform the simulations

Following scenarios shall be simulated. For each scenario, the traffic shall start at time 5 second. And the whole simulation should last 120 seconds.

1. Station 1 will be serving as receiving station, without sending out its own traffic. Six other stations will be sending traffic destined to Station 1. For all the 6 stations, packet size shall be set to constant 450 bytes. Set RTS threshold to be 750 bytes in the WLAN parameters. Do not change physical layer parameters (e.g. data rate).
2. Station 1 will be serving as receiving station, without sending out its own traffic. nine other stations will be sending traffic destined to Station 1. For all the 10 stations, packet size can be set to constant 450 bytes. Set RTS threshold to 750 bytes in the WLAN parameters. Do not change physical layer parameters (e.g. data rate).
3. Station 1 will be serving as receiving station, without sending out its own traffic. 20 other stations will be sending traffic destined to Station 1. For all the 20 stations, packet size shall be set to 450 bytes. Set RTS threshold to be 750 bytes in the WLAN parameters. Do not change physical layer parameters (e.g. data rate).
4. Repeat 1,2,3 but change the packet size to 1600 bytes.

Notice that in your simulation, you must set the packet inter-arrival time to be small enough so that during simulation time 5 to 120 second, the buffer at a sending node is not empty.

You are required to gather the following statistics for each simulation scenario as described above.

a) Network throughput (data packets successfully received in packets/second or bits/second). You should use moving average to show a smooth figure.
b) Throughput for two individual nodes respectively (data packets successfully received in packets/second or bits/second). You may not be able to observe this directly but you should be able to figure out how to collect this information indirectly.

Riverbed Modeller is capable of collecting these statistics for you. You can export the results to pictures or use screen print and submit. Be sure that the units of the axis can be seen and the picture is clear enough so that TA can judge your results. Clearly label each picture so that the TA can tell the result is for which scenario.

For each result, take screen print of the traffic generation parameters and the WLAN parameter setup and put them before the simulation result. This way TA can check your setup.

**References:**

There are various resources online for opnet tutorial. Some are:

http://www.opnet.com/university_program/itguru_academic_edition/

http://www.sce.carleton.ca/faculty/lambadaris/courses/5001/opnet_tutorial.pdf

https://www.youtube.com/watch?v=XAzXKnAwKxo

**Writeup:**

You do not need to write anything in this lab. But be sure you look at the results of different scenarios and know how they compare to each other. Just submit your results and screen shots.

**Submission Guidelines:**

Save your results in PDF/DOC format for submission to blackboard, with a file named yourstudentid.doc or yourstudentid.pdf (replace yourstudentid with your 1000… student id number).

Make sure your name and your student ID are listed in your write up. Late submissions will be accepted at a penalty as announced in the class website.

**Grading:** Total 100 Points

Each simulation run result is 15 points. Correct parameter setup are totally 10 points.

Deductions for failing to follow directions:

-10 No parameter screen shot.

-5 No student ID and name.

-5 Submitting write up in other than pdf/doc format.

-5 Submitted file has a name other than yourstudnetid.pdf/doc

**Important Note:**

You may discuss the problem definition and tools with other students. You may discuss the lab requirements. You may discuss or share project designs. All coding work must be your own. You may use any book, WWW reference or other people's programs (but not those of other students in the class or other sections) as a reference as long as you cite that reference in the comments. If you use parts of other programs or code from web sites or books YOU MUST CITE THOSE REFERENCES

If we detect that portions of your program match portions of any other student's program it will be presumed that you have collaborated unless you both cite some other source for the code. You must not violate UTA, state of Texas or US laws or professional ethics. Any violations, however small, will not be tolerated. Students who do not submit anything get a grade of 0. Therefore students who break the rules may receive a negative grade – most likely a -50 on this lab assignment.