CPEG 572 Data and Computer Communications
<u>Report No. 3</u>

Summary:

Implement VLANs which is dividing the LAN network into different broad coast domains by using Riverbed Modeler Academic Edition, and we will learn to obtain the benefit of configuration VLANs to make the network more efficient. Also, we will learn how the VLANs works, and it will help us to make the right decisions to solve problems that we face in our real life.
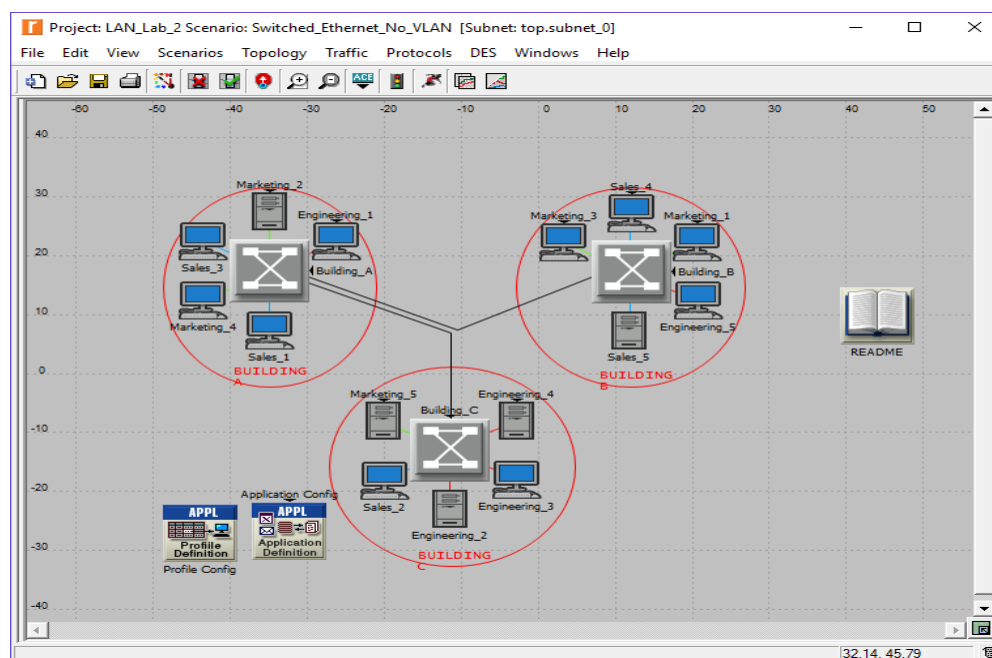
Covering 2 scenarios

- Switched_Ethernet_No_VLAN
- 3_VLANs

Implementation 1:

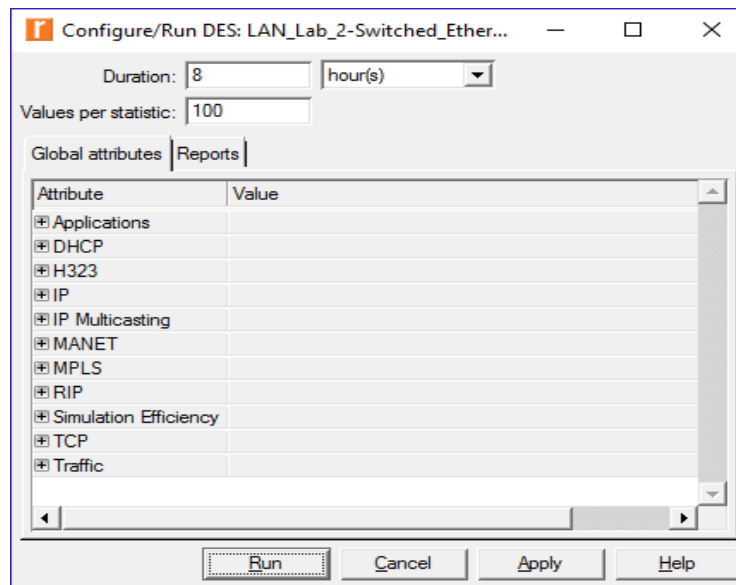- Understanding the model and environment

Open the project which is LAN_Lab_2, and will check the configuration of the application, and switches of the three building.
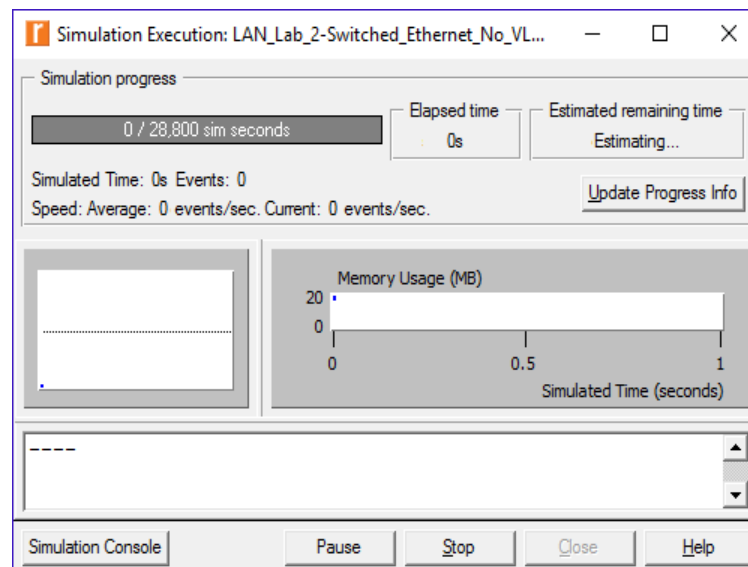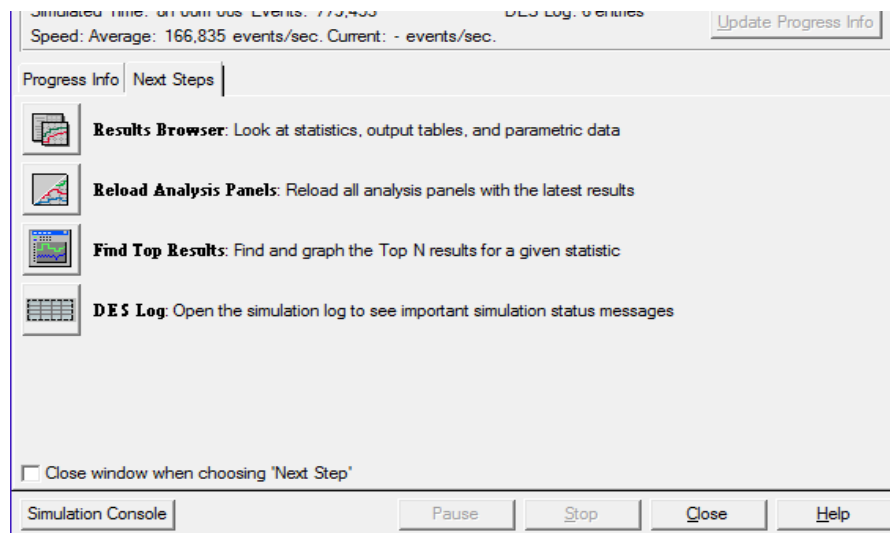

Topology

- Configure and Run simulation

Configure and run the simulation of project making sure the duration is 8 with 'hours' in units.
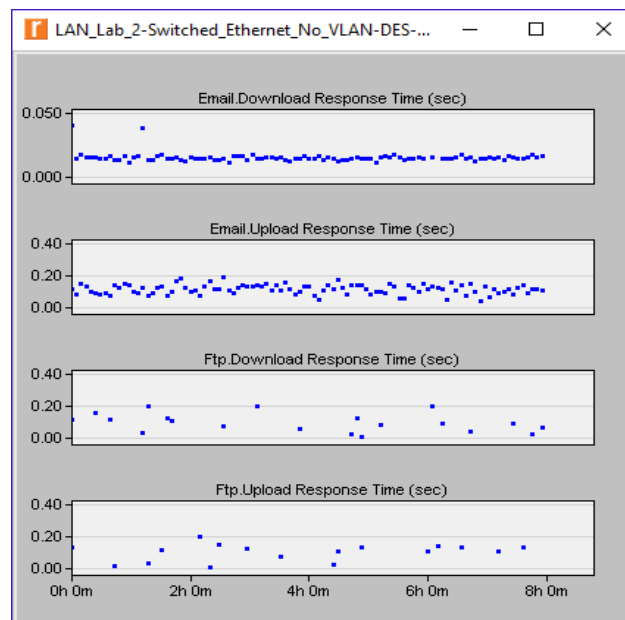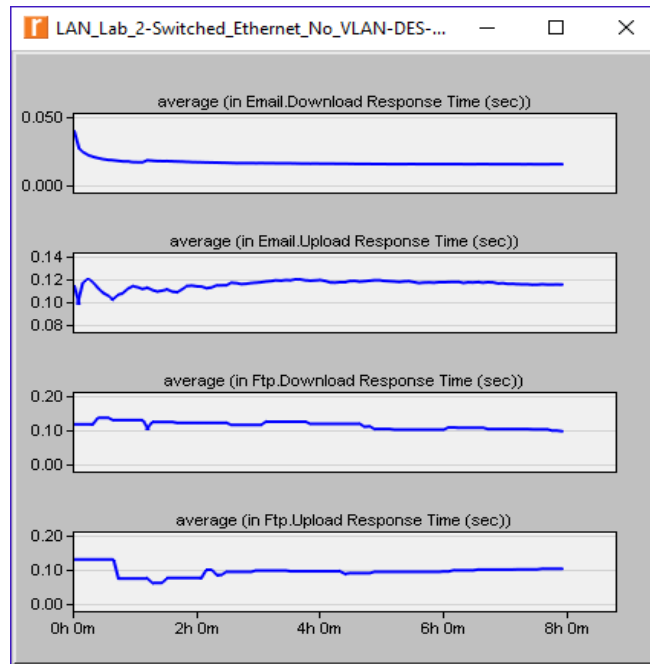

Configuration Settings

Running

Result of Simulation

Results 1:

Part 1 results shows the statistics of the Traffic which is downloaded or uploaded. Download Response Time in seconds and Upload Response. Time in seconds for both Email and FTP applications that will be noticed by the end users.
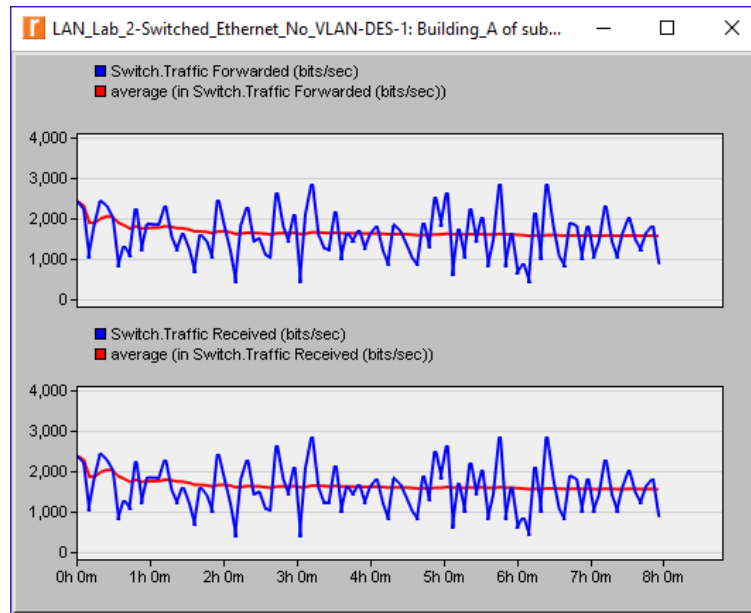

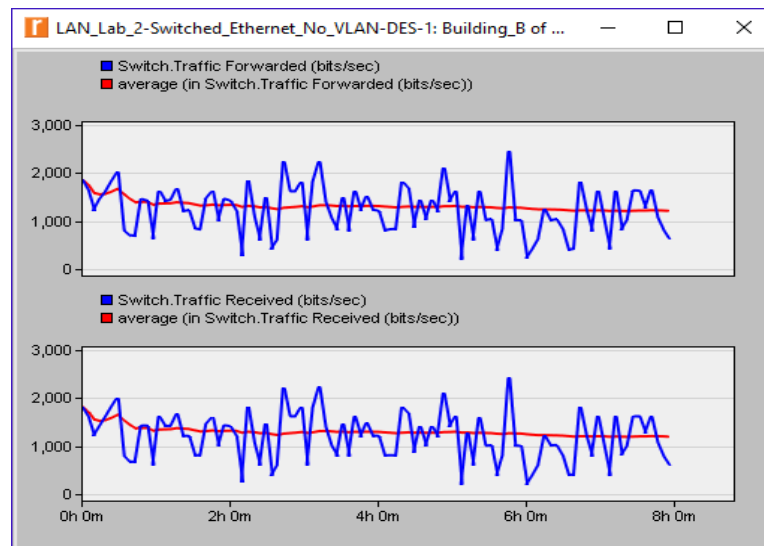Download and Upload response time for Email/FTP

Average download and average upload response time
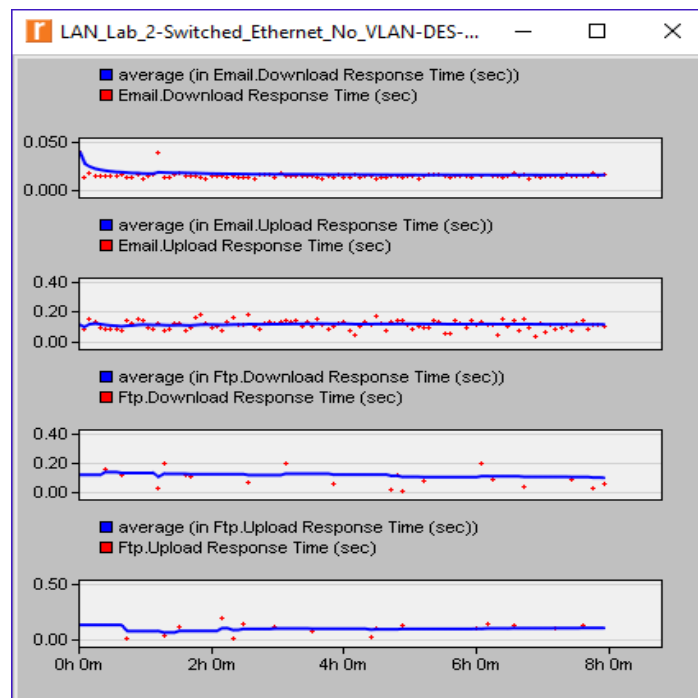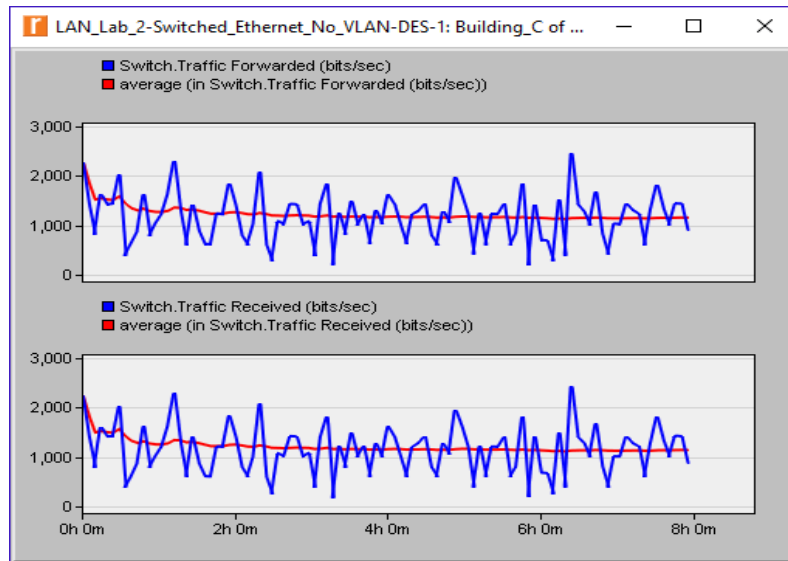

Original Data and average of Download Response and Upload Response Time

Building A: Traffic forwarded vs. Average traffic

Building B: Traffic forwarded vs. Average traffic

Building C: Traffic forwarded vs. Average traffic

Answers 1:

Email Download Response Time:

Min__0.018_____ Max _____0.040_____ Avg _____0.019_____

Email Upload Response Time:

Min___0.04_____ Max ___0.19_____ Avg _____0.12_____

FTP Download Response Time:

Min_____0.01_____ Max _____0.21_____ Avg _____0.12_____

FTP Upload Response Time:

Min_____0.01_____ Max __0.20_____ Avg _____0.10_____

Switch Building_A:

Traffic Received: Min _____480_____ Max___2700_____ Avg _____1600_____

Traffic Forwarded: Min ___480_____ Max___2700_____ Avg _____1600_____

Switch Building_B:
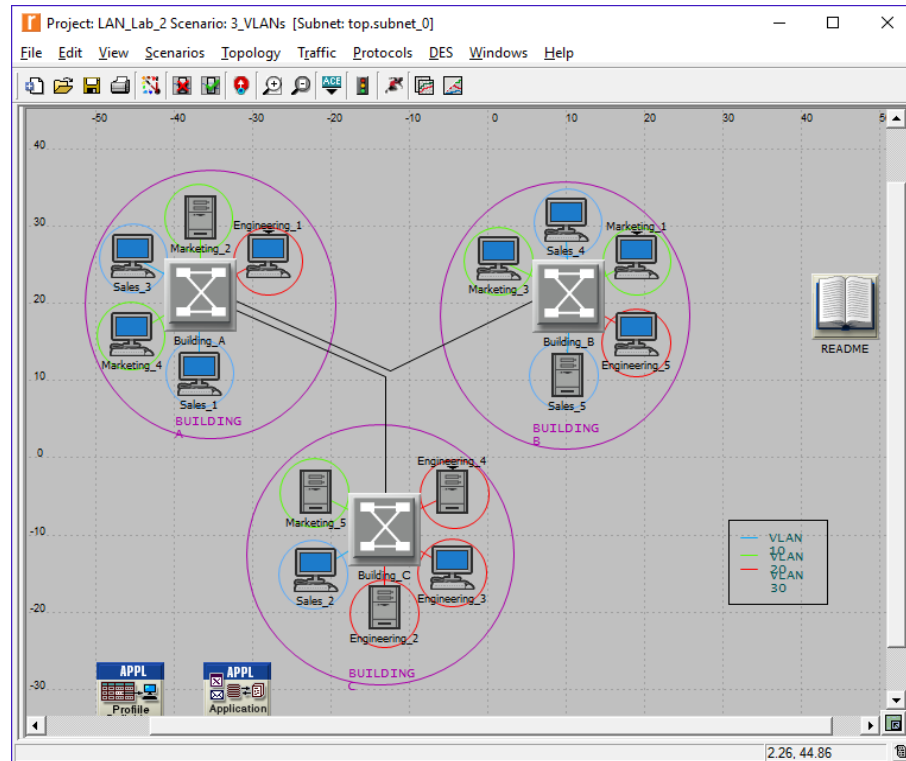
Traffic Received: Min _____250_____ Max _____2350_____ Avg ___1350_____

Traffic Forwarded: Min ___250_____ Max _____2450_____ Avg __1400_____

Switch Building_C:

Traffic Received: Min _____250_____ Max _____2400_____ Avg __1200_____

Traffic Forwarded: Min ___250_____ Max _____2480_____ Avg _____1300_____
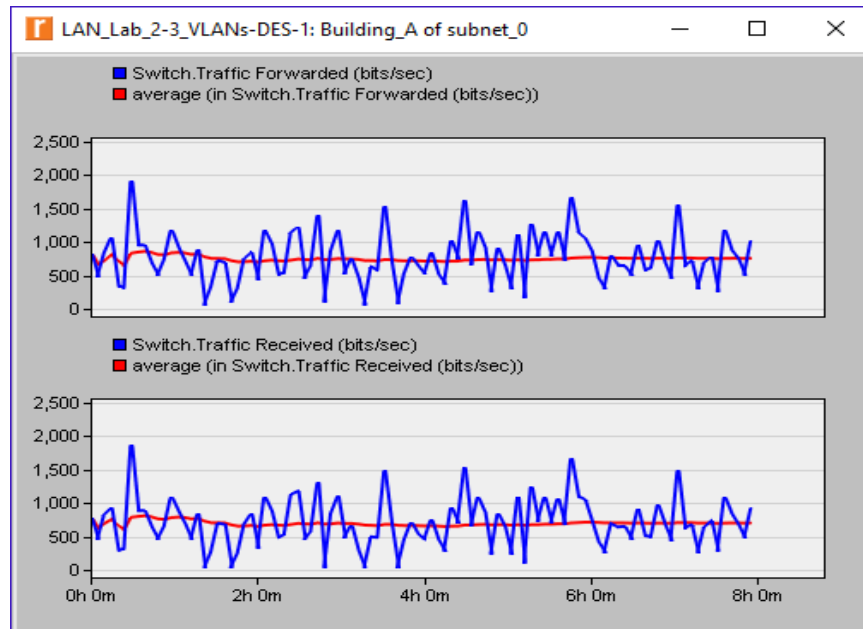
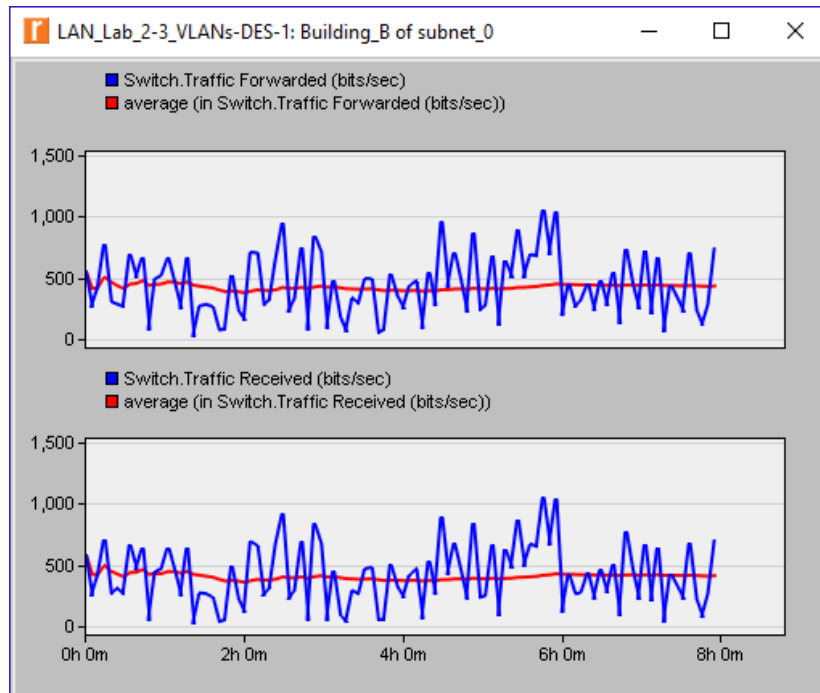# Implementation 2:

Topology
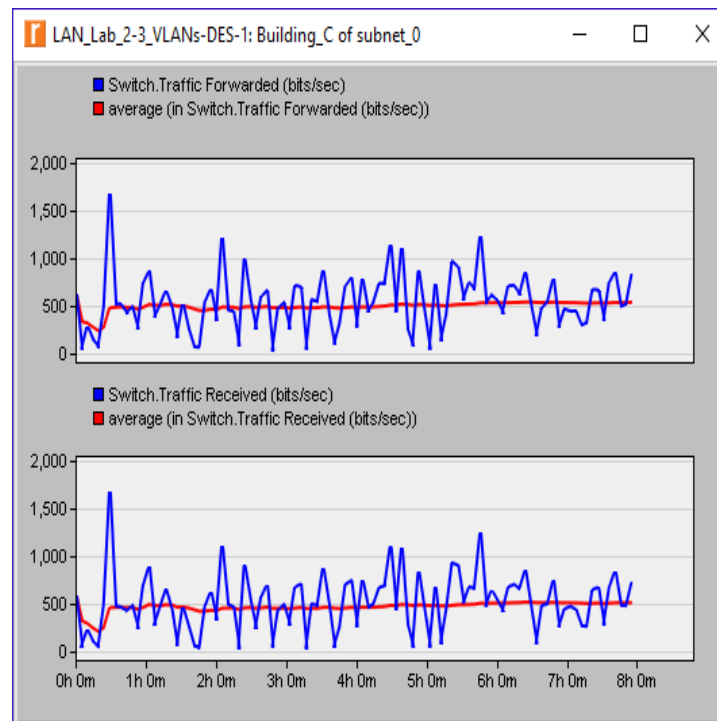

VLAN table

Results 1:

Original Data and average of Download Response and Upload Response Time

Building A: Traffic forwarded vs. Average traffic

Building B: Traffic forwarded vs. Average traffic

Building C: Traffic forwarded vs. Average traffic

Answers 2:

Email Download Response Time:
Min___0.01_____ Max ____0.21____ Avg _____0.011_____

Email Upload Response Time:
Min____0.03_____ Max ___0.23_____ Avg _____0.14_____

FTP Download Response Time:

Min___0.04_____ Max __0.20_____ Avg _____0.06_____

FTP Upload Response Time:
Min____0.03_____ Max ___0.07_____ Avg ___0.06_____

Switch Building_A:
Traffic Received: Min ____45_____ Max ___1900_____ Avg ____700_____
Traffic Forwarded: Min ___45_____ Max ___1900_____ Avg __770_____

Switch Building_B:

Traffic Received: Min ____45_____ Max ____1050_____ Avg __410_____
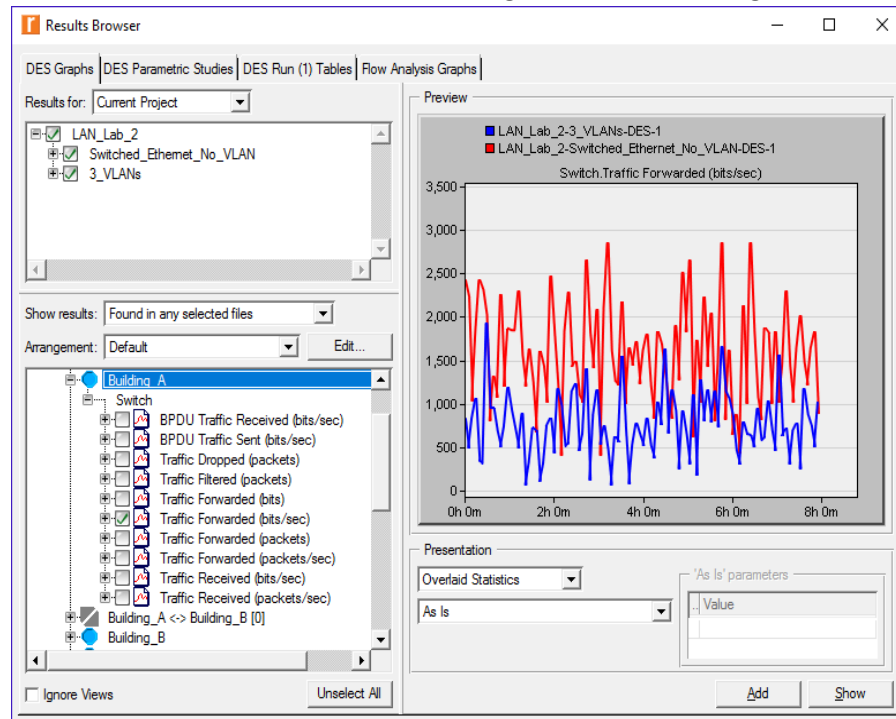Traffic Forwarded: Min ____45_____ Max ___1050_____ Avg __415_____

Switch Building_C:

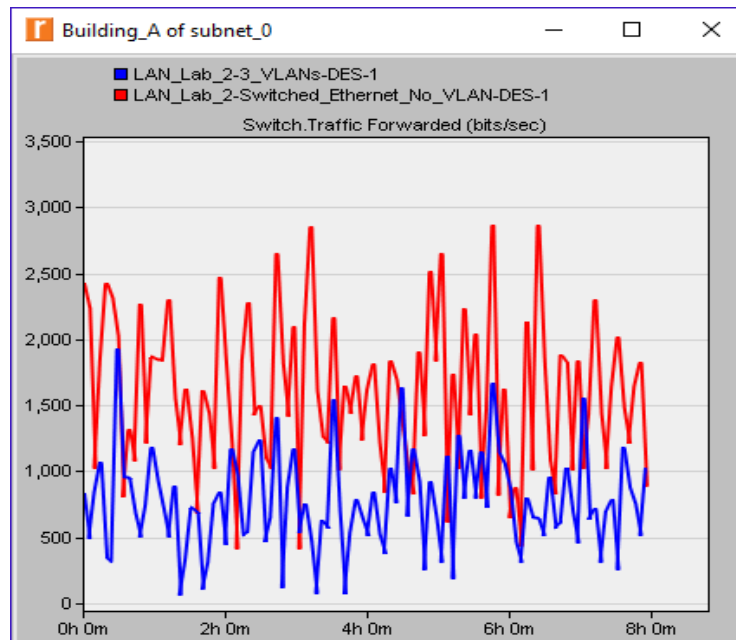Traffic Received: Min ____45_____ Max ___1700_____ Avg __550_____
Traffic Forwarded: Min ____45_____ Max ___1700_____ Avg __560_____

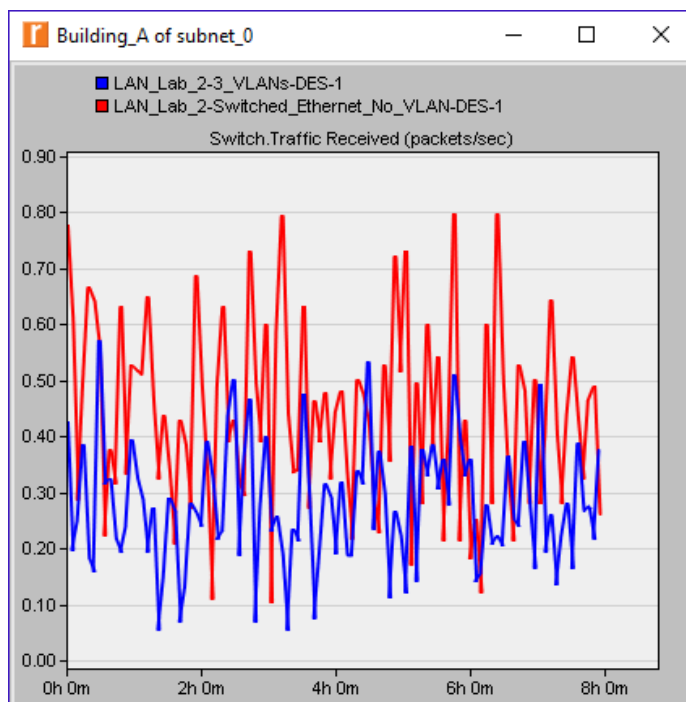**Compare the graphs with the previous scenario.**

We choose the statistics and click Show. Lower right corner has settings Overlaid Statistics.
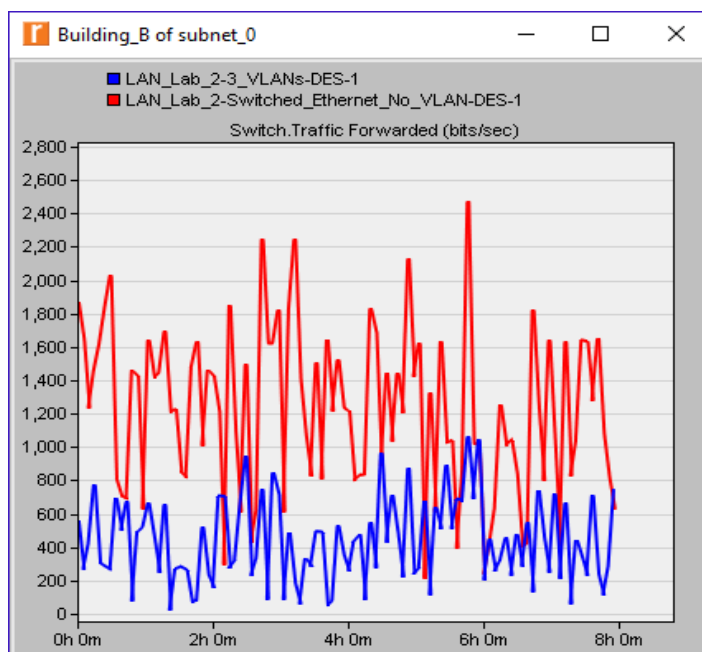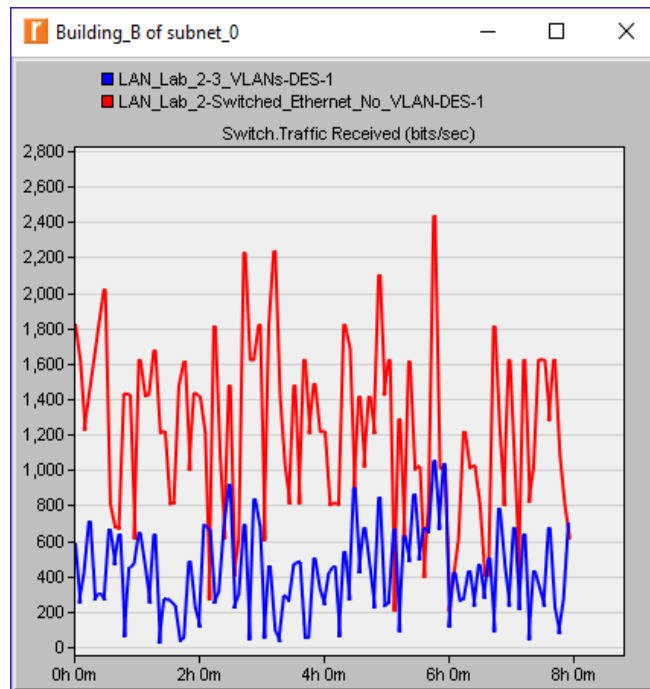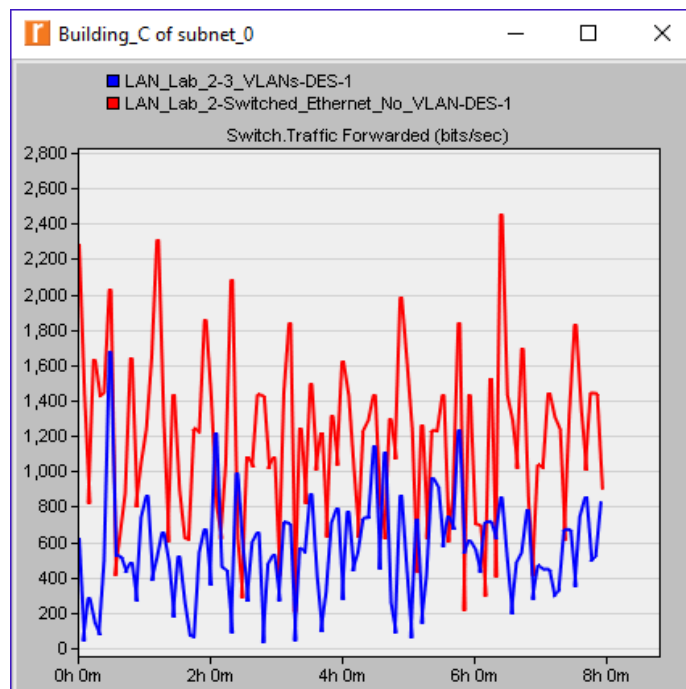

Statistics

Building A: Traffic Forwarded
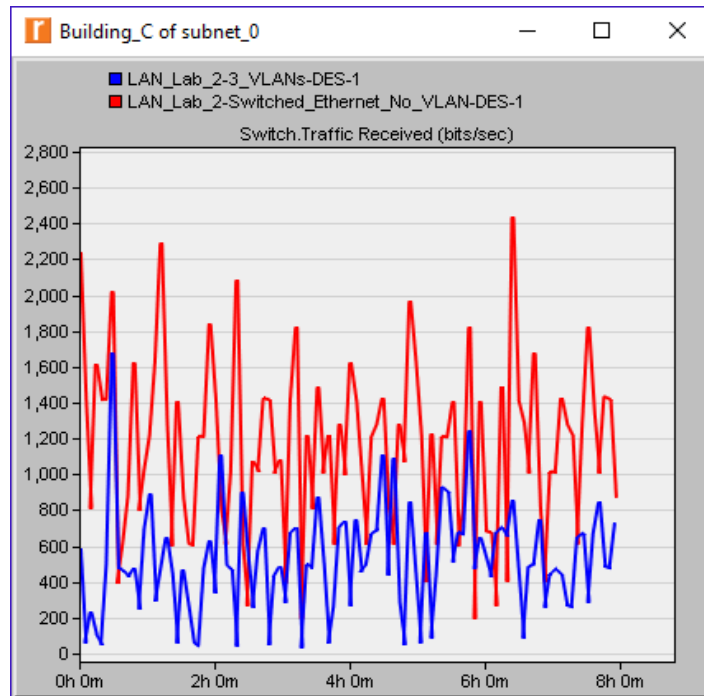
Building A: Traffic Received
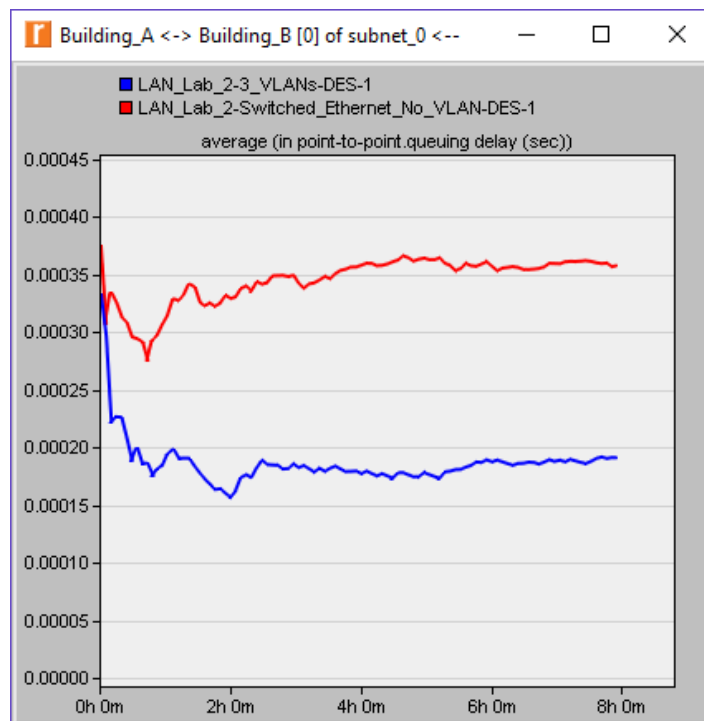

Building B: Traffic Forwarded
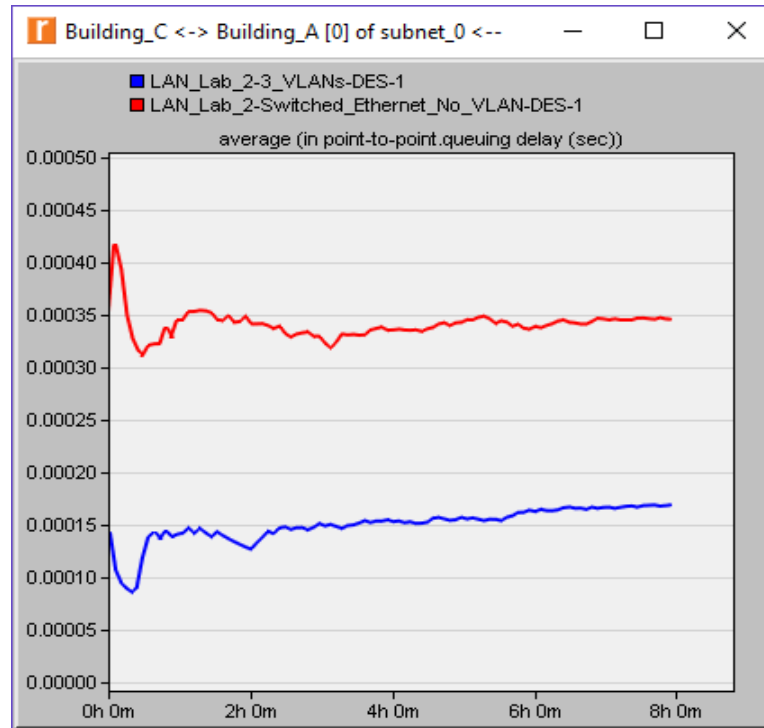
Building B: Traffic Received

Building C: Traffic Forwarded

Building C: Traffic Received

Building B-A: Queuing Delay

Building C-A: Queuing Delay

Conclusions:

We learned how VLANs work, and changed the parameters to improve the network. VLANs simplify network administration so that it can be useful to reduce the cost of networks. We also figure out the different of the queuing delay from Building_B to Building_A, and Building_C to Building_A. We also learnt if VLAN's are implemented correctly, they can do excellent performance and security improvement on a Local Area Network