Create a mesh network and compare performance of OLSR and BATMAN (20% of grade, 100 marks)

Due date: Friday 27 May

The purpose of this assignment is to get hands on experience with mesh networks and compare the performance of the OLSR and BATMAN mesh protocols.

Form teams of up to 4 students

Enter your names of your team on the Vula Honours Wiki site

https://vula.uct.ac.za/x/qkMjK4

Instructions

All of the tasks in this assignment involve logging into the gateway node of the mesh network and running a set of commands on various nodes in the mesh network in order to test the performance of the BATMAN and OLSR mesh protocols.

A testbed has been set up which contains a set of 7 Linksys WRT54G routers running OpenWRT in the honours lab, and ICTD lab. The nodes already have OpenWRT, BATMAN and OLSR running on them.

For details of all the IP addresses on the WAN and WiFi interfaces visit the wiki site:

https://vula.uct.ac.za/x/qkMjK4

Login details for all nodes

user: root

pass: galaxy

You will need to schedule time for each group to make use of the mesh testbed. I'd advice setting up something like Google Calendar to organise this. Multiple teams cannot run their tests in the test bed at the same time (apart from task1 possibly) – it will cause chaos – **I cannot stress enough the importance of not leaving this assignment to the last minute where every team suddenly needs time in the testbed.**

If you need physical access to the ICTD lab in order to change the antennas or reset a router please contact Ricahrd Maliwatu: 071 077 9922

Task 1:

Install software on your laptop that allows you to visualize the current topology of the mesh network as well as the quality of the links in the mesh. The visualization should support

OLSR and BATMAN.

Show the visualization snapshot for

1) OLSR with all antennas connected

2) OLSR with some antennas of nodes in the honours lab removed (without partitioning the network)

3) BATMAN with all antennas connected

4) BATMAN with some antennas of nodes in the honours lab removed (without partitioning the network)

20 marks

Task 2:

Compare the TCP throughput from a gateway node to every other node in the mesh networking while running BATMAN and while running OLSR. Present the results in a table and Compute the overall average. *Hint use the iperf tool for at least 30 seconds.*

20 marks

Task 3:

Compare the round trip from your node to every other node in the mesh networking while running BATMAN and while running OLSR. Present the results in a table and compute the overall average. *Hint use the ping tool for at least 30 seconds*

20 marks

Task 4:

Try to detect route flapping in the network and compute the number of route changes over a one hour period for both BATMAN and OLSR. *Hint use the Ping -R option or tracreoute in a loop*

20 marks

Task 5:

Compare repair time for BATMAN and OLSR when breaking a route in the network. Try this in a number of places in the network to establish an average

10 marks

Task 6:

Suggested some ways (e.g. with changes in the routing protocol settings) to decrease the amount of route flapping and to increase the speed of the repair time for the mesh networking

10 marks