Nomadic Communications Labs

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Analysis of the performances of a Wireless network

IPERF

- Several tools exist for the performances measurement of a network each one with different purposes:
  - Iperf:
    - http://dast.nlanr.net/Projects/Iperf/
  - d-itg:
    - http://www.grid.unina.it/software/ITG/
  - Netperf:
    - http://www.netperf.org/netperf/NetperfPage.html

IPERF: the test

- We want to measure as the performances vary changing some parameters of the configuration of the AP
- We choose IPERF
- After every modification of a parameter run N times IPERF (N>20):
  - We remove the lowest values (10%)
  - We compute the average
  - It is of interest also the best result!

IPERF: the test

- For Avaya AP (after any change of the AP parameters you have to reboot it):
  - Change the working mode: 802.11b, 802.11g, 802.11b/g
  - Change the threshold for RTS/CTS
  - Change the transmission speed (not affected the receiving speed of the AP)
- For CISCO AP:
  - Change the threshold for RTS/CTS
  - Change the threshold for fragmentation
  - Change the speed used

IPERF: Examples

- For example for an Avaya AP:

Speed 54 Mb/sec	**Speed 11 Mb/sec**
10.0 sec, 25.1 MBytes→ 21.1 Mbits/sec	10.0 sec, 7.03 MBytes→ 5.89 Mbits/sec
10.0 sec, 24.4 MBytes→ 20.4 Mbits/sec	10.0 sec, 7.16 MBytes→ 6.00 Mbits/sec

- Therefore approximately:
  - Speed ratio: 54/11 = 4.9
  - Performance ratio: 20.75 / 5.945 = 3.49

IPERF: Examples

- For example for a CISCO AP:

Velocità del link 11 Mb/sec	**Velocità del link 1 Mb/sec**
10.0 sec, 2.75 MBytes→ 2.30 Mbits/sec	10.4 sec, 872 KBytes→ 684 Kbits/sec
10.0 sec, 3.20 MBytes→ 2.67 Mbits/sec	

- Therefore approximately:
  - Speed ratio: 11/1 = 11
  - Performance ratio: 2.49 / 0.684 = 3.64

IPERF: Setup

- The IPERF server (iperf – s) is on:
  - 192.168.10.30
- You have to run iperf with a command like:
  - iperf –c 192.168.10.30 –f k –i 5 –t 20
- Where:
  - -f k means that the report is in Kbits
  - -i 5 means a report any 5 seconds
  - -t 20 means a simulation 20 seconds long

IPERF: setup

- For Avaya AP, RTS/CTS and fragmentation test: use bidirectional run!
  - -r: do a bidirectional test separately
  - -d: do a bidirectional test simultaneously

  Do the analysis of the data obtained for the two direction separately
- The packet size sent by iperf is around 1470 byte long: choose the threshold for RTS/CTS and fragmentation accordingly with this length

IPERF: setup

- Avaya AP:
  - IP: 192.168.10.15
  - SSID: NCA
  - Passwd: public
- Cisco 1230B:
  - IP: 192.168.10.10
  - SSID: NCB
  - Passwd: Cisco
- Cisco 1310:
  - IP: 192.168.10.5
  - SSID: NCG
  - Passwd: Cisco

IPERF: setup

- Server: 192.168.10.30
- Login: root
- Passwd: NC2007
- Startup of services (network/dhcpd/iperf): ./nomadic.sh
- Connect all the device (the 3 AP and the laptop-server) to the DLink gigabit switch
- Use the white network cable to connect the laptop

Lab Report

- You have to:
  - Describe the setup of the test
  - Describe the result obtained with graphs and tables
  - Do some analysis on the data (Average, Max, Min, Variation, …)
  - Write some conclusions