

# Nomadic Communications Labs

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## Analysis of the performances of a Wireless network

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### 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>

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### 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!

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### 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

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### 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:  $20.75 / 5.945 = 3.49$

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## 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:  $2.49 / 0.684 = 3.64$

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## 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

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## IPERF: setup

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

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### IPERF: setup

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- 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

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### IPERF: setup

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- 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

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### Lab Report

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- 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

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