



**First QoS policy Implemented  
at Wireless Network of  
Los Andes University**

**§ One of the aims of wireless networks, just like others network technologies, is support added value.**

**§ Understand technical issues of wireless networks and their installation procedures requires a considerable effort.**

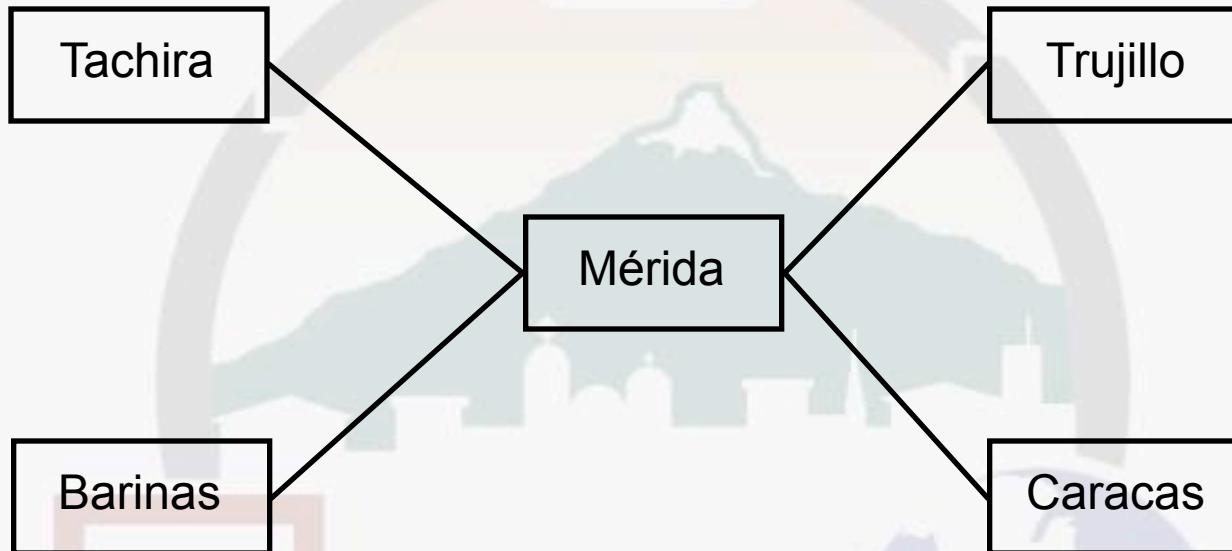


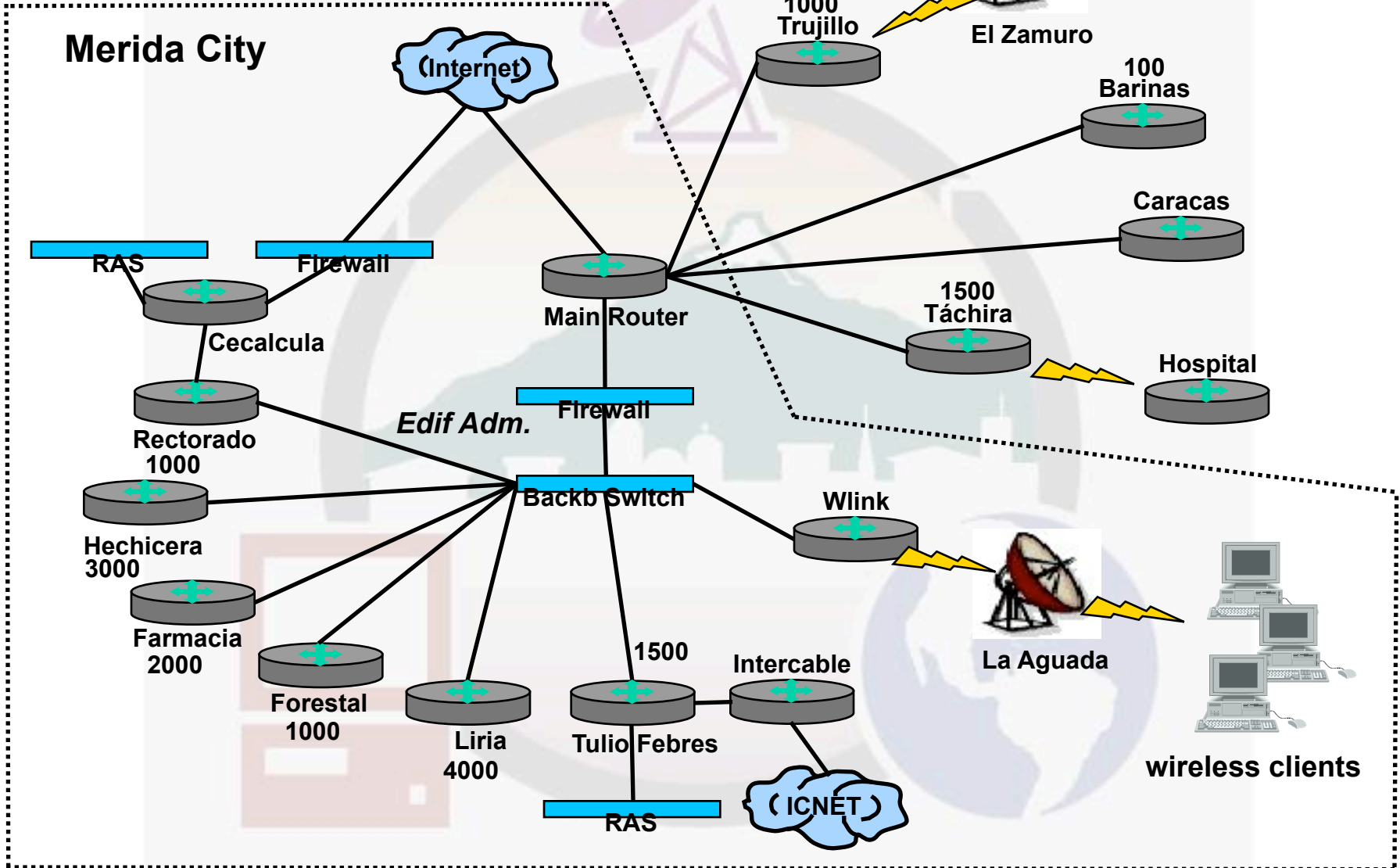
**§ However, maintenance, supervise and monitoring the network, requires a constant effort in order to keep all services available.**

**§ In order to make easier all of these administration tasks, a QoS policy help us to avoid some saturation problems in the network.**

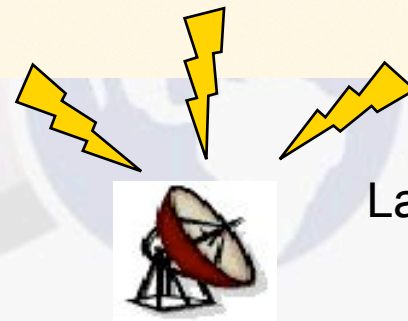
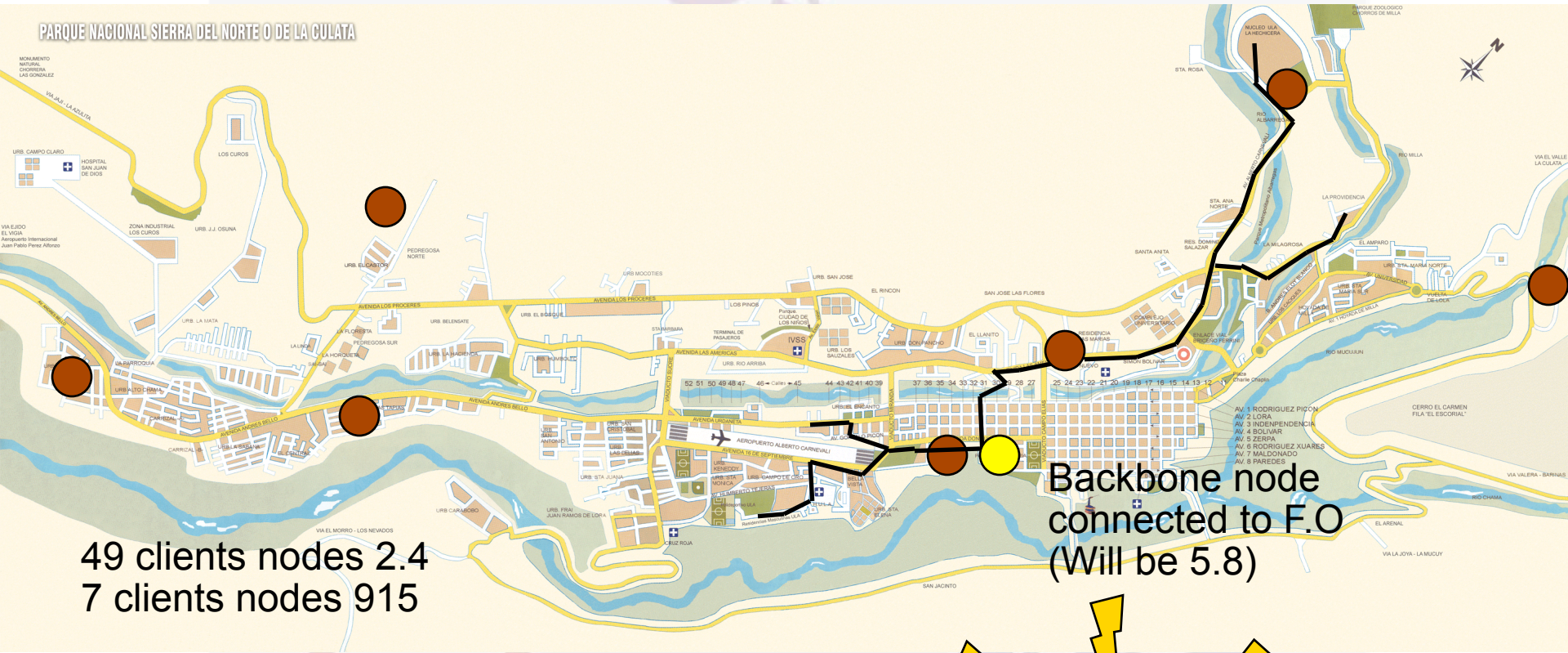


# Inter state structure





- 50 Kilometers with F.O. Giga Ethernet
- Wireless network covers approximately 500 km<sup>2</sup>



La Aguada

**§ ULA's wireless network was only for academic use, however some remote departments started to use this in order to read e-mail in text mode.**

**§ Many different applications made appearance which increase the consumption of the network resources (P2P, binaries files attached in e-mails, etc)**



**§ Initially we disconnected manually each client that hogged the bandwidth.**

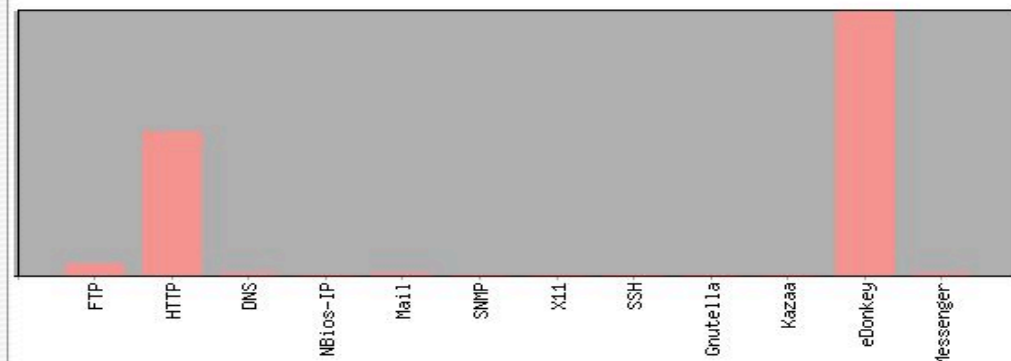
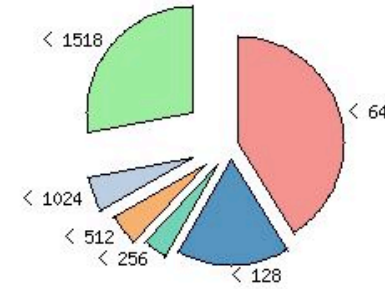
**§ We started to evaluate different inexpensive ways to avoid this problem**



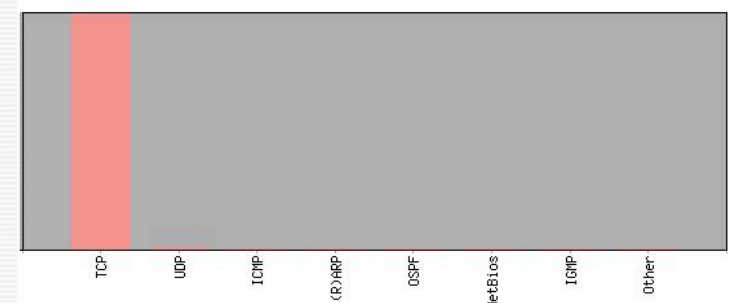
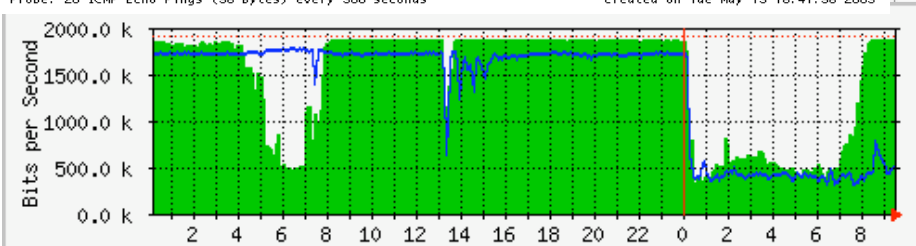
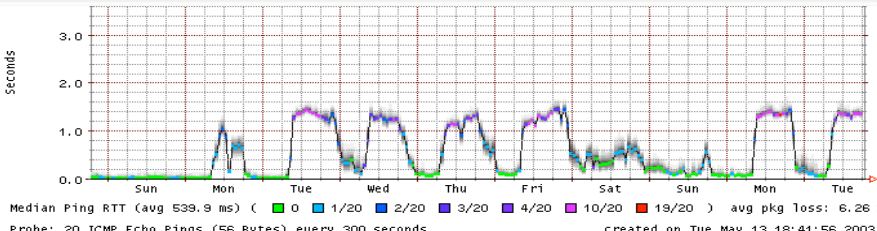
# Monitoring Tools: ntop, mrtg, smokeping

Shortest	42 bytes	
Average Size	438 bytes	
st	1,514 bytes	
ytes	41.1%	2,810,054
ytes	17.2%	1,173,513
ytes	3.7%	251,489
ytes	4.7%	322,669
ytes	5.4%	369,048
ytes	28.0%	1,912,984
ytes	0.0%	0

TCP/UDP Protocol	Data	Percentage
FTP	69.2 MB	2%
HTTP	918.0 MB	28%
DNS	12.5 MB	0%
NBios-IP	556.5 KB	0%
Mail	16.7 MB	0%
SNMP	316.0 KB	0%
X11	30.0 KB	0%
SSH	7.4 MB	0%
Gnutella	1.7 KB	0%
Kazaa	3.8 MB	0%
eDonkey	1.7 GB	52%
Messenger	16.8 MB	0%
Other TCP/UDP-based Prot.	494.5 MB	15%

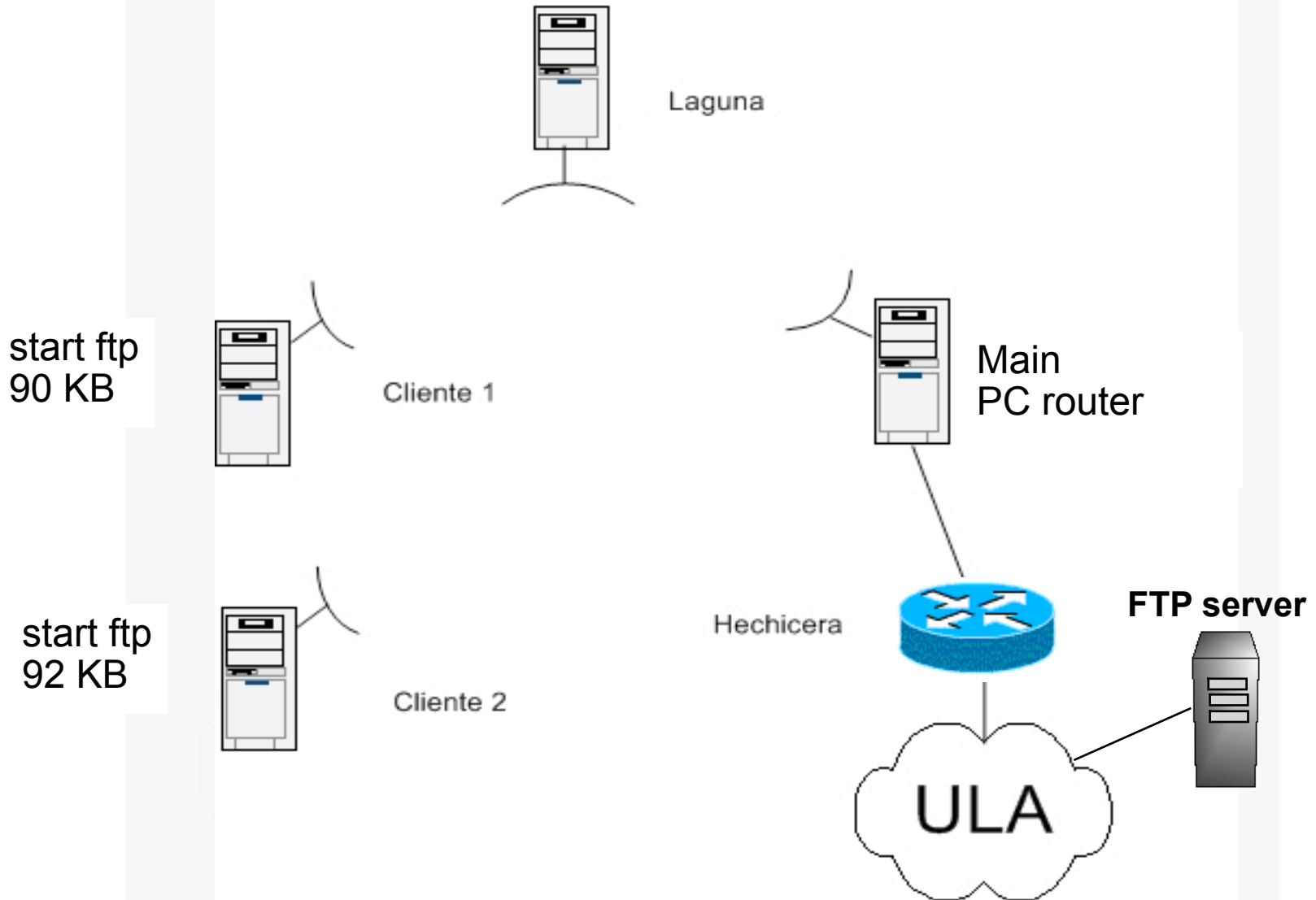


Data	Percentage
3.2 GB	99.9%
TCP	3.1 GB 99%
UDP	22.6 MB 0%
ICMP	6.2 MB 0%
(R)ARP	1.9 MB 0%
OSPF	643.0 KB 0%
NetBios	69.8 KB 0%
IGMP	0.8 KB 0%
Other	8.6 KB 0%



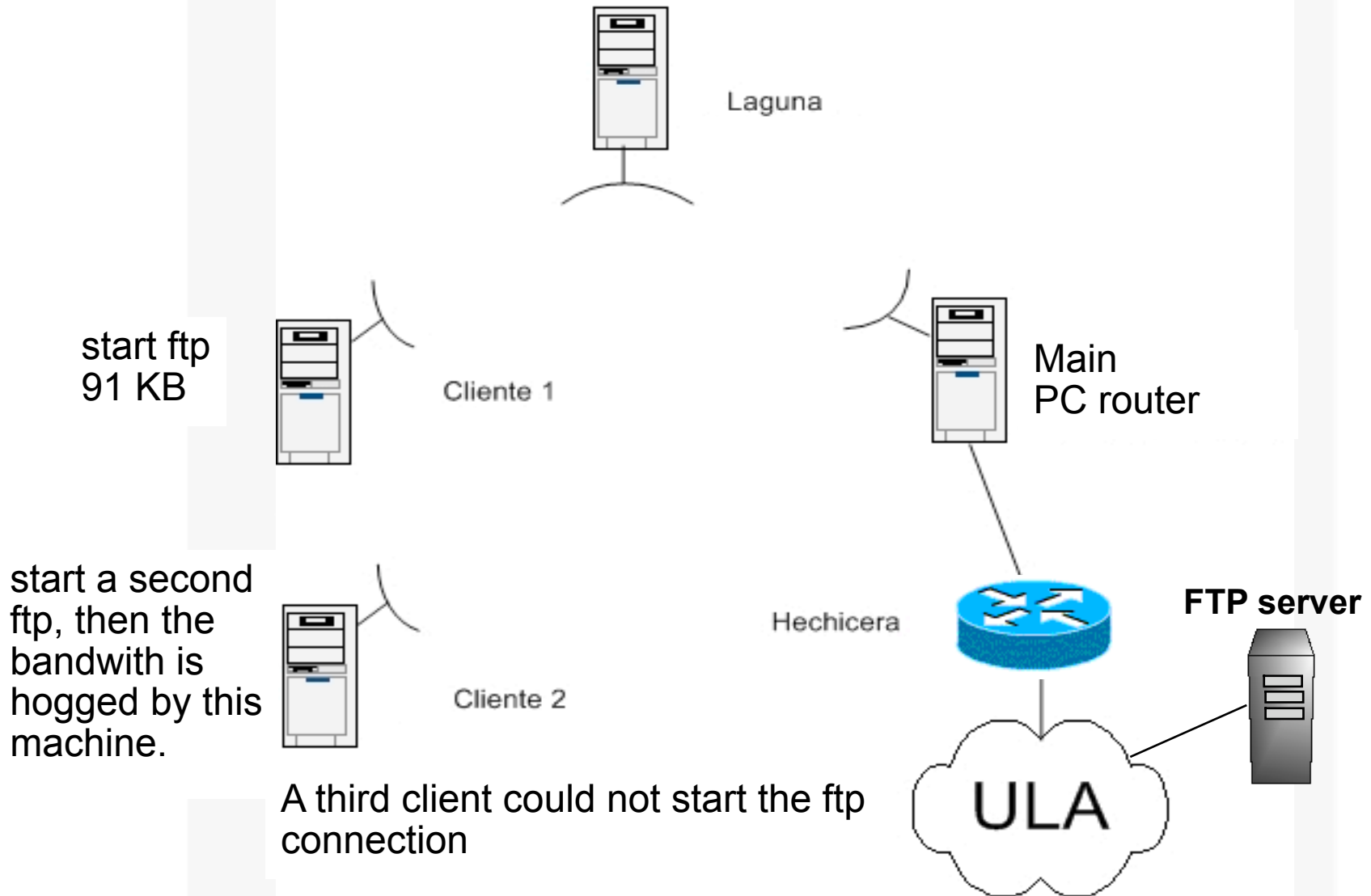
# Tests made in the lab

**First test:** enabling RTS and Sen. in all cards



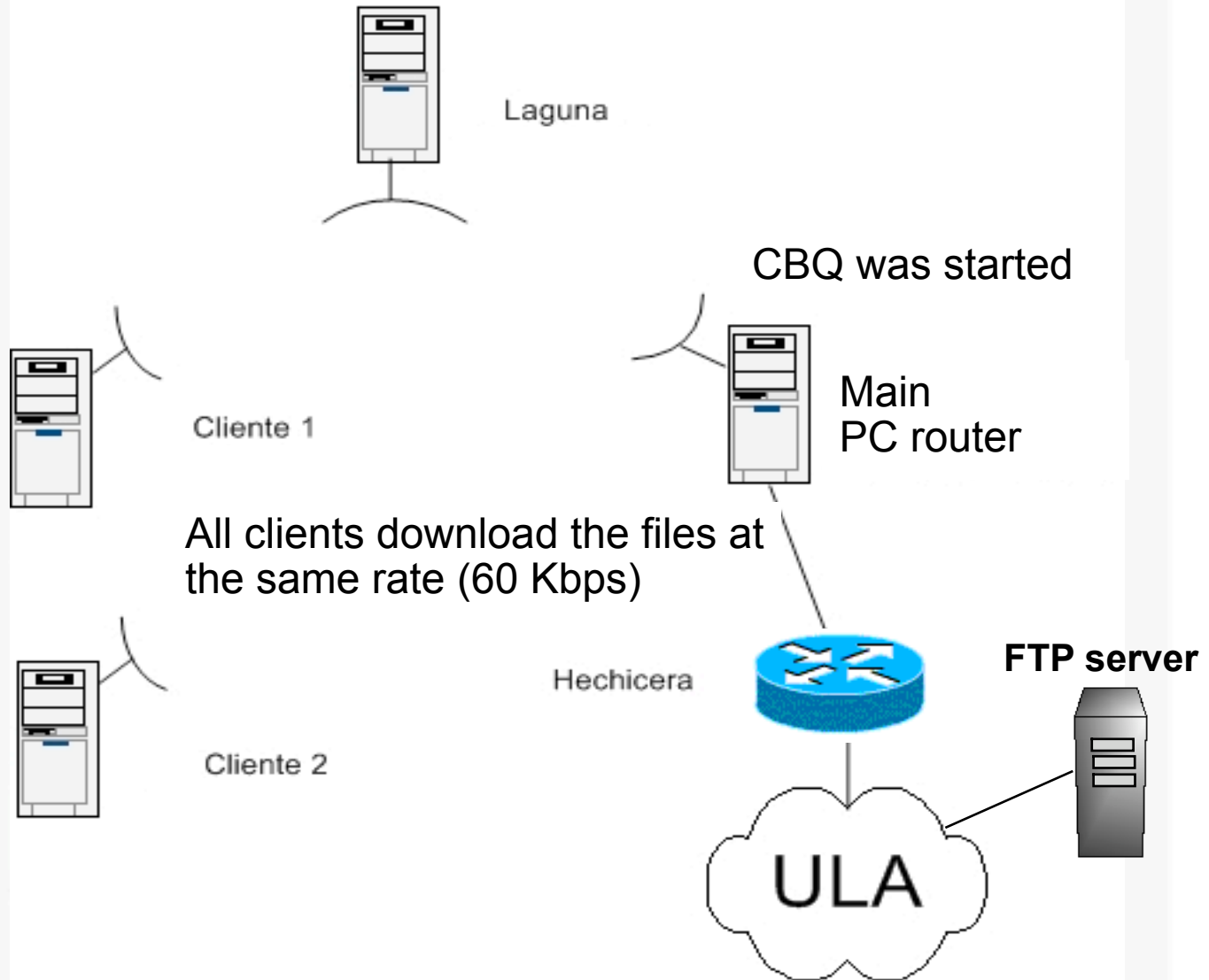
# Tests made in the lab

**Second test:** disabling RTS and Sen. in all cards



# Tests made in the lab

**Third test:** Keeping the same conditions as the last test and the ftp connections still open



## **Software used:**

**iproute:** software designed to use the advanced networking capabilities of the Linux 2.2.x kernel

**Shapcfg:** this program configures and adjusts traffic shaper bandwidth limiters (CBQ script)

## CBQ Configuration File

```
[root@enlace-adm root]# more /etc/sysconfig/cbq/cbq-test
```

```
DEVICE=eth1,11Mbit,1Mbit    #device where we do control our traffic (wireless card)  
                             #REAL ethernet card bandwidth  
                             #as a rule of thumb weight=batdwidth/10  
  
RATE=600Kbit                #Shaper's speed - Kbit,Mbit or bps (bytes per second)  
  
WEIGHT=1Kbit                 #"weight" of shaper (CBQ class).  
                             #Like for DEVICE - approx. RATE/10  
  
PRIO=5                       #shaper's priority from 1 to 8  
  
RULE=150.185.178.130        #Rule of the shaper
```

## **Things to do**

**Ajust the rate and define some rules in order to optimize the usage of the wireless network**

**Find out the way to use the entire bandwidth when all of the clients are not connected**





**Thank you!**

