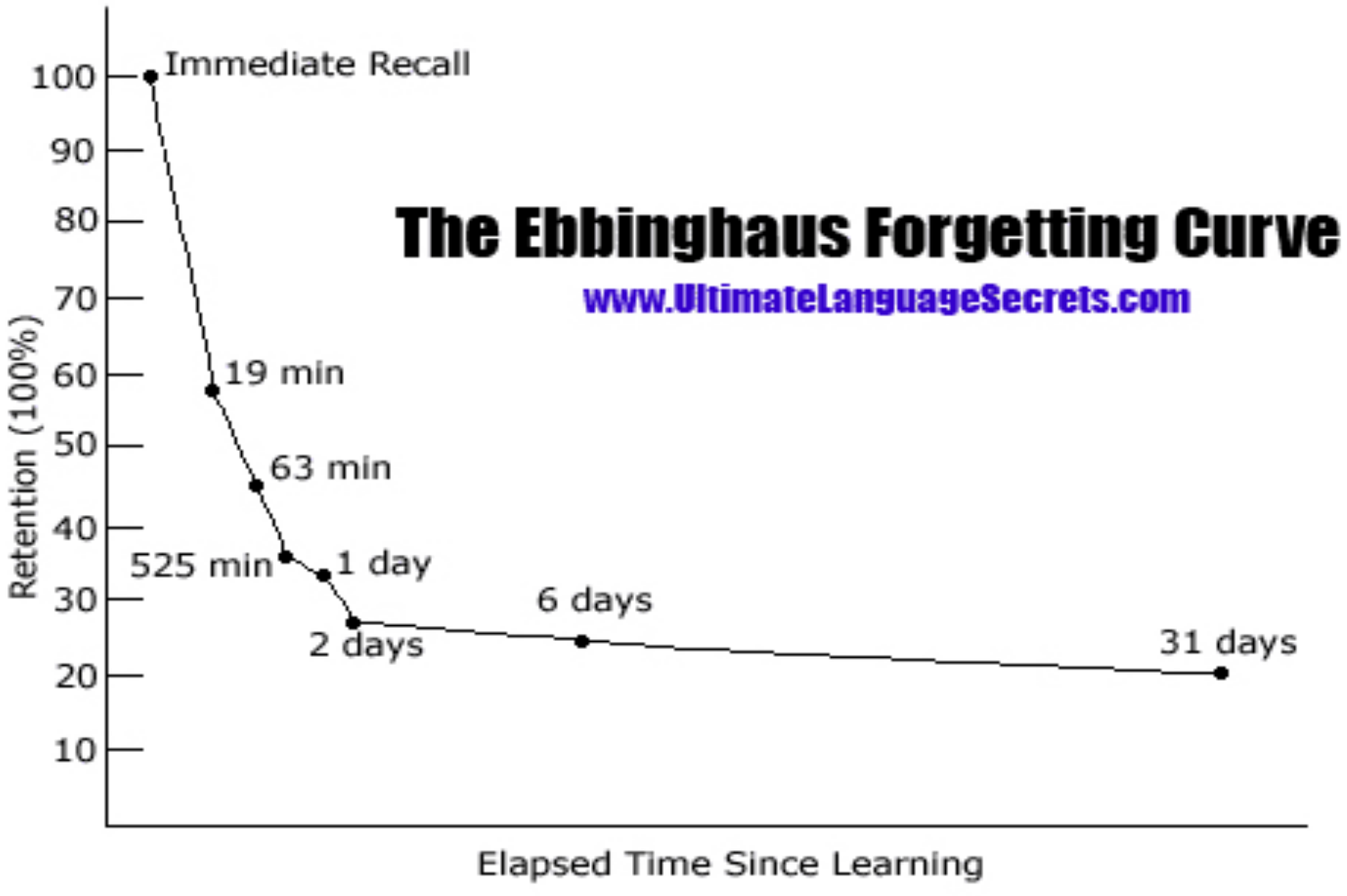
Philosophy

"One must learn by doing the thing; for though you think you know it, you have no certainty, until you try."

Sophocles

Philosophy


The Ebbinghaus Forgetting Curve
www.UltimateLanguageSecrets.com
Retention (100%)
100
90
80
70
60
50
40
30
20
10
Immediate Recall
19 min
63 min
525 min
1 day
2 days
6 days
31 days
Elapsed Time Since Learning

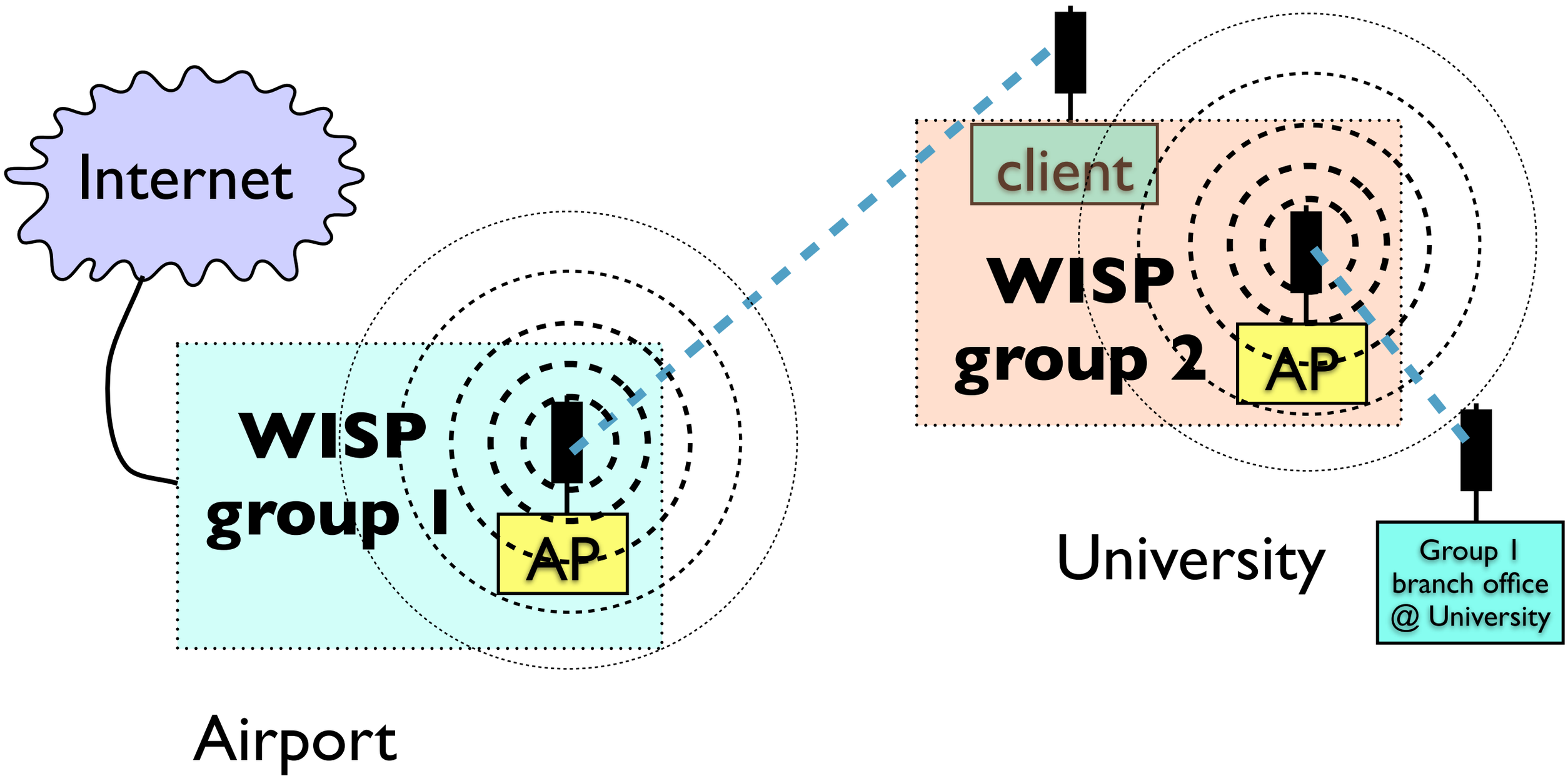
Exercise on WISP

- Four groups are formed, they have to plan and configure a Wireless ISP.
- There are two locations, some 20 Km apart: UI and Airport. These location are the same of the Radio Mobile exercise, so we will calculate the distance and the path loss tomorrow.

Exercise on WISP

- Group 1 has a wired connection to the Internet at the HQ located near the Airport, they have to provide connectivity to Group 2 via a long distance link. They will run the AP.
- Group 2 will be a customer of Group 1and will get Internet connectivity from them.
- Group 1 has a remote branch office at the University. They will get Internet connectivity there using the services of the local WISP managed by Group 2.

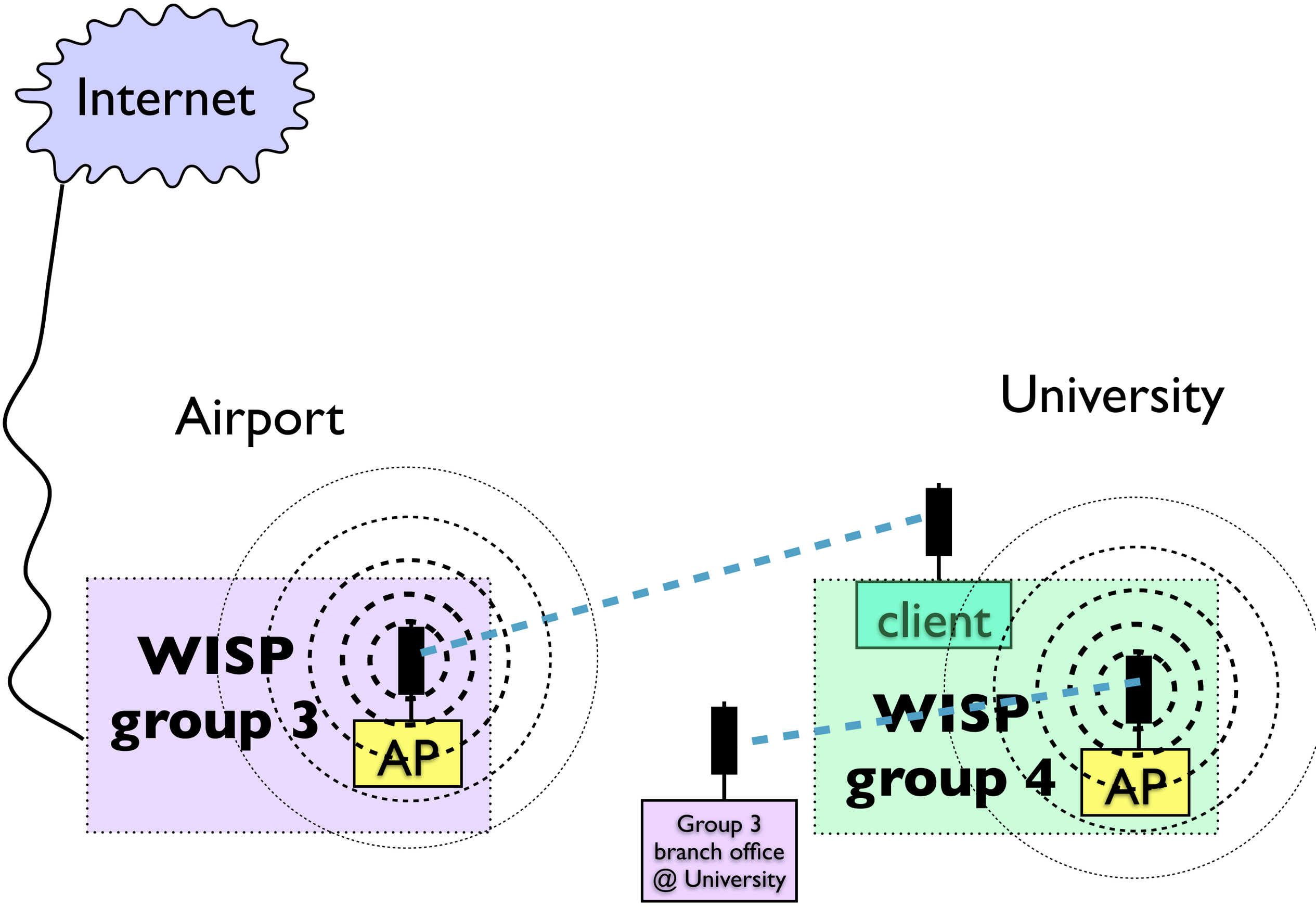
Structure of the exercise



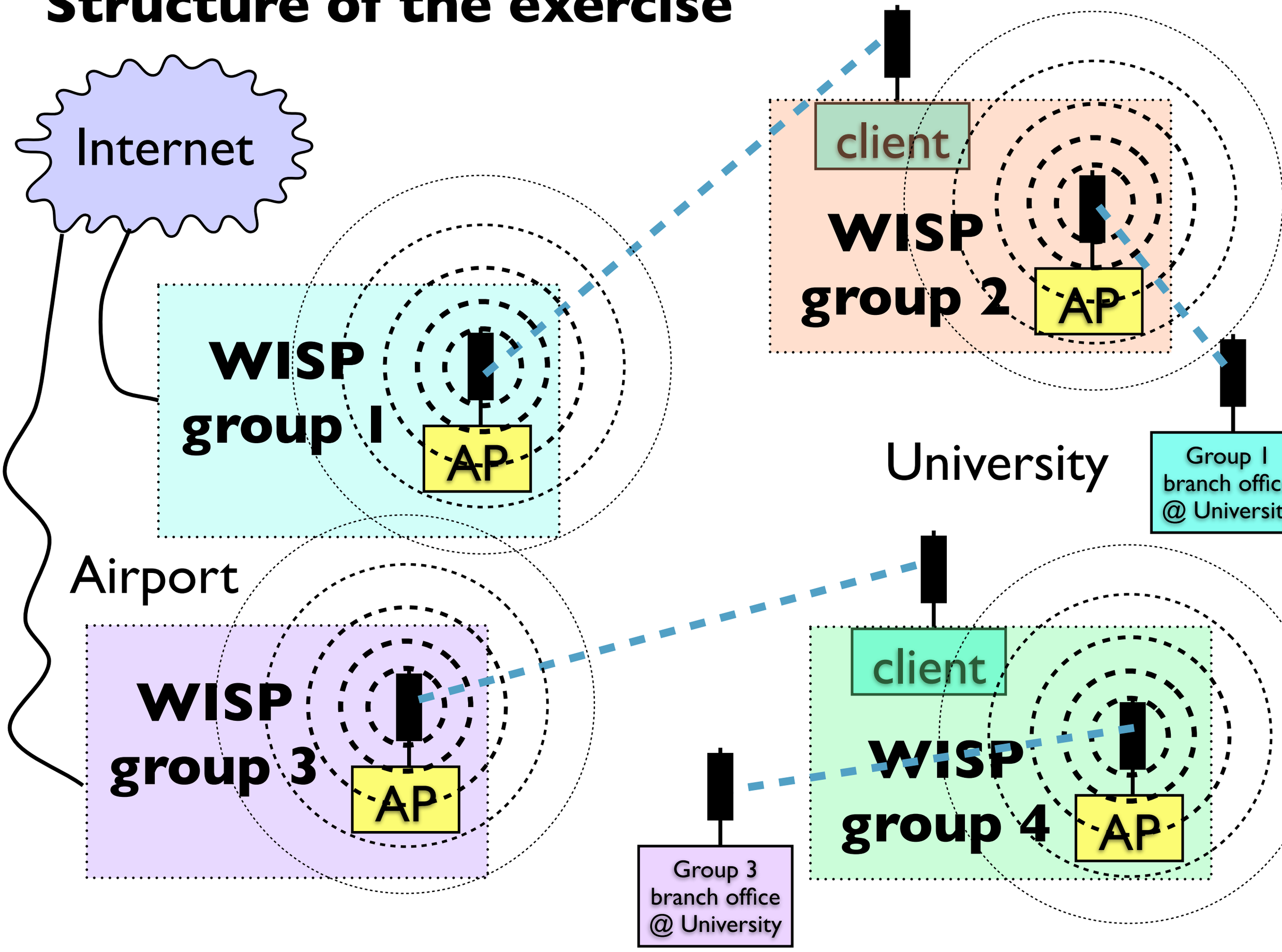
Exercise on WISP

- Groups 3 has a wired connection to the Internet at the HQ located near the Airport, they have to provide connectivity to Group 4 via a long distance link. They will run the AP.
- Group 4 will be a customer of Group 3 and will get Internet connectivity from them.
- Groups 3 has a remote branch office at the University. They will get Internet connectivity there using the services of the local WISP managed by Group 4.

Structure of the exercise



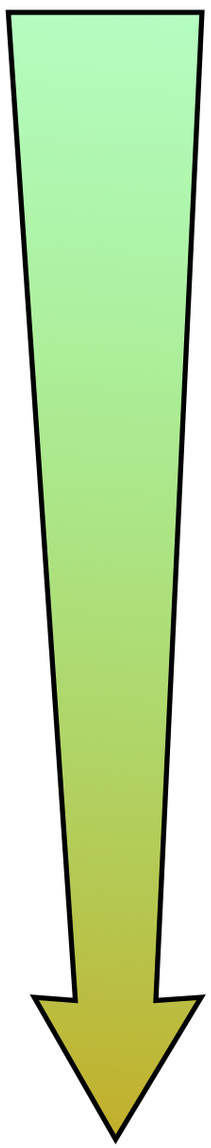
Structure of the exercise



Exercise on WISP

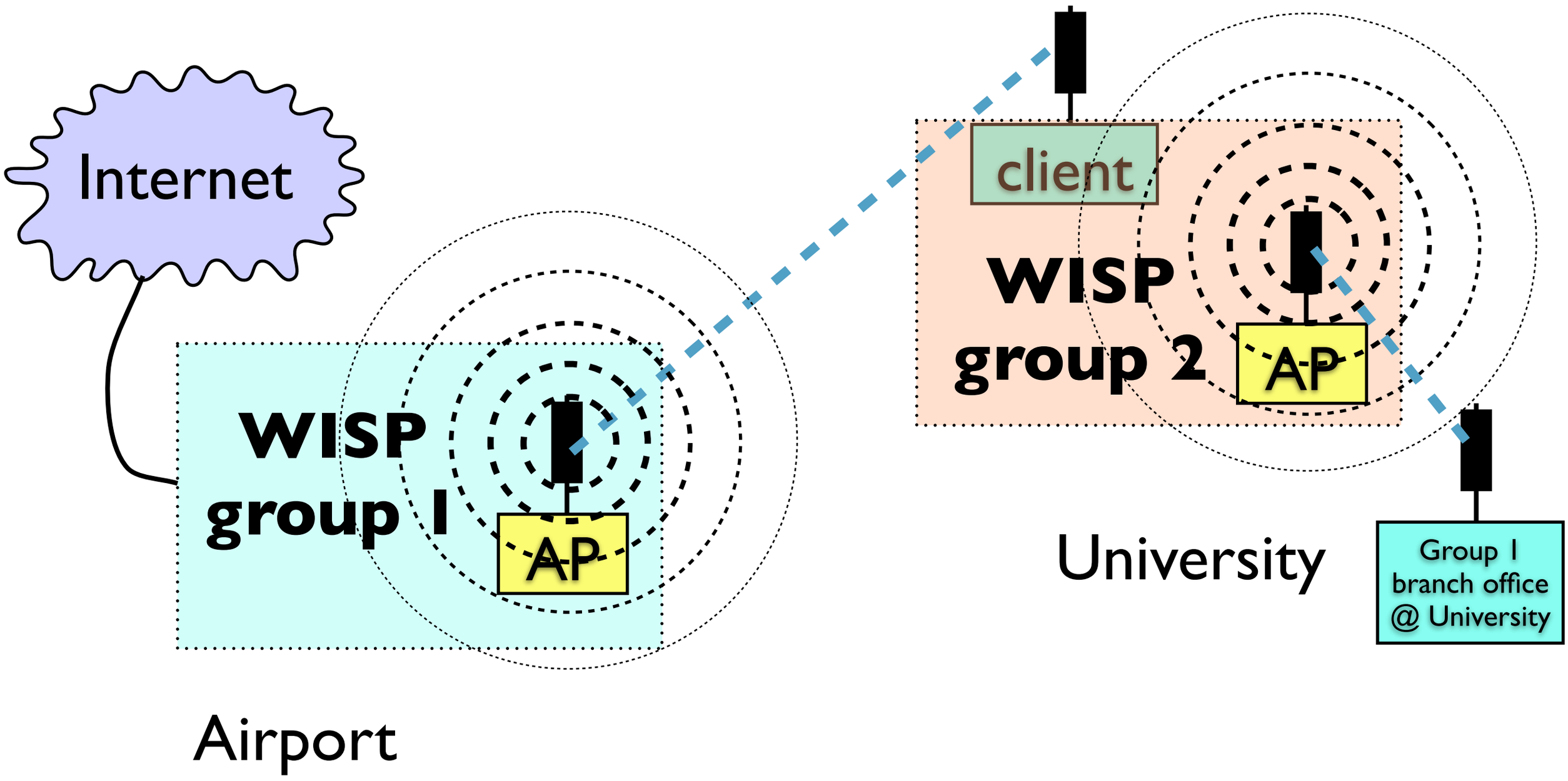
- All WISP have to provide to their customers full information on how to get the connection. This includes for example: SSID, security settings, IP configuration, etc...
- Each Group receives three radio devices: an Ubiquiti NanoStation2 (directive antenna), two PicoStation2 with a small omni antenna, with all accessories (i.e. power supplies, ethernet patch cables, PoE injectors) and an AirView (or WiSpy) for spectrum survey.

Objectives:

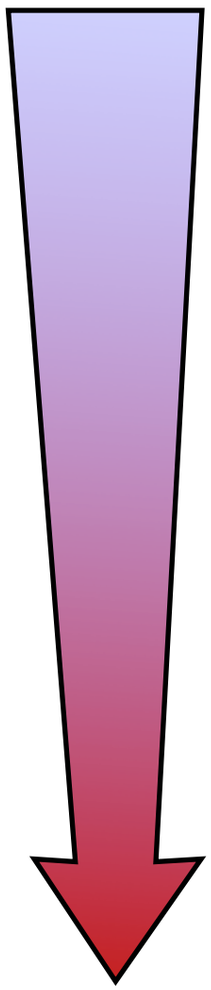


- Are Groups 1 and 3 able to browse *www.google.com* from their remote branch office at University? (If not, why?)
- Are channels configured so that APs do not interfere each other (among ALL groups)? (Is this really possible? What if it is not? Minimize interferences...)
- Have they maximized the throughput, using the proper radio as AP and client?

Structure of the exercise



More objectives:



- Are communications secured with the best available technologies? (WPA2? maybe even ssh tunnels?)
- Routing or bridging? Why? NAT?
- Net monitoring and management?

Preparatory activities - I

- If you were given a Bullet 2 device, insert the N-female to N-female connector into the antenna plug, and screw the rubber duck antenna. If you were given the Nanostation 2, you don't need to connect any external antenna as we will use the internal antenna for the exercise.

Preparatory activities - 2

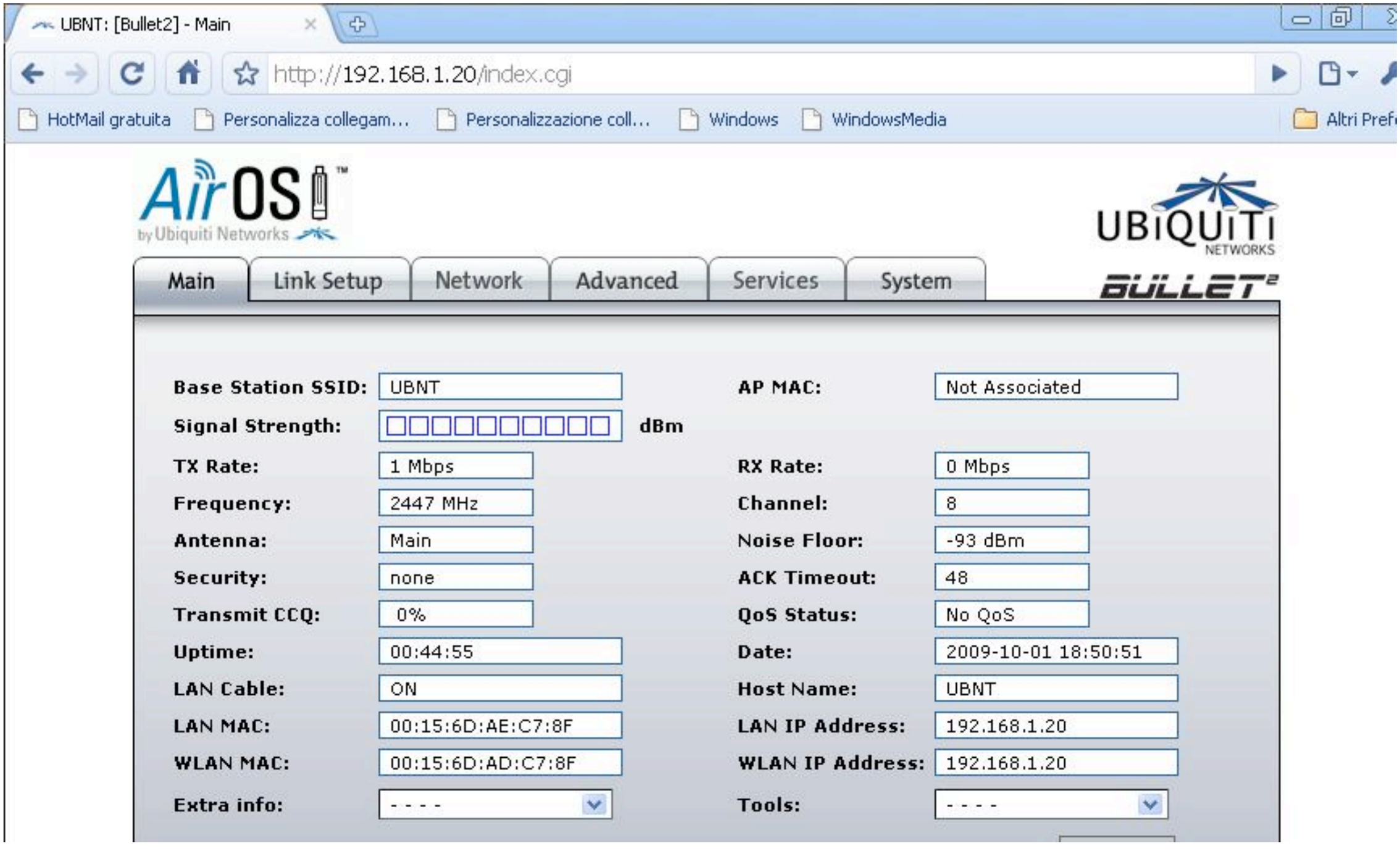
- Take the POE injector. Connect one side of a network cable to the port that says POE and insert the other side into the Bullet/Nanostation. Connect one side of the network cable to the port that says LAN and the other side into the network port of your computer. Double check the cables are correctly connected (you can burn your computer's network card if you connect it to the POE!). If everything is, connect the power supply to the port labeled as DC on the POE.

Preparatory activities - 3

- Now we need to make sure we know the IP address of the wireless device, in order to be able to connect to it. If the devices are new, you should read the default IP on the box. But if the device has been used already, you might have trouble finding the IP it uses.
- First challenge! :-)

Preparatory activities - 4

- Point a web browser at the IP address of the Ubiquity device (192.168.1.20 for new machines).
- Login with: username ubnt and password ubnt (for new machines).


UBNT: [Bullet2] - Main
http://192.168.1.20/index.cgi
HotMail gratuita
Personalizza collegam...
Personalizzazione coll...
Windows
WindowsMedia
Altri Pref
AirOS
by Ubiquiti Networks
UBIQUITI NETWORKS
BULLET2
Main
Link Setup
Network
Advanced
Services
System
Base Station SSID: UBNT
AP MAC: Not Associated
Signal Strength:
dBm
TX Rate: 1 Mbps
RX Rate: 0 Mbps
Frequency: 2447 MHz
Channel: 8
Antenna: Main
Noise Floor: -93 dBm
Security: none
ACK Timeout: 48
Transmit CCQ: 0%
QoS Status: No QoS
Uptime: 00:44:55
Date: 2009-10-01 18:50:51
LAN Cable: ON
Host Name: UBNT
LAN MAC: 00:15:6D:AE:C7:8F
LAN IP Address: 192.168.1.20
WLAN MAC: 00:15:6D:AD:C7:8F
WLAN IP Address: 192.168.1.20
Extra info: - - - -
Tools: - - - -

Preparatory activities - 5

- The first thing to do when logged in the system is to change the default password. It is not safe at all to leave the default password: any user may log in the system and change settings! The password may be changed in the System pane.

Preparatory activities -6

- Please take note of the username, password, IP, channel used on the sticker we will provide you!

Enjoy!

Common mistakes

- Group 2/4 choose to use the Nanostation as AP and the Bullet as client...
  This is wrong, because the client is part of a long-distance link and it need a high gain antenna (like the Nano has), while the AP is only serving a local area at University, so it may be done with the Bullet and the small omni (360° coverage)

Questions, problems?

- How are groups doing?
- Tell us your answers and your experiences!
- Most important: collaboration and teamwork!
- Solve problems by trying/testing/checking.