

Philosophy

"For the things we have to learn before we can do, we learn by doing."

Aristotle

**Lo que tenemos que
aprender a hacer,
lo aprendemos
haciéndolo.**

Aristóteles

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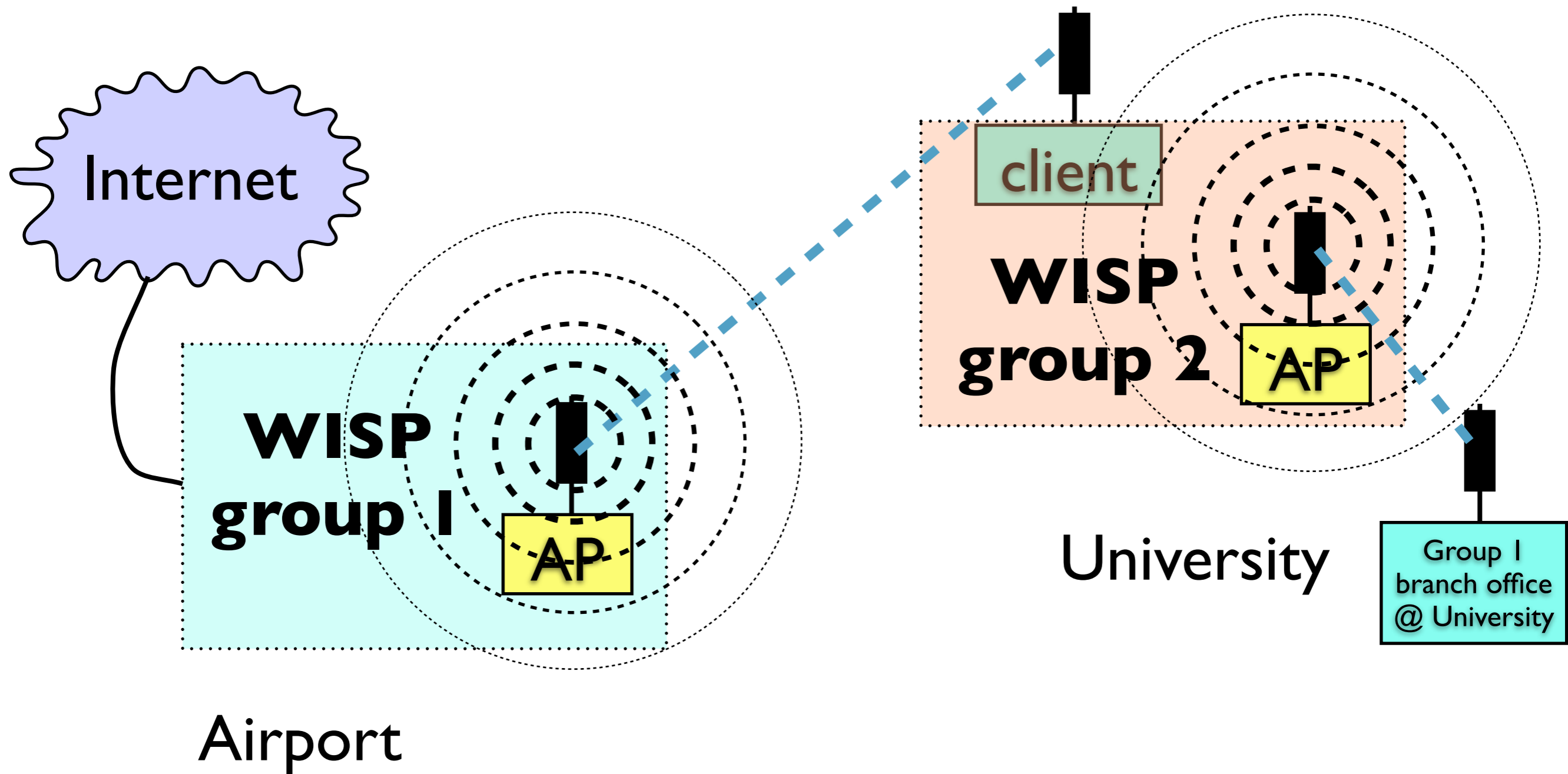
Exercise on WISP

- Four groups are formed, they have to plan and configure a Wireless ISP.
- There are two locations, some 20 Km apart: University 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 1 and 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.

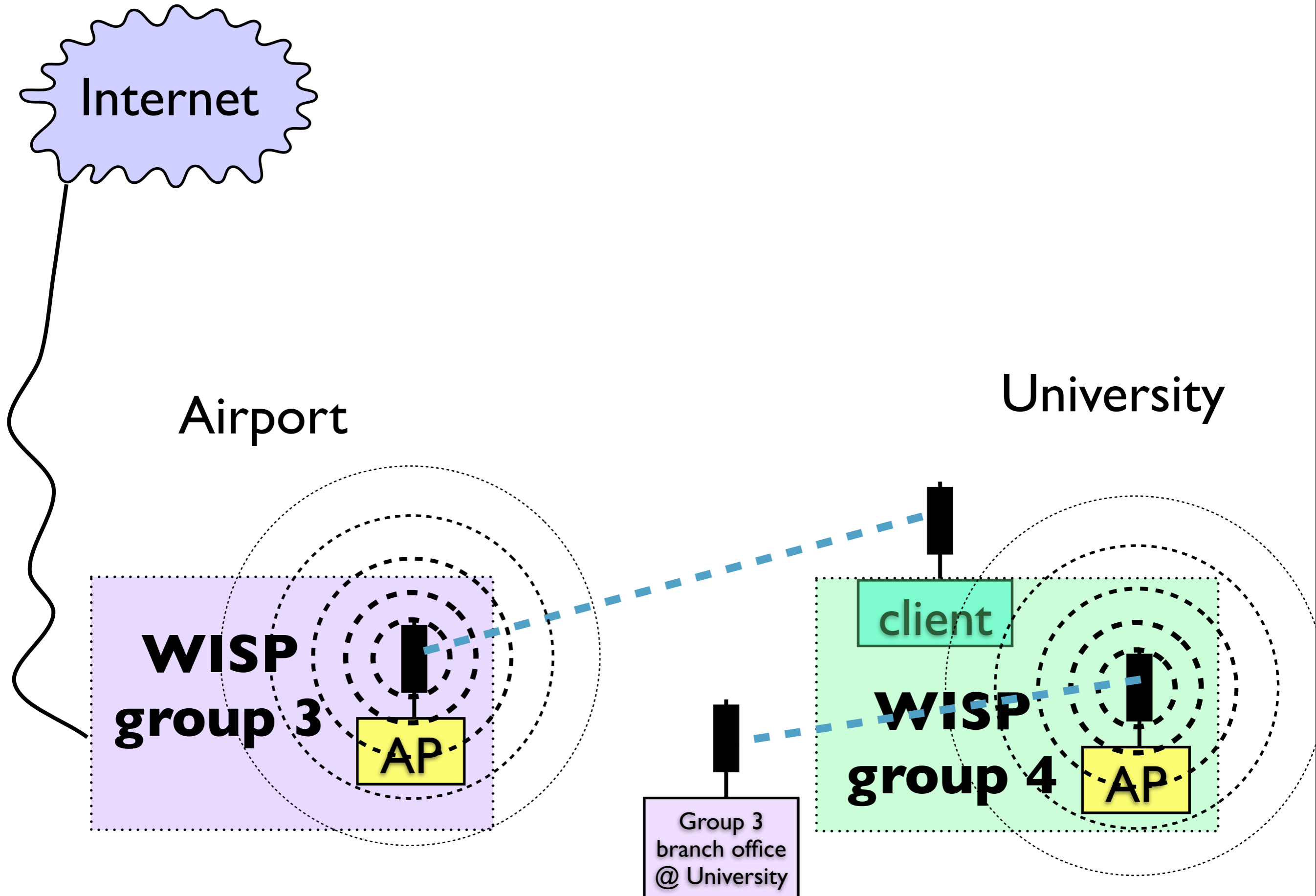
Structure of the exercise



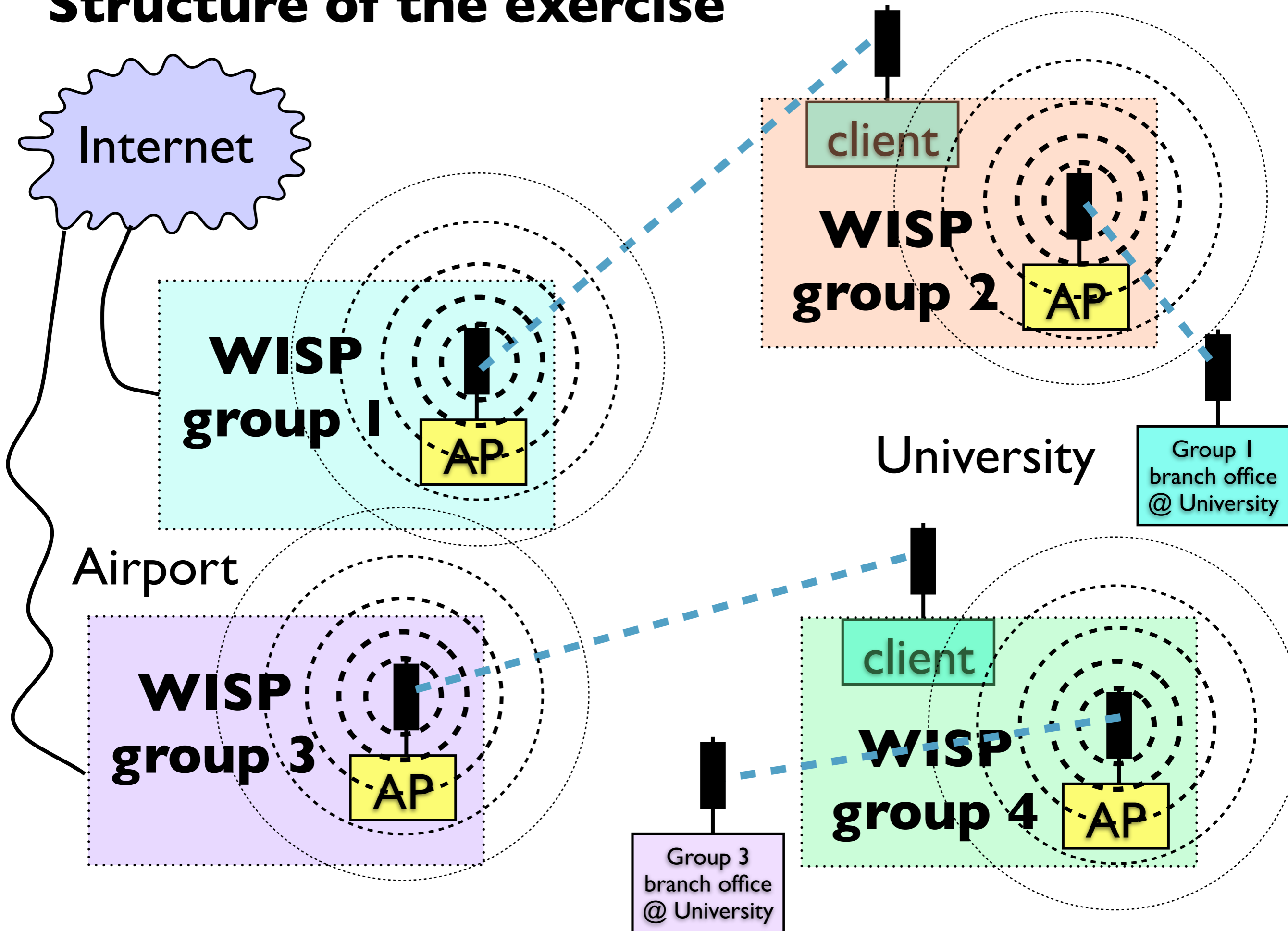
Exercise on WISP

- 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



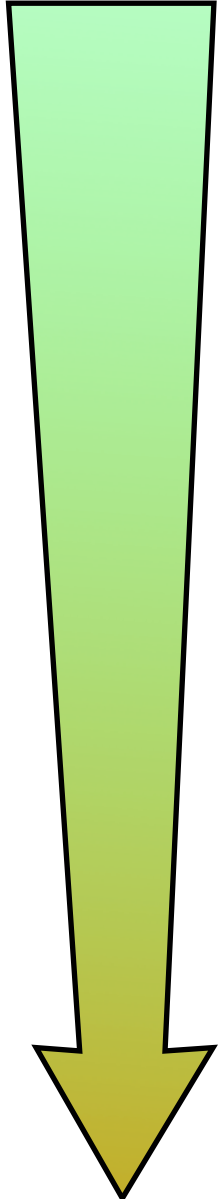
Structure of the exercise



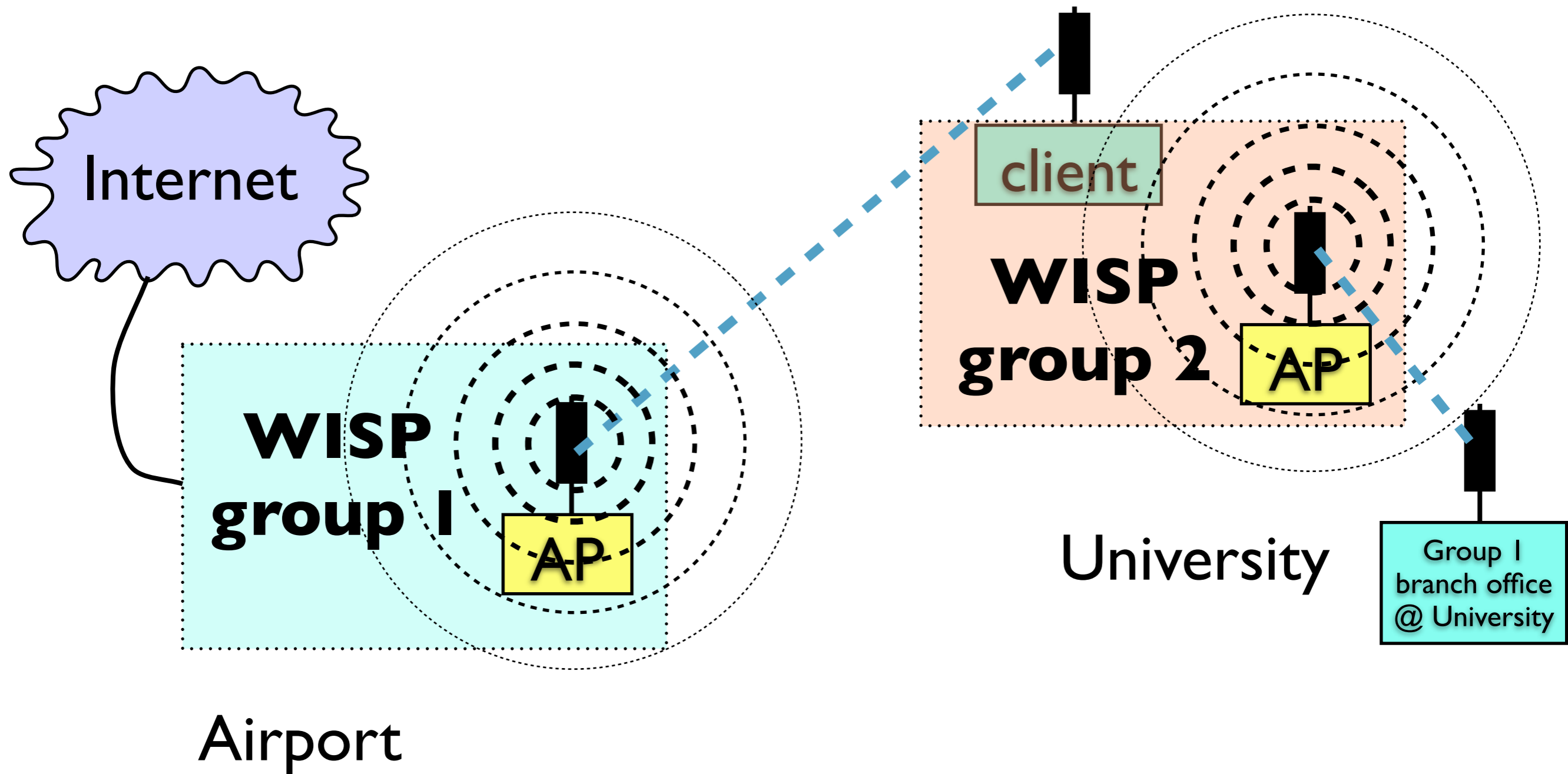
Exercise on WISP

- 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 two radio devices: an Ubiquiti NanoStation5loco (directive antenna) and a PicoStation2 with a small omni antenna, with all accessories (i.e. 2 power supplies, 4 ethernet patch cables, 2 PoE injectors).

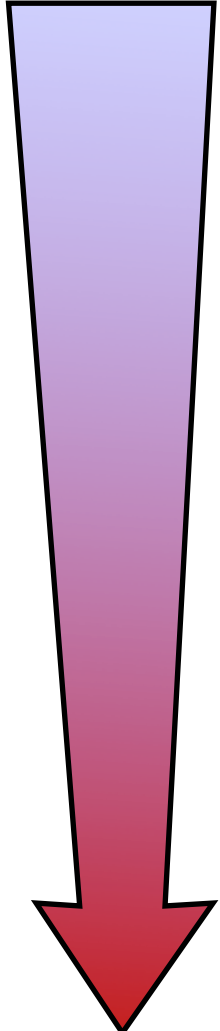
Objectives:

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- 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:

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- 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 the PicoStation2, you need to connect the small external omni antenna before anything else (i.e. before switching on the radio!)

Preparatory activities - 2

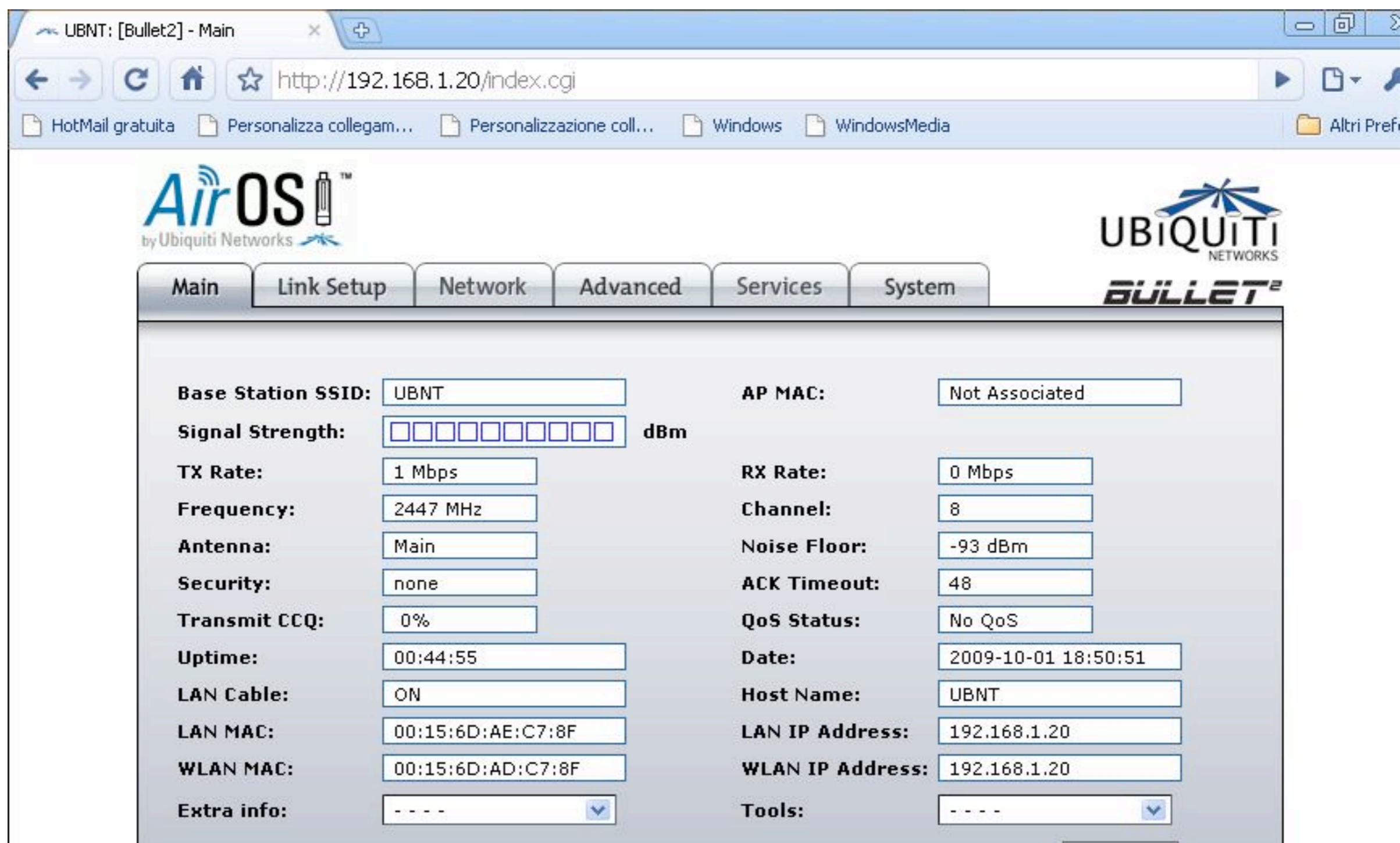
- Take the POE injector. Connect one side of a network cable to the port that says POE and insert the other side into the Bullet/Nanostation. Connect one side of the network cable to the port that says LAN and the other side into the network port of your computer. Double check the cables are correctly 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 Ubiquiti device (192.168.1.20 for new machines).
- Login with: username ubnt and password ubnt (for new machines).



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!

Questions, problems?

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

Power over Ethernet

- PoE injector + power supply

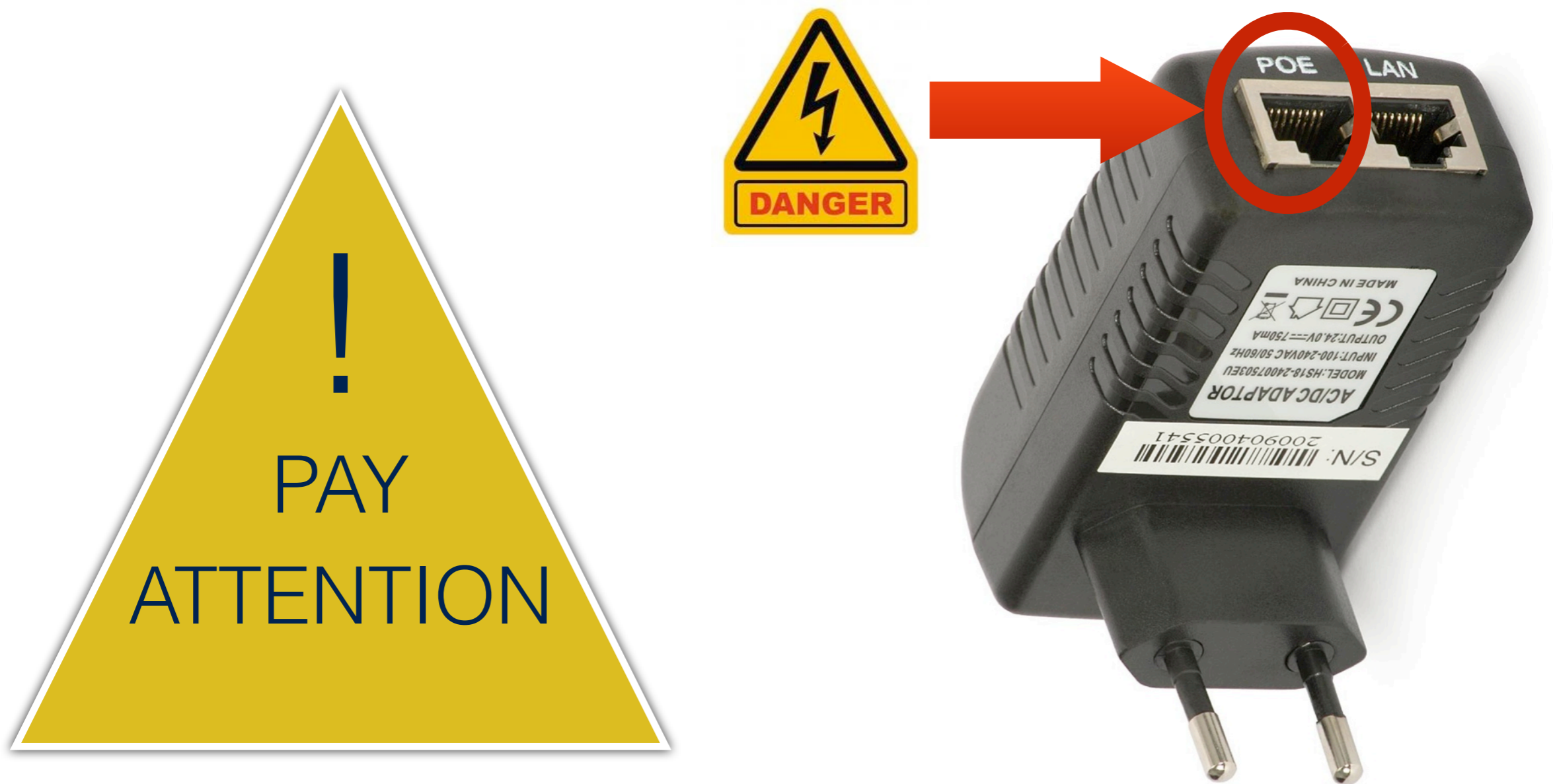


Power over Ethernet

- all-in-one PoE injector and power supply
- Ethernet switch with PoE



Power over Ethernet



DON'T CONNECT THE *POWERED* PORT TO YOUR LAPTOP!