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How we created our first wireless network – some notes (group 4)

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Our laboratory practice exercise for Monday and Tuesday (16 and 17 February) was to create a wireless network using several access points and bridges. Before, on Saturday (14 February) we installed Slackware Linux 9.1 on our computers. On Monday we were thought how to set up network cards, IP addresses, etc., and how to configure computer to run as a router under Linux. Then our task was to design a plan for the wireless network in our laboratory. The problem was that we had access points and bridges produced by different manufacturers and not all of them could work with each other. The task was to distribute the hardware between groups in the way that each group had enough hardware to build a local network and have access to the internet. Our group proposed such a plan and other groups accepted it. (We even signed an agreement between representatives of the groups that all groups agree with this plan!). Then we decided how to distribute the available frequency channels for wireless communication in order to prevent interference. After that each group started to build their part of the wireless network.

According to the plan our group had to set up a router for 3 networks (192.168.1.0 - Internet Access Point network, group 2; 192.168.2.0 - group 1, and 192.168.3.0 – our local network). Using IP aliasing we set up one of our computers as a router between three networks. We had only one Ethernet card on our PC. We used D-Link switch to connect two computers, a bridge and an access point. Then we reconfigured Apple Airport Extreme access point for connecting with group 1 and established a wireless connection. At that time group 1 also succeeded in configuring their Apple Airport Extreme Access point. (The Apple Airport Extreme Access points that we had could communicate with each other as Access points and bridges simultaneously – WDS – Wireless Distribution System). The next step was to establish a wireless connection with group 2 and connect to internet. For that purposes we had an Orinoco bridge, which had to communicate with the Neagate access point of group 2. We spent few hours by trying to establish a connection to Access point from our bridge. At first the encryption was used at the access point because group 3 and 5 could not connect to access point without encryption. Our problem was that our bridge did not accept 128 and 64 bit encoding so we spent some time with Carlo Fonda for finding the way to correctly set up hexadecimal encryption key in our bridge and decimal version of it on the access point. After some trials we succeeded and established a connection. But in few minutes the connection with group 2 disappeared. After some time we found out that the encryption at the access point was disabled. After contacting with people from group 3 and 5 we find out that they can communicate even when the access point works without encryption. So they reconfigured the access point. We disabled the encryption at our bridge and reestablish connection.

Later, we found quite an interesting phenomenon when we tried to ping from our local network and from group 1 to the router of group 2. At first, ping reported about packet duplication and after some time (around 30-60 sec) a normal connection established without missing packets. We tried many times but got always the same result. We checked the configuration of the routers and bridges but did not find mistakes.

I think that such a strange behavior is due to single and multiple reflections from the walls in the laboratory and also because of presence of so many radiating devices on a small room. The fact that after some time we get nice performance is because our bridge and access point doing some smart adjustments in the hardware level in order to improve communication. May be there is another explanation to this phenomena too, so please let me know if you have any!?! At the present time we have quite good working wireless network and fast internet connection from our local network at the laboratory!

Thank you for spending your time on reading these notes!