LAB REPORT

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School on Digital Radio Communications for Research & Training in Developing Countries 9-27 February 2004

the
abdus salam
international centre for theoretical physics

United Nations Educational, Scientific and Cultural Organization

GROUP 2

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Work Done in LAB.

- Connecting the N-Connector on coaxial cable RG-213
- Connections in Cross Cable (Twisted Pair)
- Installation of Slack ware LINUX 9.1
- Measuring the Length, Velocity Factor, attenuation of RG -213 coaxial cable, and unknown impedance
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- Designing & Establishing a Wireless Network of all 5 groups
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- Making Omni directional collinear antenna for 2.4 GHz
- **PEBBLE** Configuration
- Biquad antenna for 2.4 GHz for stand-alone use ***(work in progress)***

Designing **&** **E**stablishing **a** **W**ireless **N**etwork **of all 5 G**roups

- Networking the computers of 5 groups (*G1, G2, G3, G4, and G5*) using the wireless devices *(access points and bridges)*
- Designing of Network
- Limitation of availability of the wireless devices
- IP address scheme
- Main router for the network
- Channels used
- Network Name

Hardware and IP Settings at Router

- **Hardware**
- **NIC Settings:**
  - **eth0** (*for external network*):
    - **IP:** 140.105.17.227
    - **Net mask:** 255.255.252.0
    - **Default gateway:** 140.105.16.5
    - **DNS:** 140.105.16.50
  - **eth1** (*for internal network*):
    - **IP:** 192.168.1.254 *(gateway of our clients)*
    - **Net mask:** 255.255.255.0

Settings of Access Point

- **Access point name:** Trieste
- **Wireless network name (SSID):** ictp
- **IP:** 192.168.1.227
- **Net mask:** 255.255.255.0
- **Default gateway:** 0.0.0.0
- **DHCP client:** disable
- **Encryption type:** OFF
- **Access control:** disable
- **Region:** Europe
- **Channel: 1** (2.412 GHz)

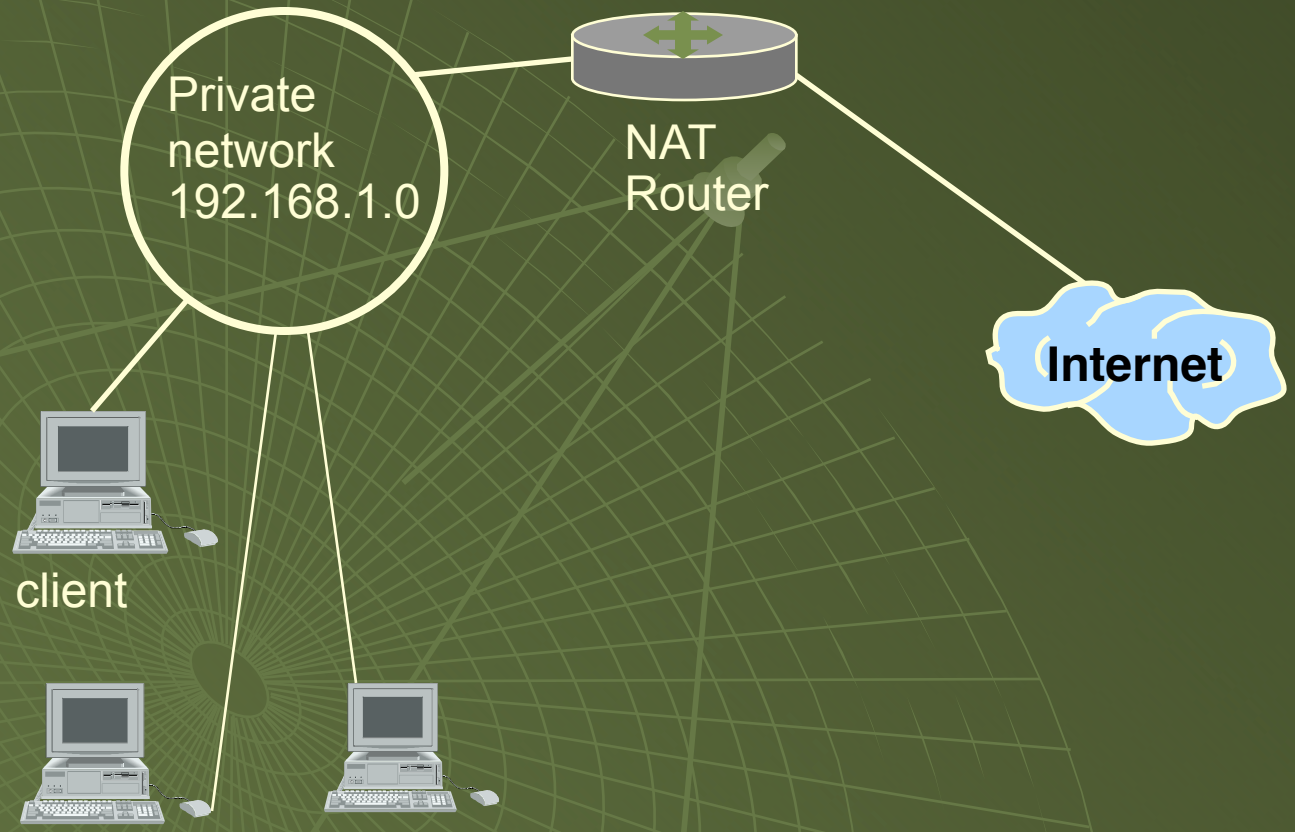
Settings of Bridge of G3

- **Network name (SSID):** ictp
- **Existing network name (SSID):** ictp
- **Network type:** infrastructure
- **IP:** 192.168.1.2
- **Net mask:** 255.255.255.0
- **Gateway:** 192.168.1.254
- **Data rate:** 802.11b/g combo
- **Regulatory domain:** Europe
- **Security settings:** ***WEP data encryption***
  - ***Authentication type:*** *auto*
  - ***Key length:*** *64 bit*
  - ***Pass phrase:*** *--*
  - ***Key1:*** *2482231622*

PC settings of G3

- **eth0**:
  - **IP:** 192.168.1.33
  - **Net mask:** 255.255.255.0
  - **Default gateway:** 192.168.1.254
  - **DNS:** 140.105.16.50
- **eth0:1**
  - **IP:** 10.0.0.1
  - **Net mask:** 255.255.255.0

NAT?



Reference: **Gilberto**

How to enable NAT?

Create file using the vi editor:

- root@192.168.1.254> vi NatActivations.sh

```
# !/bin/sh
echo 1 > /proc/sys/net/ipv4/ip_forward
iptables --flush
iptables --delete-chain
iptables --table nat --delete-chain
iptables --table nat --append POSTROUTING --out-interface eth0 -j
    MASQUERDE
iptables --append FORWARD --in-interface eth1 -j accept
```

Problems in Setting up the Wireless Network

- Unable to develop connection between access point & bridge
- Solution

Remember!

- Use same network address for AP & Bridge

Commands Frequently Used

- Ifconfig
- Netconfig (*semi graphical interface*)
- /etc/rc.d/rc.inet1 stop/start
- ifconfig eth0 192.168.3.1 netmask 255.255.255.0 broadcast 192.168.3.255
- route –n
- route add/delete –net default gw 192.168.3.254
- /sbin/ifconfig eth0:1 10.0.0.1 broadcast 10.0.0.255 netmask 255.255.255.0