Assignment 1 – Q1

Revision ….

Q1: 207.15.37.35/28 is one of the IP addressees of assigned to a company.

- How many addresses are there in this network (including all special addresses!)?
- Find the network id and broadcast id of the network?

1 mark

Assignment 1 – Q2

Revision ….

Q2: An ISP is granted a block of addresses starting with 140.77.0.0/16. The ISP wants to distribute the block to 2816 customers as follows. (You can include first and last addresses and first and last subnets.)

- **The first group has 256 medium-size businesses; each needs 128 addresses.**
- **The second group has 512 small businesses; each needs 16 addresses.**
- **The third group has 2048 households; each needs 4 addresses.**

1) Design the subnets (sub-blocks) and give the slash notation for each subnet.
2) Find out how many addresses are still available after these allocations.

2 marks

Assignment 1– Q3

- **Q3: Your are hired as a consultant to a company to redesign its network. The company has the following requirements.**
  - The company has a 10Gbps high speed backbone Ethernet comprising 6 servers and with potential to expand up to 10 servers.
  - The backbone network is connected to 2 other clusters through (two) routers. One serving R&D department, which has 7 labs at present, with potential to expand up to 12 labs. Each lab requires at least 60 IP addresses for hosts. (Note: The backbone router connects to the switches of all labs, each lab is a subnet).
  - The other cluster is providing access to both on-site and remote sales personnel. The number of on-site sales people is 20 and expandable to 30 in the foreseeable future. Each on-site sale person has a desktop computer.
  - The remote sales people access the network via VPN, and at any given time it is expected that not more than 10 people access the network.
  - For security reasons the company does not want to use any NAT box.

Assignment 1– Q3

a) Suggest a cost effective size of the public IP address block required. . [*Note:- Your solution should consider the potential future expansions given in the description above*].

b) Draw a neat diagram of the network. (sample in next slide)

c) For each LAN (or lab), provide the IP subnet details such as net-id, broadcast-id and netmask in the format shown in the table below (in following slides).

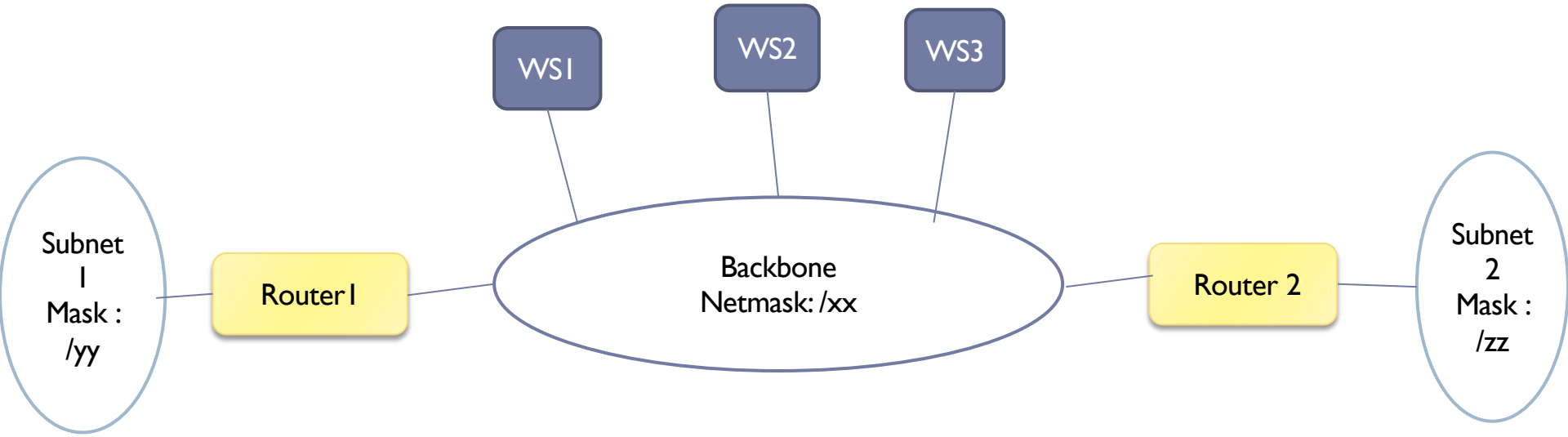
   a) Assume the starting block address of the network as 140.78.0.0/n where "n" is the number you have determined from part (a).

   b) Assume, first and last addresses (special addresses) in each subnet are not usable.

7 points

Submit to LumiNUS->Files->Homework 1 before next Lecture.

Sample Network Diagram



Assignment 1– Q3

Network Name	Net-id (a.b.c.d/n)	Broadcast id
Backbone		
Lab-1		
Lab-2		
Lab-3		
Lab-4		
Lab-5		
Lab-6		
Lab-7		
On-site sales persons network		
Remote sales persons network		
Unused blocks (list all in multiple rows)		

Labs Sessions – More Info….

- Most lab exercises are done in pair, except first one.
- 20 mins consultation session per group.
- Register to same lab session. There is some flexibility in time slots! However, attendance is mandatory. Email TS to mark attendance if you have completed without support.
- Lab Sheet --- From LumiNUS (It is not full recipe. Some info are just abstract.
  - We want you to figure-out the details and live with the hardware/software glitches!
  - That's reality. (Now you have us around!)
- Preparation --- Slides and Pre-Lab Readings (textbook & online) in LumiNUS (Some theories are covered in pre-requisite module)
- Lab Questionnaire --- Fron LumiNUS (what to fill?, how to fill? , etc… If you are not sure, pls ask.)
- Please **communicate early and directly with me through Discord** if you have problems.

Project Theme

- Assignment 2 – Investigate Application Layer Protocols with NW Tools (Hands-on, Requies SoC unix account or Laptop with Unix/Linux)
- Assignment 3 – Client/Server program. [talk to public severs or clients] - Must use C/C++ language.
- Assignment 4 – Secured Communication or Routing protocols in SDN or Packet Capture and Analysis or IoT Protocols
- Project – Secured eExam/eQuiz tool <OR> Packet Capture for Specific Purpose (eg. Firewall or Analytics/Visualisation) <OR> p2p file transfer [C/C++/Java]

END

THANKS FOR YOUR TIME!

Module Theme: *"Build, Configure and Observe the Protocols in Action and Develop Applications with the Protocols"*

Comment/feedback on lectures and labs through Discord Early!

Continuous feedback will help you and your classmates!