First name:
Last name:

CYBER 2, ENSIBS Vannes, 2015-09-21

Network evaluation

One handwritten A4 sheet double sided allowed but no communication at all (unless you want your exam to be ended)! **Short** and right answers are the best (French or English).
No need to debate, nor philosophize. Final marking scheme may vary.
Good luck!

1 Design it (10 pts)

In this question you need to design several subnetworks. Starting from 172.17.0.0, give for each single subnetwork (no schema expected, though it can be helpful for you):

- the subnet mask and maximum number of hosts,
- the network IP address,
- the first node IP address,
- the last node IP address,
- the broadcast IP address.

Sub-networks to be designed are:

1. 1000 machines for the students,
2. 30 machines for the network services (DNS server, web, NAS...),
3. 40 machines for the network lab,
4. 500 machines for the teachers and workers,
5. 14 machines for experimental purposes.

Use Table 3 on the fourth page.

2 OSI model (2 pts)

Give the name and a short overview of the four first layers:

3 Routing decision (2 pts)

3.1 Definitions

What are the definitions of: *router*, *routing algorithm* and *forwarding*? (You can make up these three definitions in one sentence).

3.2 Next NIC?

Route #	Destination	Genmask	Iface
R0	0.0.0.0	/0	s0
R1	10.0.0.0	/8	eth0
R2	212.27.60.0	/22	s1
R3	80.10.200.0	/22	s2
R4	192.168.0.0	255.255.255.0	eth1
R5	192.168.3.0	255.255.255.0	eth0
R6	192.168.5.0	255.255.255.128	eth1

Table 1: Routing table

According to the routing Table 1:

- What are the (optional) missing details ?
- Where will be forwarded packet with destinations:
  - 198.41.191.47?
  - 192.168.4.3?
  - 192.168.1.1?
  - 80.10.201.0?
  - 80.10.210.0?
  - 10.128.0.4?
  - 212.27.61.1?
- Is there routes than can be summarized ? If yes, which one(s) into which "super-network"?

4 What layer is it ? (2 pts)

Complete the table 2 with (include the default port, if any, in brackets -see HTTP example-): ~~HTTP~~, HTTPS, TCP, UDP, MAC, IP, telnet, ssh, ftp, IEEE 802.11, IEEE 802.15.2, DNS, SIP, TLS, ICMP, IS-IS, RIP.

4.1 Next NIC?

Layer	Protocols
*	
7	HTTP(80),
6	
5	
4	
3	
2	
1	

Table 2: Protocol table

5 Who is it? (2 pts)

What can you conclude according to the two packets shown in 1?

Source	Destination	Protocol	Info
172.17.96.139	193.52.48.66	DNS	Standard query 0xc857 A 9gag.com
193.52.48.66	172.17.96.139	DNS	Standard query response 0xc857 A 176.34.246.218 A 176.34.112.194

Figure 1: Two lonely packets

6 Bonus question (0.5 pts)

6.1 DEF CON 22 Hacking Conference

What did you learn by watching to the video named *Blinding The Surveillance State By Christopher Soghoian*?

You may want not to write the whole IP addresses but only the changing bytes.

Network ID	Mask (CIDR)	# hosts	Network	First node	Last node	Broadcast

Table 3: Designed networks