

Workshop #1

IP, ICMP, TCP and UDP

KTHNOC

20040128

Abstract

The questions should be answered before the workshop begins on the 28th of January. They can be solved in groups, but each student should be prepared to present his/her solution in front of the class at the blackboard.

The questions below should be possible to answer if you have payed attention in the lectures and if you read the course literature.

Every answer you give should be well motivated.

1 IP prefix

1. How large is the smallest netmask for a network with
 - 2 hosts in it?
 - 5 hosts in it?
 - 7 hosts in it?
 - 8 hosts in it?
2. How many hosts can you have in a:
 - /30 net?
 - /31 net?
 - /32 net?
3. Split up the net 192.168.48.0/22 into four equally sized /24 nets.

2 TCP

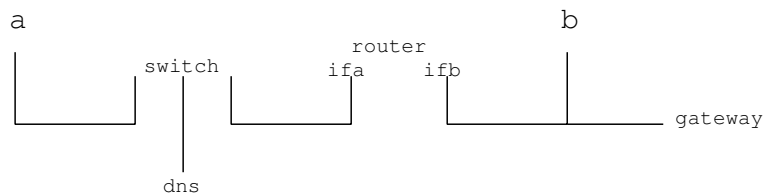
- How does flow control work?
- How does congestion control work?
- Whats the difference between the two?

3 ICMP

- Why do IP, ICMP, UDP and TCP all throw packets away without sending a error message to the sender when receiving a packet with a garbled checksum?

4 The TCP/IP stack and DNS

- Host `a.foo.com` connects to the routers `ifa` interface using telnet. Describe what then happens in detail in the entire TCP/IP stack in all involved systems. You can disregard DNS in this chain of events entirely.
- Host `a.foo.com` connects to `b.foo.com` using telnet. Describe what then happens in detail in the entire TCP/IP stack in all involved systems. You can disregard DNS in this chain of events entirely.
- Repeat the last question, but this time using DNS. Assume that both `a.foo.com` and `dns.foo.com` has not cached the ip number to `b.foo.com`. Furthermore you may assume that `dns.foo.com` is the name server responsible for the zone `foo.com`.



HOST	IP ADDRESS	MAC ADDRESS
a.foo.com	192.169.1.12	08:00:20:b0:5b:37
b.foo.com	192.169.2.12	08:00:20:88:fc:0e
dns.foo.com	192.169.1.199	08:00:20:88:fa:76
router-ifa.foo.com	192.169.1.1	08:00:20:b0:72:07
router-ifb.foo.com	192.169.2.2	08:00:20:b0:72:08
switch.foo.com	192.169.1.3	08:00:20:a8:83:46
gateway.foo.com	192.169.2.1	08:00:20:a8:72:09

Note: Both hosts a and b reside on a /24 network.