

DATAKOMMUNIKATION I

7,5 HP

GENERAL NETWORK AND
NAME RESOLUTION TROUBLESHOOTING

LABORATION II

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Purpose

The lab aims to give the student the following:

- Practical experience in using utilities for network troubleshooting
- Understanding of the name resolution process of operating systems
- Understanding of the IP, TCP, UDP and ARP protocols

The course web page is located at:

<http://www.his.se/da120g>

1 INTRODUCTION

In this lab, you will use a number of utilities/tools for troubleshooting of general network problems and problems with name resolution. You may use any of the systems you set up in lab I (Debian or Windows XP/Server 2003).

The lab consists of a number of questions that should be answered. For each question, it is up to you to find out what tool to use (sometimes it is given, though) and how to use it, to answer the question. The answers to these questions should be put in an appendix to your lab report.

2 ASSIGNMENTS

Answer the following questions. For each question, present the answer and give a concise explanation on how the answer was found. Explaining how you found the answer is often as simple as presenting the command you used, including parameters and arguments. However, some questions may also require you to briefly discuss the result.

2.1 QUESTIONS

1. Find the fully qualified domain names and IP addresses of the name servers authoritative for the domain “skovde.se”.
2. Find out the hostnames of the SMTP servers responsible for e-mail for the his.se domain. Present their fully qualified domain names and IP addresses. In addition, present the MX priority for each host found.
3. Find the hostname bound to the IP (version 4) address 193.10.176.24 in the inverse DNS name space.
4. Find the date of the last change in zone data on the his.se zone.
5. Examine the serial field of the SOA (start of authority) record of the domains “his.se” and “skovde.se” respectively. Explain how this field is used differently for the two domains.
6. Find out what IP address the fully qualified domain name “his.se” resolves to.
7. Try to resolve your domain name (e.g a07login.local) without any prefix, to see if it resolves to any IP address.

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root@server:~$ dig a07login.local A
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What is the result? If this fully qualified domain name cannot be resolved into an IP address, configure your DNS server to make that possible and present your solution.
8. Find out the MAC addresses of your client computer and name server 1.
9. ARP is a layer 2 protocol to map MAC addresses to IP addresses and the reverse operation. The “arp” command in Windows and Debian systems can be used to view the ARP cache of the operating system, as well as creating static mappings. Use the “arp” command to find the MAC address of your default gateway.
10. On your client computer, contact your ns1 machine using ping and verify that your arp cache contains an entry for that machine. Now, contact the www.his.se host and view the arp cache again. Explain why no entry for the www.his.se host is shown.
11. Use a traceroute utility to find out how many routers an IP packet need to pass through (hop count) to reach the “www.sunet.se” host.
12. Find out the IP address of the interface on the router the packet passes through right after it has passed your default gateway.

13. From your client, create an SSH session to ns1. Use the “netstat” utility to find the source and destination port of the TCP connection set up for this session.
14. For the SSH session you just set up, what will the corresponding source and destination port be on ns1.
15. On one of your name servers, find out on what transport protocol and port number your DNS server is listening on for incoming connections.
16. Find out all TCP and UDP ports vmhost (using Windows Server 2003) are listening on for incoming connections.