Applied Advanced Routing

Introduction and course overview

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Examples of Course Contents

- Advanced routing protocols such as OSPF, EIGRP, BGP etc.
- Management and manipulation of routing updates together with filtering and redistribution.
- Scalable networks, IPv6, OSPF routing with IPv6 addresses.
- Report writing. Presentation techniques.

Course Disposition

- Lecture part
- Laboratory exercises
- Project part
- Written exam by the end of the course
- Practical exam

- YOU MUST CHECK THE COURSE HOME PAGE AND READ THOSE INTRODUCTION SLIDES

Other Details

- Prerequisites:
  - Knowledge in computer communications and computer networks corresponding to the courses Computer Networks I 7.5 credits, and Computer Networks II 7.5 credits or the equivalent
  - Basic prerequisites for the master program
- Course literature:
  - Behrouz A. Forouzan, *TCP/IP Protocol Suite*, 3rd Edition, 2005, McGraw-Hill, ISBN 0-07-296772-2
  - "Implementing Cisco IP Routing (ROUTE) Foundation Learning Guide: Foundation Learning for the ROUTE 642-902 Exam" by Diane Teare.
  - Slides and other course material/CNAP material
  - RFCs

Reading Instructions – Forouzan´s Book

Core Course Topics

5. Subnetting/Supernetting and Classless Addressing
6. Delivery and Routing of IP Packets
13. Unicast Routing Protocols
31. Next generation:IPv6 and ICMPv6

Important Background Material

2. The OSI Model and the TCP/IP Protocol Suite
3. Underlying Technologies
4. IP Addresses: Classful Addressing
7. ARP and RARP
8. Internet Protocol
9. ICMP
11. UDP
12. TCP

All topics are not treated on the lectures but might appear on the written exam including (indirectly at least) the background material

Do not forget other course material, e.g. the Implementing Cisco IP Routing , which both covers some additional topics and some topics in more detail

Lecture

- Reports and Presentation
- TCP/IP and IP Routing Basics
- VLSM
- EIGRP
- OSPF
- BGP
- IPv6
- Path control

Laboratory Exercises

- **Mandatory** course LABs
  - Week 12,13,14
  - Two groups

- Home page:

https://www.hh.se/english/ide/education/student/coursewebpages/appliedadvancedrouting.4833.html

  - One big file for all the ordinary LABs

Project

- Each participant shall (in group) do a project work
  - Preliminary, only **groups of 3** or 2-3 students are allowed
- The project includes:
  - A practical experiment where you setup a network and configure it (4 routers)
  - Writing a report with details on the experiment
  - Presenting the results from the experiments orally with slides (15 minutes per group)

Project (cont.)

- Send report to Olga.Torstensson@hh.se (6-7 pages) in time – week 16 Monday 16 April
- **Be very careful** with permissions, references, quotations etc. (we have to report any suspicion of cheating)
- You are not allowed to copy from documents on Internet etc

Project Schedule

Submit report week 16 – Monday latest

Demonstration week 16 – working network

Wednesday gr1 10-12, gr2 13-15

Presentation week 16 – PowerPoint

Thursday 8.15-12.00

Project Topics

1. OSPF multi-area include NSSA with external, EIGRP redistribution
2. OSPF multi-area include stub area, OSPF multi-area with virtual links
3. EIGRP and static route redistribution, Path control
4. BGP: IBGP and EBGP, Local preference, MED, static route redistribution
5. IPv6: OSPF for IPv6 & Configuring 6to4 Tunnels

Networks:

Group 1: 172.16.0.0/16

Group 2: 172.10.0.0/16

Questions about the project assignment can be answered at the LABs

Examination Week 17&21

- Practical exam week 17
  - Monday
  - All LABs must have been done and approved before being allowed to attend the practical exam
- Written exam week 21

Teachers

Magnus Jonsson <Magnus.Jonsson@hh.se>

- Lecturer

Malin Bornhager <Malin.Bornhager@hh.se>

- Lecturer

Olga Torstensson <Olga.Torstensson@hh.se>

- Examiner, course responsible, lecturer
- CNAP account administrator
- Supervises and examines project and labs
- Supervise and examine the project
- Conducting the ordinary laboratory exercises
- Practical exam

CNAP (Cisco) Registration

You must have an account to access CNAP

Mail the following information to Olga.Torstensson@hh.se to get the access:

- Name
- Mail address
- Social security number (Swedish ID)
- Course name: Applied Advanced Routing
- Cisco login (if you already have one)

CCNP Route Certificate

- The CCNP Route Final Exam (not the same as the course exam) is optional
- Requirement for Network Academy Certificate
  - To pass Final Exam with minimum 70%
  - To pass all mandatory LABs and Skills

Resources on Course Home Page

- Course information
- Former written exams
- Slides from the last year
- LAB manuals and schedule for the different LAB topics
- Information on the network simulator GNS3