



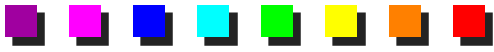
Progetto di Reti Locali A.A. 2016-2017

Fulvio Riso, Ivano Cerrato

<http://prl.frisso.net/>

<http://fulvio.frisso.net/>





Outline

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Lecturers

- In-class lectures
 - Fulvio Riso (fulvio.riso@polito.it)
- Labs and exercises
 - Ivano Cerrato (ivano.cerrato@polito.it)
- Additional seminars will be set up during the year





Course mission

The course presents the most important technologies related to Local Area Networks, and giving some information about how to engineer these infrastructures.

Additional topics include Cabling, Data Centers, and Virtual networking.





Course Outline

- LANs and Ethernet basics
- High Speed Ethernet
- Bridging and Spanning Tree
- Switching
- Design of Switched Networks
- Advanced Topics (Rapid Spanning Tree, Qos, ...)
- VLAN
- L3 Switching
- Design of Campus Networks
- Data Centers
- Networking in the Cloud Computing Era
- L7 switching and Content Delivery Networks
- Cabling





Prerequisites

- IP and the most important protocols of the TCP/IP suite
 - ARP, IP, DNS, TCP, UDP
- IP Network design
 - IP addressing, static routing
- Packets generated on the network in the most common conditions, e.g.:
 - ping www.mydomain.com
 - Open a web page
 - Interaction with the DNS
 - Behavior with hot/cold ARP and DNS caches

The student is required to check that he is ok with those exercises; if not, he has the responsibility to fill his gaps by himself.




Teaching organization

- Some in-class exercises
- Some additional exercises are provided
 - Student should complete them on their own
 - Closed-answer questions available as well
- Labs
 - Most important switching technologies, packet sniffing
 - Check the schedule of the lab on the calendar



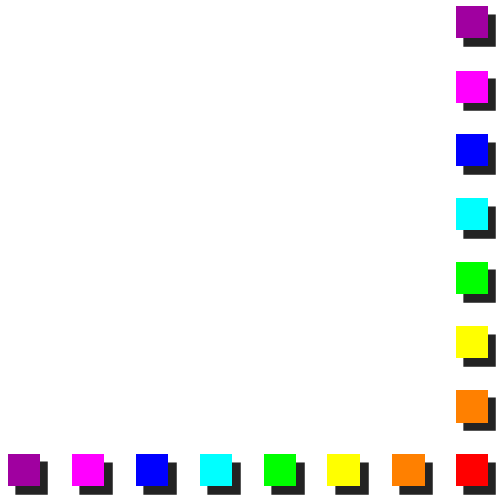


Lectures

- We will not present everything in class
 - Not enough time
 - Boring
 - Useless
 - We would like to introduce the topics
 - Why a technology works in a given way
 - How (briefly) a technology works
 - Case studies
 - What you really have to take care of
 - More details are left to self study
 - You have to *assimilate* the lecture, not *hear* the professor voice
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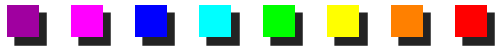
Exercises

- A few in-class exercises
 - Not enough time for exercises in class
 - Students must practice with exercises (**at home!**)
 - Having everything solved by the professor does not help the learning process
 - An extensive set of (solved!) exercises and closed-answer questions are available on the course web site
 - Ethernet, IP Traffic Analysis, L2 forwarding, Spanning Tree, VLANs, Network Design
- 



Lab assignments

- Lab is a unique opportunity
 - “Real” devices, not toys
 - Objectives
 - Touch what we teach in classroom
 - Facilitate the learning process
 - Three assignments
 - Filtering Database, Spanning Tree Protocol, VLANs, Fundamentals of Virtual Networking
 - We feel that the lab is fairly easy
 - Can be completed also from home
 - VM (for Virtualbox or USB boot) ready; ask Ivano Cerrato
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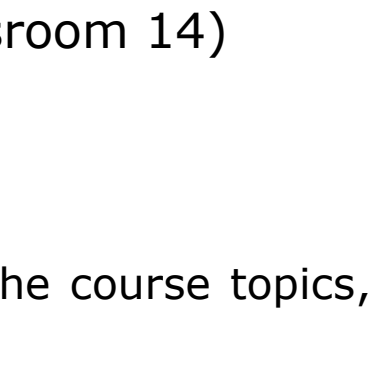
Labs and exercises

- No “bonus” points
- We expect students to complete their duties timely
 - **Not at the end of the semester!**



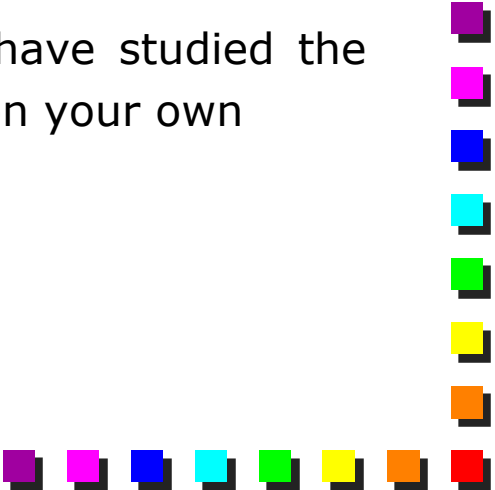


Schedule

- 6 (7) hours/week
 - Hopefully, some spare hours at the end of the course
 - Partly in classroom, partly in lab
 - No fixed schedule for class/lab
 - Depends on what we have to do
 - Please check the online calendar week after week
 - Some additional lectures during the period
 - Lab location: most likely LADISPE (above classroom 14)
 - Lab Hours = Consultancy Hours
 - Please use those hours for having hints about the course topics, exercises, homework, lab, etc
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Exams rules

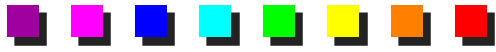
- Usually, written exam
 - A mixed set of open-answer questions, multiple-choice questions, and exercises
 - Oral examination in case few students are present
 - Possibility to ask for an **additional** oral session if mark ≥ 26
 - Usually, only ONE question
 - Note for who is looking for **30**
 - To achieve the maximum grade, you need to have studied the subject **and** be able to reach some new results on your own
 - This means, just studying is not enough
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Exams schedule

- Two exams in summer
 - End June
 - Mid-July
- One exam in September
- Another in February

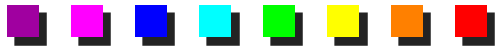




Personal project

- No assignments available *in addition* to the exam
- A few assignments are available that *replace* the exam
 - Scouting (new standards, etc)
 - Coding, mostly on SDN/virtual networking
 - About 3 weeks full time
 - Eligible students must have an *average mark* > 27





Students who were enrolled in the past

- The outline of the course is almost unchanged from the old PRL/PRLC/LMAND
- You can keep the rules valid in your year
 - E.g., lab grades may still be valid (check the rules of your year)
- We expect in 2016/17 to increase the part dedicated to virtual networking and datacenter





Textbooks

- Baldi, Nicoletti. Switched LANs (in Italian) (or)
- Seifert, Edwards. The All-New Switch Book: The Complete Guide to LAN Switching Technology (in English)

- But...
 - Both do not cover all the topics
 - Slightly outdated (the former)
 - Please take your own notes in class





Logistic (1)

- Course website
 - <http://prl.frisso.net/>
- Day-by-day calendar (Google-based)
- Online slides
 - Available (hopefully) before the class

! Warning !

! Slides are not enough !

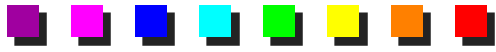
! Homework and labs are very important !





Logistic (2)

- Class live recording (on <http://didattica.polito.it/>)
 - For who cannot attend to the class
 - Done on “best effort” basis
 - No guarantees, e.g., when the professor’s laptop crashes
 - Online publication may be delayed for some days
 - **Volunteers needed!**
- Prof. hours for consultancy
 - Before/after the class
 - Face-to-face meetings
 - Check for “rules” on the professor’s website:
 - <http://fulvio.frisso.net>




Logistic (3)

- Almost all the documentation is in English
 - This choice aims to help foreign students who are interested in this subject
- Classes will be in Italian
- Exams will be in Italian

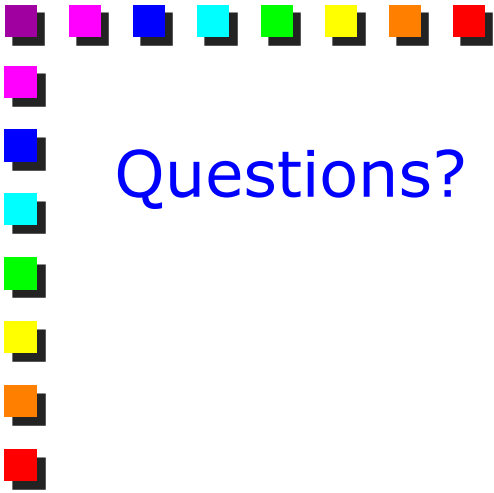




And finally... a plus: Cisco CCNA

- This course has a strong relationship with the Cisco CCNA program
 - First level of certification for Cisco
 - Good students will end up with an excellent background on theory and exercises
 - Work do to mainly with respect to practical Cisco configurations
 - A CCNA certification may require a reasonable effort at this point
 - Some student may have a look at this
 - Some companies in Torino can help you to get this certificate
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Questions?

