Course Contents and Rules

Arquitectura de Comunicações
Communication Architectures

Mestrado em
Engenharia de Computadores e Telemática
DETI-UA

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Professors

- Prof. Paulo Salvador
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    - Change your nickname to **your real name**
    - Ask for AC role.
- Prof. António Nogueira
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- Office hours
  - Flexible
    - Discord and e-mail to schedule.

AC Objectives

- Provide an integrated vision of communication networks.
- Understand and develop architectures and methodologies for
  - Telecommunication systems;
  - Technologies and service support in service provider environments;
  - Network architectures and virtualization trends.

Contents

- IP-based QoS models
  - IntServ architecture
  - DiffServ architecture
- BGP review and advanced topics
- Advanced overlay networks
  - Layer 3: MPLS (MPLS tunnels and MPLS VPN)
  - Layer 2: VXLAN and BGP EVPN.
- Network Monitoring and management
  - SNMP
  - Netflow
- Content Distribution Networks (CDN)

Evaluation

- Final Grade =
  - 40% * Theoretical Grade + 60% * Practice Grade
- Minimal grade: 7.0 in each component.
  - Theoretical Grade
    - Exam (40%) - Exam and/or Repeat Exam Seasons
      - Best grade is the one considered to calculate final grade.
  - Practice Grade
    - Project (60%) - in groups of 2 students (or 1 exceptionally).
      - First Presentation (20%) - December 22nd
        - » Problem identification.
        - » Proposal of solution.
        - » Only presentation with slides, no report!
      - Final Presentation (40%) - last class.
        - » Presentation and demonstration of working solution.
      - During presentations/demo students must answer to specific questions. Grades may be different within a group.
    - Repeat Exam Season
      - The project can be improved (or fully redone).
      - Best grade is the one considered to calculate final grade.

Classes Planning (tentative)

	Class	Wednesday	
1	22/Sep	Introduction. Program and Rules.	
2	29/Sep	IP-based QoS models: IntServ and DiffServ Architectures)	TP: DiffServ Architecture
3	06/Oct	BGP review and Advanced topics	TP: BGP (advanced topics)
4	13/Oct		TP: BGP (advanced topics)
5	20/Oct	Advanced L3 overlay networks with MPLS: MPLS tunnels and MPLS VPN.	TP: MPLS tunnels
6	27/Oct		TP: MPLS VPN
7	03/Nov		TP: MPLS VPN
8	10/Nov	Advanced L2 overlay networks with VXLAN: BGP EVPN.	TP: BGP EVPN
9	17/Nov		TP: BGP EVPN
10	24/Nov	Network Monitoring and management: SNMP and Netflow	TP:SNMP (Extra: Netflow)
	01/Dec	Feriado	
	08/Dec	Feriado	
11	15/Dec	Content Distribution Networks (CDN)	TP: CDN Routing with Conditional DNS
12	22/Dec		TP: CDN Routing with Conditional DNS
	29/Dec	Férias Natal	
13	05/Jan		Project demo

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- Alan B. Johnson, “SIP: Understanding the Session Initiation Protocol”, 3rd ed., Artech House, 2009.
- Otto Carlos, M.B. Duarte, Guy Pujolle (eds.), “Virtual Networks: Pluralistic Approach for the Next Generation of Internet”, Wiley-ISTE, 2013.
- Russ White, Jeff Tanstura, “Navigating Network Complexity: Next-generation routing with SDN, service virtualization, and service chaining: Next-generation routing with SDN, service virtualization, and service chaining”, Addison-Wesley Professional, 2015.
- Antonio Sanchez-Monge, Krzysztof Grzegorz Szarkowicz, “MPLS in the SDN Era”, O’Reilly, 2016.
- Eugenio Iannone, “Telecommunication Networks”, CRC Press, 2017