

Program and Rules

Segurança em Redes de Comunicações

**Mestrado em Cibersegurança
Mestrado em Engenharia de Computadores e
Telemática
DETI-UA**



Professores

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UC Informations

- All materials, documents and software will be available on eLearning.ua.pt (Moodle).
 - Subjected to weekly updates.

Flexible office hours

- Email (to discuss any topic or schedule a meeting).
- Discord: Invite <https://discord.gg/bPPpKy5>
 - ➔ **Change your nick to your real name** (First and Last names).
 - ➔ **Ask SRC student role.**
 - ➔ Only after you will have access the course contents.



Program

- Corporate network architecture (resilience and redundancy).
- Network vulnerabilities (known and unknown), attack vectors and attack phases. Network management good practices and introduction to security architecture
 - ◆ Networks and services isolation.
 - ◆ Cybersecurity KPI.
- Virtualization (device and network).
- Access Layer control (802.1X+RADIUS/TACACS).
- Firewalls, Load Balancers and Orchestrators. Secure zones. Network deployment and integration.
- DoS and DDoS (Attacks and Defenses).
- IDS and IPS.
- Privacy and anonymity.
- Certificate Authority (CA) characteristics and deployment.
- Secure communication (SSL/TLS).
- Secure communication (SSH and IPsec). VPN (site-to-site and user).
- Network monitoring (SNMP, Netflow, rsyslog,...). SIEM. SOC.



Planning (tentative)

Week	Theory	Practice	Tuesday	Friday
Feb 14	T1: Program and Rules. Corporate Network Topics.	P1: Corporate Network Fundamentals.	T1+P1	T1+P1
Feb 21	T2: Introduction to Network Security.	P1: Corporate Network Fundamentals.	Carnaval	T2+P1
Feb 28	T3:Network Access Control.	P2: Layer2 Access Control (802.1X & RADIUS).	T2+P1	T3+P2
Mar 07	T4:Network Flow Control.	P3: Introduction to Firewall Deployment.	T3+P2	T4+P3
Mar 14		P3: Introduction to Firewall Deployment.	T4+P3	P3
Mar 21		P4:High-Availability Firewalls Scenarios.	P3	P4
Mar 28		P4:High-Availability Firewalls Scenarios.	P4	P4
Apr 04	Páscoa	Páscoa	Páscoa	Páscoa
Apr 11	T5: Secure IP Connections.	P5: Overlay IP and IPsec Networks.	P4	T5+P5
Apr 18		P5: Overlay IP and IPsec Networks.	T5+P5	P5
Apr 25	Sem.Académica	Sem.Académica	Sem.Académica	Sem.Académica
May 02	T6: Remote Access.	P6: Network Remote Access (OpenVPN).	P5	T6+P6
May 09	T7: Intrusion Detection and Prevention	P6: Network Remote Access (OpenVPN).	T6+P6	Feriado
May 16		P7: Intrusion Detection (Suricata).	P6	T7+P7
May 23	T8: Network Monitoring. SIEM. SOC.	P7: Intrusion Detection (Suricata).	T7+P7	T8+P8
May 30		P8: Network Monitoring.	T8+P8	P8
Jun 06		P8: Network Monitoring.	P8	

Report 1

Report 2



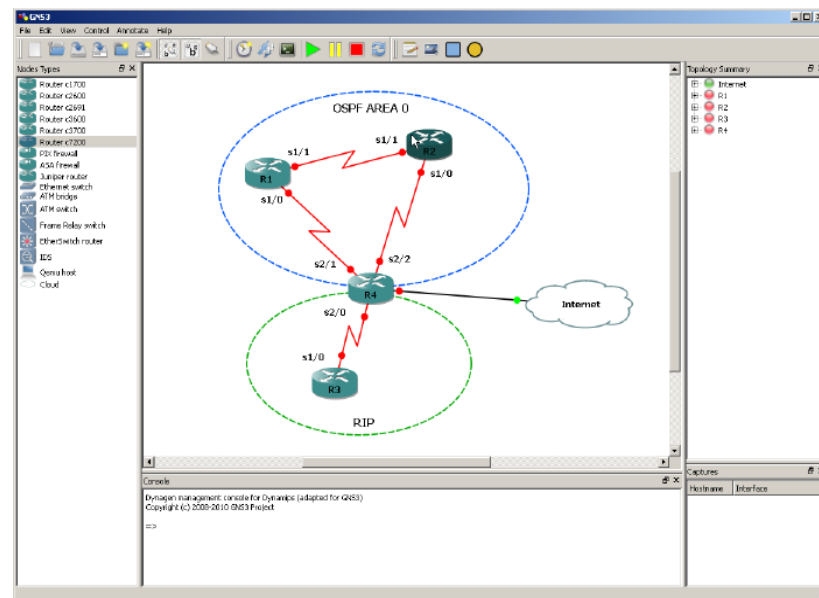
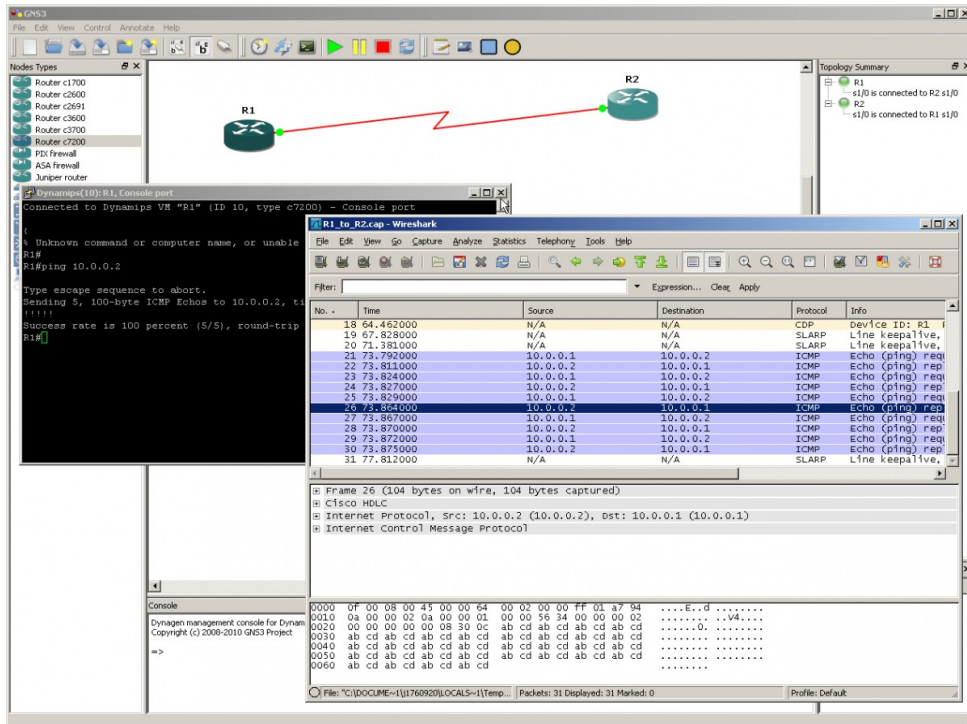
Evaluation

- Final Grade = 50% * Theory Grade + 50% * Practice Grade
 - ♦ There are no minimum grade for any component.
 - ♦ Theory grade
 - 1 Final Exam (100%) in the exam season;
 - and/or 1 Exam in “repeat exam” season;
 - The best grade is considered.
 - ♦ Practice Grade
 - 2 practice reports (25%+25%)
 - Tasks will be specified during the semester.
 - “Repeat exam” season
 - One single project with specific tasks.
 - The best grade is considered.



GNS3

- Network Simulator + Device Emulator
 - ◆ Emulates Cisco devices(Routers)
 - ➔ Uses IOS/Firmware real with Dynamips
 - ◆ Emulates Servers and Firewalls with QEMU or VirtualBox.



Bibliography

- Ciampa, M. (2017). CompTIA Security+ Guide to Network Security Fundamentals - Standalone Book, 6th Edition. Cengage Learning, ISBN 1337288780
- Stallings, W. (2016). Cryptography and Network Security: Principles and Practice (7th Edition). Pearson. ISBN 978-0134444284
- Designing Cisco Network Service Architectures (ARCH), John Tiso, Cisco Press, ISBN-13: 978-1587142888, 3rd Edition, 2011.
- Yusuf Bhajji, Network Security Technologies and Solutions (CCIE Professional Development), Cisco Press, 1st edition, 2008.
- Network Security Through Data Analysis: From Data to Action, Michael Collins, O'Reilly Media; 2nd edition, ISBN-13: 978-1491962848, 2017.
- Crafting the InfoSec Playbook: Security Monitoring and Incident Response Master Plan, Jeff Bollinger, Brandon Enright, Matthew Valites, O'Reilly Media; 1st edition, ISBN-13: 978-1491949405, 2015
- A Practical Approach to Corporate Networks Engineering, António Nogueira, Paulo Salvador, River Publishers, ISBN-13: 978-8792982094, 2013.
- Computer Networks: A Systems Approach, Larry Peterson, Bruce Davie, Morgan Kaufmann, ISBN-13: 978-0123850591, 5th Edition, 2011.
- Jeff Doyle, Jennifer Carroll, Routing TCP/IP, Volume 1 (CCIE Professional Development), Cisco Press, 2nd, edition, 2005.
- Jeff Doyle, Jennifer Carroll, Routing TCP/IP, Volume 2 (CCIE Professional Development), Cisco Press, 2001.

