

Introduction to Computer Networks and Network Management with EPOPTES

Purpose

This course is an introduction on how the Internet operates (i.e. computer networking) as well as how to manage a linux based computer laboratory using EPOPTES, an open-source software. This course is appropriate to anyone interested in learning the Internet behind the scenes in order to better understand it, as well as teachers involved in computer laboratories.

No prior knowledge required, as this course starts from scratch introducing simple terms with simple examples. It covers topics such as computer addressing, packet routing, firewalls, internet security, emails, instant messaging and the web. Moreover, the participants will setup their own basic network including WiFi (wireless network) setup.

Furthermore participants will install and use the EPOPTES software. The EPOPTES software allows the central management of a wired computer laboratory. This includes: central user account management, file sharing, broadcasting of teacher's display, remote assistance and more.

Through hands-on activities participants end up creating their own complete small local network which they will be able to control using the EPOPTES tool. They will gain a deeper understanding of the Internet.

Agenda

DAY 1

- Introduction to the course, place and time arrangements, forming of teams.
- Basic concepts of networking: what's the "phone" equivalent for a computer?, packets carrying data, addresses of communicating hosts, the Internet Protocol, the Transmission Protocol and its ports and backdoor ports (small introduction to Internet threats).
- Teamwork "meet the switch": using ping, nc and the ip program to setup communication between two computers connected first back to back and then through a switch.
- Introduction to routers.

DAY 2

- Who is who in a local network, understanding how to discover which way to go from a switch perspective.
- Introduction to the Servers around the Internet and their clients.
- Meet the first server, the Dynamic Host Configuration server.
- Teamwork : Setup a DHCP server, check connectivity as in day one. Connect a third partner at the switch.
- Using the nc program to better understand communication between clients and servers.
- From names to numbers: how does www.google.gr transforms to an internet address with numbers? Meet the Domain Name Servers.
- Teamwork: Give names to each of the three computers connected over the switch, check connectivity.

DAY 3

- Meet more Servers : Email server, Web Server.
- Explore their communication protocols using the nc program.
- More on routers. Teamwork: Neighbour teams connect their switches through a router. Router configuration. Checking connectivity.
- Introduction to Internet threats, protecting each network using a firewall.



Objectives

- Understanding fundamental aspects of Internet: packet communication, host addressing, routing, firewalls and security, emailing, instant messages and web services.
- Use of EPOPTES: installation, user account management, remote assistance, remote presentation, host management.

Methods

- Lectures
- Exercises
- Hands-on activities
- Teamwork

Target Groups

- Teachers working in primary schools
- Teachers working in secondary schools
- Teachers working in vocational schools

Place

Heraklion, Crete, Greece

- Teamwork: Limiting connectivity through router configuration (firewalls).

DAY 4

- Going wireless : Introduction to wireless communication, what is required and why. Configuration of a wireless access point. Checking connectivity.
- Computer Networks in a class: potentials and challenges.
- The EPOPTES tools: introduction and installation (teamwork: each team installs it in its network).

DAY 5

- Using the EPOPTES tool: Remote control, Remote presentation, control of a host.
- Course overview, limitations of EPOPTES, a glance at the future of Internet.