Dyn@NG Virtual Lab

Fulvio Risso, Politecnico di Torino, Italy

http://fulvio.frisso.net/
Teaching networks in the old days

- Real hardware, real networks
- Limited number of routers
- Sharing lab among different users
- Using different topologies
- Low-level issues (e.g., faulty cables)
- Generation of real traffic
Next step: going virtual

Virtual hardware, real networks
Multiple topologies
Scalability issues (CPU power)
Need Cisco IOS
Need specific software (GNS-3, Dynamips)
Generation of real traffic

dynamips
Our solution: the Dyn@NG Virtual Lab

- Virtual hardware, real networks
- Multiple topologies
- Scalable (no CPU power issues)
- No Cisco IOS needed (for clients)
- Web 2.0 (no specific software needed)
- Generation of real traffic
Dyn@NG screenshot
How it works (1)

- User clients
- Server farm
- Web server
- Dyn@NG Supervisor
- dynamips1
- dynamips2
- dynamips3
- Mgm daemons (MySQL, packet capture, data cleanup)
How it works (2)

• GUI on the client side (Javascript)

• User connects to the Dyn@NG web portal for
  – Sync the local config with the Dyn@NG supervisor
  – Interact with routers (router consoles get “proxied” through the web server)

• Dynamips ports and parameters are handled by the supervisor
  – Completely transparent to the user

• Supervisor also handles cleanup, zombie sessions
  – Dynamips instances are cleared up when the user disconnects
Can do and cannot do

- Learning how to do with router OS features
- Practice with OS commands
- Practice with network devices
  - Several supported devices (e.g., Cisco 2600, 3600, 3700, 7200, ...)
- Play with different OS images
  - Can offer a wide set of OS images
- Capture real traffic

- Evaluate routers performance
- Simulate all aspects of a real network
- Play with all types of network devices (datacenter devices, catalyst switches, ...)

netgroup
How to use Dyn@NG
Main steps

1. Register on Dyn@NG
   - http://dynng.ipv6.polito.it

2. Check what you have to do
   - E.g., download the homework from the course web site

3. Create the topology on Dyn@NG (or) import a topology file if this is available on the course website

4. Configure the routers (see later)
Dyn@NG: user registration

Registration available only from selected domains
The main window
Configuring the network devices

• Complete the setup of the topology
  – E.g., routers (with the proper linecards), links
• Start the network (i.e., launch the route virtualization environment)
  – Menu: network / start
• Open the consoles of the router
  – Click on the terminal icon, on the bottom of the screen
  – Configure the routers
• To capture traffic, select the proper link (or all) on the rightmost window and select "start capture"
  – Captured packets can be either shown in Dyn@NG or downloaded as a dump file and visualized with Wireshark
The main window (running)
For any questions...

• Contacts
  – Fulvio Risso

• Credits
  – Niccolò Cascarano
  – Marco Leogrande
  – Daniele Aramu