

Lesson Plan 5 | Form 2 | Web Server Introduction with Nginx and Wireshark

Objective

Students will be introduced to the concept of a web server, along with an actual implementation of one on the lab computers. They will see how their changes are reflected in the page served by the web server, and visualize the background communications involved using Wireshark.

Warm-up

None.

Presentation (requires local wireless network)

In lecture, talk to students about the concept of a *server* as a host of resources or services. Have them understand that in order to make web pages available to more than just ourselves, we need some software to serve those pages to others who know our IP address or DNS hostname.

Move to the lab and explain to them that a web server has been installed on their computers. Have them run **service nginx status** so they can see confirmation that a web server is installed and running.

Then have them open a browser and type “127.0.0.1” into the browser, reminding them that this is the special loopback IP address discussed previously. Then inform them of the location of the nginx HTML directory: /home/student/nginx_html. Using **gedit**, have them make some changes to the HTML in that file and reload their web browser to see the changes.

Now have them visit the page of the person in front of them by typing that person’s IP address into the browser. Confirm that everyone can see everyone else’s pages, as if the lab was its own private Internet.

Point out that they can also type “tumaini<num>” where <num> is the last byte of the IP address. This is similar to a DNS hostname (mapped in /etc/hosts), and they can use this instead of an IP address to interact with the people around them.

Lastly, have them start Wireshark and capture packets as they visit each other’s web pages. Have them limit results to HTTP only if necessary. They may need to use Ctrl+Shift+R to see the actual contents of the web pages in Wireshark, as browsers will cache the page bodies.

Guided Practice

None.

Independent Practice

If time allows, have them continue to make changes to the default Nginx web page, play with Wireshark, etc.

Closing

Briefly highlight the similarities and differences between the local network in the lab versus the Internet at large.

In Hindsight

01/25/2017: Students understood the concept of a server easily, and caught on to the similarity of fixed hostnames to DNS domain names for lab purposes. Many were visibly excited about their ability to visit their classmates' web pages from their own computers, and expressed interest in combining their knowledge of HTML with Python to make an HTML-based chat application.

01/27/2017: Same observations for the second stream as recorded above.