Lab Assignments

Students will submit the following lab assignments: 1, 2, 5, 6, 7, 8, 9, 10, 11 and 12. Each lab covers a different Internet protocol, as indicated below.

1. Protocol Layers. Text §1.3 and §1.4. This is the introductory lab that comes first.
2. Ethernet. Text §4.3.
3. IPv4. Text §5.6.1 to §5.6.3.
4. ICMP. Text §5.6.4.
5. ARP. Text §5.6.4.
6. DHCP. Text §5.6.4.
7. UDP. Text §6.4.
8. TCP. Text §6.5.
9. DNS. Text §7.1.
10. HTTP. Text §7.2.4.

Instructions for each lab can be found in Course Materials/Labs/Networking Labs in a document named after the lab assignment, i.e., lab-protocol-layers.pdf for the first assignment.

For each assignment, you will collect its own trace; do not use the supplied trace unless the per-assignment instructions direct you to do so. Your answers are to be submitted in a Word document, not a pdf file. In addition to submitting answers to the questions, indicate which operating system and release you used, which Wireshark release you used, and anything that you had to do to get the lab working that was not included in the instructions. In addition, any suggestions or documentation that you can provide for helping future students with the assignment or for improving the assignment would be appreciated.

Lab Steps and the associated Turn-ins should be clearly numbered; the questions must be submitted with your answers.

I suggest that you also complete the “Explore on your own” section. You may submit the answers to these questions if you wish. The best way to learn any protocol is to “explore it on your own”, per the title of this section.

Assignments are due at 5:30 P.M. at the next class meeting after we complete the associated chapter and are to be submitted through the Assignments section of Blackboard. Not that in certain weeks, multiple labs are due, so you should plan accordingly.

See the syllabus for due dates; there is a 20% penalty for each day that your assignment is late.

Assignments are automatically marked late by Blackboard at 5:30 P.M. on the date due.

You should begin work on these assignments as early as possible. If you wait until the last moment to work on the assignment, you will likely not be able to complete it on time. My experience indicates that students who get high grades submit assignments early. Since you cannot predict how long it will take you to complete an assignment, waiting for the last day to work on it is not a formula for success.

You may not share your lab results with other students. Suspected cases of academic dishonesty will be referred to the Dean of Students.

Academic dishonesty includes, but is not limited to, cheating, plagiarism, obtaining an unfair advantage, and falsifying records or documents whether intentional or not.

The labs can be run on Windows, Mac OS, and Linux platforms. They have been tested with Windows 7 (Service Pack 1), Mac OS 10.7 (Lion), and Linux Fedora Core 13.

To work across platforms, the labs make use of tools that are widely-used and either installed as part of the operating system or freely-available as downloads. Inevitably, there are differences between tools on different operating systems, e.g., the wget utility for Windows is replaced with the curl utility for Mac. The authors have noted the differences they know about, but you should expect some local variations.

All of the labs use the Wireshark network protocol analyzer to inspect packet traces; you will need to install WireShark on a machine of your own in order to do the lab assignments. WireShark is not available in the Linux lab.

Different labs also use different tools depending on their purpose. Each lab begins by listing the tools that it uses, a small number of which you may need to install. The tools include: wget/curl and your web browser to fetch web pages; ping and traceroute to probe network paths; operating system utilities such as ipconfig, ifconfig, arp, netstat and route to check and manipulate the state of your computer’s network interface; telnet to send and receive interactive traffic; and dig to examine the DNS.

Most labs can be completed in a single sitting. To help the reader, each lab has been divided into a series of steps that build on each other and use these formatting conventions:

* *Actions that must be taken are given in italics.* This is the absolute minimum an experienced lab taker must read.
* Examples of input and command-line programs are given in computer font. These are commands you will enter into a terminal window or text you will enter into a program’s user interface.
* Explanatory text that elaborates the instructions in more detail is given as normal text.
* Background material is given in grayed out type. This material includes descriptions of tools and how to use them that is not specific to the lab and may be repeated across labs. You can skip this material if you are already familiar with it.