

IPv6 ACLs

Agenda

- The critical importance of understanding encapsulation, and sequence of operations for any (every) common internet activity
... and thus the critical importance of learning and **memorizing** all the networking details that seem(ed) pointless when you first encounter them.
- Authoring ACLs: there aren't any "multiple choice" answers available; you have to analyze and compose them using only your own unprompted creativity!
- Complete: Configuration of standard & extended ACLs
Cover: IPv6 ACL slide deck

Assignments and Lab work

- Lab 9 post-lab: due **before** your lab session next week.
- Lab 10 pre-lab: due **before** your lab session next week.
- Lab 10: ACLs - extended & IPv6
- Readings: NetAcad Module 5: ACL Concepts; by Mon **Nov 14 @ 8am**

References

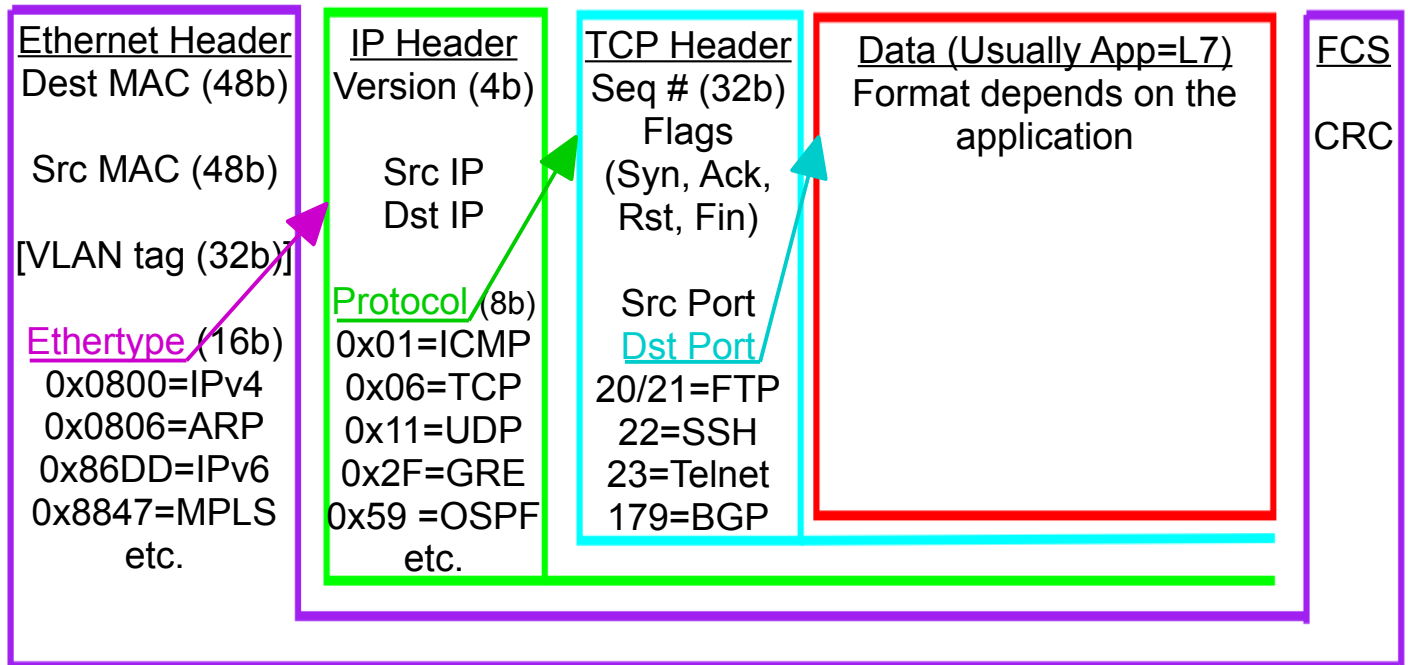
- Researching protocols: <https://wiki.wireshark.org/SampleCaptures> and refs there
e.g. <https://njrusmc.net/jobaid/jobaid.html>,
<https://tshark.dev/search/pcaptable/>
- Cisco articles on ACLs:
 - 1 <https://community.cisco.com/t5/networking-knowledge-base/access-control-lists-acl-explained/ta-p/4182349>
 - 2 <https://www.cisco.com/c/en/us/support/docs/ip/access-lists/26448-ACLsamples.html>

Notes on IPv6 ACLs

- As with IPv4, there's three *different* keywords associated with ACLs:
 - **ipv6 ccess-list** when creating & *defining* an ACL
 - **ipv6 traffic-filter** to apply an ACL *to an interface*
 - **ipv6 access-class** to apply an ACL *to VTY connections*
 - The *whole* truth about showing ACLs:
 - **show ip access-list** *only* IPv4 ACLs
 - **show ipv6 access-list** *only* IPv6 ACLs
 - **show access-list** *both* IPv4 and IPv6 ACLs (i.e. *all*)
- ... So why didn't we see any difference between the commands in Lab 8?

Encapsulation for L2, L3, L4, L7

You need to understand how each layer of encapsulation always has some field that identifies what's in the next set of bytes. Here's a general sketch of that layout.



<https://en.wikipedia.org/wiki/Ethertype>

<https://en.wikipedia.org/wiki/IPv4>

https://en.wikipedia.org/wiki/List_of_IP_protocol_numbers

https://en.wikipedia.org/wiki/Transmission_Control_Protocol

https://en.wikipedia.org/wiki/Well-known_port_numbers

<https://cabulous.medium.com/http-3-quick-and-how-it-works-c5ffdb6735b4>

Sequence of Operation (from cold boot)

Imagine a typical sequence of a user wanting to surf the internet or telnet to NetLab. It's important to know the steps and what type/protocol/port each one requires!

- DHCP (includes 4 steps for D.O.R.A.)
- ARP the gateway
- DNS to resolve the desired site
- TCP 3-way handshake to open a session; port numbers are included!
- HTTP, HTTPS, Telnet, etc (... application data flows back & forth ...)
- TCP 3/4-way teardown of session