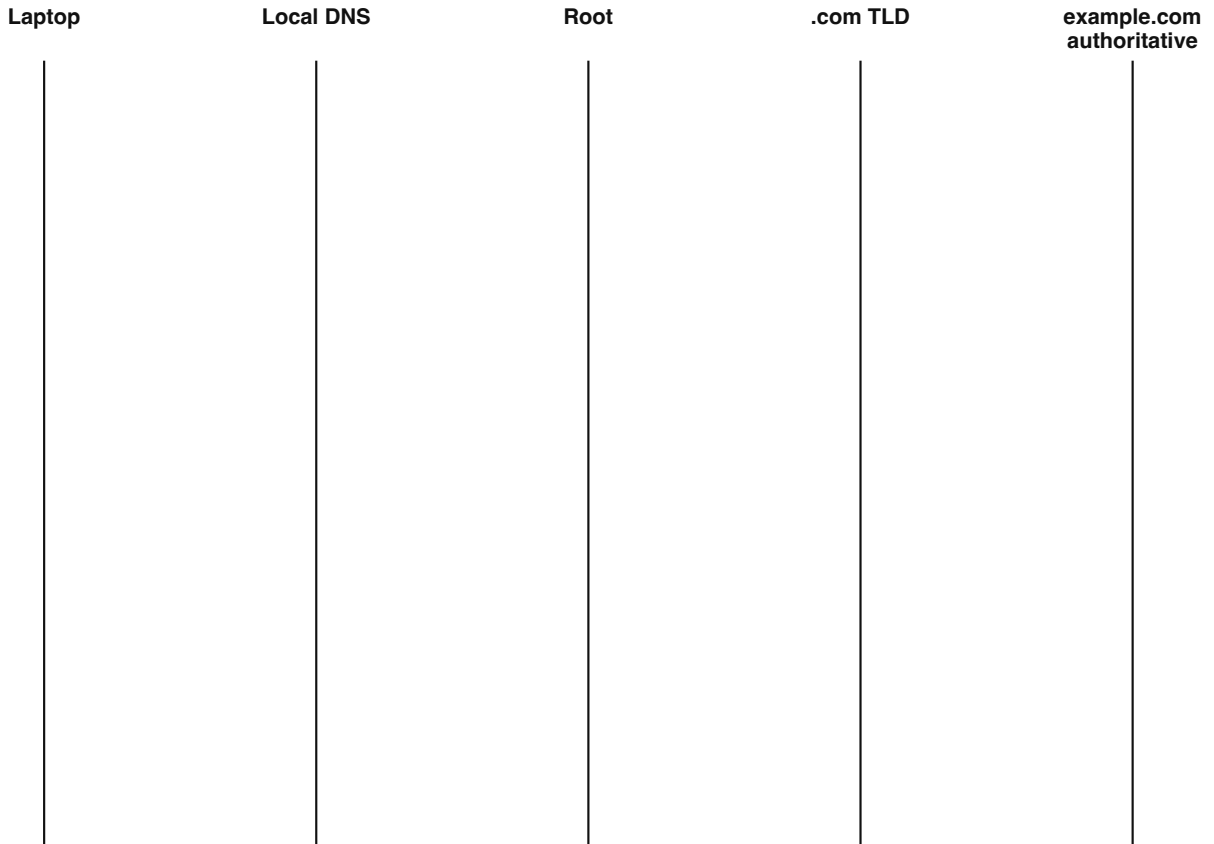


Q1 A DNS Lookup Ch. 2 slides 76–78

Names: _____

A laptop wants the IP address of `www.example.com`. It sends every DNS question to its **local DNS server**, which resolves names with **iterated** queries. An earlier lookup left the **.com TLD server's address** in the local server's cache; nothing else about `example.com` is cached.

1. Draw every DNS message, from the laptop's question until the laptop has the address. One arrow per message, with an arrowhead. Label each arrow **Q** if it carries the question, **P** if it carries a pointer to another server, or **A** if it carries the address.



- 2. Which server on the timeline is never contacted, and why not?**

Discuss with your partner

The laptop sent one message and got one reply. Who did the rest of the work — and why is it useful that the laptop does not do it itself?

Q2 An HTTP Request

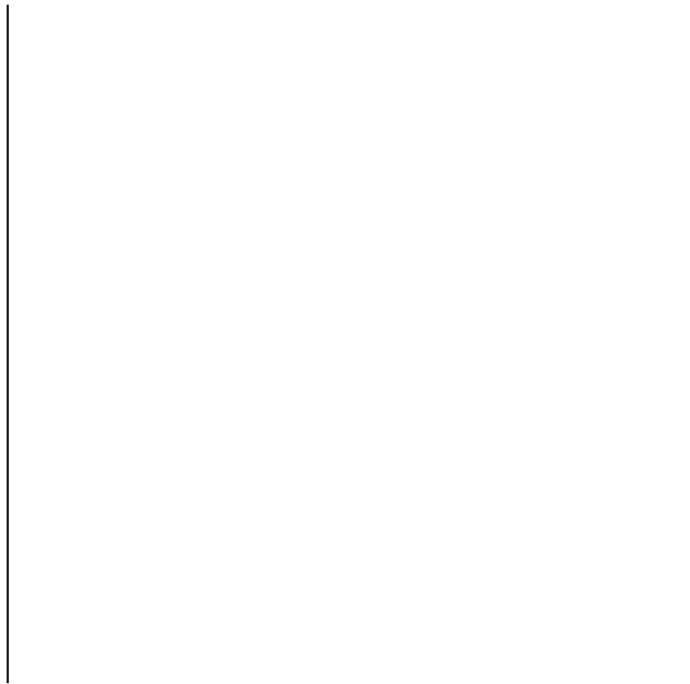
Ch. 3 slides 99–106

The laptop now knows the web server's address. The browser loads `http://www.example.com/`, a page with **one image**, `logo.png`. It opens **one persistent TCP connection**, sends **one request at a time** — waiting for each response before sending the next — and, once it has the image, **closes the connection**. Ignore the ACKs TCP sends for data.

1. Draw every message, from the first TCP message until the connection is closed. One arrow per message, with an arrowhead, labelled with the TCP flags or HTTP message it carries.

Laptop

Web server



2. How many of your arrows carry no HTTP at all? What is each group of them for?
3. Suppose the browser used **non-persistent** HTTP instead. What would you have to add to your drawing?

Discuss with your partner

Closing took a `FIN` from each side. Why doesn't one `FIN` from the laptop close the whole connection?