TCP, SOCKETS & SOCKET.IO

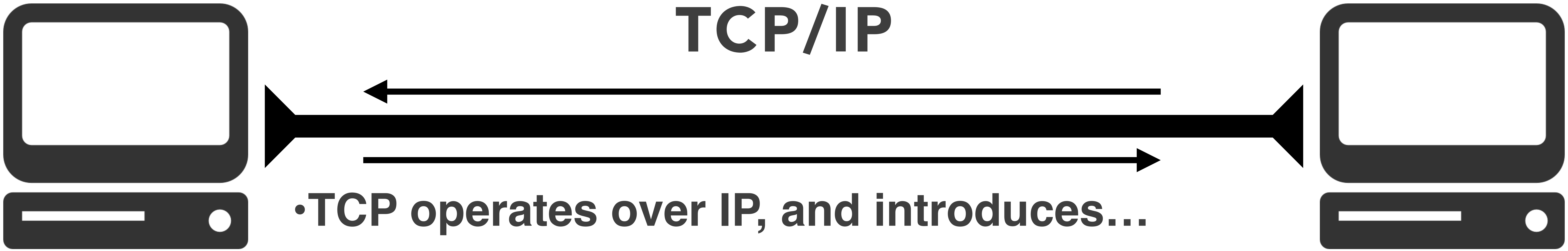
TCP

Transmission Control Protocol

TCP

- **Protocol: standardized way that computers communicate with one another**
- **Establishes a reliable, duplex connection between two machines that persists over time**
  - **Reliable:** All your data gets there in the order you sent it
    - (or you know that it didn't)
  - **Duplex:** Either end of the connection can send or receive bits
  - **Persistent:** The connection lasts until one side ends it
- **TCP is a *transport* layer protocol**

TCP/IP

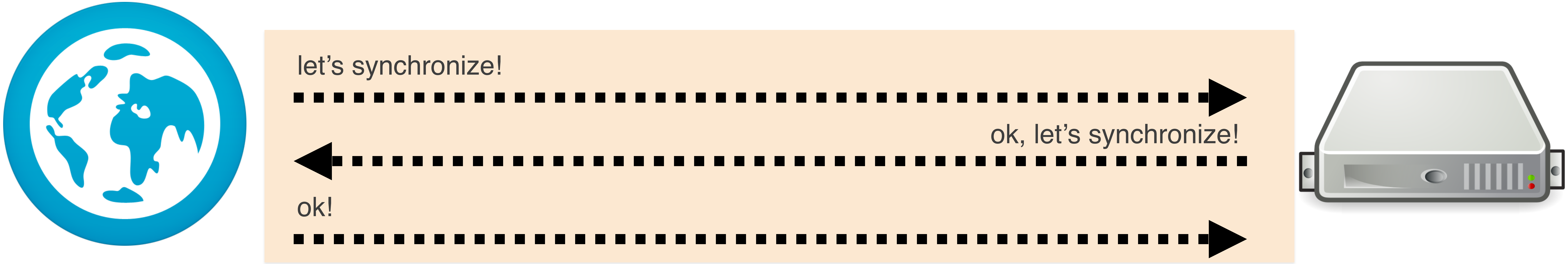


- TCP operates over IP, and introduces…
- Ports: to figure out which process gets the packet
- Connections: to figure out packet ordering & loss
- Retries & flow control: to deal with packet loss
- Reliable connection that persists over time

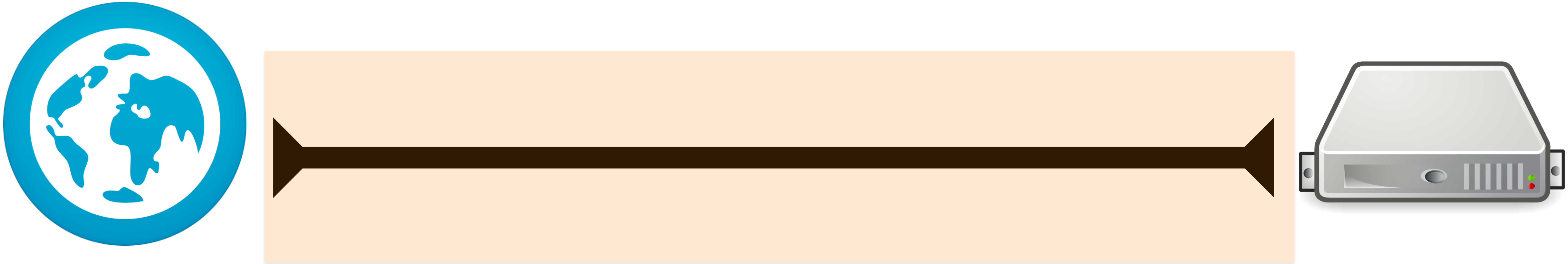
TCP AND HTTP

- **HTTP is an application layer protocol**
- **It (usually) operates over TCP, (usually) on port 80**
  - But “HTTP only presumes a reliable transport; any protocol that provides such guarantees can be used” — HTTP 1.1 Spec
  - HTTPS, for instance, operates over TLS on port 443
- **Implements the idea of a “session”, which establishes a TCP socket for the client to make requests and the server to issue responses**

CLIENT OPENS A TCP CONNECTION TO SERVER

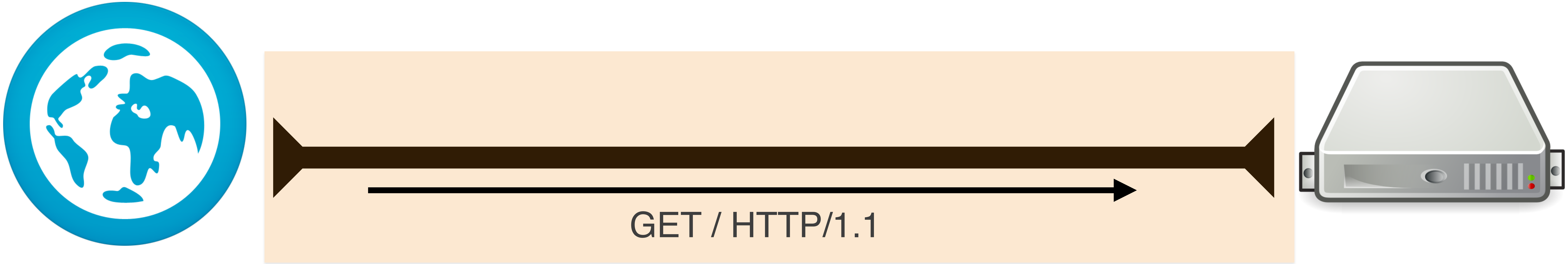


TCP CONNECTION IS ESTABLISHED



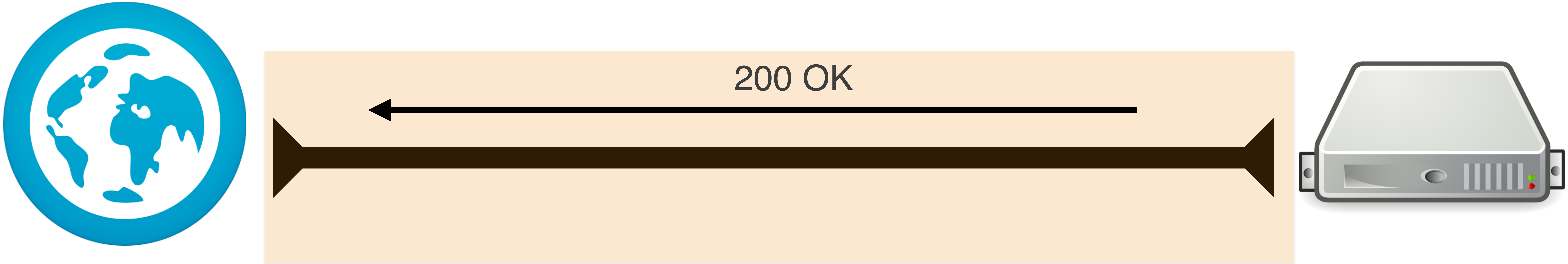
CLIENT SENDS A REQUEST

(over the connection)

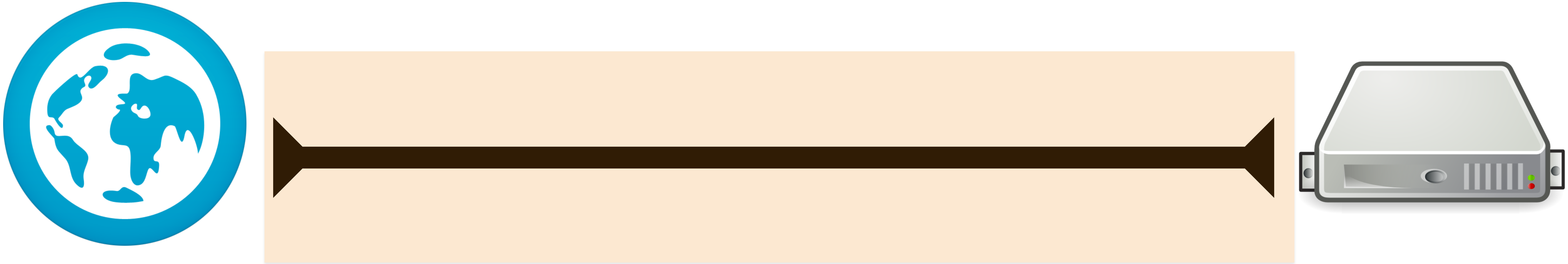


SERVER SENDS A RESPONSE

(over the connection)

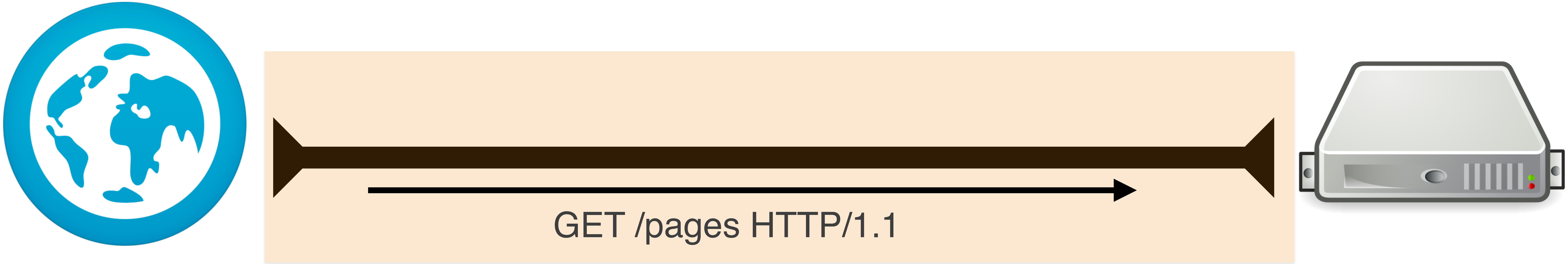


TCP CONNECTION STAYS OPEN



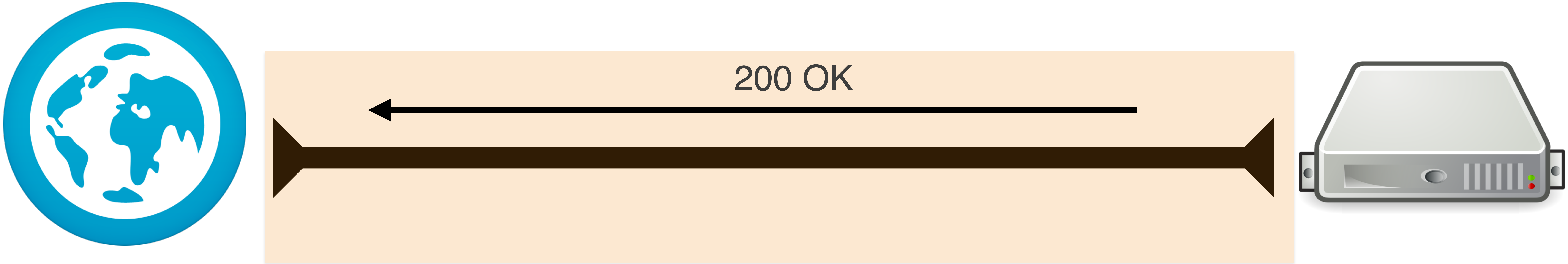
CLIENT SENDS MORE REQUESTS

(over the same connection)

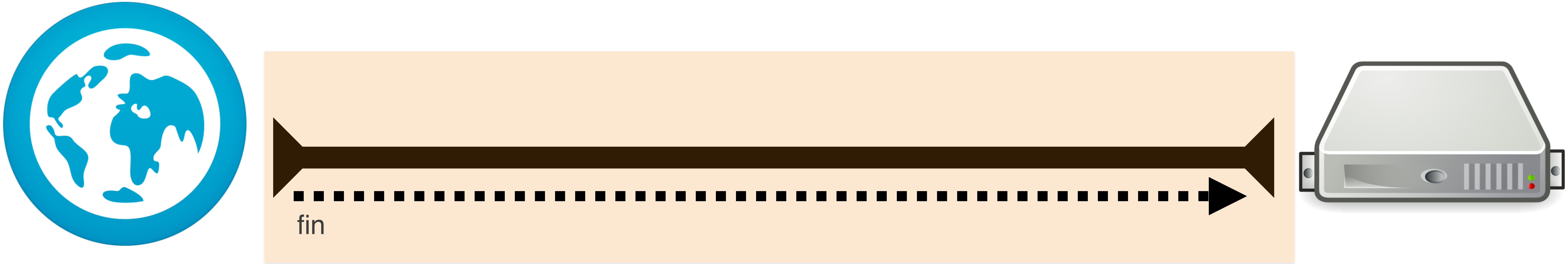


SERVER SENDS MORE RESPONSES

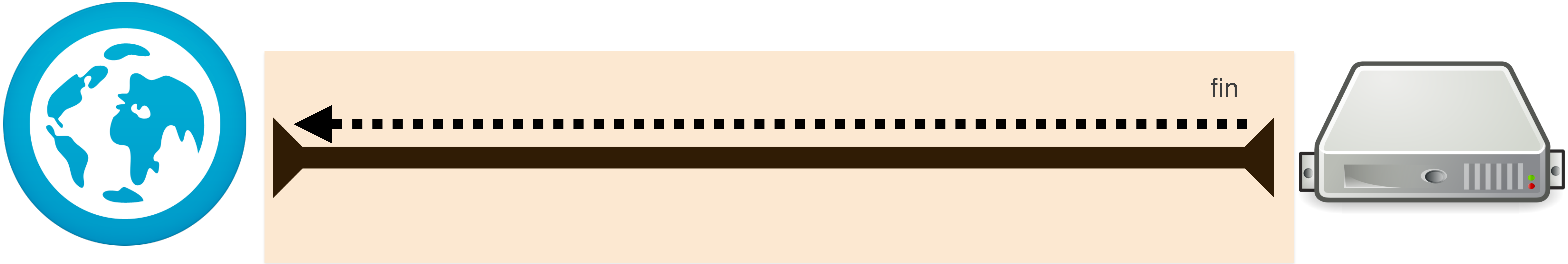
(over the same connection)



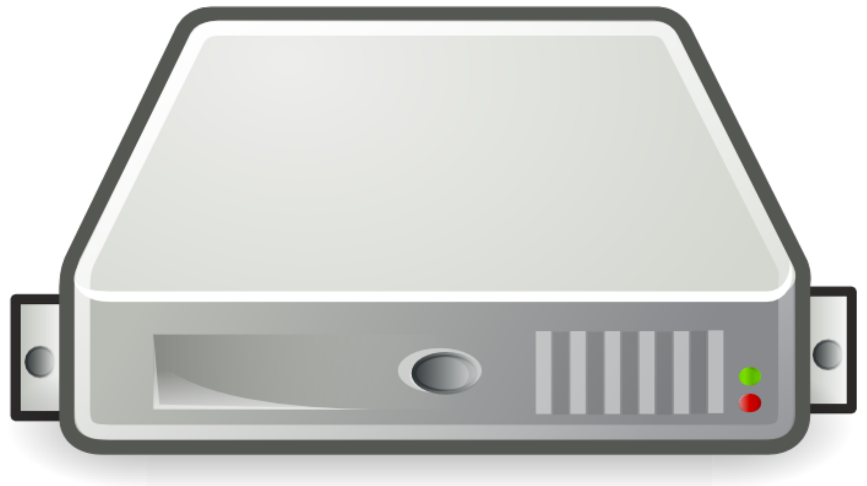
EVENTUALLY, YOU CLOSE THE TAB



OR YOU DON'T SAY ANYTHING FOR A WHILE AND THE SERVER TIMES OUT



AND ONE OF YOU ENDS THE CONNECTION



TCP
UDP
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