Suzie's Internet Service Provider (ISP)

The Internet

Suzie

Google

Part 1 – Name Resolution

1) Suzie types in `www.google.com` in her web browser
2) Suzie's computer doesn't know the IP address, so it sends a lookup request to the configured DNS server (*most likely Suzie's ISP*)
3) The ISP DNS doesn't know `google.com`, but it does know the DNS server in charge of `.com`, so it forwards the request to the `.com` DNS server on the Internet
4) The `.com` DNS server knows `google.com`, but not the IP address for `www.google.com`, so it forwards the request to the DNS servers in charge of `google.com`
5) The Google DNS server look at the request, identifies the IP address for `www.google.com`, and replies with the IP address
6) The reply returns along the same chain of DNS servers until it reaches Suzie's computer

Part 2 – Web Browsing

1) Suzie's computer sends an HTTP request to the IP address DNS identified
2) Suzie's cable modem doesn't know how to get to the IP address, so it forwards the request to the ISP routers
3) The ISP routers don't know where that IP address is, but they have a default route for forwarding unknown traffic to the Internet
4) A router on the Internet that knows the network that contains the IP address will forward the request to Google's routers
5) The Google routers will forward the traffic to the IP address of the Google web servers
6) The Google web servers will reply to the HTTP request by providing the requested HTML webpage
7) The packets containing the HTML data will follow the best path determined by the routers back to Suzie's ISP (**this may not be the same path the original request came**)

THE OSI MODEL

7 – Application	DNS, HTTP, Email
6 – Presentation	
5 – Session	
4 – Transport	TCP (*reliable*), UDP (*unreliable*)
3 – Network	IP Addresses, Routing
2 – Data Link	Ethernet, WPA, MAC Addresses
1 – Physical	Cat 5 Cables, WiFi

Reliable vs. Unreliable Transport Protocols

TCP handles packet sequencing and session control, so it ensures a more reliable delivery of data (*but at a cost in speed*).

UDP just sends packets as fast as possible, not caring about the order (or even if) the packets arrive. Higher level protocols are required to perform these functions.

DNS and HTTP use TCP because speed isn't a major concern. Skype and similar applications are more concerned with responsiveness, so UDP is usually used.