CSC574 Computer Networking

Homework 6: Chapter 6 Answers

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Q1.

DNS uses UDP instead of TCP. If a DNS packet is lost, there is no automatic recovery. Does this cause a problem, and if so, how is it solved?

Answer: Yes, using UDP does mean that DNS packets, if lost, aren't automatically recovered. This is acceptable because DNS queries are generally short and can be easily retransmitted. The problem is solved through retransmission of queries by the DNS client. When a DNS client does not receive a response within a specific time interval, it retransmits the query. Additionally, DNS clients typically send queries to multiple DNS servers configured in their settings, thus providing redundancy and reliability.

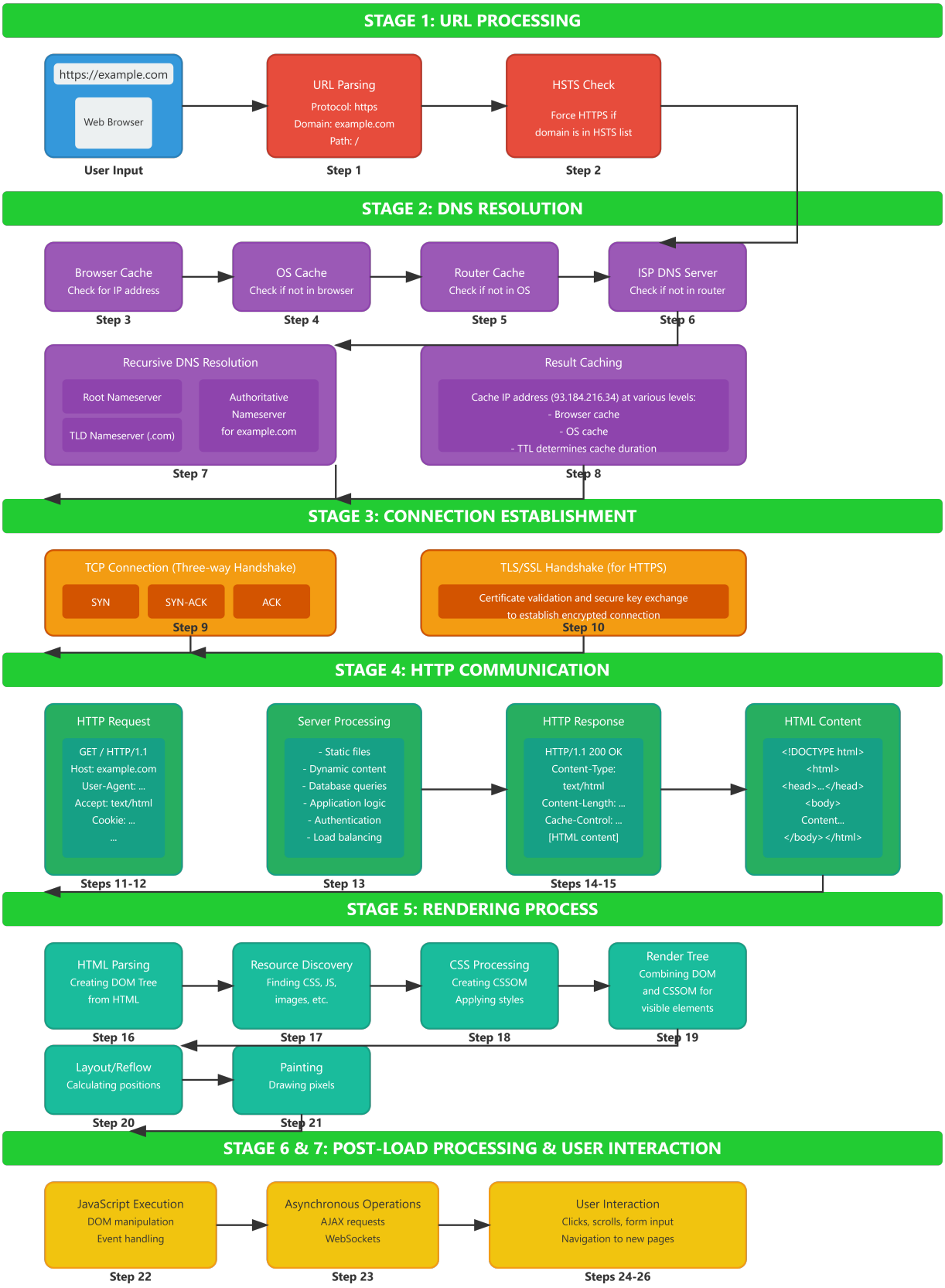
Q2.

Elaborate on the web-browsing process.

Answer: The web-browsing process involves several steps:

1. **DNS Resolution:** The browser first performs a DNS query to convert the domain name of the website into an IP address.
2. **Establishing Connection:** After resolving the IP address, the browser establishes a TCP connection with the server hosting the website, typically through a three-way handshake.
3. **HTTP Request:** The browser sends an HTTP request message to the server, requesting the HTML content of the webpage.
4. **Server Response:** The server processes this request and sends back an HTTP response containing the requested webpage (usually in HTML format).
5. **Rendering Page:** The browser parses the HTML document and renders the webpage, loading additional resources (images, CSS, JavaScript files) through subsequent HTTP requests.
6. **Closing Connection:** After all necessary data is retrieved, the TCP connection may be closed, or kept alive for further requests.

The Complete Web Browsing Process



Q3.

Watch the following 9-hour video for Computer Networking:
`https://www.youtube.com/watch?v=qiQR5rTSshw&t=9644s&ab_channel=freeCodeCamp.org`. Enumerate your blind spots in this course.

Answer:

- Deep understanding of advanced routing protocols (e.g., BGP, OSPF).
- Implementation details and practical debugging of TCP/IP stack.
- Network security mechanisms such as VPNs, IPSec, or firewalls.
- In-depth knowledge of wireless and mobile networking standards and protocols.
- Network management and monitoring tools, e.g., SNMP, Wireshark.
- Advanced network optimization and performance tuning techniques.
- Practical understanding of Software-Defined Networking (SDN).