

Loading a Web Page

Computing

Every step between typing a URL and seeing pixels.

Typing an address sets off six distinct stages, each of which can fail on its own.

1 DNS lookup

The name becomes an IP address, asking a resolver, then the root,

2 TCP connection

A three-way handshake opens a connection to that address on

3 TLS handshake

For https, certificates are exchanged and checked, and an

4 HTTP request

The browser sends GET / with its headers, cookies and what

5 Server response

A status code, headers and usually HTML come back.

6 Render

HTML is parsed into a DOM, CSS into styles, then layout, paint,

WHERE IT USUALLY GOES WRONG

Site not found → DNS

Certificate warning → TLS

404 or 500 → the request or the server

Blank page that loads → JavaScript, at render

Sub-resources — CSS, JS, images, fonts — each repeat steps 2 to 5 on their own.