

Exercise walk-through

9.5

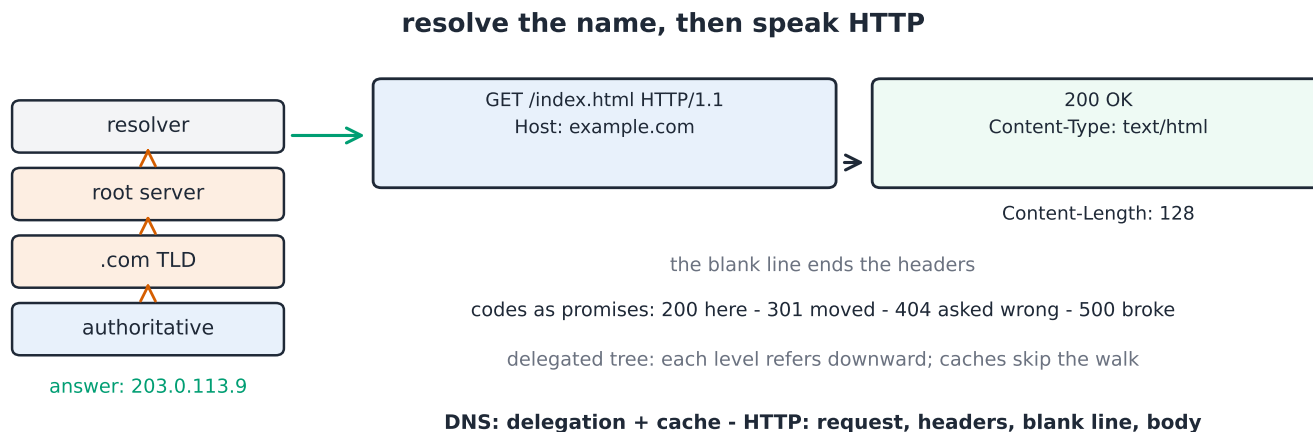
Application protocols

University Computer Science

Applications: names and pages

- 1 **DNS** Root refers to the TLD, the TLD to the authoritative server - and caching skips the walk for the answer **TTL**.
- 2 **HTTP** GET with a Host header; 200 OK with Content-Type and Content-Length 128, blank line, exactly 128 body bytes.
- 3 **Codes** 200 here it is; 301 moved (Location); 404 asked wrong; 500 broke - a crawler treats each differently.

Message flow



A **DNS** delegation walk, then an **HTTP** exchange ending 200 OK.

Exercises 2.1-2.3

2.1 Which DNS level finally holds the host record?

[3]

2.2 What physically ends an HTTP header block?

[3]

2.3 Name the four status-code classes in one line.

[3]

Exercises 2.1-2.3

2.1 Which DNS level finally holds the host record? [3]

2.1

- The authoritative server for the zone ✓.

2.2 What physically ends an HTTP header block? [3]

2.2

- A blank line – two consecutive newlines (CRLF CRLF) ✓.

2.3 Name the four status-code classes in one line. [3]

2.3

- 2xx success, 3xx redirect, 4xx client error, 5xx server error ✓.

Exercise 3.1

3.1 A resolver with a cold cache resolves `www.example.com`.

List each server it contacts and what each returns (referral or answer). State which contacts the cache eliminates for the next lookup of `example.com` and for how long. State what changes if the TLD's answer is already cached but the authoritative's is not.

[8]

Exercise 3.1

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3.1

- Root: referral to the `.com` TLD servers ✓.
- TLD: referral to `example.com`'s authoritative servers ✓.
- Authoritative: the answer – `www.example.com`'s address ✓.
- The cache eliminates the root contact on the next lookup, for the TTL of the cached referral ✓.
- With the TLD cached but not the authoritative: the walk starts at the TLD – one contact fewer, same final answer ✓.

Exercise 3.2

3.2 The server replies HTTP/1.1 301 Moved Permanently with Location: `https://example.com/new` and Content-Length: 0.

State what the client should do next and the header that tells it. State what a 200 for the same URL would have carried instead. Give the byte-level structure of a 200 response with a 60-byte body (list the parts in order). State why the blank line is load-bearing. [7]

Exercise 3.2

3.2 The server replies HTTP/1.1 301 Moved Permanently with Location: `https://example.com/new` and Content-Length: 0.

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3.2

- Follow the redirect: request the URL in Location ✓.
- A 200 would have carried the resource body with its Content-Type and Content-Length ✓.
- Structure: status line; headers (Content-Type, Content-Length: 60); blank line; 60 body bytes – in that order ✓.
- The blank line is load-bearing because headers are length-prefixed by nothing else: the parser cannot know where they end without it ✓.