

W UNIVERSITY of WASHINGTON L21: HTTP CSE333, Summer 2020

## Protocols

- ❖ A **protocol** is a set of rules governing the format and exchange of messages in a computing system
  - What messages can a client exchange with a server?
    - What is the syntax of a message?
    - What do the messages mean?
    - What are legal replies to a message?
  - What sequence of messages are legal?
    - How are errors conveyed?
- ❖ A protocol is (roughly) the network equivalent of an API

6

6

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## HTTP Requests

- ❖ General form:
  - `[METHOD] [request-uri] HTTP/[version] \r\n`  
`[headerfield1]: [fieldvalue1] \r\n`  
`[headerfield2]: [fieldvalue2] \r\n`  
`[...]`  
`[headerfieldN]: [fieldvalueN] \r\n`  
`[request body, if any]`

*Handwritten notes:*

- Type of Action to take (points to [METHOD])
- Resource to act on (points to [request-uri])
- In this class, 1.1 (points to HTTP/[version])
- Any# of headers (designed for flexibility) (points to the header block)
- Blank line to indicate the end of the headers. (points to \r\n before request body)
- \r\n is used to indicate a "new line" in HTTP (points to \r\n in the code)

8

8

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## HTTP Responses

- ❖ General form:
  - `HTTP/[version] [status code] [reason] \r\n`  
`[headerfield1]: [fieldvalue1] \r\n`  
`[headerfield2]: [fieldvalue2] \r\n`  
`[...]`  
`[headerfieldN]: [fieldvalueN] \r\n`  
`\r\n`  
`[response body, if any]`

*Handwritten notes:*

- A number (points to [status code])
- A Human readable string (points to [reason])
- Typically the requested resource (points to [response body, if any])

18

18

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## Status Codes and Reason

- ❖ **Code:** numeric outcome of the request – easy for computers to interpret
  - A 3-digit integer with the 1<sup>st</sup> digit indicating a response category
    - 1xx: Informational message
    - 2xx: Success
    - 3xx: Redirect to a different URL
    - 4xx: Error in the client's request
    - 5xx: Error experienced by the server
- ❖ **Reason:** human-readable explanation
  - e.g. "OK" or "Moved Temporarily"

19

19

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❖ Are the following statements True or False?

	Q1	Q2
A.	False	False
B.	False	True
C.	True	False
D.	True	True
E.	We're lost...	

**Q1:** A protocol only defines the "syntax" that clients and servers can communicate with.

**Q2:** Clients and servers use the same header fields.

27

27

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❖ Which HTTP status code family do you think the following Reasons belong to?

	Q1	Q2
A.	4xx	2xx
B.	4xx	3xx
C.	5xx	2xx
D.	5xx	3xx
E.	We're lost...	

**Q1:** Gateway Time-out

**Q2:** No Content

29

29