

Restful API

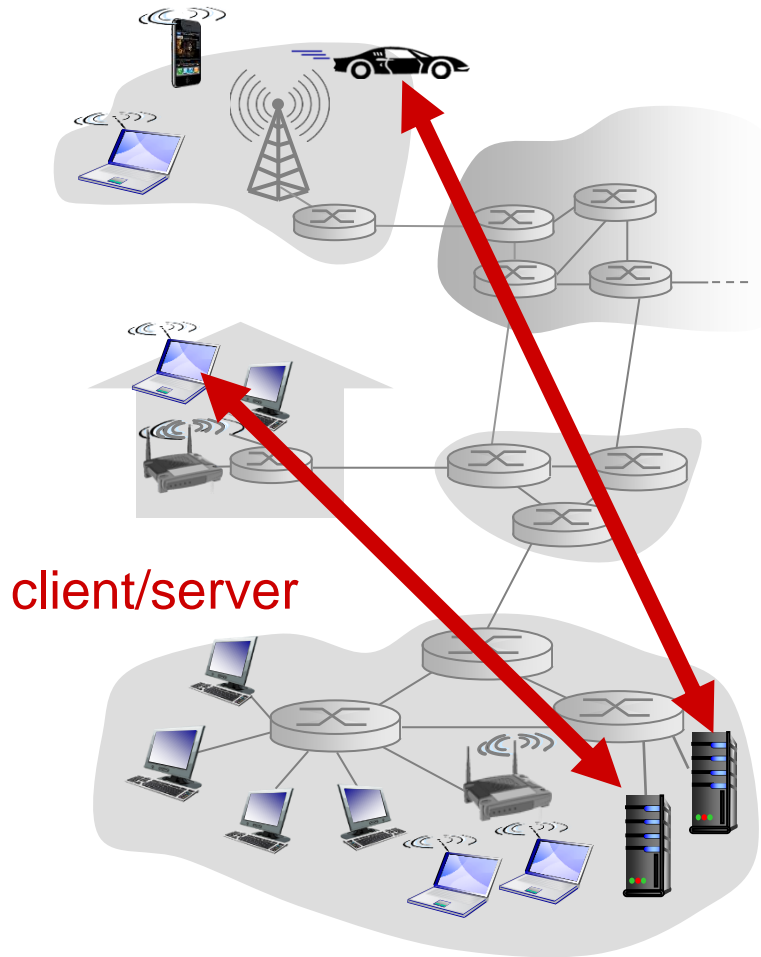
Http자료- Top Down Approach Computer Network책에서 발췌

- **Background** : Internet HTTP protocol
- Restful API(Application Programming Interface)

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Background – HTTP protocols

Client-Server Architecture



server:

- ❖ always-on host
- ❖ permanent IP address
- ❖ data centers for scaling

clients:

- ❖ communicate with server
- ❖ may be intermittently connected
- ❖ may have dynamic IP addresses
- ❖ do not communicate directly with each other

Web and HTTP

First, a review...

- ❖ *web page* consists of *objects*
- ❖ object can be HTML file, JPEG image, Java applet, audio file,...
- ❖ web page consists of *base HTML-file* which includes *several referenced objects*
- ❖ each object is addressable by a *URL(uniform resource locator)*, e.g.,

www.someschool.edu/someDept/pic.gif

host name

path name

HTTP overview

HTTP: hypertext transfer protocol

- ❖ Web's application layer protocol
- ❖ client/server model
 - **client**: browser that requests, receives, (using HTTP protocol) and "displays" Web objects
 - **server**: Web server sends (using HTTP protocol) objects in response to requests



HTTP overview (continued)

- ❖ HTTP messages (application-layer protocol messages) exchanged between browser (HTTP client) and Web server (HTTP server) using Networking protocol s/w and interfacing HW (i.e TCP/IP/link layer/Phy. Layer)

HTTP is “stateless”

- ❖ server maintains no information about past client requests

aside
protocols that maintain “state” are complex!

- ❖ past history (state) must be maintained
- ❖ if server/client crashes, their views of “state” may be inconsistent, must be reconciled

HTTP request message

- ❖ two types of HTTP messages: *request, response*
- ❖ **HTTP request message:**
 - ASCII (human-readable format)

request line
(GET, POST,
HEAD commands)

header
lines

carriage return,
line feed at start
of line indicates
end of header lines

(Method) (URL) ...
GET /index.html HTTP/1.1\r\n
Host: www-net.cs.umass.edu\r\n
User-Agent: Firefox/3.6.10\r\n
Accept: text/html,application/xhtml+xml\r\n
Accept-Language: en-us,en;q=0.5\r\n
Accept-Encoding: gzip,deflate\r\n
Accept-Charset: ISO-8859-1,utf-8;q=0.7\r\n
Keep-Alive: 115\r\n
Connection: keep-alive\r\n
\r\n

carriage return character
line-feed character

The diagram illustrates the structure of an HTTP request message. It shows a sequence of lines: a request line, followed by header lines, and a final line indicating the end of the header. Annotations with arrows point to specific parts of the message: 'request line (GET, POST, HEAD commands)' points to the first line; 'header lines' points to the subsequent lines; 'carriage return, line feed at start of line indicates end of header lines' points to the '\r\n' at the end of the header section; and 'carriage return character' and 'line-feed character' point to the '\r' and '\n' characters respectively in the first line.

Method types

HTTP/1.1:

- ❖ GET, POST, HEAD
- ❖ PUT
 - uploads file in entity body to path specified in URL field
- ❖ DELETE
 - deletes file specified in the URL field

Restful API

What is Rest

- **REpresentational State Transfer**

- PhD by Roy Fielding
- The Web is the most successful application on the Internet
- What makes the Web so successful?

- **Addressable Resources**

- Every “thing” should have an ID
- Every “thing” should have a **URI**

- **Constrained interface**

- Use the standard methods of the protocol
- HTTP: GET, POST, PUT, DELETE

- **Resources with multiple representations**

- Different applications need different formats
- Different platforms need different representations (Different applications need different formats (HTML, XML, JSON, CSV, TXT))

- **Communicate statelessly**

- Stateless application scale

Describing a URI

- Human readable URIs: Desired but not required
- URI Parameters : Query parameters to find other resources

“ You can pass parameters to HTTP GET requests by adding query parameters to the URL “

Ex) `?type=album&q=beyonce`

- Defined as key-value pairs
i.e: ***param=value***
- The first query parameter starts with a ?
- Subsequent query parameters start with &

Restful API

- Resources as URI
 - Use unique URI to reference every resource on your API
- Operations as HTTP Methods
 - GET – Queries
 - POST – Queries
 - PUT – Inset
 - DELETE - Update and delete

Many websites **expose REST APIs to outside developers.**
These are often called "**3rd-party APIs**" or "**Developer APIs**"

Examples:

GitHub

Hoads of Google APIs

Facebook

Instagram

Twitter

etc...

Most services including **Cloud management services** open it using **restful API...**

