



CENG 3507 Web Development & Programming

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MUĞLA SITKI KOÇMAN ÜNİVERSİTESİ
COMPUTER ENGINEERING
2022 – Fall

Introduction

Content, Logistics, Grading, etc.



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What this course is about?

“Front-End Development”

Front-End = User interface

Web Pages & Applications.

Programming Languages

HTML, CSS, and JavaScript.

HTML



Hyper Text Markup Language

- **create** web pages

CSS



Cascaded Style Sheets

- **style** web pages

JS



JavaScript

- **interactive** web pages



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About the Class - Class Web-Access

- **dys.mu.edu.tr**, the official LMS site of MSKÜ
 - **Quizzes & Exams**
 - Lecture Notes
 - Forums
 - Online Guides, Reading Assignments,
 - Any materials related to the course.
- **Office-365: MS Teams**, “**CENG 3507–2022**” Team.
 - **Homework & Projects**
 - Q&A's sessions, Collaborative Studies/Works
 - You can access it by your account for **posta.mu.edu.tr**



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Logistics & Lecture Flow

- **Course hours**

- Thu : 13:30 – 17:10 (4 Lectures)
- Wed: 13:30 – 14:10 (1 Lecture - Recitation/Office Hours)

- **Location**

- Classroom: **B3B08-Lab**

- **Lecture Flow**

- 40mins per lecture,
- **Lecture** -> **Lab** -> [**Quiz**] sessions per lecture.

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Evaluation & Grading

- **Grading**

- **40% Midterm**, (Mostly HTML & CSS)

- 10% - Quizzes + Class-Work
- 10% - Homeworks
- 20% - Project – 1
- 10% - Written exam.

- **60% Final**

- 10% - Quizzes + Class-Work
- 10% - Homeworks
- 30% - Project – 2
- 30% - Written exam.

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Academic Integrity & Ethics

- Don't **copy-paste** codes in projects from the internet. Doing so, **will result in a 0 score**.
- This class encourages the use of templates and collaboration, as long as you clearly indicate (give reference to) when you use external resources, and be sure the main part of the work is your own.

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World Wide Web (WWW)

History, Internet Protocols for WWW, etc.

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The Internet – Networks of Networks

Invented in 1969

Defense Advanced Research Projects Agency (DARPA)



- The Internet began as a network to **connect computers at research facilities and universities.**
- Messages travel from source to destination by **multiple routes**, or paths.
- This configuration **allows the network to function even if parts of it were broken or destroyed.**



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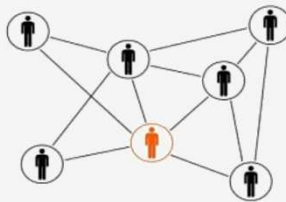
Internet vs Intranets

**Global Network
(Unlimited User)**



Internet

**Company's Network
(Limited User)**



Intranet

VS

Internet

The interconnected network of networks.

Intranet

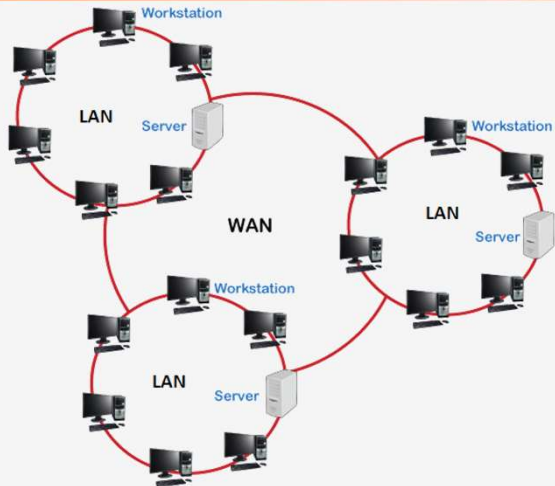
The networks of private groups of individual users.
e.g., University networks, company networks, etc.



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WAN vs LAN



WAN – Wide Area Net

=> Internet

LAN – Local Area Net

=> Intranet connection



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WWW – World Wide Web

Invented in 1991,
by **Tim Berners-Lee** from **CERN**,
as a means of communication by
“**hyperlink**”ing research papers
to each others for easy access.



World Wide Web (WWW)

is the

network of web servers



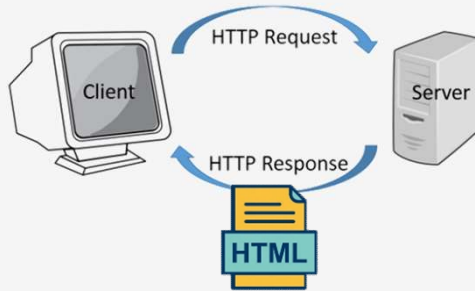
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WWW – World Wide Web

“Front-End”

“Back-End”



WWW

uses

Hypertext Transfer Protocol (**HTTP**)
to transfer Web Pages, formatted by
Hypertext Markup Language (**HTML**),
from
web servers to **client computers**.

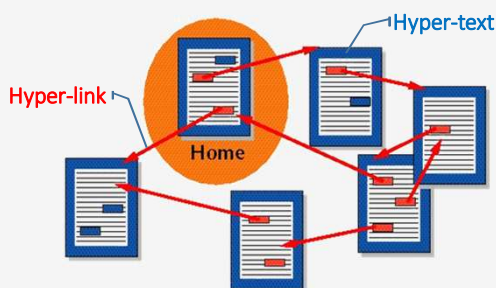


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What is **Hypertext** in **HTML** (and **HTTP**)?

WWW
is
a network of **Hypertext**



Hypertext is
a **text document** with **hyper-links** to
other text documents.

HTML is a **Markup Language**
to markup/create such
Hypertext with hyper-links.

HTTP is a **Transport Protocol**
to transport **Hypertext**
from servers to clients.

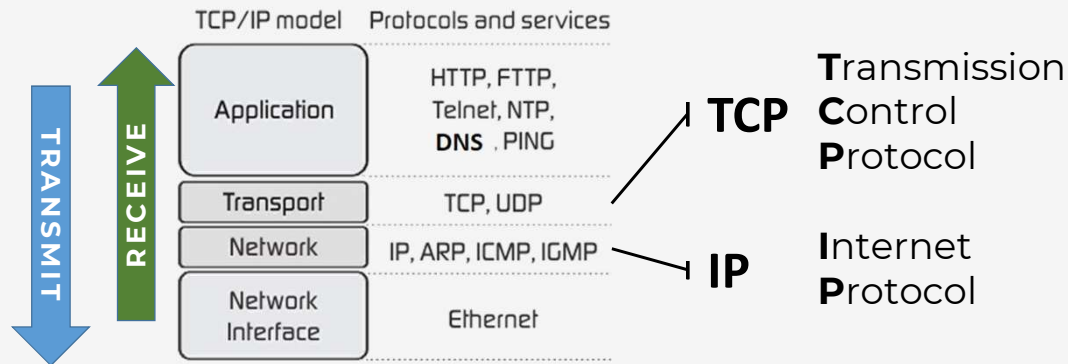


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HyperText Transfer Protocol (HTTP)

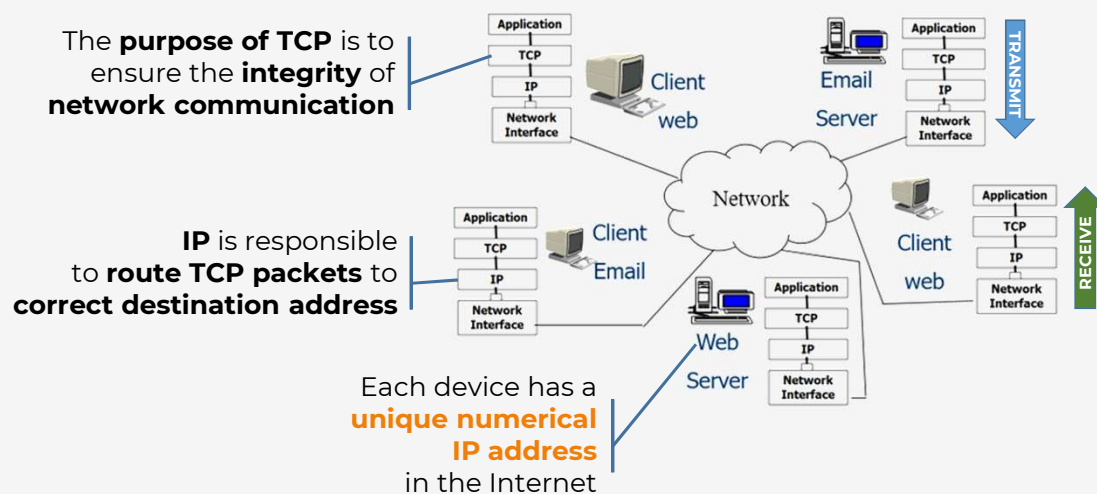
HTTP is a TCP/IP Service



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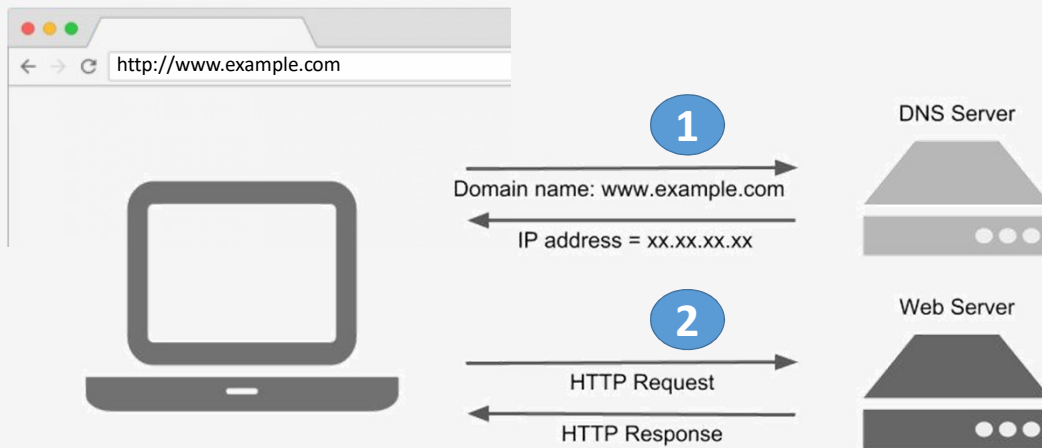
TCP/IP = Internet Protocol



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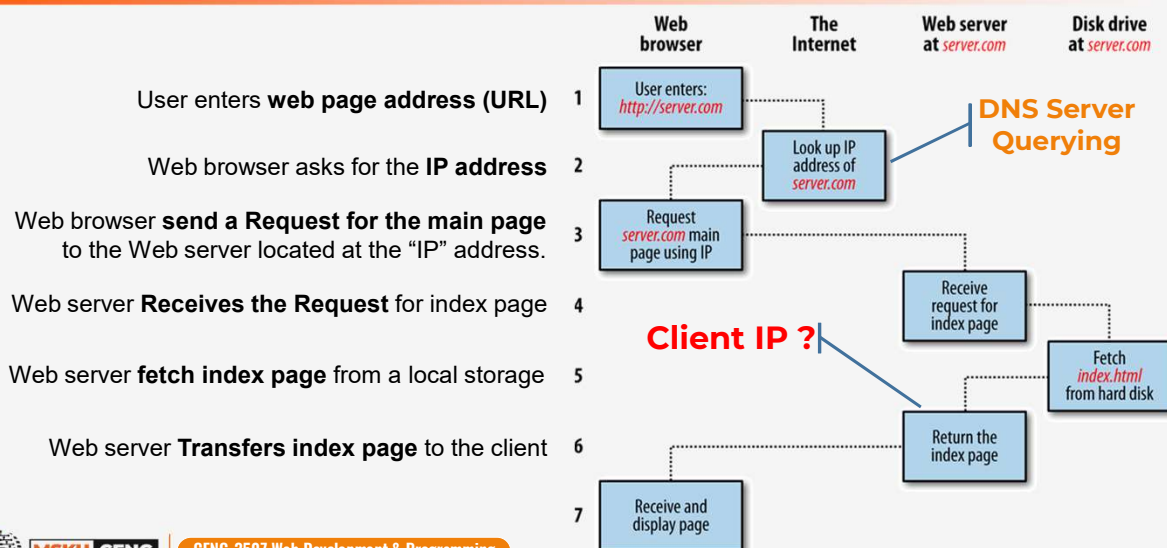
Browsing WWW



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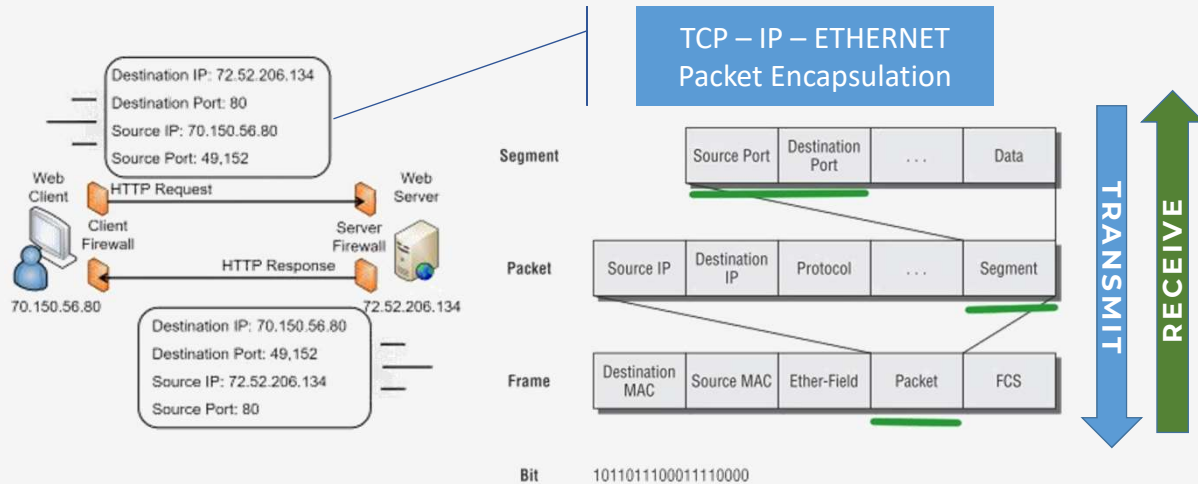
Browsing to a Web Page: Step-by-Step (DNS Query + HTTP)



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Browsing to a Web Page: Step-by-Step (DNS Query + HTTP)



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TCP Ports for Common TCP/IP Services (Protocols)

Port	IP	Protocol
25	TCP	SMTP
53	TCP & UDP	DNS
80	TCP	HTTP
161	UDP	SNMP



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Domain Name Service – Domains & Domain Hierarchy

https://	www.	domain-name	.com
Protocol used in the link	Subdomain	domain name	top-level domain

http://www.example.com

ftp://www.example.com

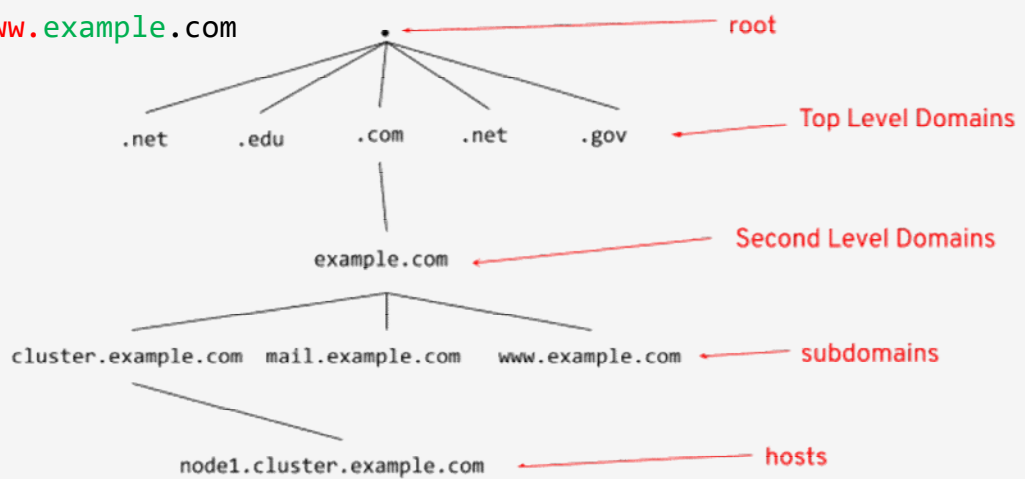


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Domains & Domain Hierarchy

http://www.example.com



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DNS Lookup

www.google.com => 142.250.87.164

```
ceng3507@webdev:~$  
ceng3507@webdev:~$  
ceng3507@webdev:~$ nslookup www.google.com  
Server:      127.0.0.53  
Address:     127.0.0.53#53
```

Query DNS
servers

Non-authoritative answer:

```
Name:   www.google.com  
Address: 142.250.187.164
```

IP v4
Address

```
Name:   www.google.com  
Address: 2a00:1450:4017:811::2004
```

IP v6
Address



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Requesting Index Page from a http server

Telnet is an application that provides a bidirectional text-oriented communication between two computers.

```
ceng3507@webdev:~$ telnet www.google.com 80  
Trying 172.217.169.132...  
Connected to www.google.com.  
Escape character is '^['.
```

Connect to
google web server
at port 80



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Requesting Index Page from a http server

```
ceng3507@webdev:~$ telnet www.google.com 80
Trying 172.217.169.132...
Connected to www.google.com.
Escape character is '^]'.
GET / HTTP/1.1
HTTP/1.1 200 OK
Date: Sun, 04 Sep 2022 21:12:13 GMT
Expires: -1
Cache-Control: private, max-age=0
Content-Type: text/html; charset=ISO-8859-1
P3P: CP="This is not a P3P policy! See g.co/
```

Request index page

Extra CR

Response



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Uniform Resource Locators – URLs

URL

http://www.example.com

Protocol

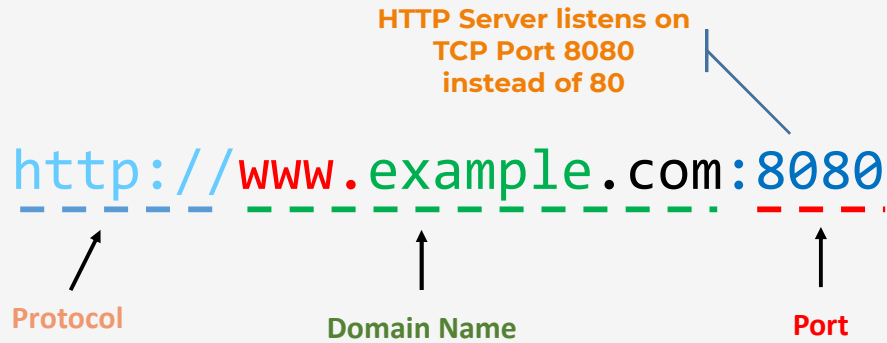
Domain Name



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URLs

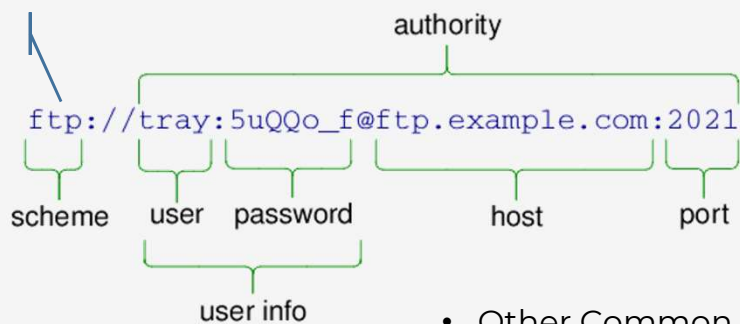


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URLs

FTP
Protocol
(Service)



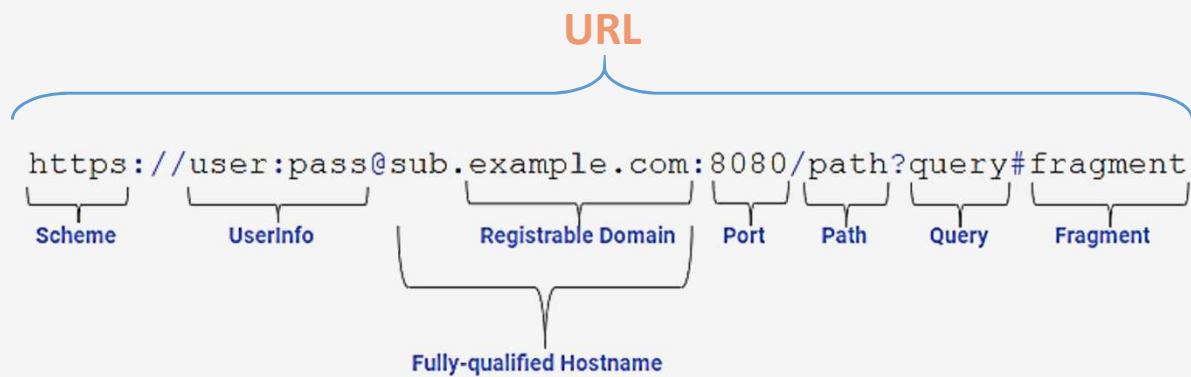
- Other Common Protocols:
 - **https://** (secure)
 - **ftp://** (file transfer)
 - **mailto://** (e-mail address)
 - **file://** (local files)



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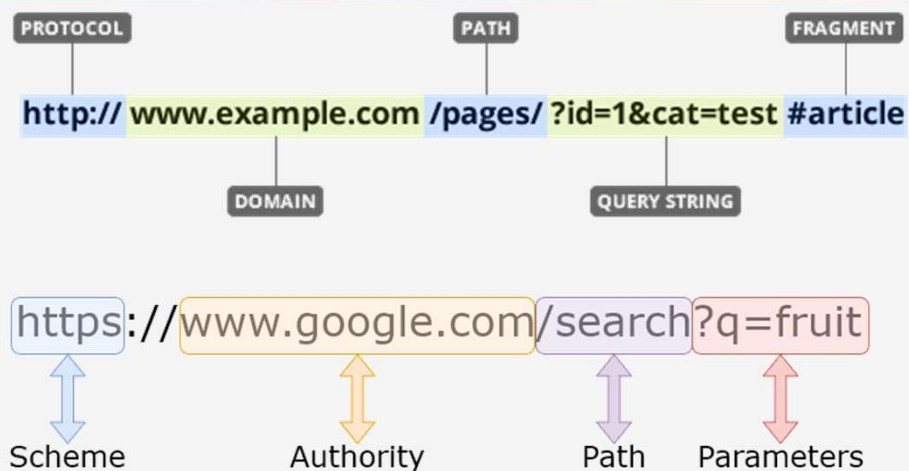
URLs – Fully Decorated



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URLs



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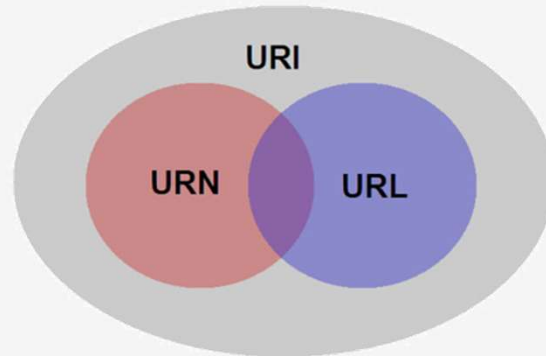
URI, URL and URN

URI : Uniform Resource Identifier

URL : Uniform Resource Locator

URN : Uniform Resource Name

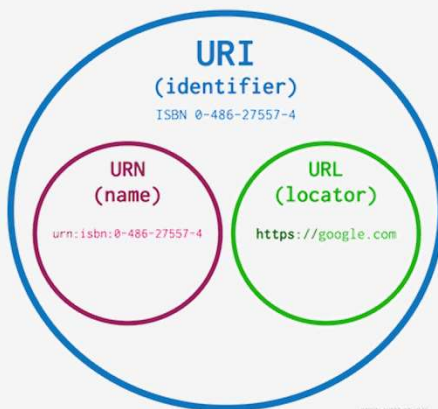
**All URLs are URIs
but not vice versa**



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URI, URL, URN Examples



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URL

URN

`https://en.wikipedia.org/wiki/Uniform_Resource_Identifier#Examples`

URI

Misc. URN Examples

`urn:isbn:1234567890`

`urn:ISSN:0167-6423`

`urn:ietf:rfc:2648`

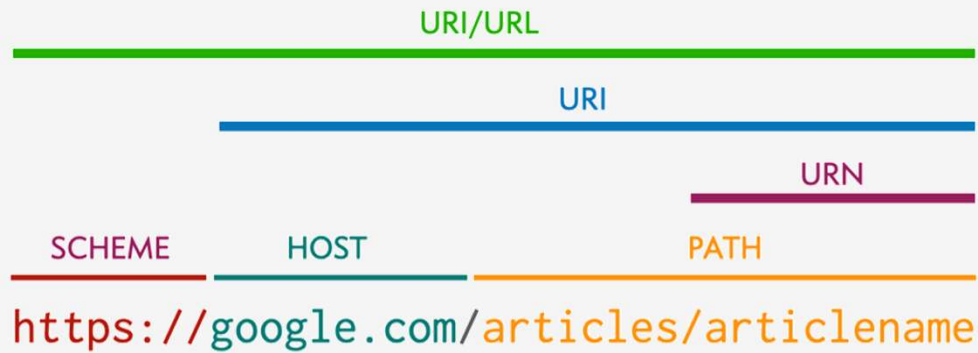


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<https://uri.to/index.php?a=1&u=WebService>

URI, URL, URN Examples

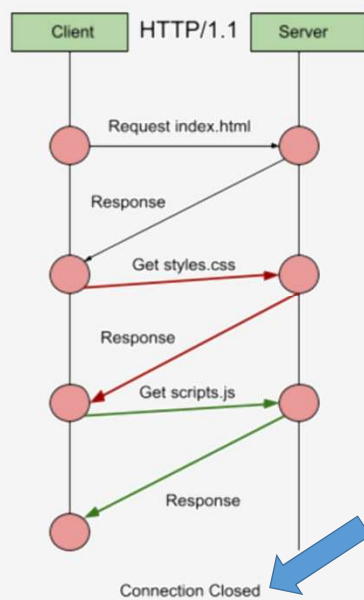


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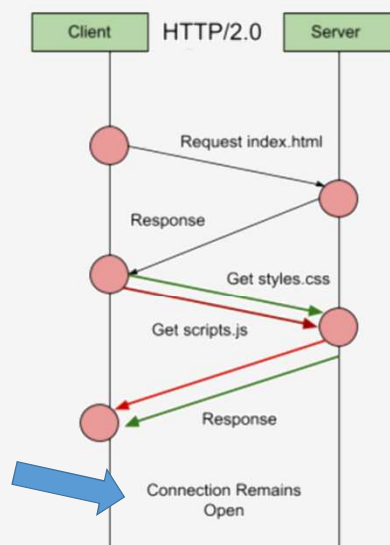
<https://danielmiessler.com/study/difference-between-uri-url/>

Slow Communication



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Fast Communication



Multipurpose Internet Mail Extensions (MIME) Types

```
Connected to www.google.com.
Escape character is '^]'.
GET / HTTP/1.1

HTTP/1.1 200 OK
Date: Sun, 11 Sep 2022 17:40:27 GMT
Expires: -1
Cache-Control: private, max-age=0
Content-Type: text/html; charset=ISO-8859-1
P3P: CP="This is not a P3P policy! See g.co/p3
Server: gws
X-XSS-Protection: 0
X-Frame-Options: SAMEORIGIN
Set-Cookie: 1P_JAR=2022-09-11-17; expires=Tue,
```

text/html

MIME Type refers to
HTML page.



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Multipurpose Internet Mail Extensions (MIME) Types

Primary MIME Types

- **text/plain** : default for textual files.
- **application/octet-stream** : default for all other cases.

Common MIME Types

- **text/css** : Cascading Style Sheets (CSS).
- **text/javascript** : JavaScript.
- **application/json** : JSON format.
- **image/jpeg** : JPEG images



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Other Markup Languages

Standard Generalized Markup Language (SGML)

SGML itself is not a markup language. Instead, it is a standard for specifying a markup language and create a **document type definition (DTD)**. Tim Berners-Lee use SGML to develop HTML and create its specification.

Extensible Markup Language (XML)

XML was developed by the **W3C**, and designed to describe, deliver, store, exchange, transport data. It is intended to extend the power of HTML by separating data from presentation. It is designed to be both human and machine readable.



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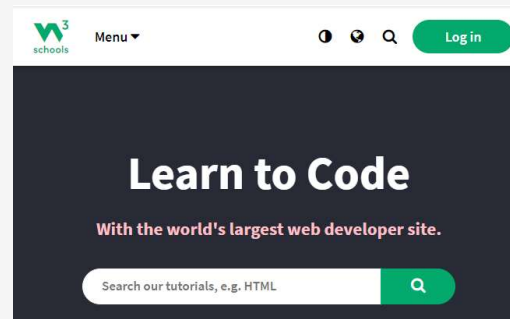
Organizations



World Wide Web Consortium

The World Wide Web Consortium is the main international standards organization for the World Wide Web. Founded in 1994 and currently led by Tim Berners-Lee.

<https://www.w3.org/>



<https://www.w3schools.com/>

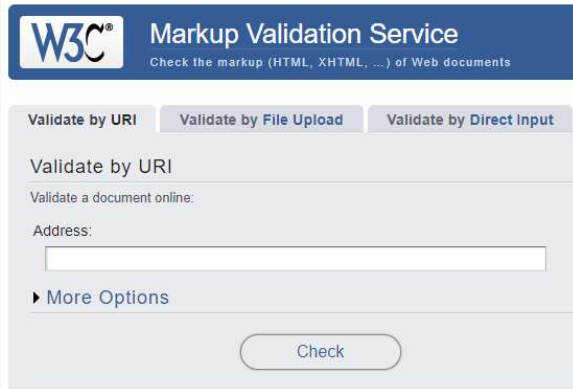


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Validators

<https://validator.w3.org/>



W3C® Markup Validation Service
Check the markup (HTML, XHTML, ...) of Web documents

Validate by URI Validate by File Upload Validate by Direct Input

Validate by URI

Validate a document online:

Address:

► More Options

Check

<https://jigsaw.w3.org/css-validator/>



W3C® CSS Validation Service
Check Cascading Style Sheets (CSS) and (X)HTML documents with style sheets

By URI By file upload By direct input

Validate by URI

Enter the URI of a document (HTML with CSS or CSS only) you would like validated:

Address:

► More Options

Check

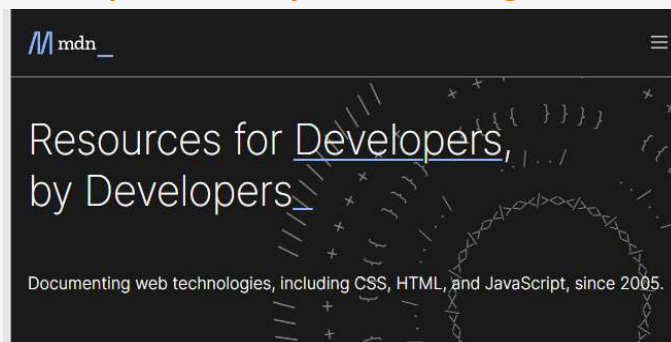


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Mozilla Developer Network

<https://developer.mozilla.org/en-US/>



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