BADJI MOKTAR – Annaba university
faculty of technology
Computer Science department

Course materials:

Web development

2nd year computer science bachelor's degree

Dr, Mohamed BESNACI

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Content

- **Generalities**
  - Web Development, Website
  - Internet, Protocol, Internet Service
  - Client/Server, Hosting, Browser, DNS, IP
  - Web Page, Hyperlink, Web Language
  - Front-end/Back-end Development
- **HTML**
  - Introduction, Tags, Attributes
  - Basic Tags and Structure
  - Common Tags
  - Lists, Images, Tables, Forms, Other Elements
  - Deployment (Hosting)

- **CSS**
  - Introduction, principles, rules, selectors
  - Text, background, borders, positioning
  - Responsive web design
- **JavaScript**
  - Introduction, Language Basics
  - Common objects
  - DOM manipulation
- **PHP**
  - Principle, Installation & Usage
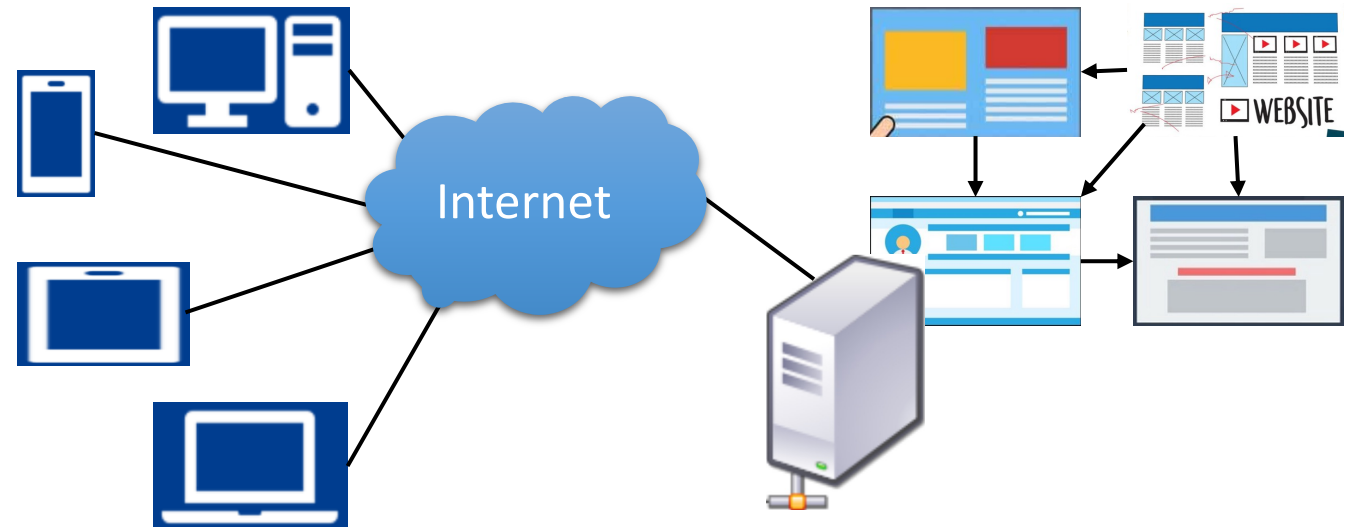 - Language Basics
  - Forms
  - Databases
- **Advanced tools**
  - Bootstrap, Sass, React/Angular/Vue, jQuery, JSON, AJAX
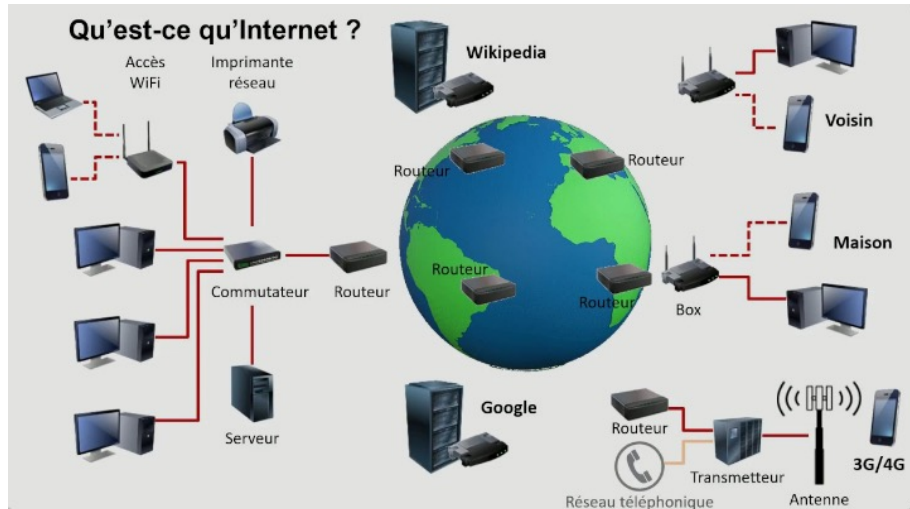
Part I: Generalities

Generalities

- WebDev ? Construction of **web sites**
- Web site ? Set of interconnected **web pages hosted** in a **server** connected to the **internet**, the pages are **requested** by **clients** also connected to the internet

Internet

Generalities

Web site ? set of interconnected **web pages hosted** in a **server** connected to the **internet**, The pages are **requested** by **clients** also connected to the internet

Internet ? Global public computer network composed of a very large number of interconnected machines (computers, phones, modems, routers, repeaters, switches, etc.), where information transfer occurs through a set of transfer **protocols**, offering various **services**.

Internet ?

Generalities

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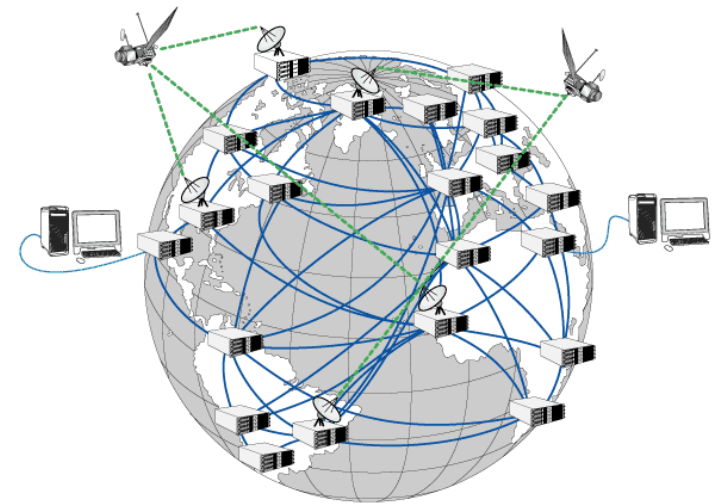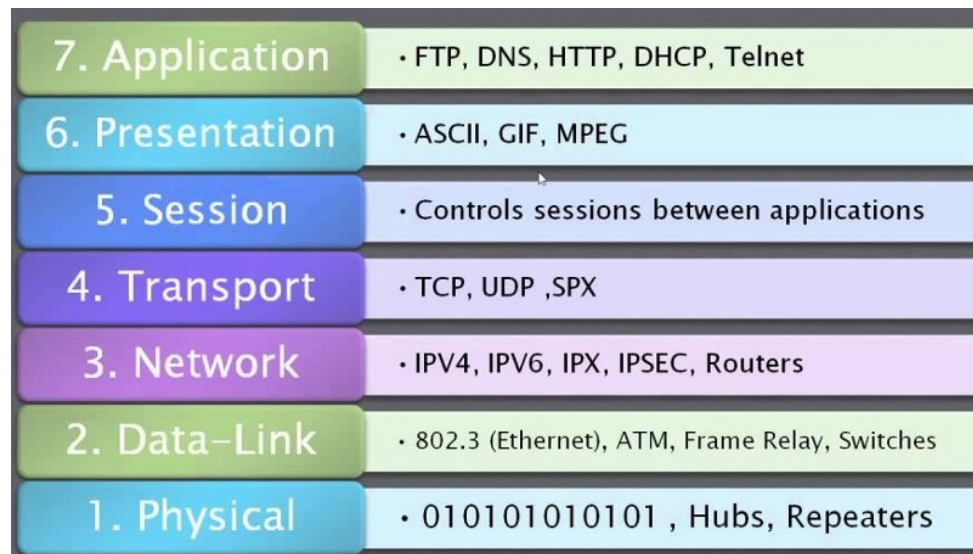
Protocoles ? Set of rules managing data transfer via the network (rules ensuring communication between two machines on the same network abstraction layer).

7. Application	· FTP, DNS, HTTP, DHCP, Telnet
6. Presentation	· ASCII, GIF, MPEG
5. Session	· Controls sessions between applications
4. Transport	· TCP, UDP ,SPX
3. Network	· IPV4, IPV6, IPX, IPSEC, Routers
2. Data–Link	· 802.3 (Ethernet), ATM, Frame Relay, Switches
1. Physical	· 010101010101 , Hubs, Repeaters

Generalities

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Services ? Web, messaging, file transfer (FTP), streaming, podcasting, chat, forum, telephony, …

Web

Messaging

Files

Generalities

Web site ? set of interconnected **web pages hosted** in a **server** connected to the **internet**, The pages are **requested** by **clients** also connected to the internet

- Client/serveur ? Client is the one who sends requests (e.g., requesting a page) to the server, which responds to them. The server thus provides a service to the client.

  ➢Client: machine equipped with client software (e.g., web browser).
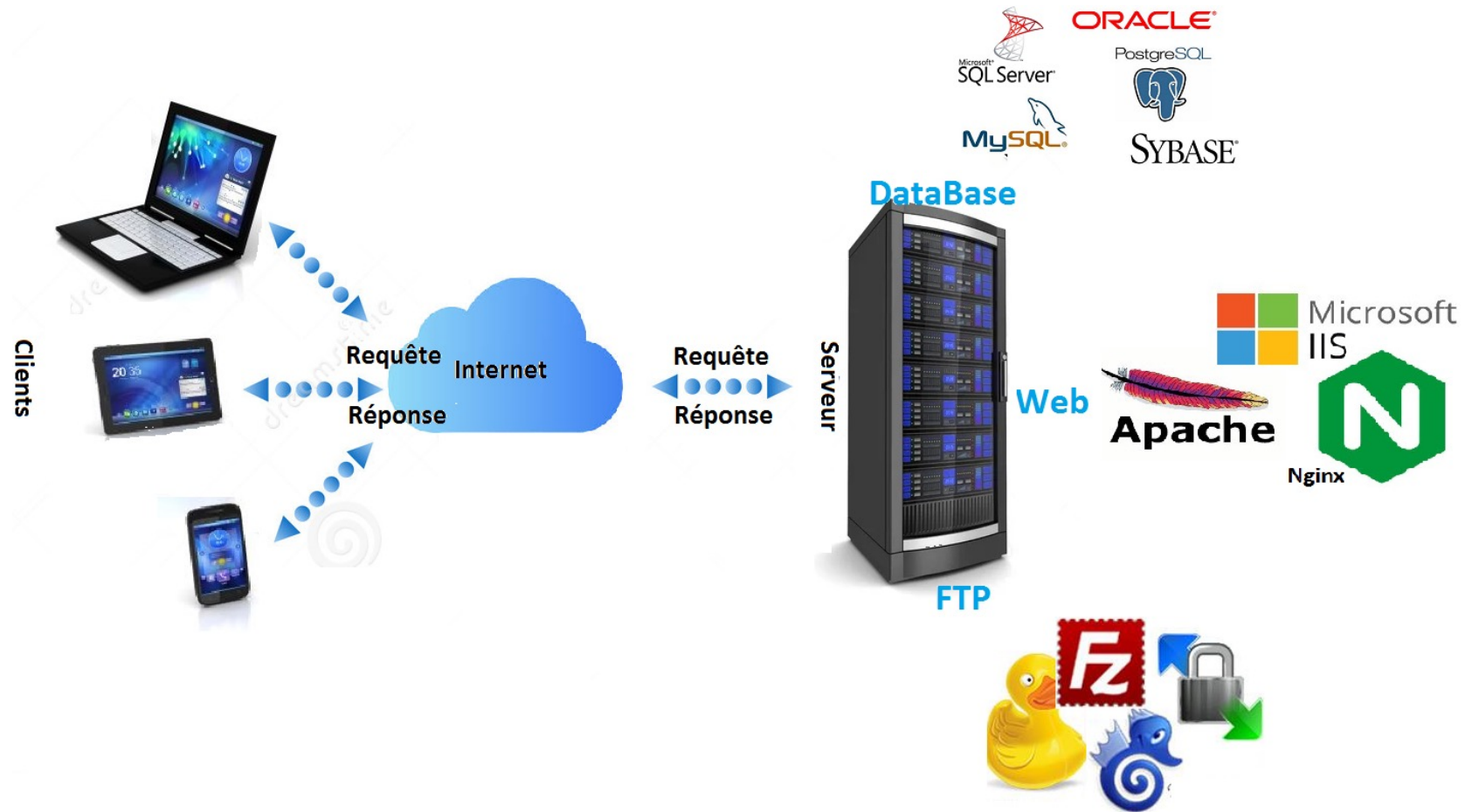 ➢Server: machine equipped with server software (e.g., web server).

Generalities

Web site ? set of interconnected **web pages hosted** in a **server** connected to the **internet**, The pages are **requested** by **clients** also connected to the internet

- **Clients:** personal computers, smartphones, tablets.
- **Servers:** computers having superior characteristics in terms of: computing power, storage capacity, permanent internet connection, security, etc.
- Depending on the service offered, we distinguish, among others:
  - **Web server** publishing web pages requested by web browsers.
  - **Mail server** transmitting emails to mail client.
  - **Database server** sending data from a database to requesting clients.

Generalities

Generalities

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- Web hosting provider: company providing server machines to host websites in a secure manner (protection against disconnection, power outage, various attacks, etc.).
  - **Exemples**: Hostinger, LWS, O2Switch, Ionos, Godaddy, …

- Web browser: software designed to browse and display web pages that have been requested from servers.
  - **Exemples**: chrome, safari, mozilla firefox, opera, …

Generalities

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How does it work?

When a visitor requests a page through their web browser, the browser queries **DNS servers** to find out the **IP address** of the server hosting that site. With the IP address, the browser queries the server and requests the page. The server looks for the page in its storage space (**static page**) or generates it using a script (**dynamic page**), then sends it to the browser, which displays it on the visitor's screen.
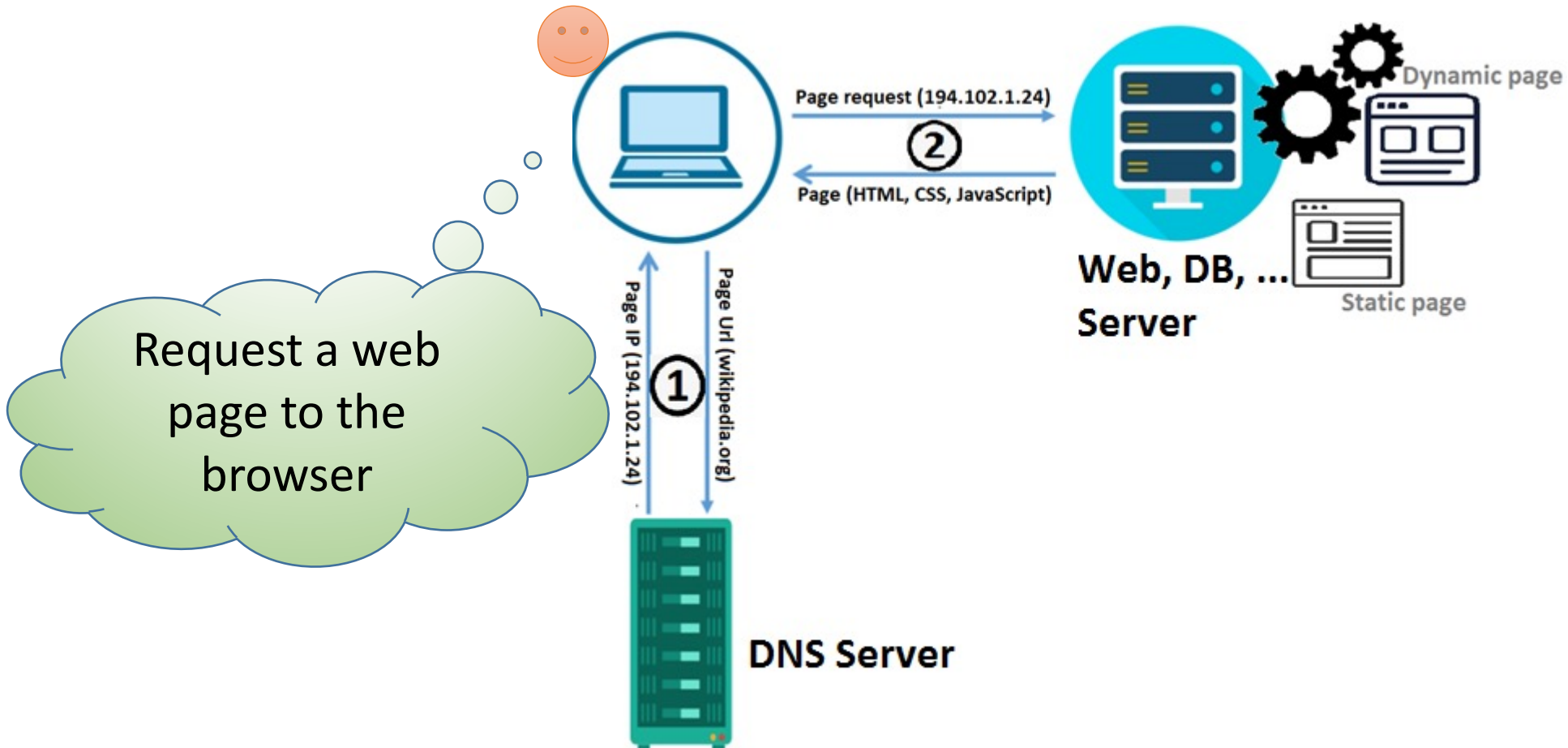
Generalities

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Request a web page to the browser

Page request (194.102.1.24)
②
Page (HTML, CSS, JavaScript)

Dynamic page

Web, DB, ... Server

Static page

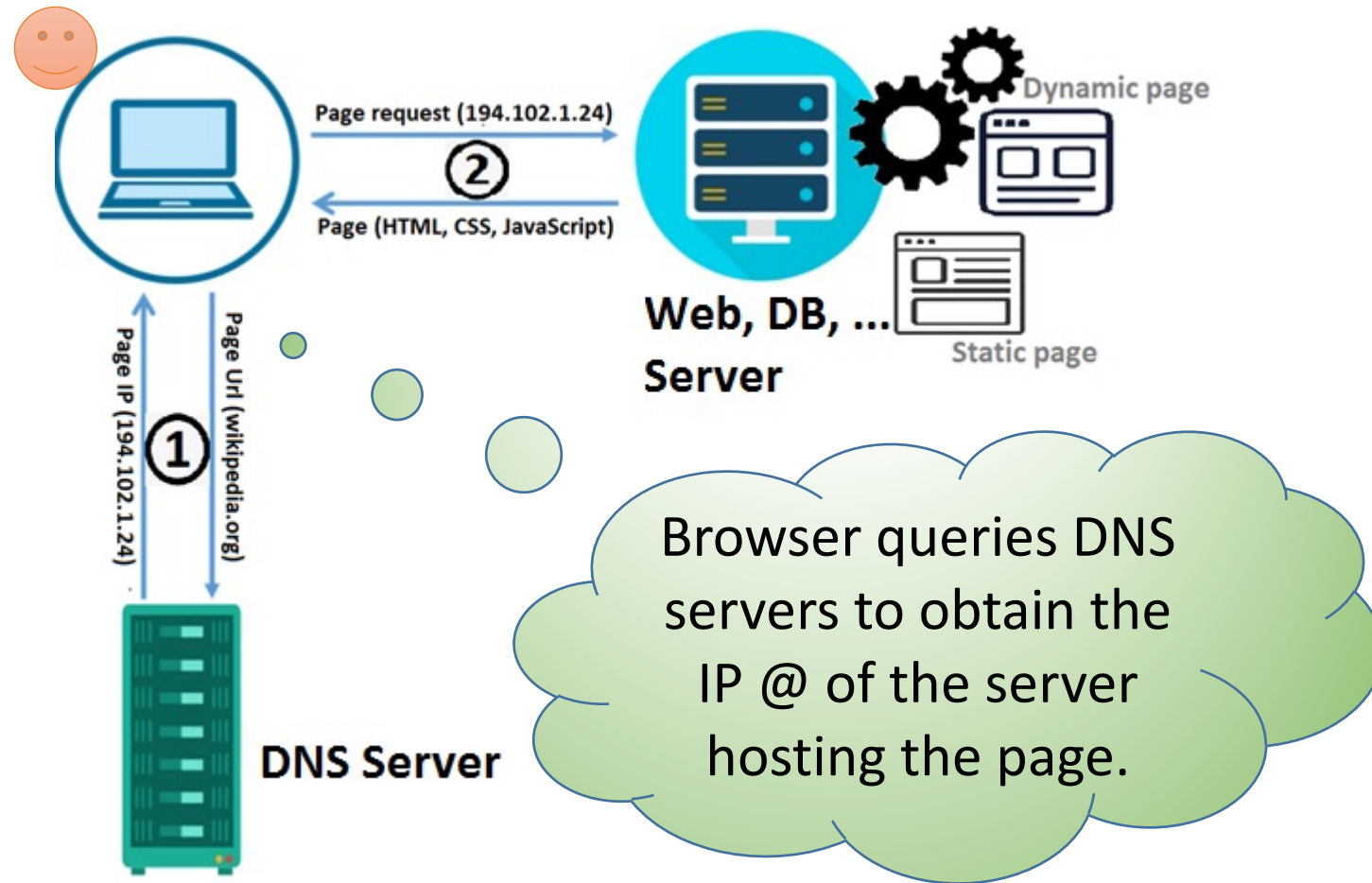Page IP (194.102.1.24)

Page Url (wikipedia.org)

①

DNS Server

Generalities

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Page request (194.102.1.24)

②

Page (HTML, CSS, JavaScript)

Dynamic page

Web, DB, ...
Server

Static page

Page IP (194.102.1.24)

Page Url (wikipedia.org)

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DNS Server

Browser queries DNS servers to obtain the IP @ of the server hosting the page.

Generalities

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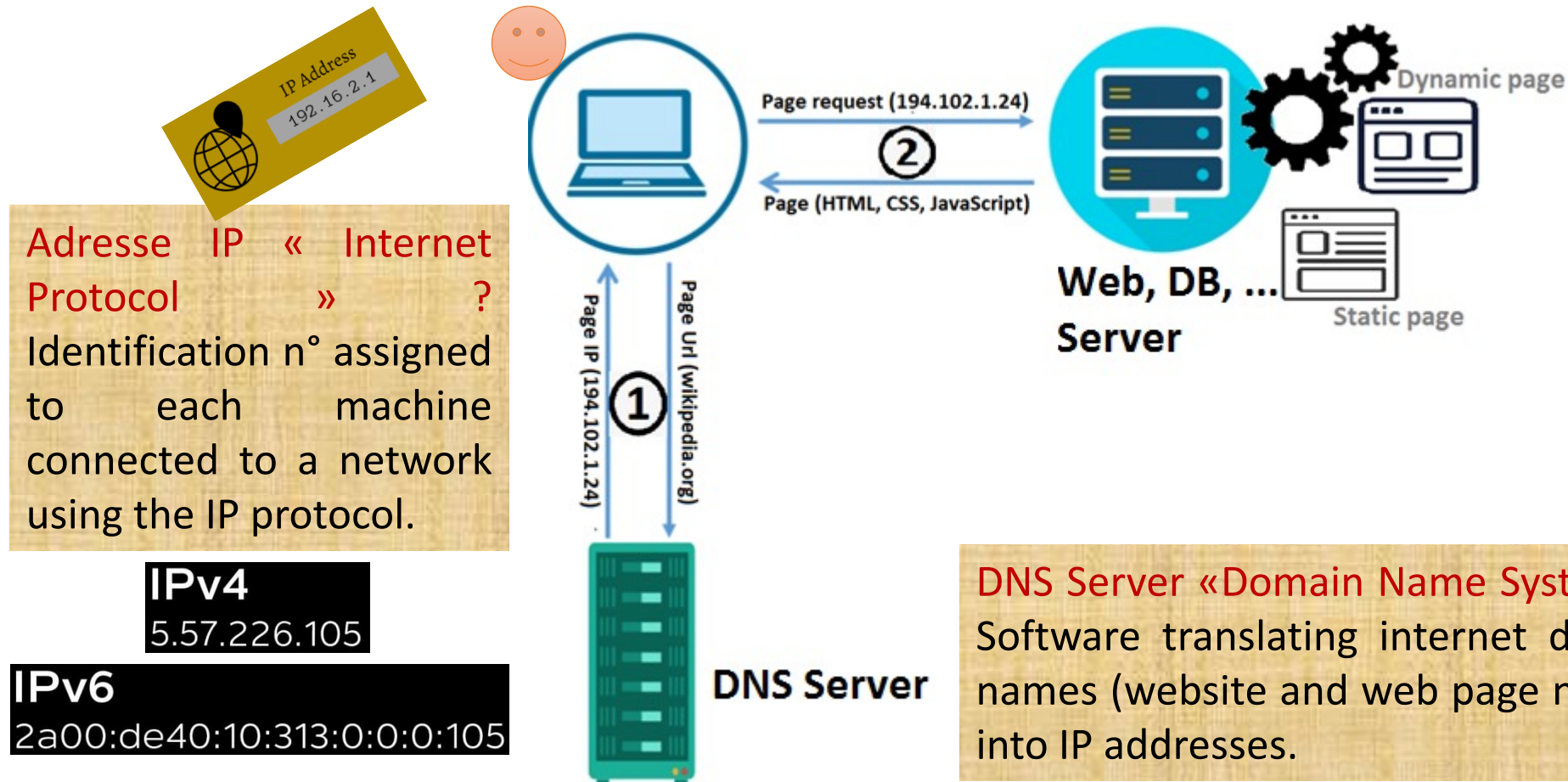
IP Address
192.16.2.1

Page request (194.102.1.24)
②
Page (HTML, CSS, JavaScript)

Page IP (194.102.1.24)
①
Page Url (wikipedia.org)

Adresse IP « Internet Protocol » ?
Identification n° assigned to each machine connected to a network using the IP protocol.

IPv4
5.57.226.105

IPv6
2a00:de40:10:313:0:0:0:105

Dynamic page

Web, DB, ...
Server

Static page

DNS Server

DNS Server «Domain Name System» ?
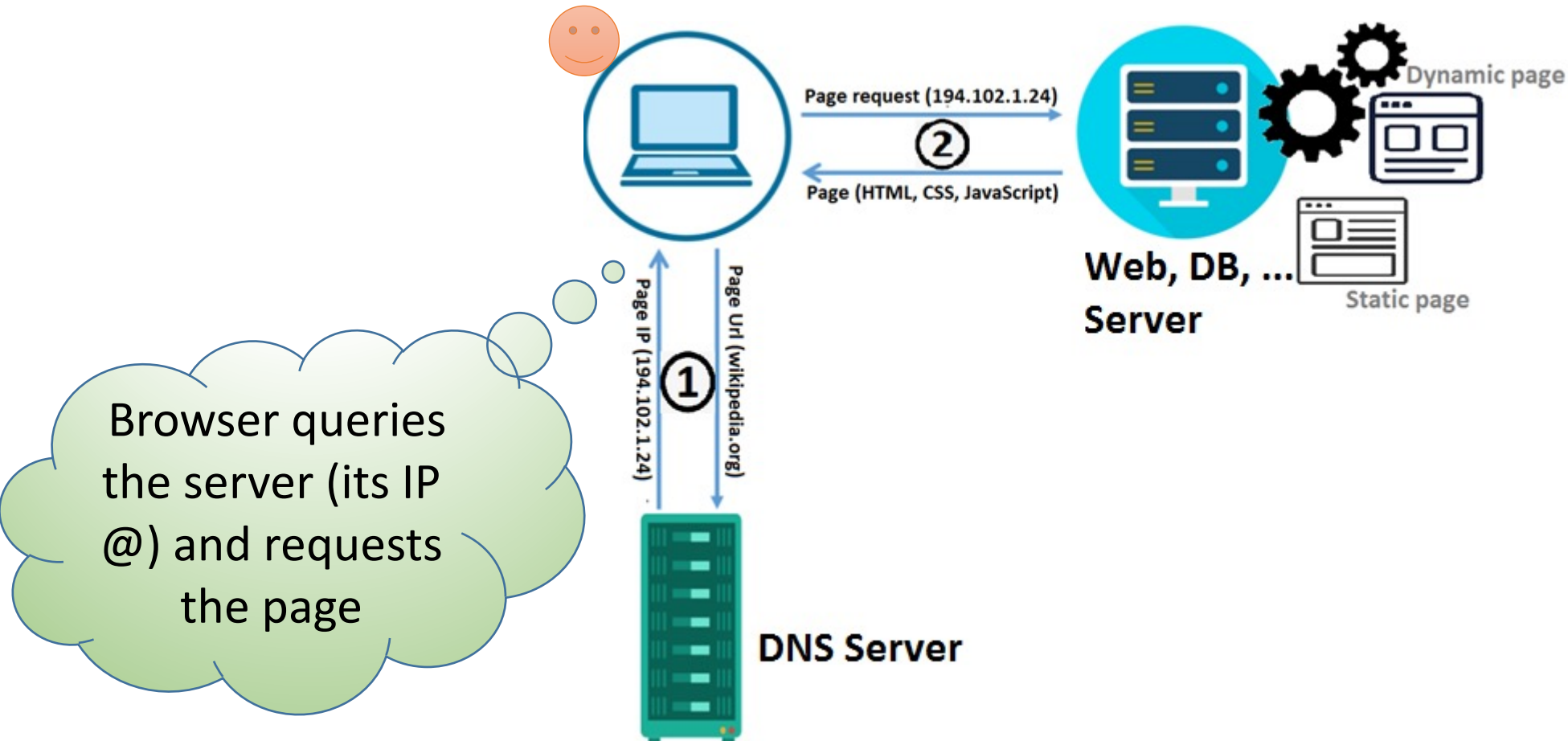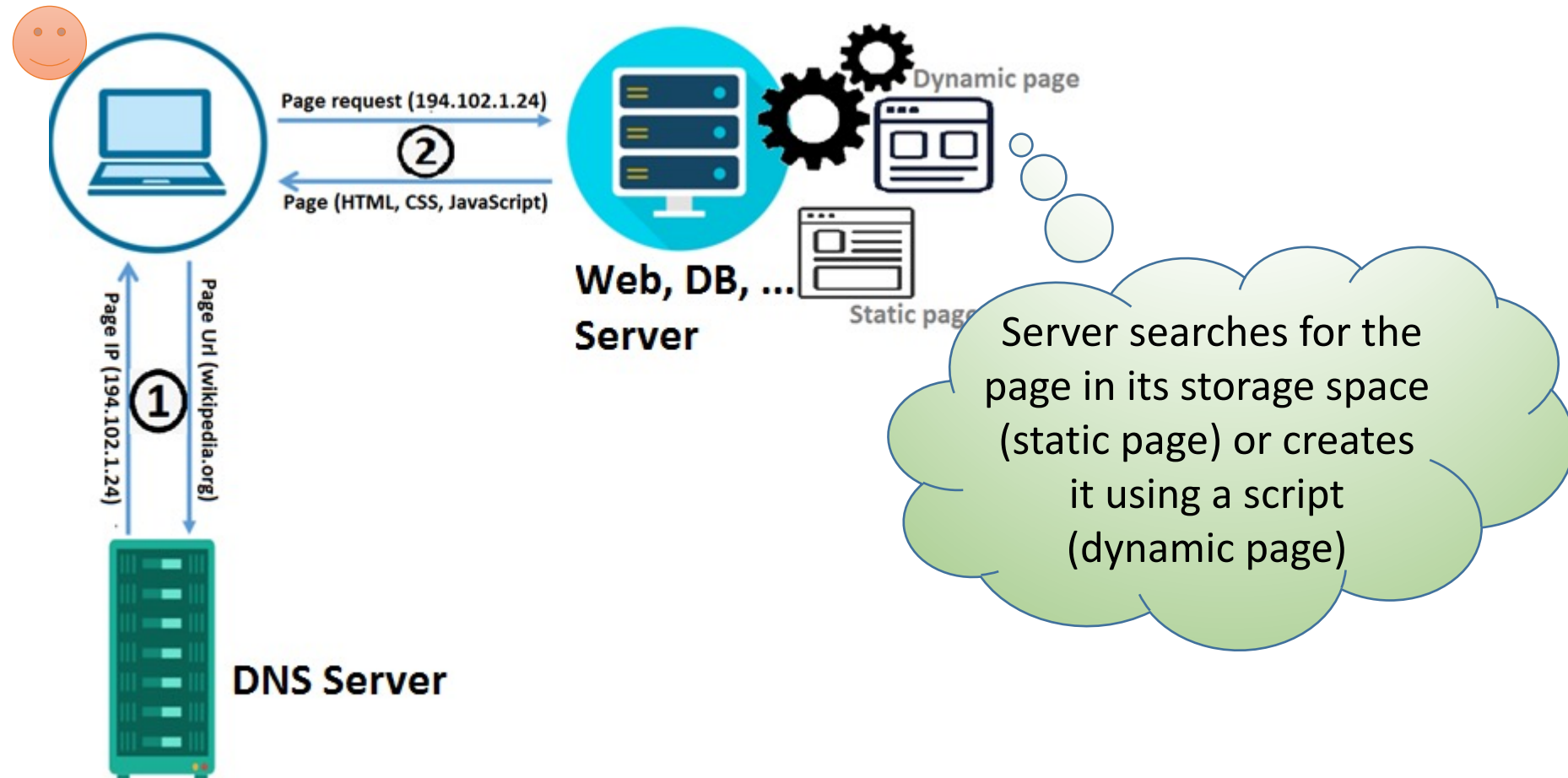Software translating internet domain names (website and web page names) into IP addresses.

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Page request (194.102.1.24)

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Page (HTML, CSS, JavaScript)

Dynamic page

Static page

Web, DB, ... Server

Page IP (194.102.1.24)

Page Url (wikipedia.org)

①

DNS Server

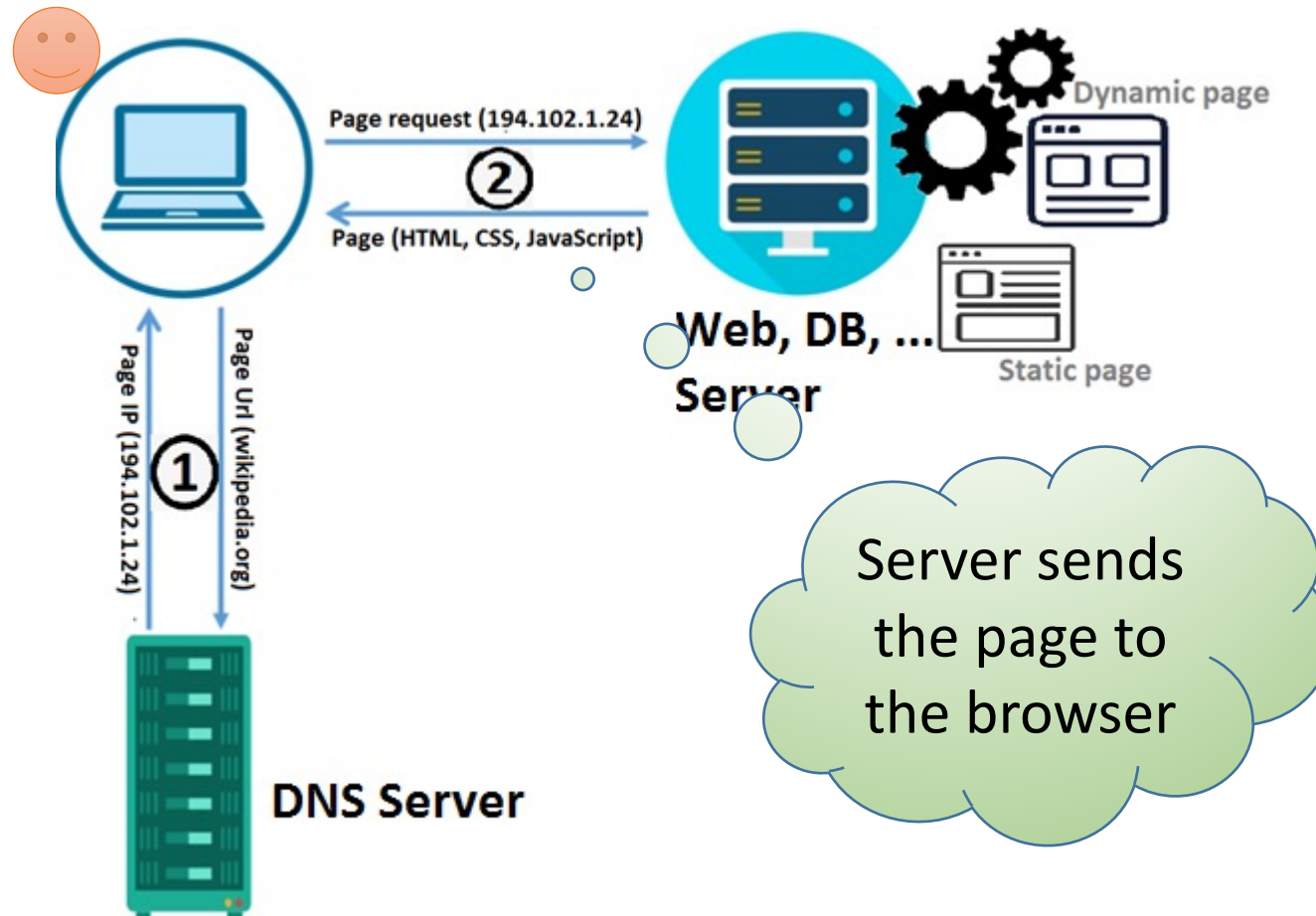Browser queries the server (its IP @) and requests the page

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Page request (194.102.1.24)
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Page (HTML, CSS, JavaScript)

Web, DB, ...
Server

Dynamic page

Static page

Page IP (194.102.1.24)
Page Url (wikipedia.org)
①

DNS Server

Server searches for the page in its storage space (static page) or creates it using a script (dynamic page)
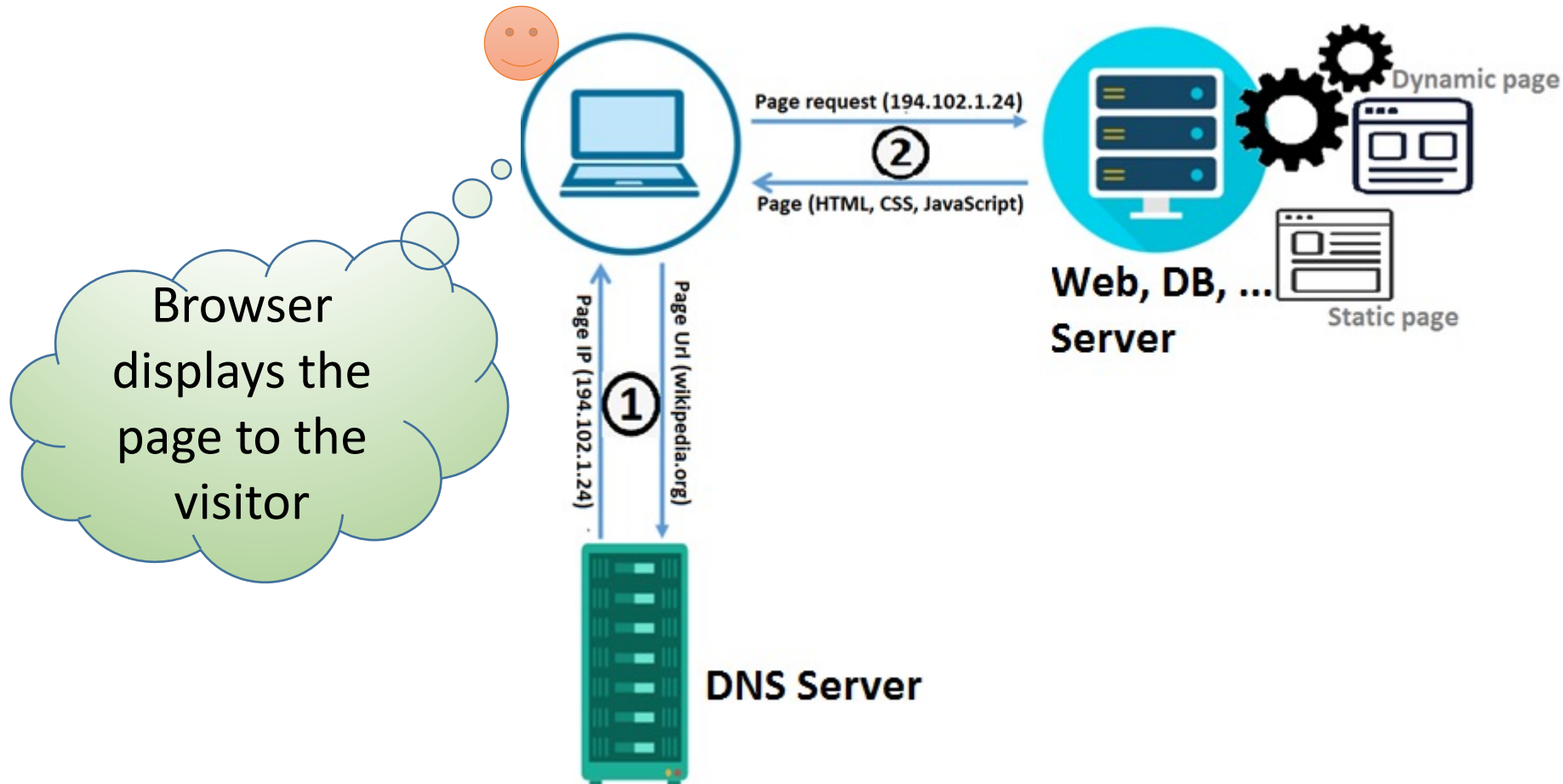
Generalities

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qui l'affiche sur l'écran du visiteur.

Page request (194.102.1.24)
②
Page (HTML, CSS, JavaScript)

Dynamic page

Web, DB, ...
Server

Static page

Page IP (194.102.1.24)

Page Url (wikipedia.org)

①

DNS Server

Server sends the page to the browser

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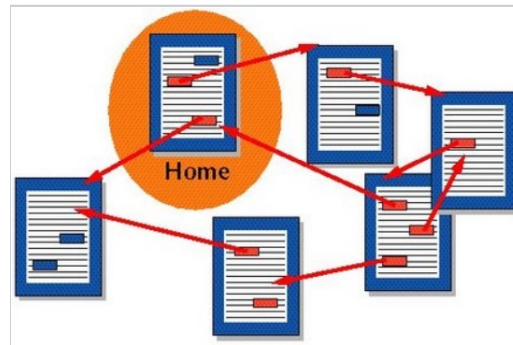
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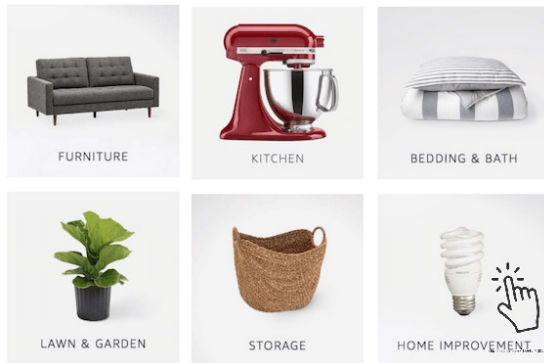
- Web page ? Electronic document composed potentially of text, **hyperlinks**, images, tables, forms, etc., viewable with a web browser, originally written in **HTML** but also with other **web languages**.
  - Static page: content remains unchanged regardless of the requester.
  - Dynamic page: generated on demand and varies depending on the requester.

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- Hypertext link ? Clickable reference (text, image, button, etc.) allowing navigation from one place on a web page to another place (same page, same site, or another site).

- Web languages? Languages used to build websites :
  - Client side: HTML, CSS, JavaScript
  - Server side: PHP, Python, Java, Ruby, …

Generalities

- Front-end ? Focuses on the visible elements (on the screen) and with which users can interact. In addition to design tasks, several tools are used in front-end development:
  - **HTML, CSS, JavaScript**
  - Framework/Library: Bootsrap(CSS), W3.CSS, Jquery(JS), React(JS), Vue.js, AngularJS, …
- Back-end ? Focuses on the hidden elements of websites. Hosting and server configuration, database creation and management, writing scripts for dynamic parts of the site are the basic functions of the Back-end. Among the tools used:
  - **PHP**, Java, Python, Node.js, Ruby, …
  - SQL
  - Frameworks: Django(Python), Express.js(JS), Lavarel(PHP), Ruby on rails(Ruby), …

Generalities