IT8201
Information Technology Essentials

PROFESSIONAL CORE

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Unit 1 Web Essentials

- Introduction to Website
- Creating a Website
- Working Principle of a Website
- Browser Fundamentals
- Authoring Tools
- Types of Servers

Introduction to Website

Website is a collection of web pages and related contents that is identified by a common domain name and published on at least one web server.

Web page is a special type of document written in scripting languages, such as HTML, CSS, JavaScript, PHP, etc.

Creating a Website

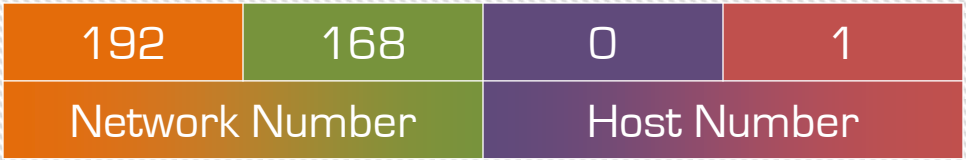
Testing the Website

IP Address

Each host on a network is assigned with a unique 32bit logical address that is divided into two main parts, the network number and the host number. This address is called IP Address.

IP address is grouped into four 8bits separated by dots

Eg: 192.168.0.1



DNS

It is difficult to remember numerical information but it is simple to remember textual information

Numerical Information	Textual Information
192.168.0.101	www.varuncm.com

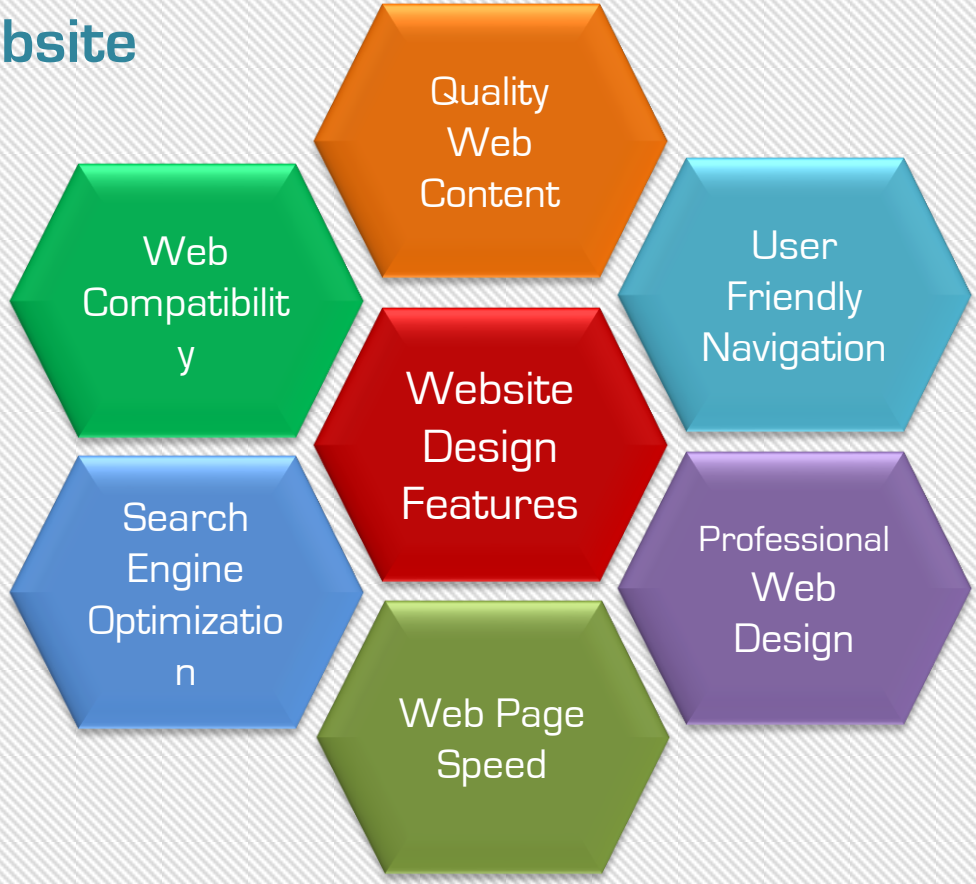
URL

Uniform Resource Locator

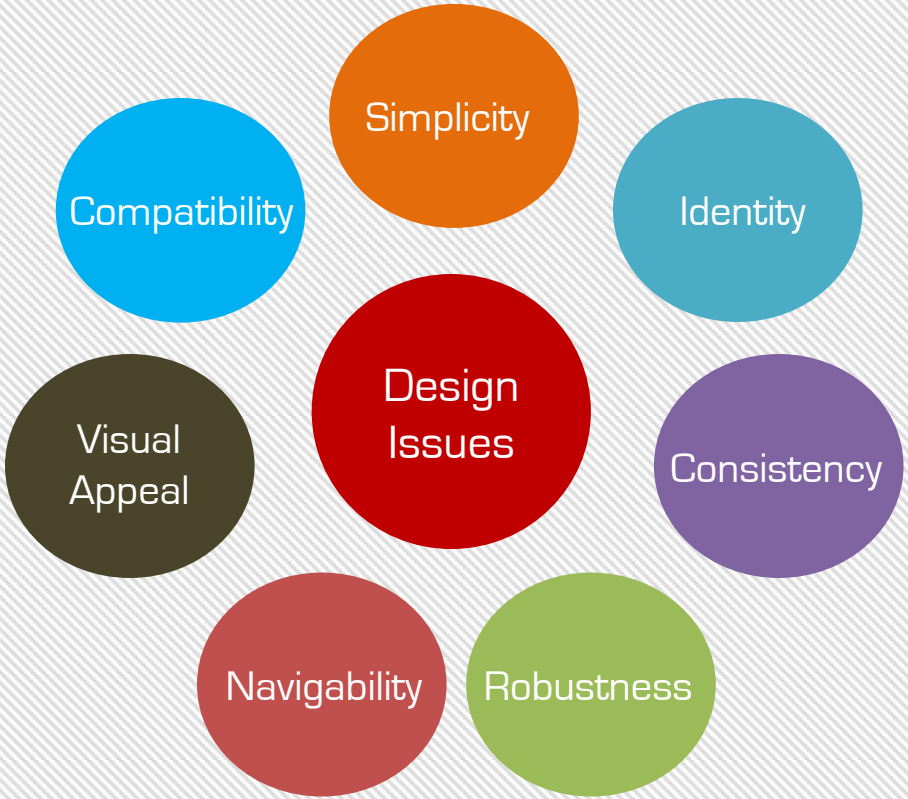
http://www.example.com/images/banner01.jpg

Protocol://	username@hostname	path	Filename
http://	www.example.com	images	banner01.jpg

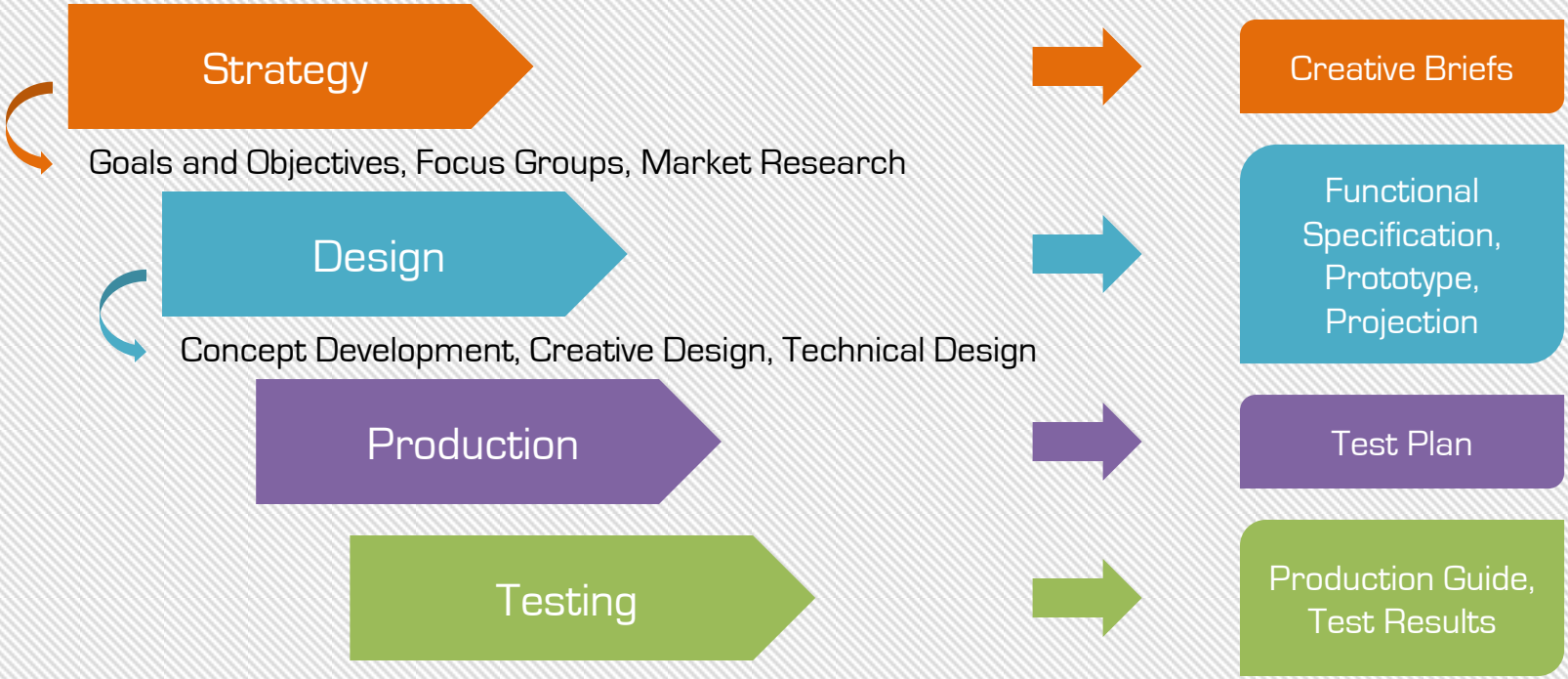
Working Principle of a Website



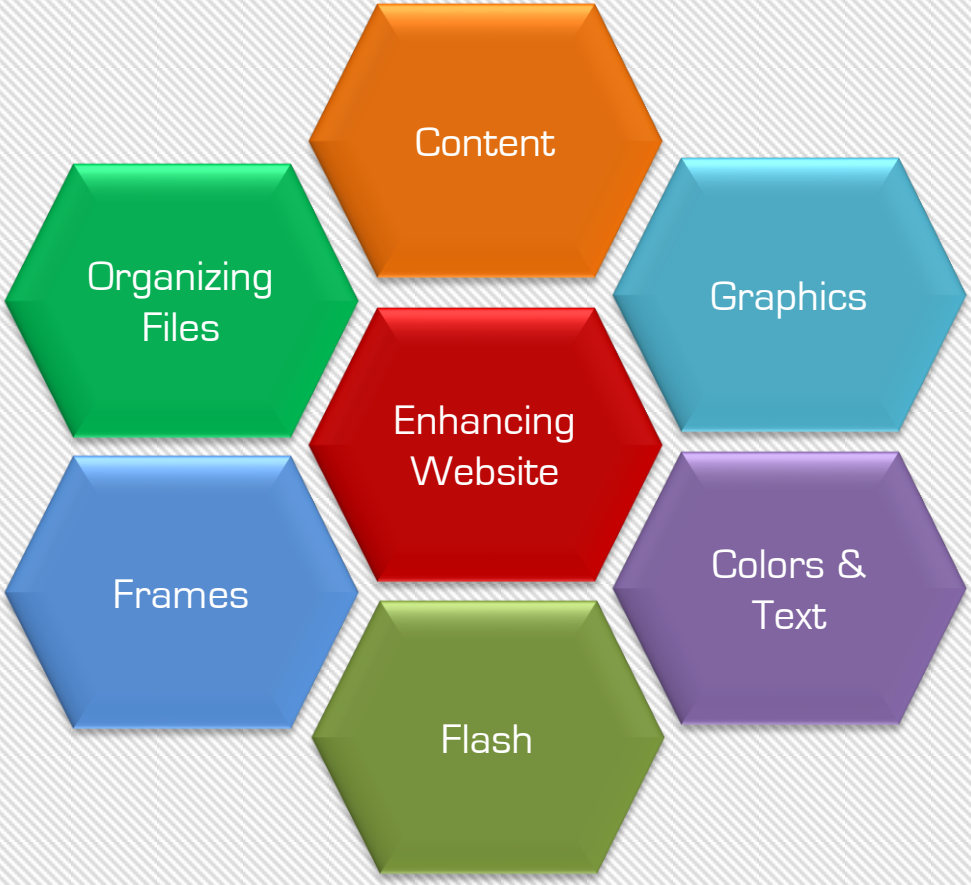
Working Principle of a Website

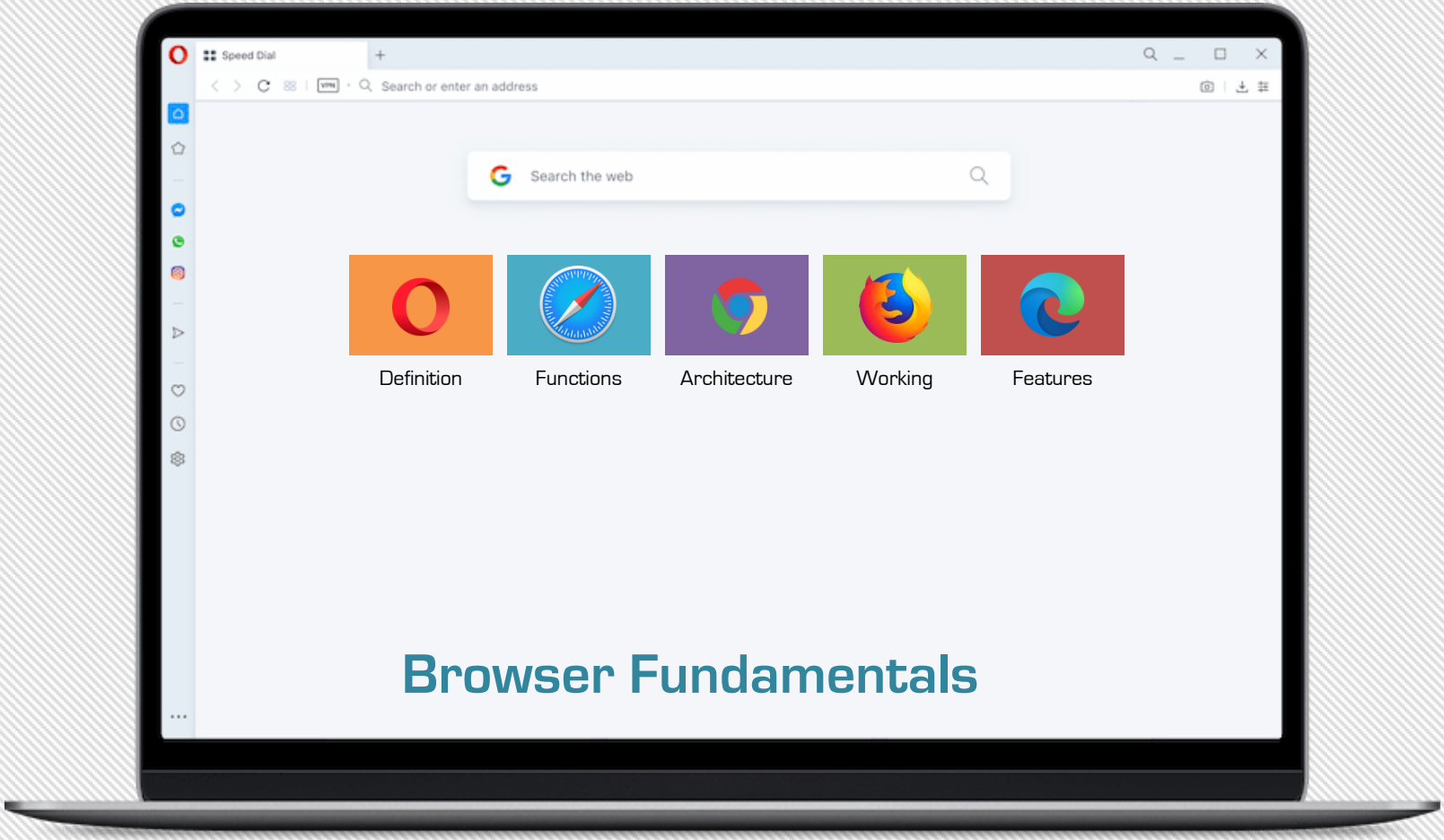


Phases of Website Development

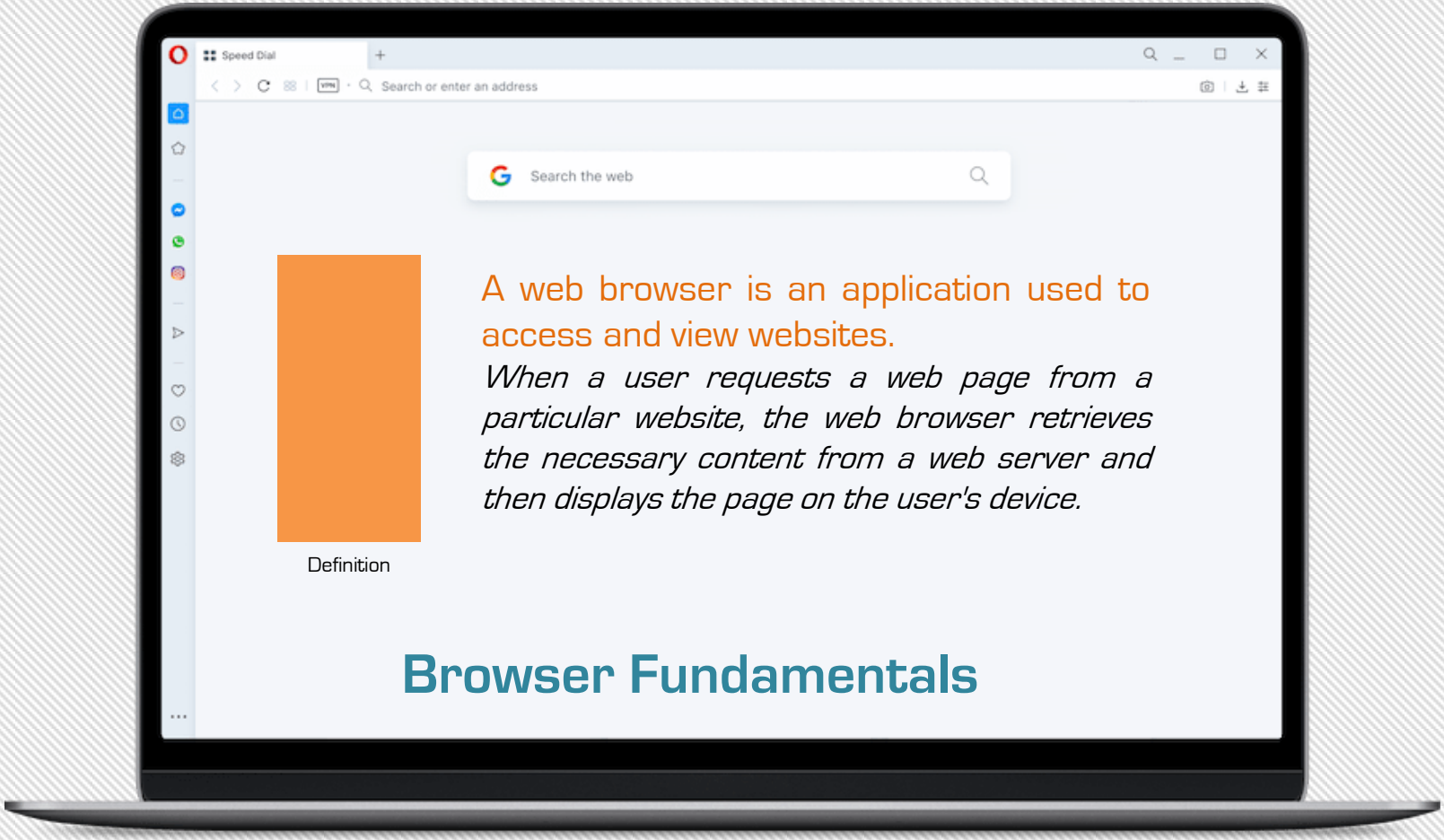


Enhancing Website





Browser Fundamentals

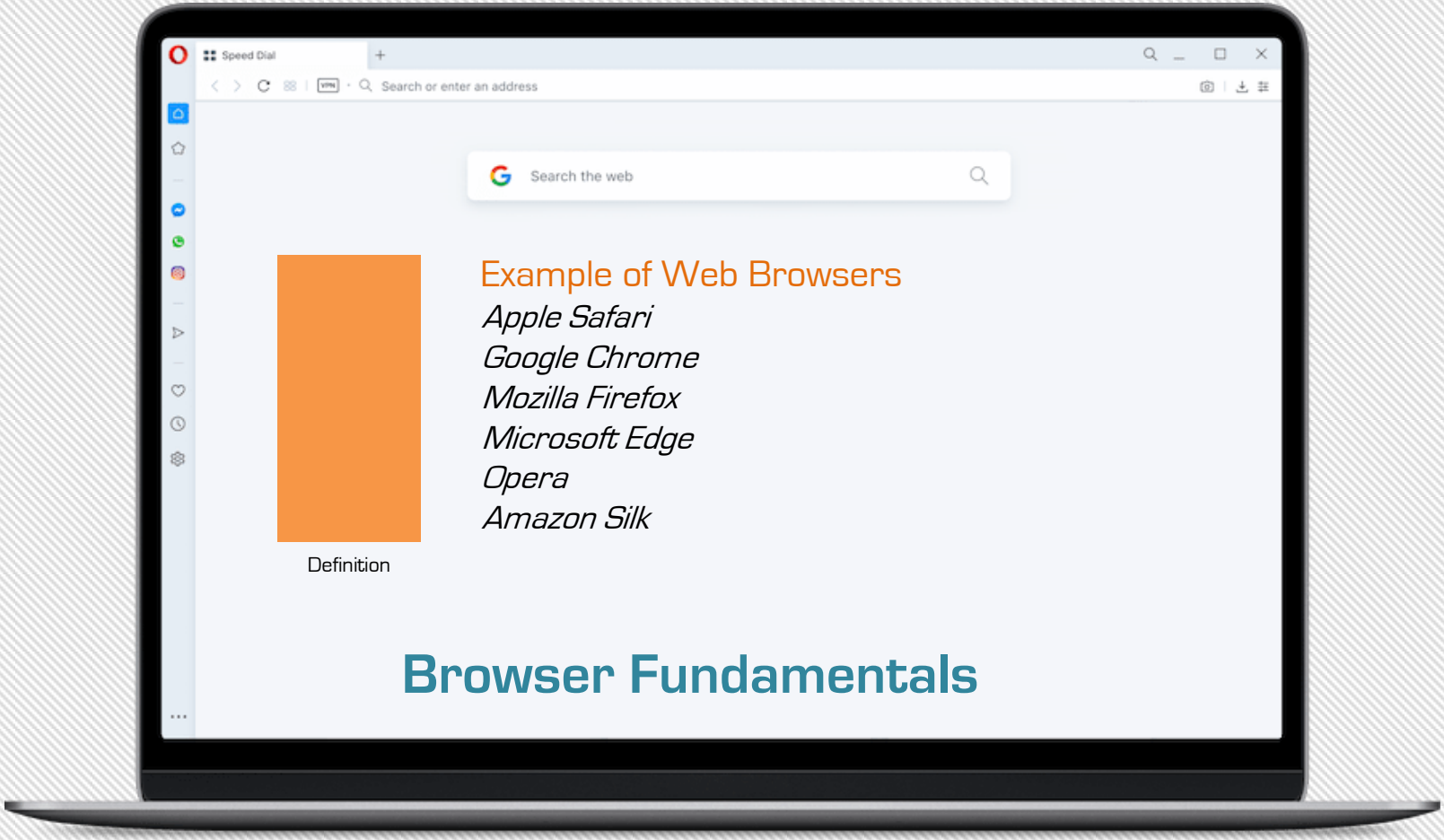


Definition

A web browser is an application used to access and view websites.

When a user requests a web page from a particular website, the web browser retrieves the necessary content from a web server and then displays the page on the user's device.

Browser Fundamentals

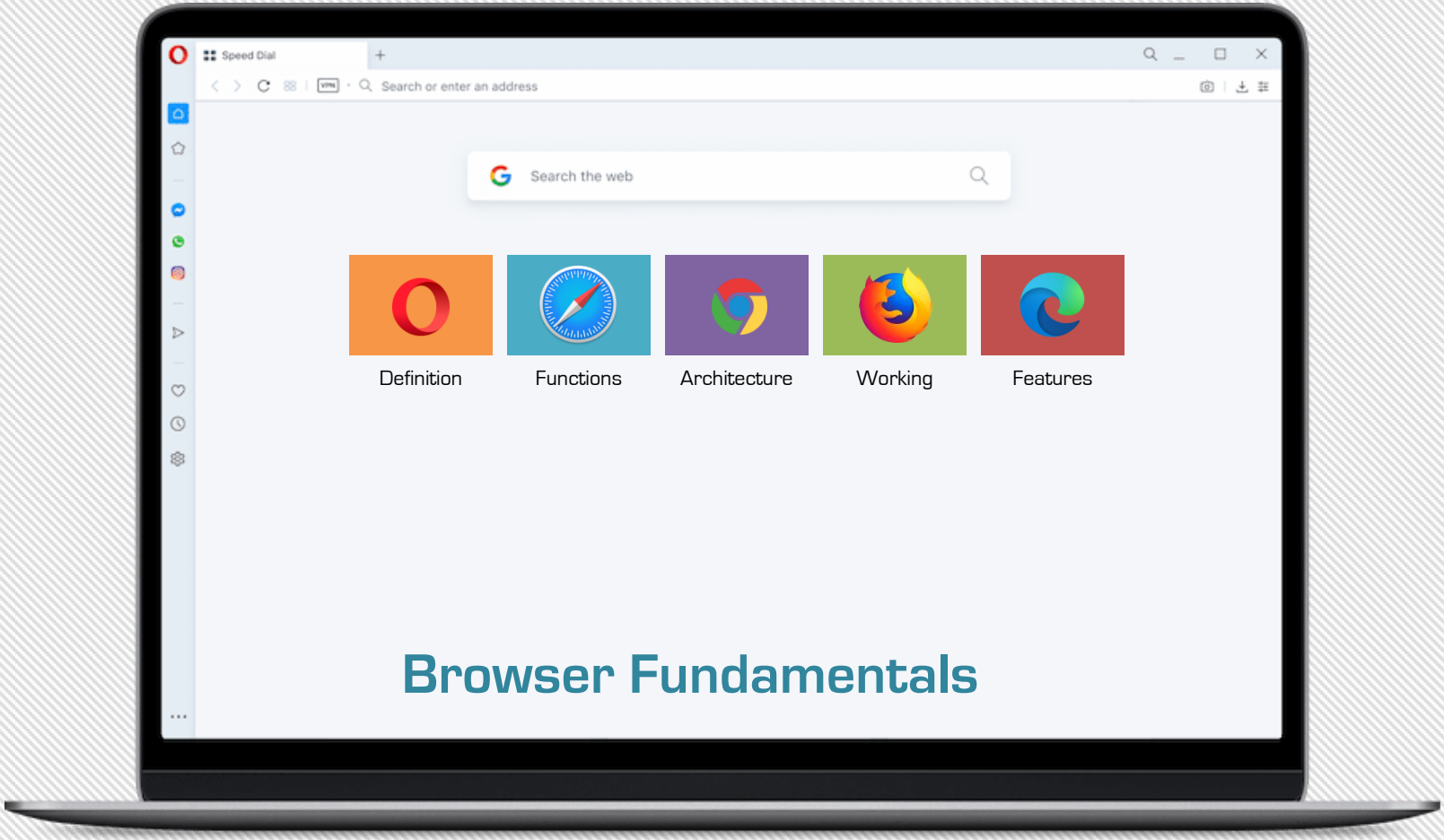


Definition

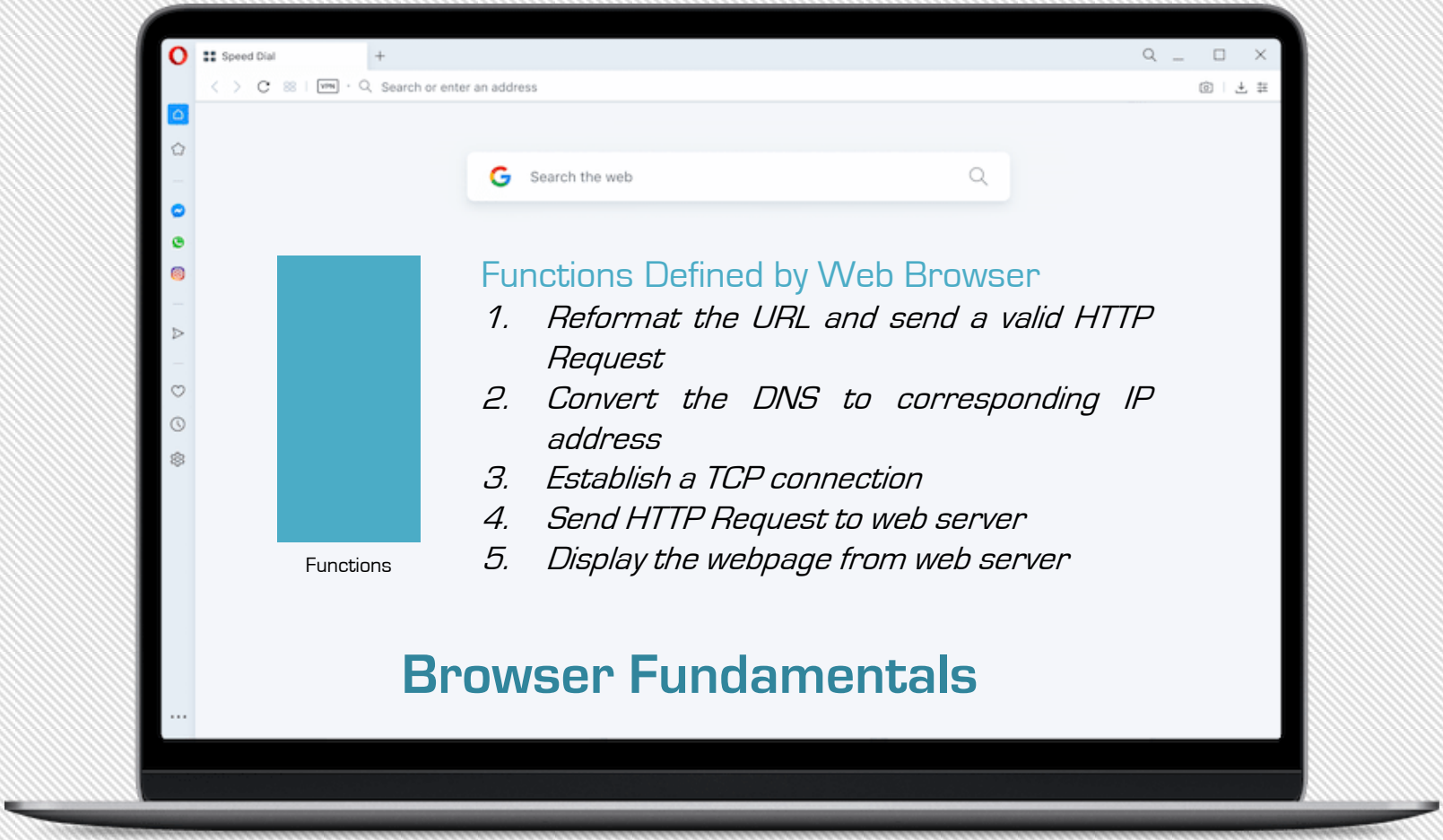
Example of Web Browsers

Apple Safari
Google Chrome
Mozilla Firefox
Microsoft Edge
Opera
Amazon Silk

Browser Fundamentals



Browser Fundamentals

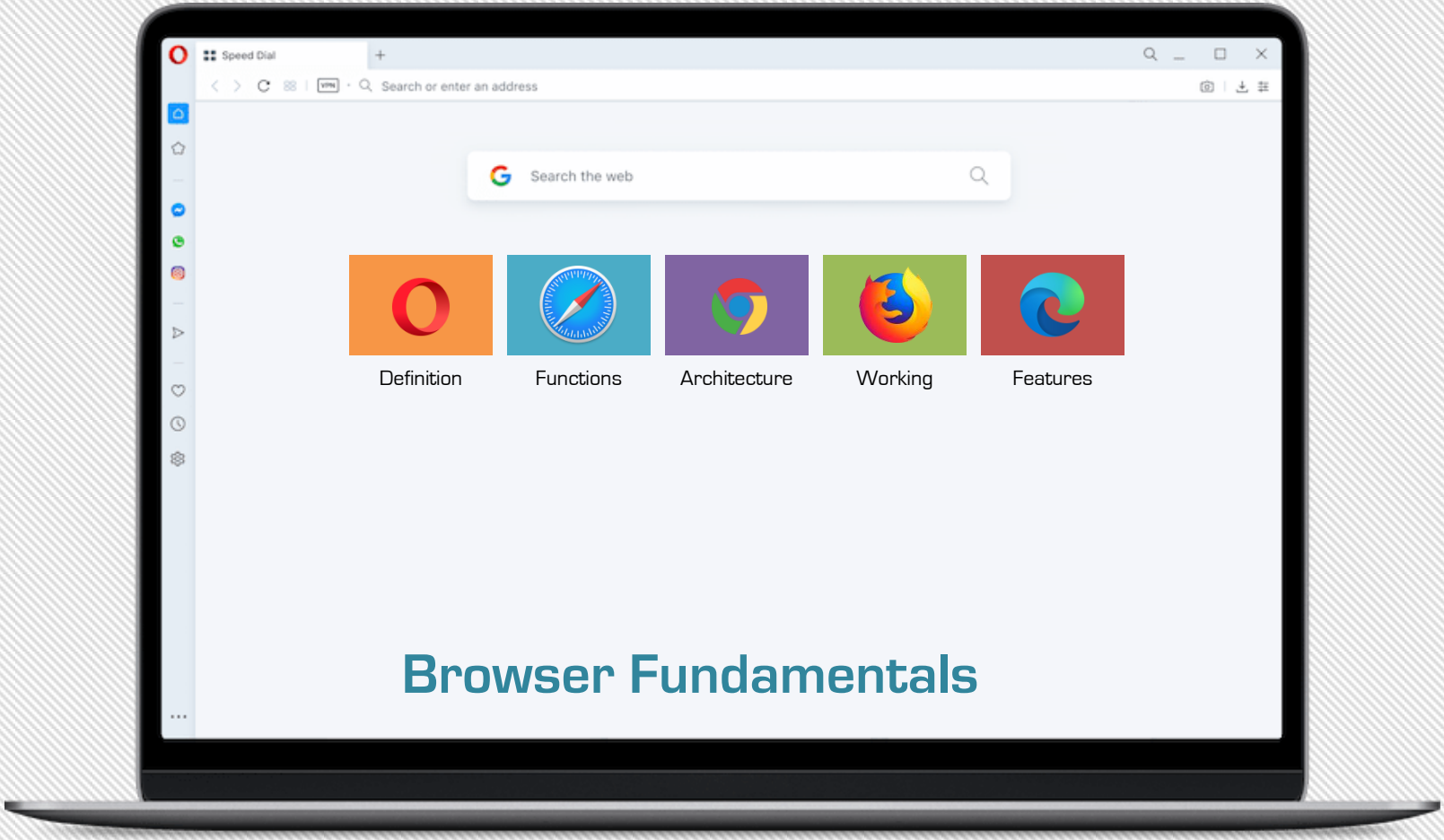


Functions

Functions Defined by Web Browser

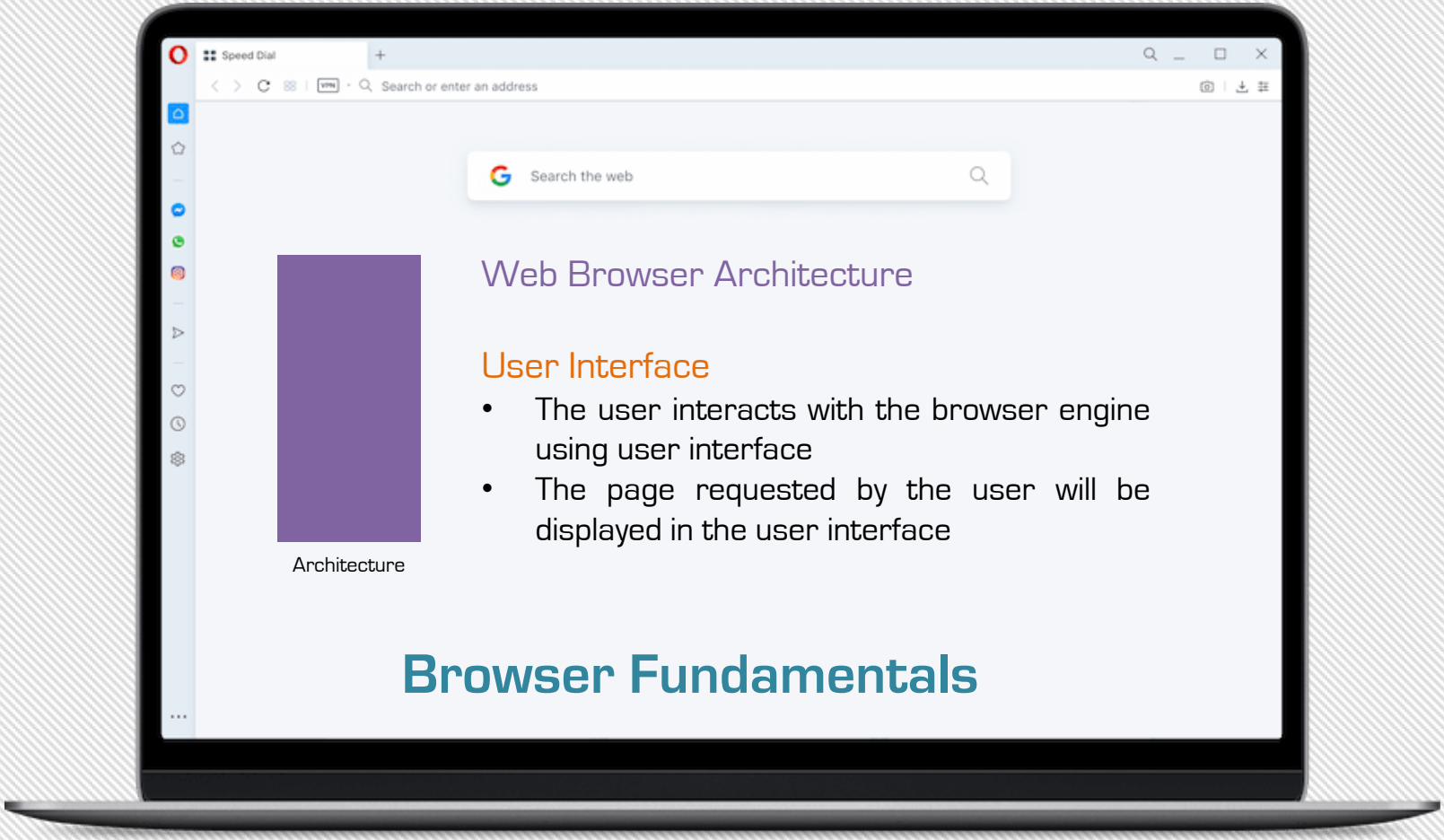
1. *Reformat the URL and send a valid HTTP Request*
2. *Convert the DNS to corresponding IP address*
3. *Establish a TCP connection*
4. *Send HTTP Request to web server*
5. *Display the webpage from web server*

Browser Fundamentals



Browser Fundamentals


Speed Dial
Search or enter an address
Search the web
Web Browser Architecture
User Interface
Browser Engine
Rendering Engine
Architecture
Data Persistence
{.js}
interpreter
Networking
JavaScript Interpreter
User Interface Backend



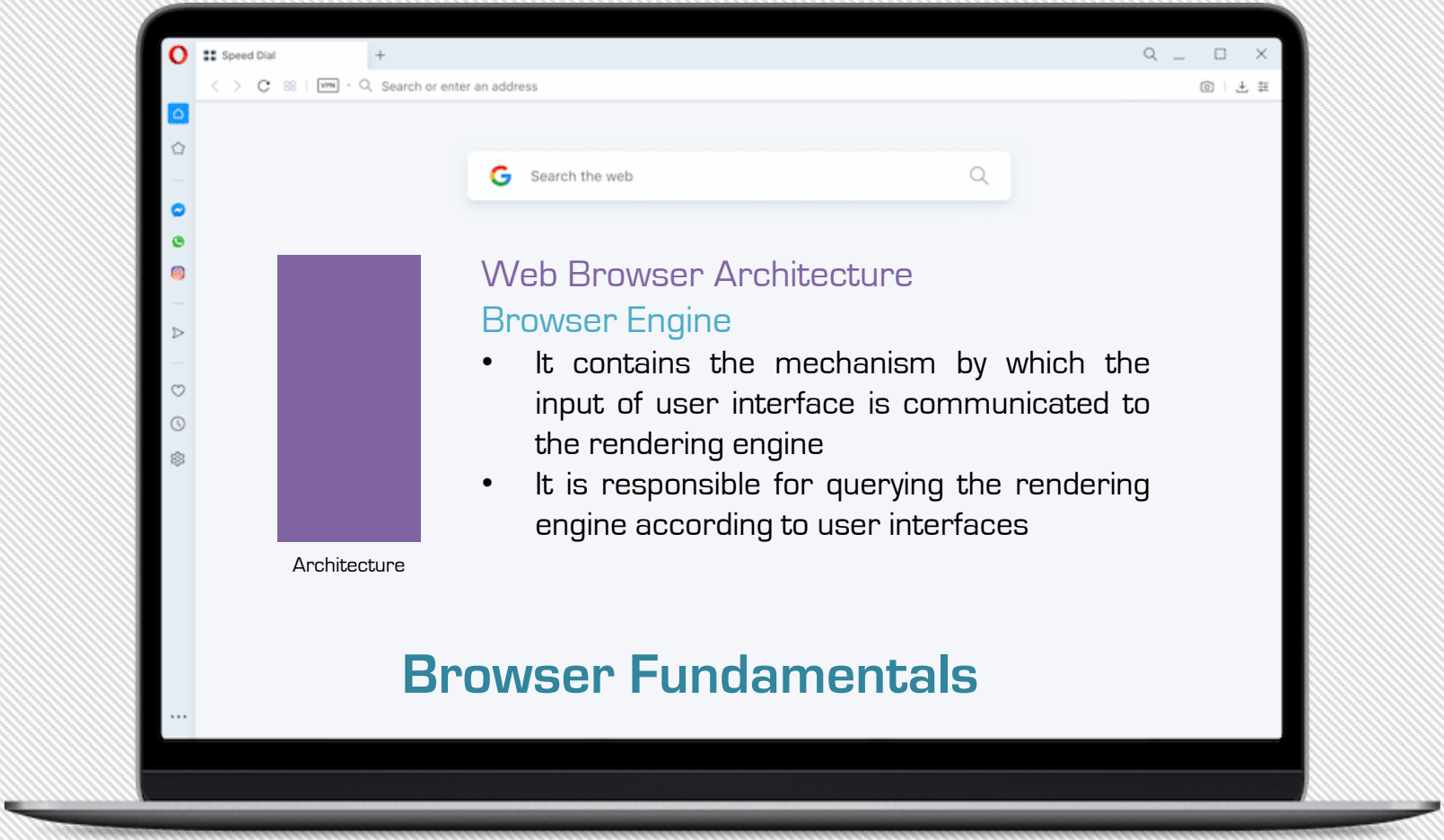
Architecture

Web Browser Architecture

User Interface

- The user interacts with the browser engine using user interface
- The page requested by the user will be displayed in the user interface

Browser Fundamentals



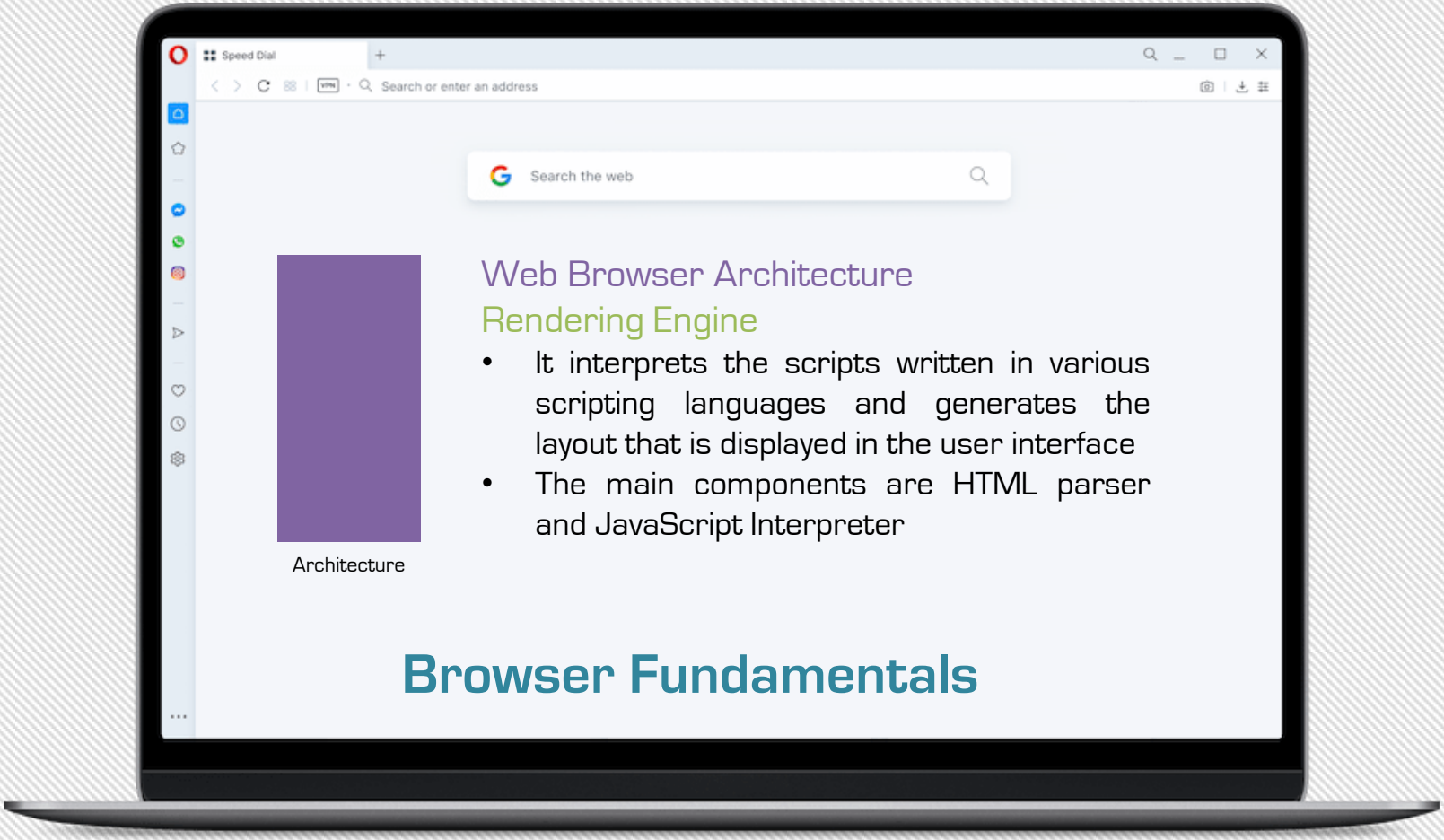
Architecture

Web Browser Architecture

Browser Engine

- It contains the mechanism by which the input of user interface is communicated to the rendering engine
- It is responsible for querying the rendering engine according to user interfaces

Browser Fundamentals



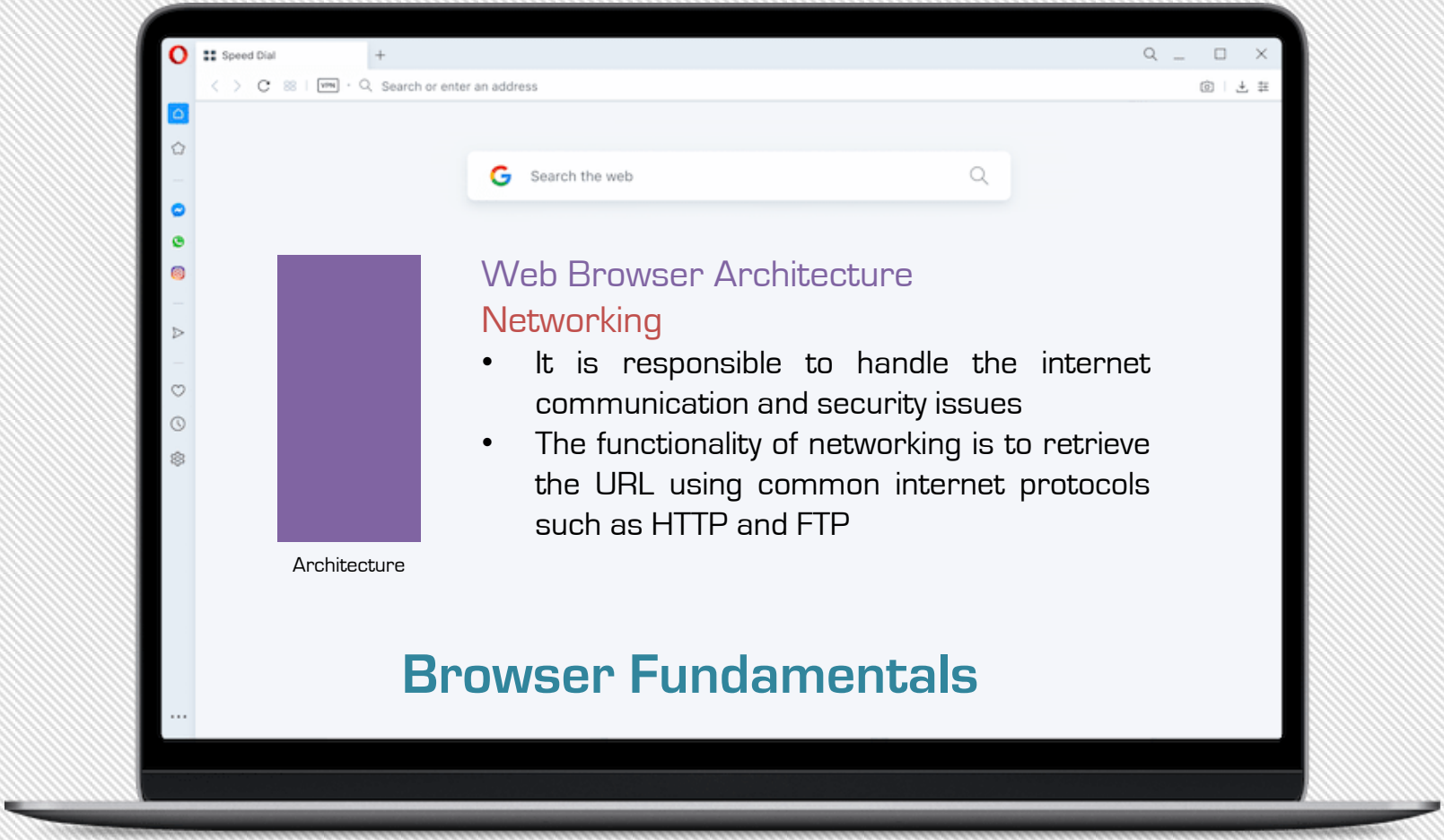
Architecture

Web Browser Architecture

Rendering Engine

- It interprets the scripts written in various scripting languages and generates the layout that is displayed in the user interface
- The main components are HTML parser and JavaScript Interpreter

Browser Fundamentals



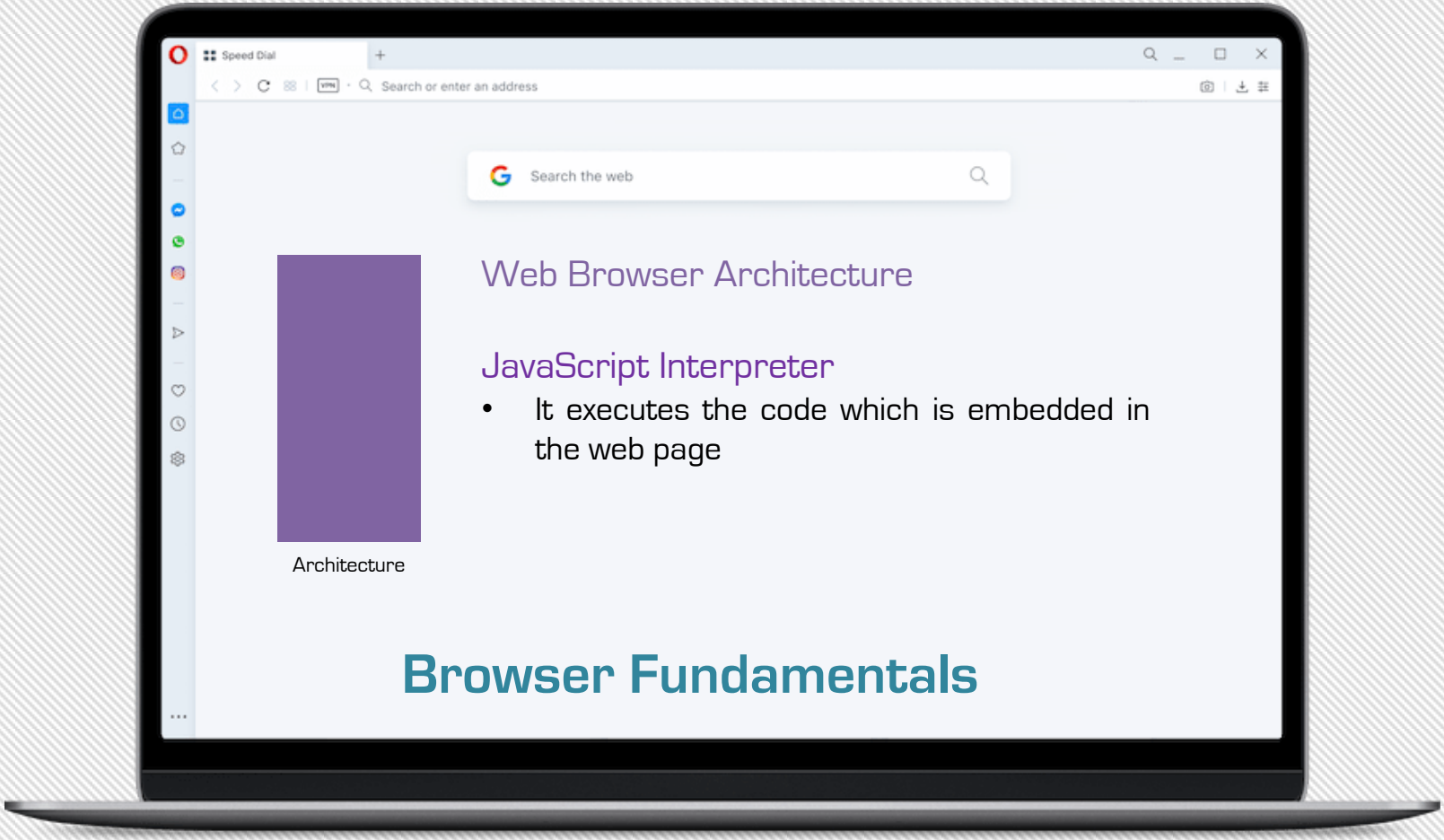
Architecture

Web Browser Architecture

Networking

- It is responsible to handle the internet communication and security issues
- The functionality of networking is to retrieve the URL using common internet protocols such as HTTP and FTP

Browser Fundamentals



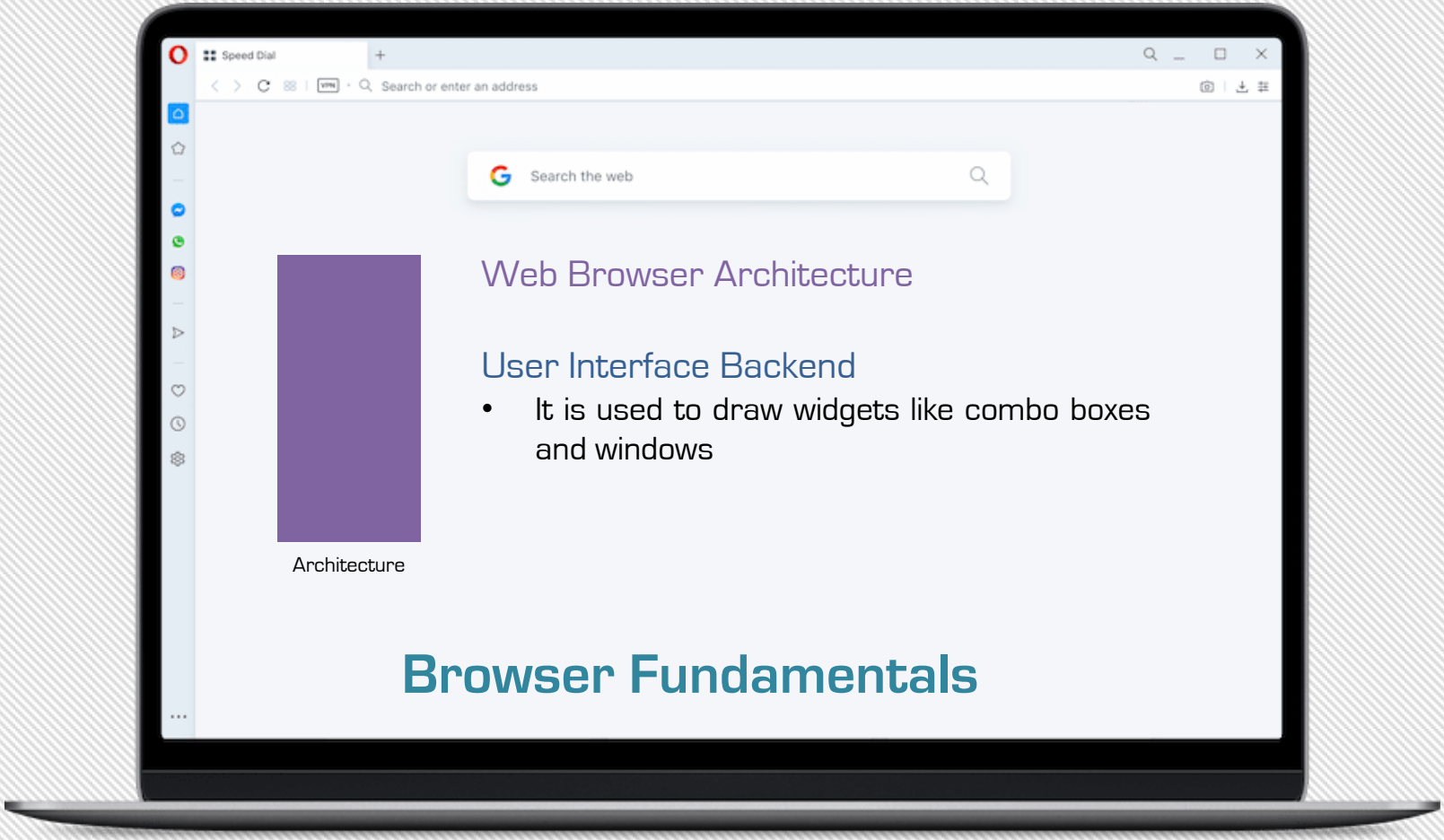
Architecture

Web Browser Architecture

JavaScript Interpreter

- It executes the code which is embedded in the web page

Browser Fundamentals



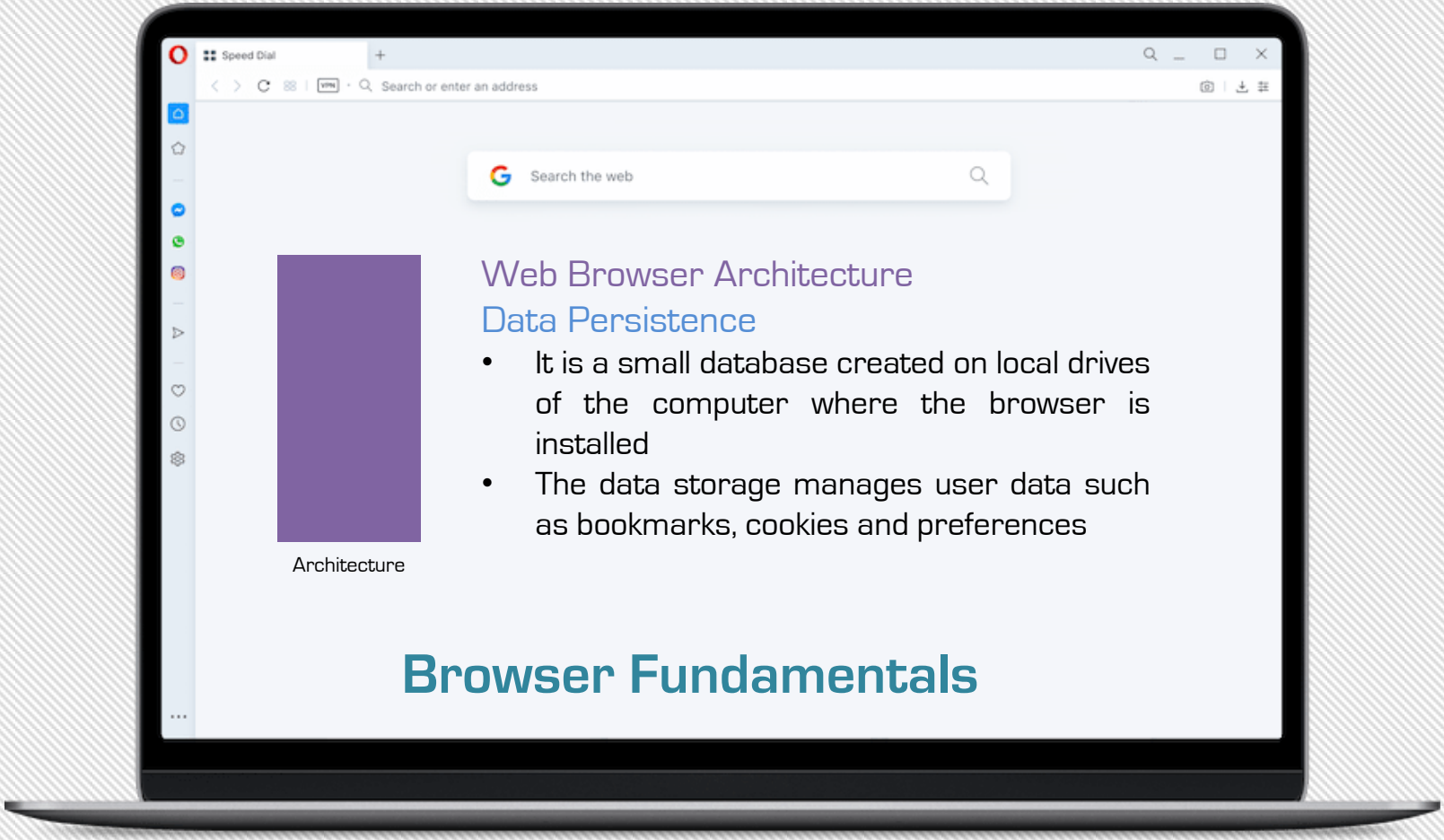
Architecture

Web Browser Architecture

User Interface Backend

- It is used to draw widgets like combo boxes and windows

Browser Fundamentals



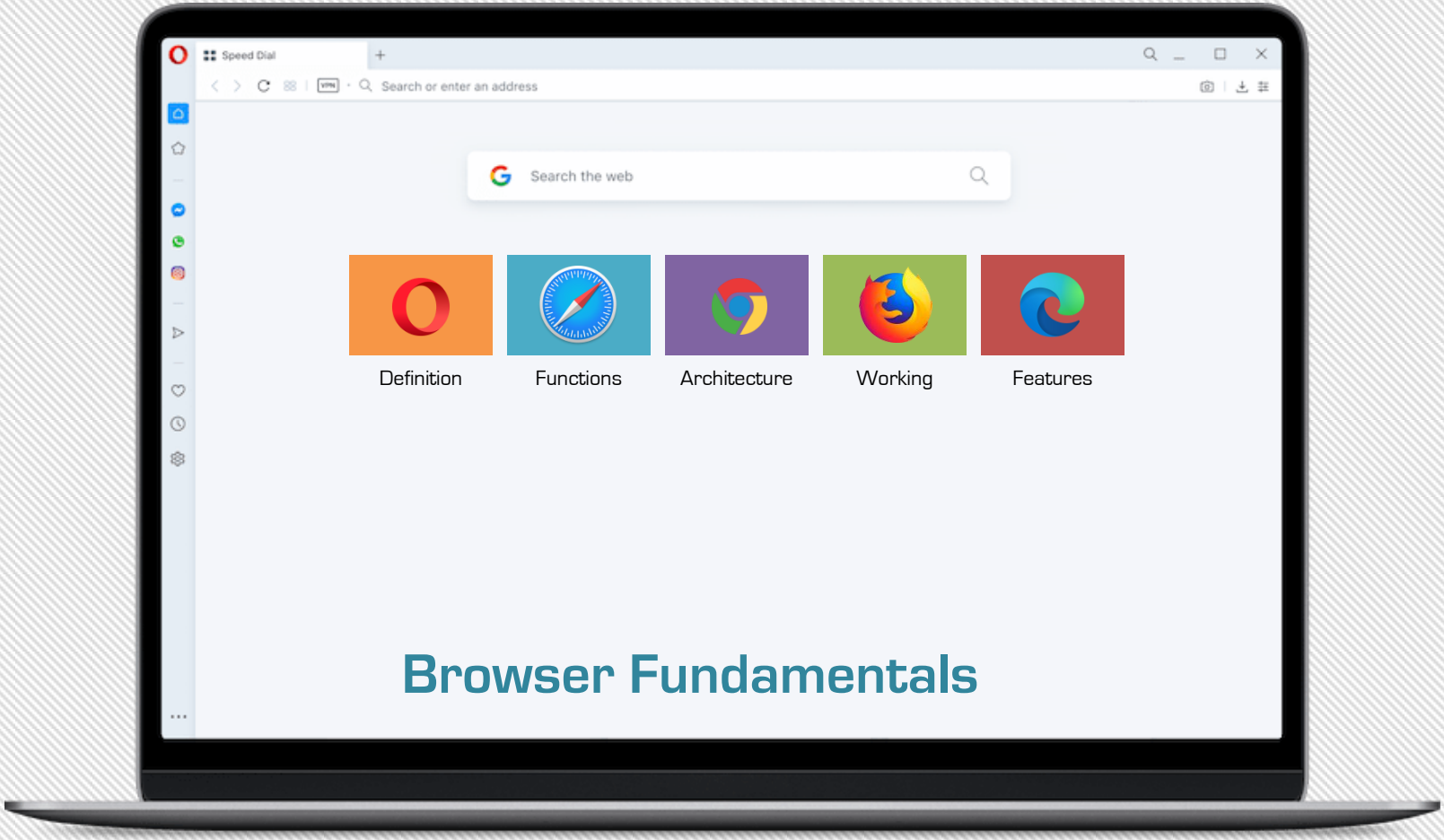
Architecture

Web Browser Architecture

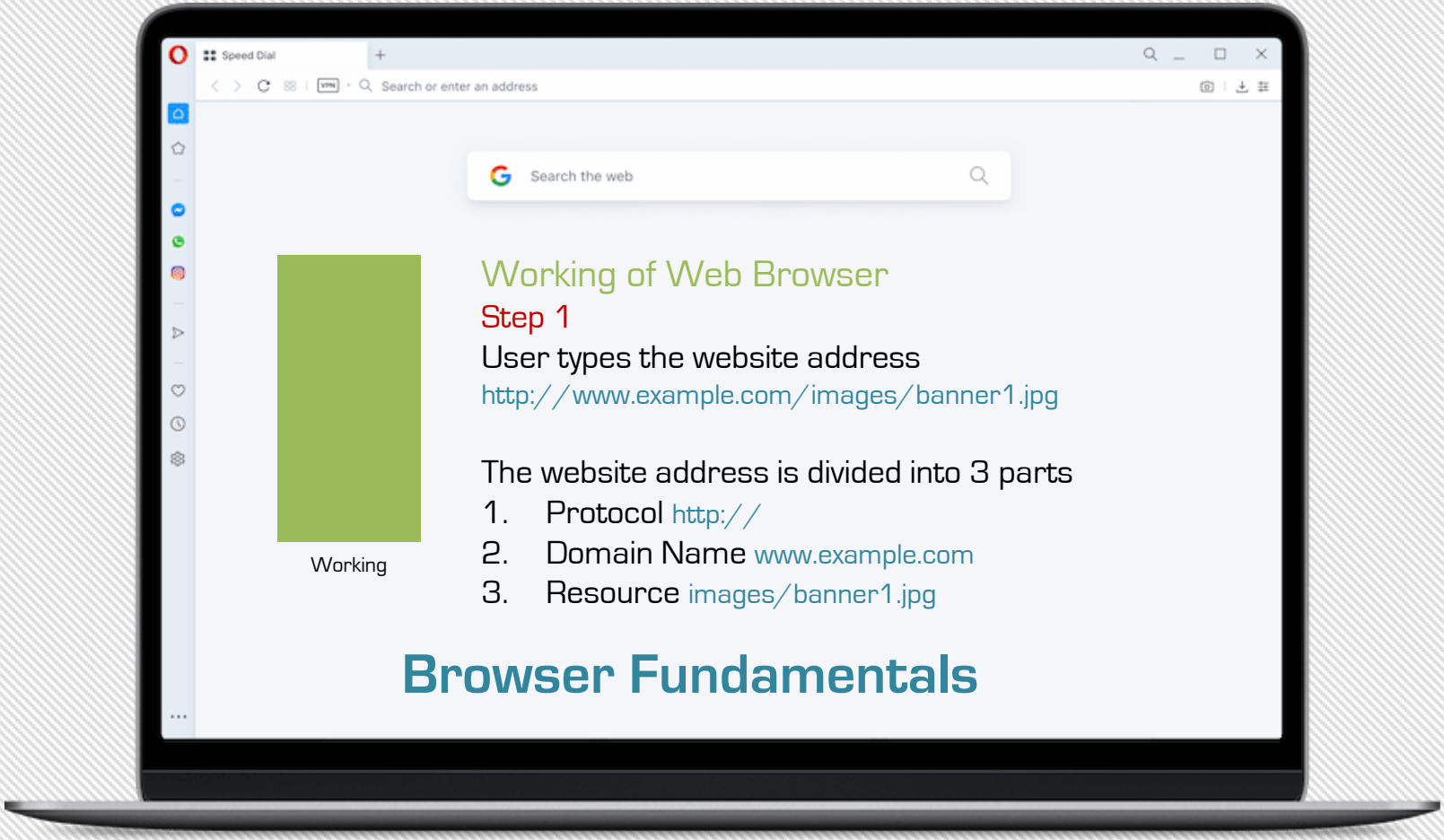
Data Persistence

- It is a small database created on local drives of the computer where the browser is installed
- The data storage manages user data such as bookmarks, cookies and preferences

Browser Fundamentals



Browser Fundamentals



Working

Working of Web Browser

Step 1

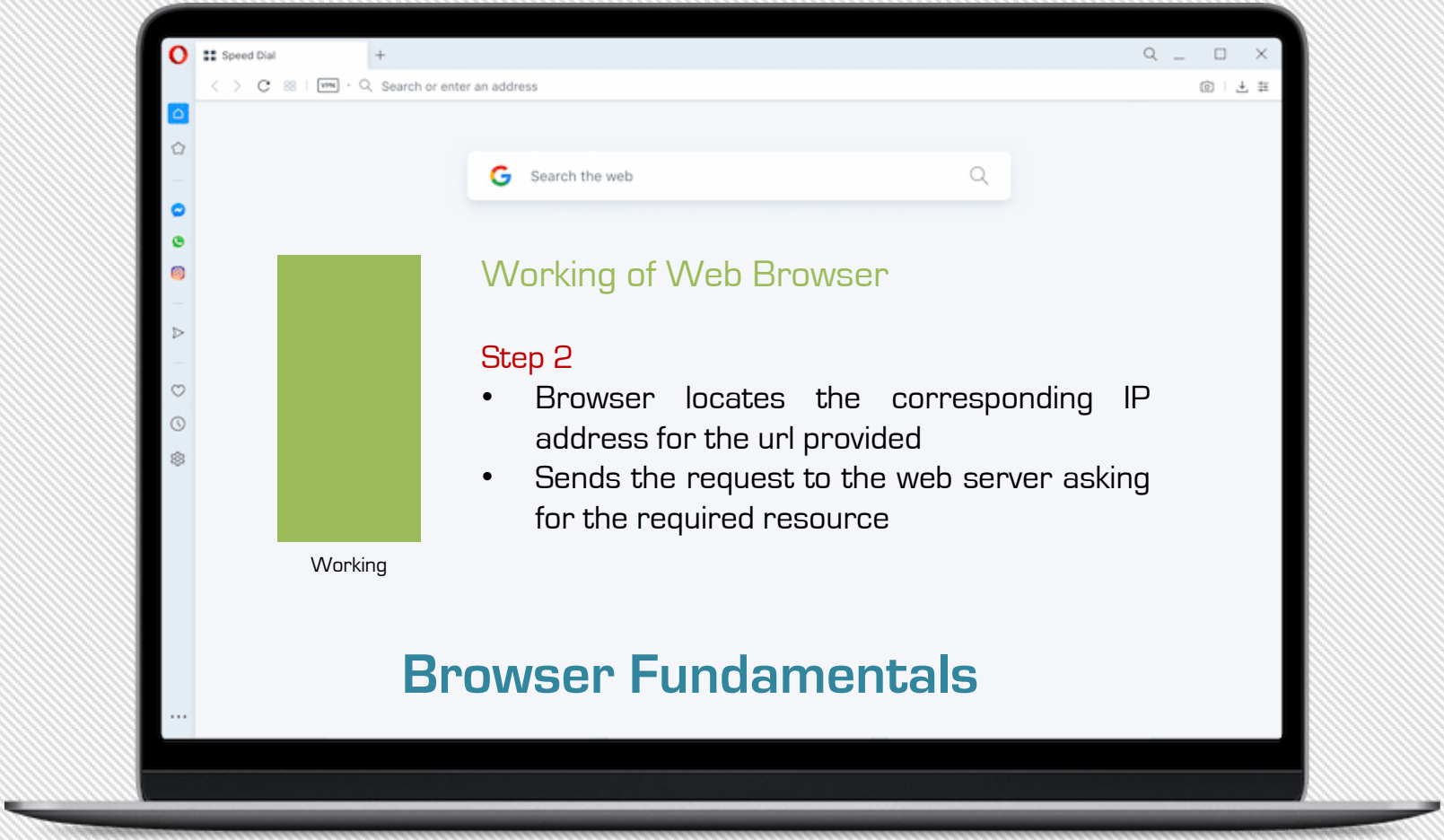
User types the website address

http://www.example.com/images/banner1.jpg

The website address is divided into 3 parts

1. Protocol http://
2. Domain Name www.example.com
3. Resource images/banner1.jpg

Browser Fundamentals



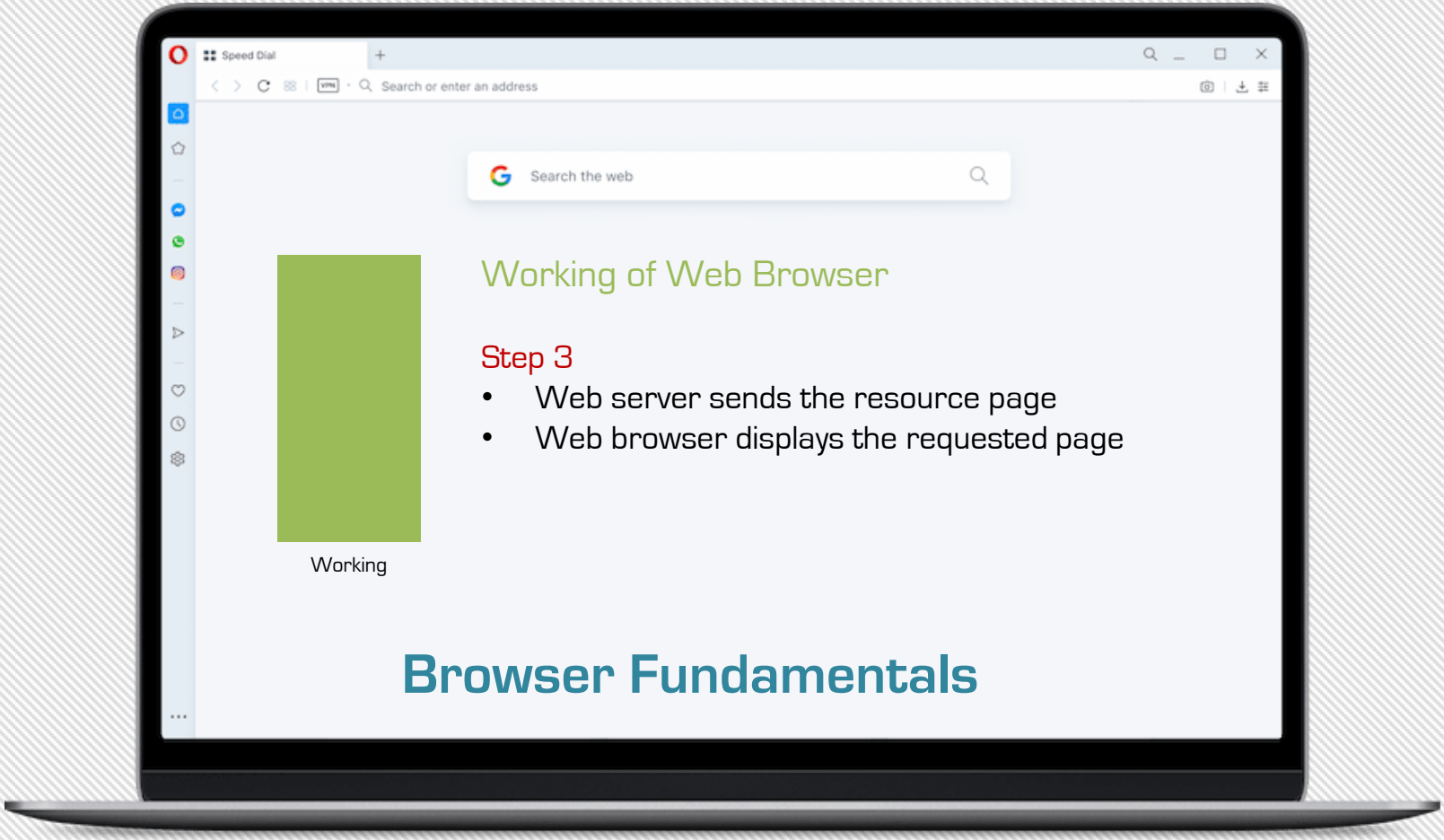
Working

Working of Web Browser

Step 2

- Browser locates the corresponding IP address for the url provided
- Sends the request to the web server asking for the required resource

Browser Fundamentals



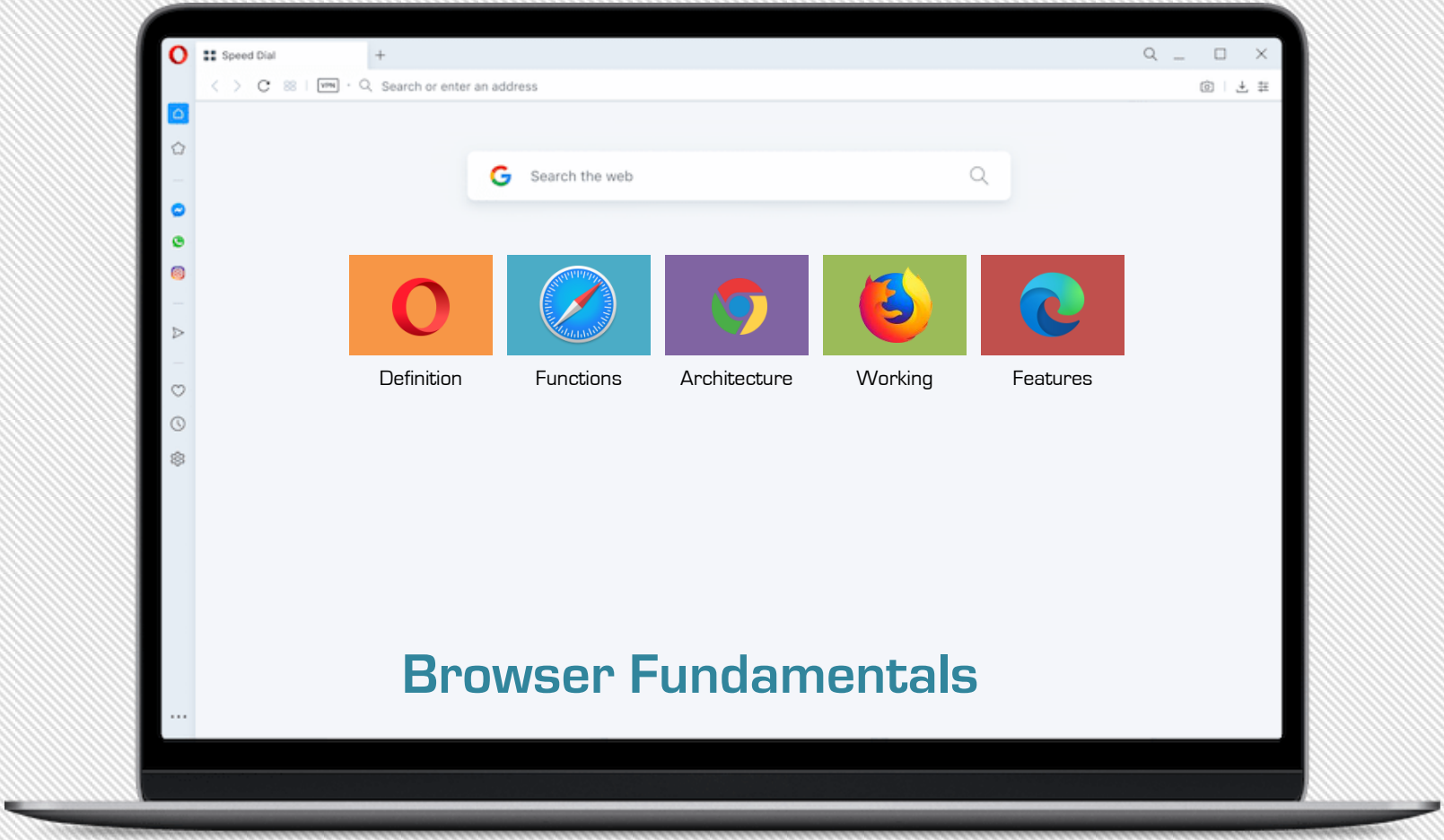
Working

Working of Web Browser

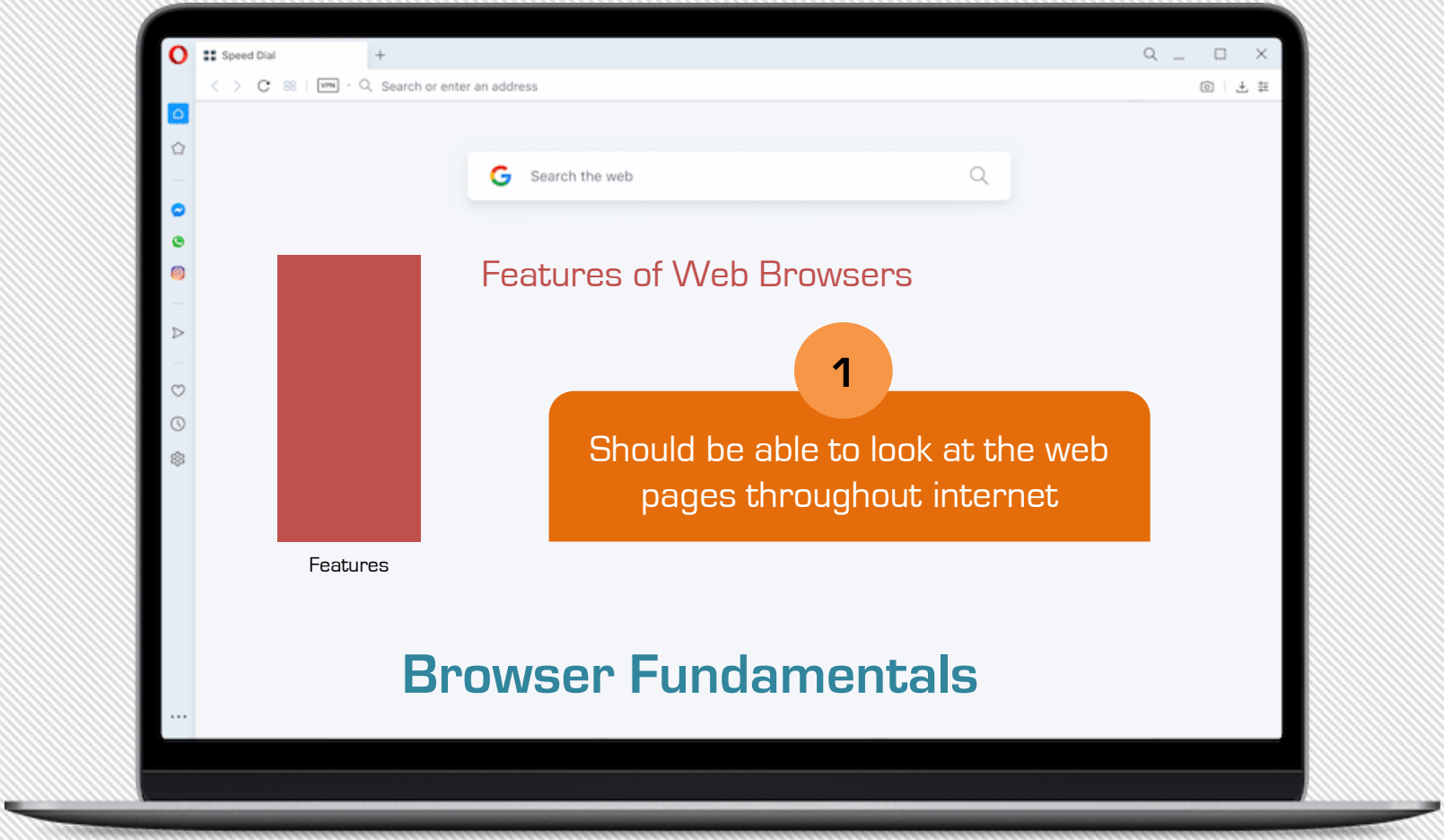
Step 3

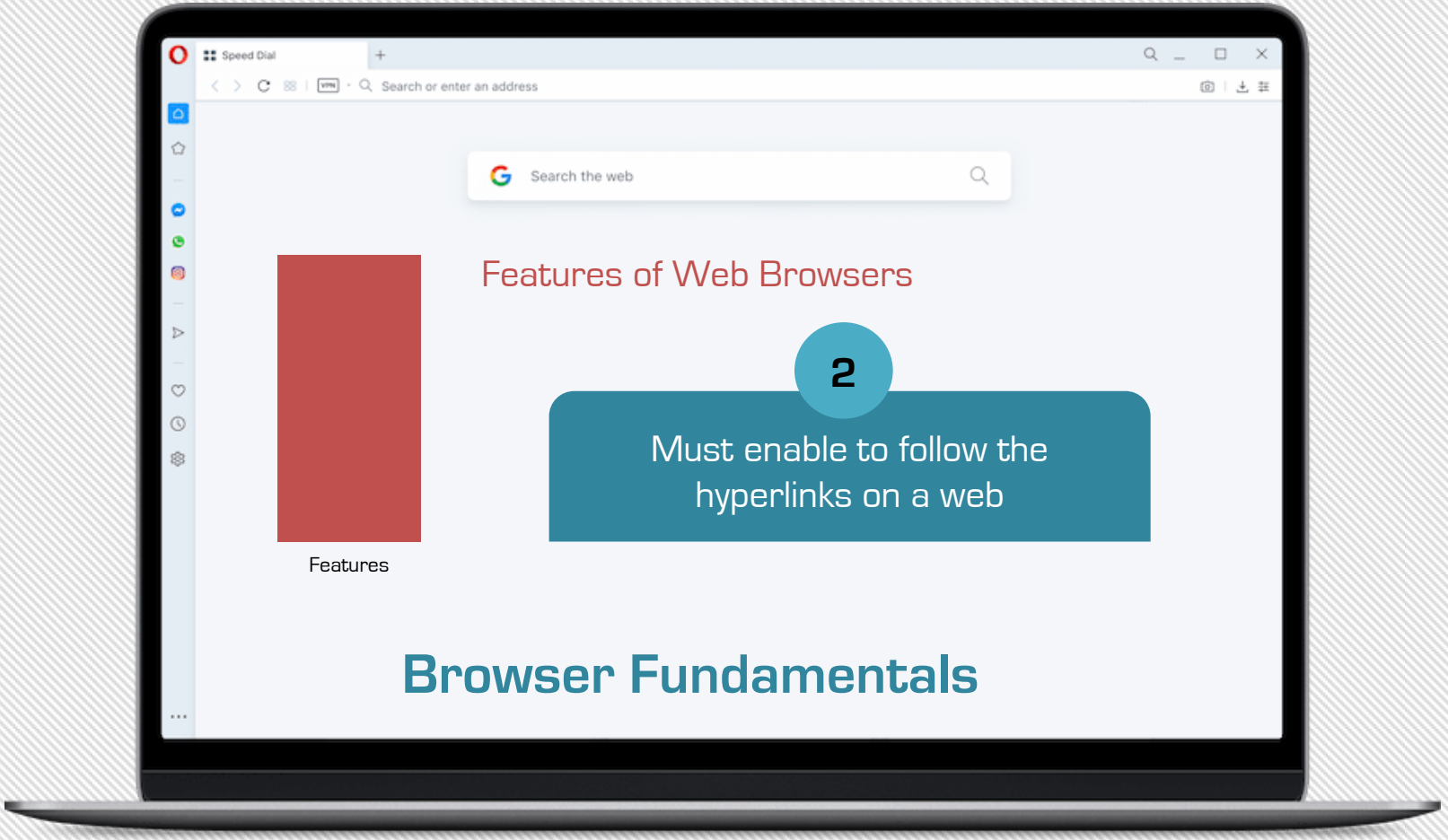
- Web server sends the resource page
- Web browser displays the requested page

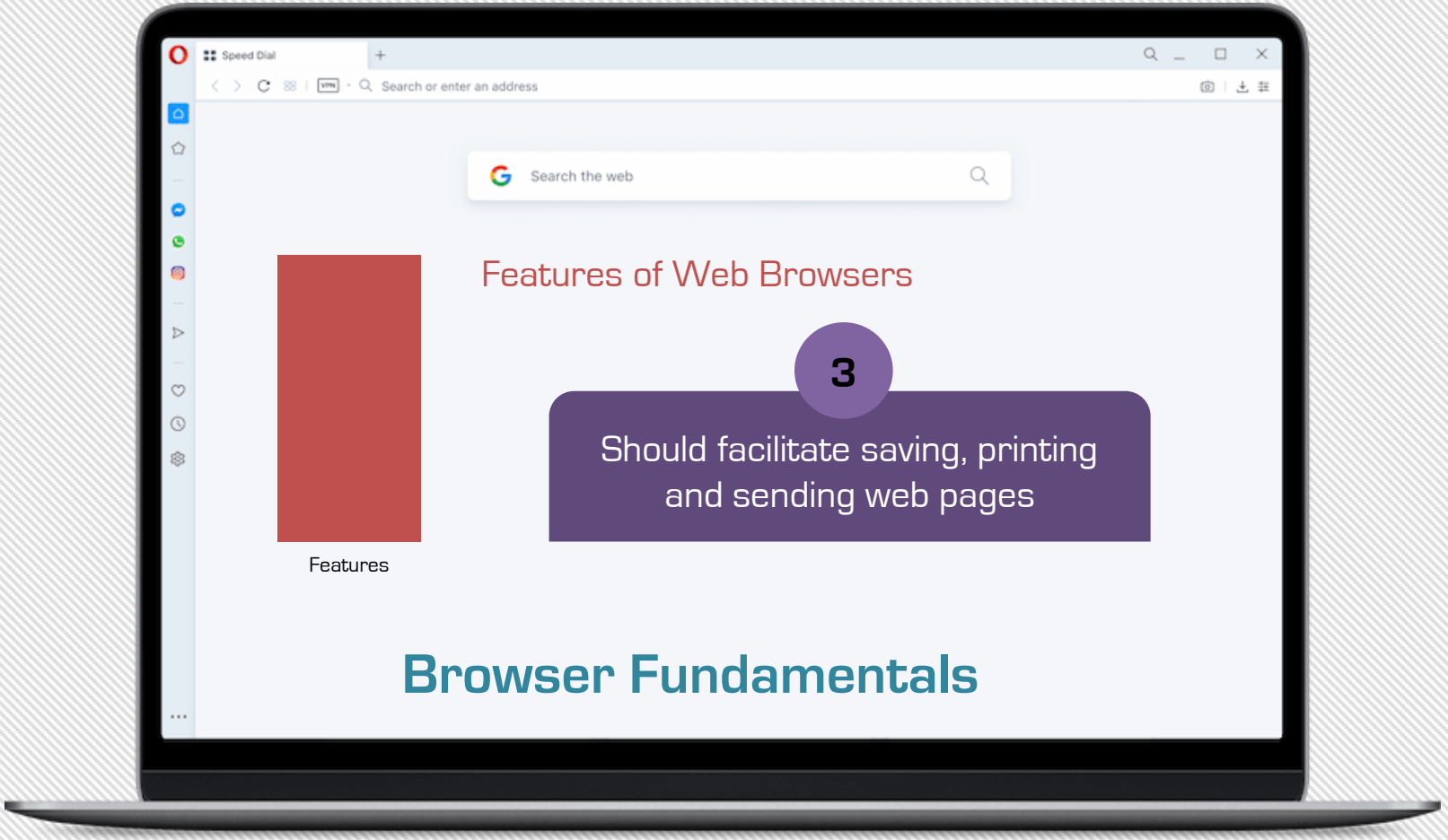
Browser Fundamentals



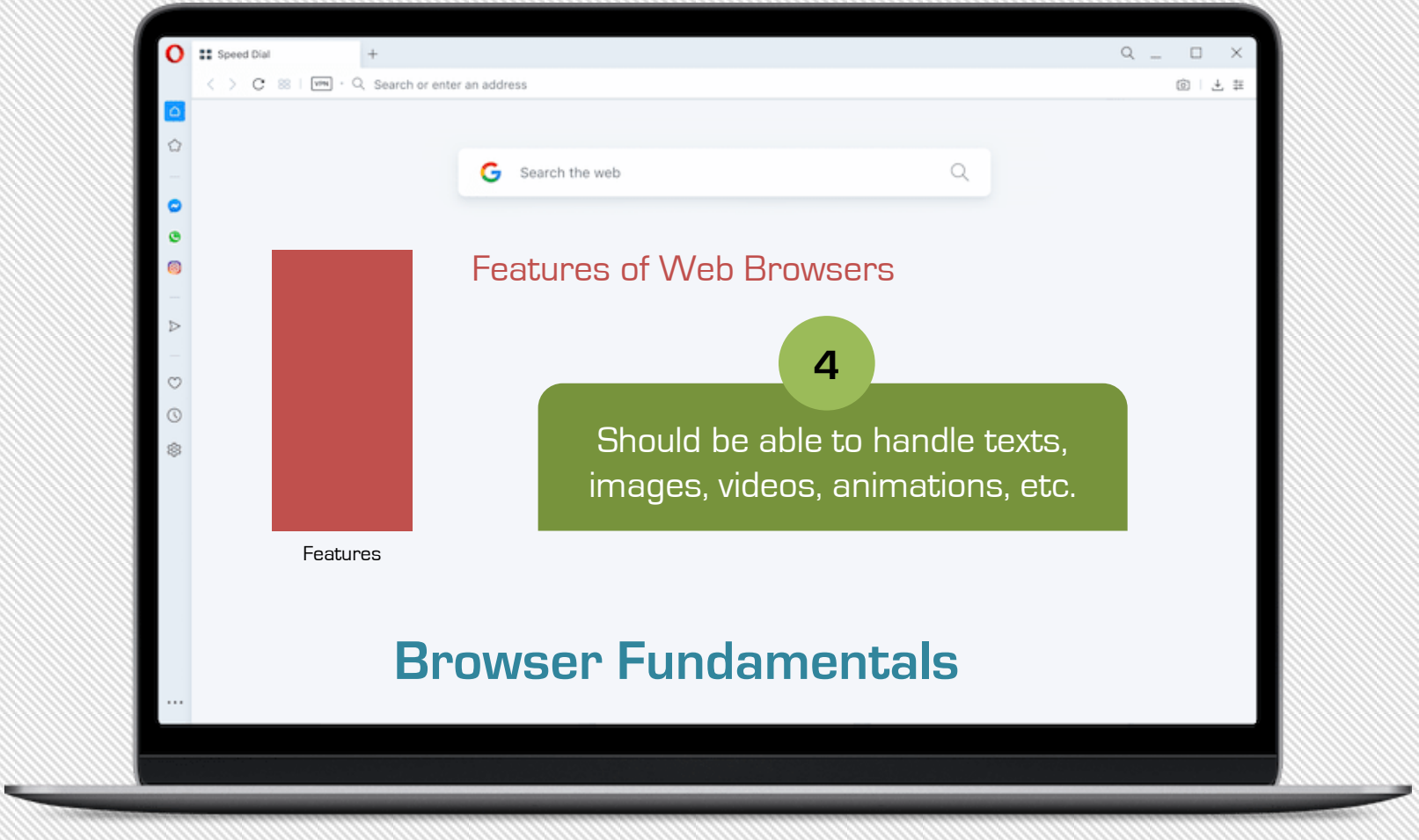
Browser Fundamentals

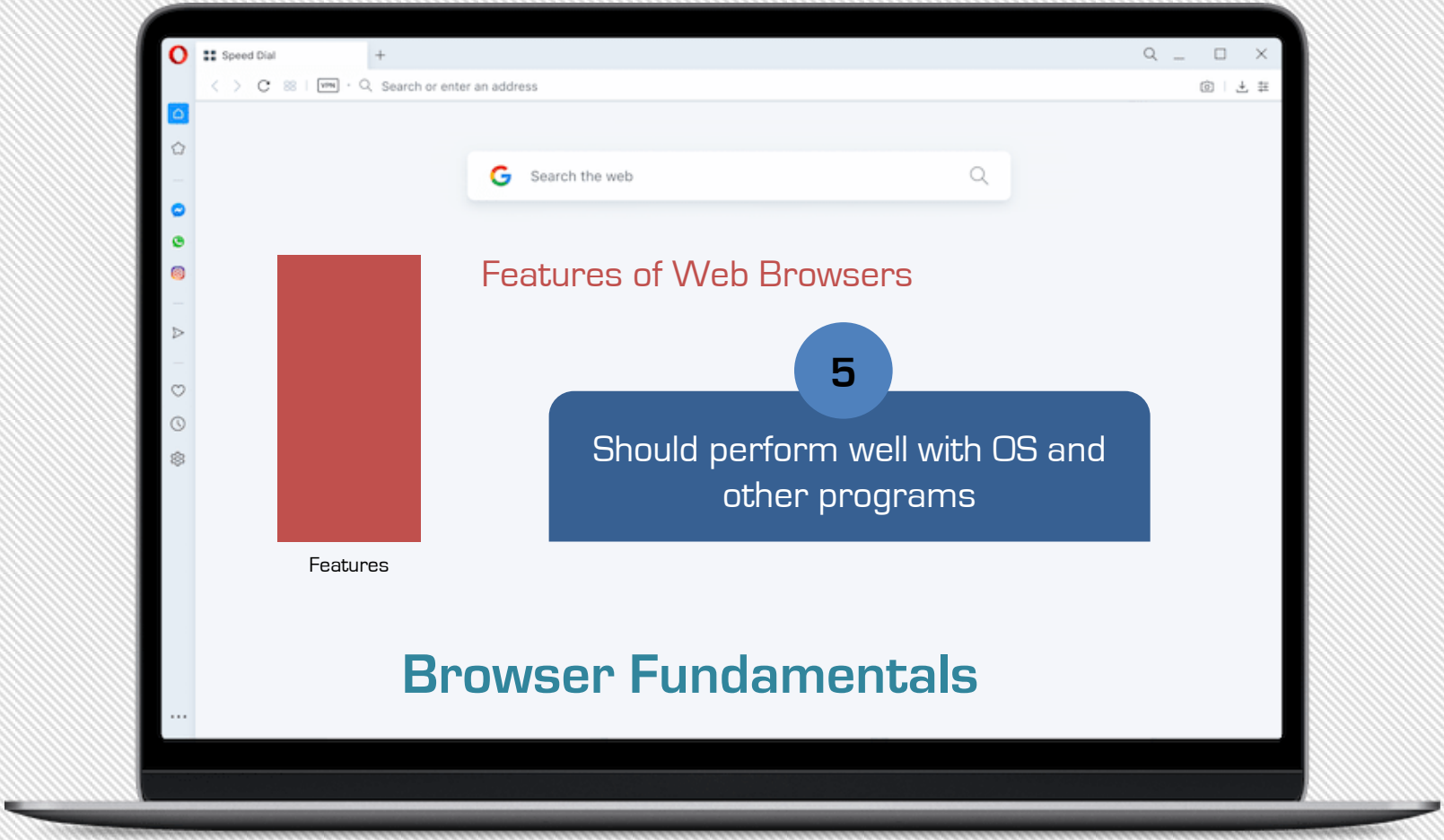

Speed Dial
Search or enter an address
Search the web
Features of Web Browsers
1
Should be able to look at the web pages throughout internet
Features
Browser Fundamentals

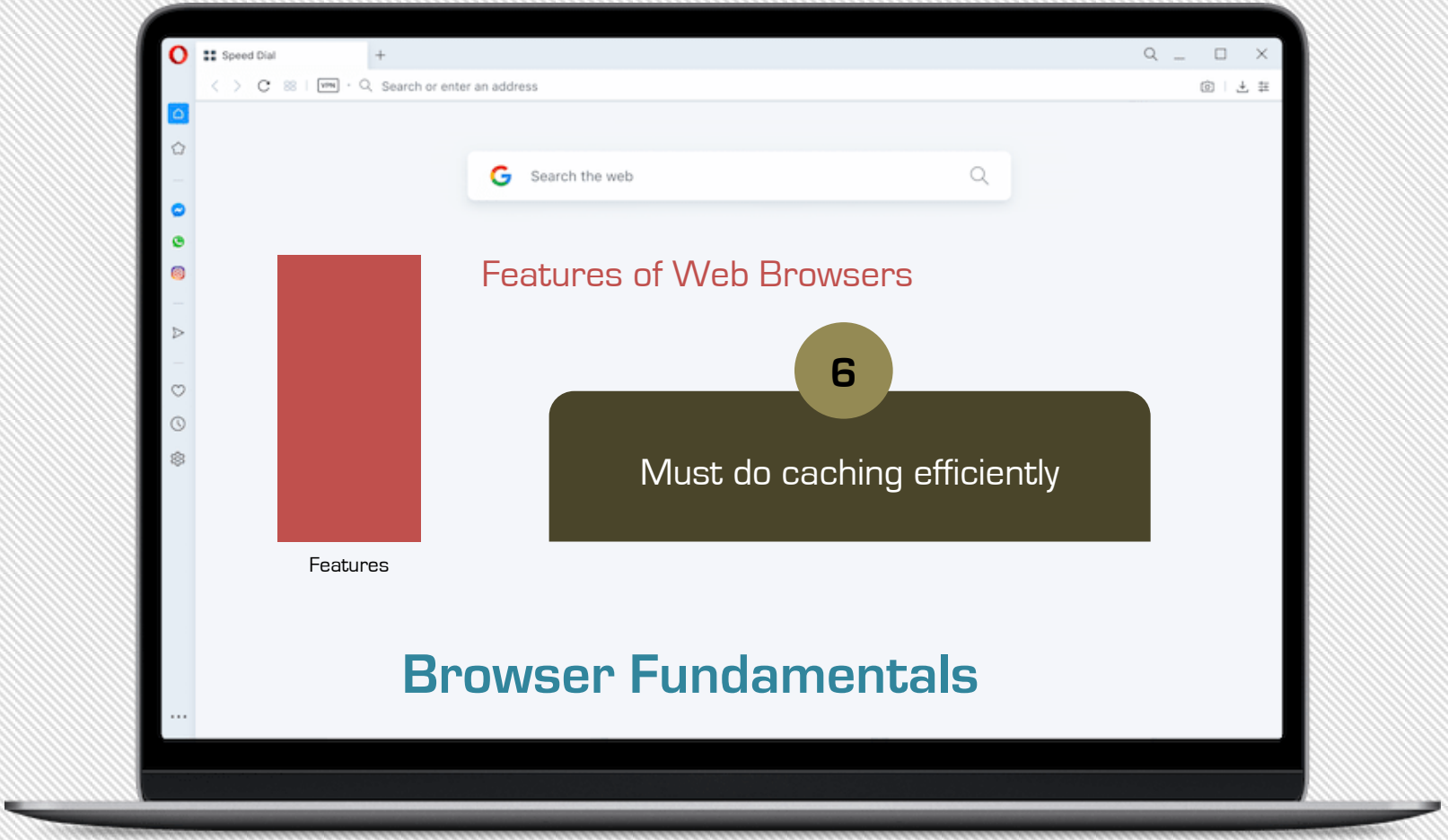

Speed Dial
Search or enter an address
Search the web
Features of Web Browsers
2
Must enable to follow the hyperlinks on a web
Features
Browser Fundamentals



Browser Fundamentals


Speed Dial
Search or enter an address
Search the web
Features of Web Browsers
4
Should be able to handle texts, images, videos, animations, etc.
Features
Browser Fundamentals


Speed Dial
Search or enter an address
Search the web
Features of Web Browsers
5
Should perform well with OS and other programs
Features
Browser Fundamentals


Speed Dial
Search or enter an address
Search the web
Features of Web Browsers
6
Must do caching efficiently
Features
Browser Fundamentals

Hyper Text Transfer Protocol (HTTP)

- It takes part in the web browser and web server communication - Communication Protocol
- It follows request response model
- Web browser sends request message to the web server and the web server responds the request through response message

Hyper Text Transfer Protocol (HTTP)

HTTP Request Message

<**Start** Line>
<Header Fields>
<Blank Line>
<Message Body>

Hyper Text Transfer Protocol (HTTP)

HTTP Request Message

<**Start** Line>
<Header Fields>
<Blank Line>
<Message Body>

Start Line

- Consists of three parts

Hyper Text Transfer Protocol (HTTP)

HTTP Request Message

<**Start** Line>
<Header Fields>
<Blank Line>
<Message Body>

Request Method

GET

- Retrieve the information that is requested by the user

POST

- Request the server for desired web page and request made is accepted as a new subordinate of the resource identified

Hyper Text Transfer Protocol (HTTP)

HTTP Request Message

<**Start** Line>
<Header Fields>
<Blank Line>
<Message Body>

Request URI

- URI = URL + URN
- URI consists of two parts, the part before : denotes the scheme and the part after : depends upon the scheme

Hyper Text Transfer Protocol (HTTP)

HTTP Request Message

<**Start** Line>
<Header Fields>
<Blank Line>
<Message Body>

HTTP Version

- Denotes the version of the HTTP

Hyper Text Transfer Protocol (HTTP)

HTTP Request Message

<**Start** Line>
<Header Fields>
<Blank Line>
<Message Body>

Header Fields

- It contains the information about the request message
- The header fields are in the form of field name and field value

Hyper Text Transfer Protocol (HTTP)

HTTP Request Message

<**Start** Line>
<Header Fields>
<Blank Line>
<Message Body>

Message Body

- It contains the actual message that need to be send to the server.

Blank Line

- Just a blank line to inform the server that the header field in over and the message body is about to start

Hyper Text Transfer Protocol (HTTP)

HTTP Request Message

<**Start** Line>
<Header Fields>
<Blank Line>
<Message Body>

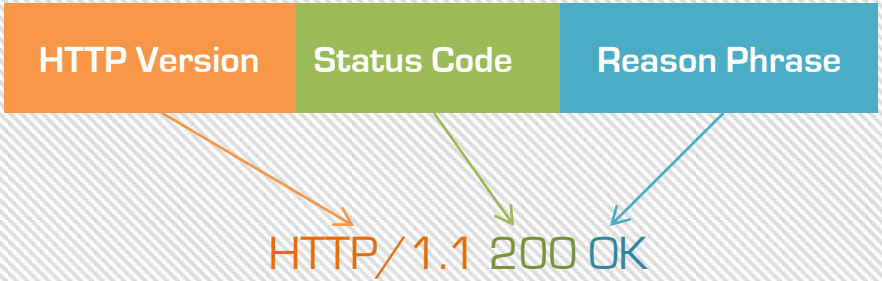
HTTP Response Message

<**Status** Line>
<Header Fields>
<Blank Line>
<Message Body>

Hyper Text Transfer Protocol (HTTP)

Status Line

- Consists of three fields



HTTP Response Message

<**Status** Line>
<Header Fields>
<Blank Line>
<Message Body>

Hyper Text Transfer Protocol (HTTP)

Status Line

HTTP Version	Status Code	Reason Phrase

- Denotes the version of the HTTP

HTTP Response Message

<**Status** Line>
<Header Fields>
<Blank Line>
<Message Body>

Hyper Text Transfer Protocol (HTTP)

Status Line

HTTP Version	Status Code	Reason Phrase

- Numeric Code indicating the type of response

HTTP Response Message

<**Status** Line>
<Header Fields>
<Blank Line>
<Message Body>

Hyper Text Transfer Protocol (HTTP)

Status Line

HTTP Version	Status Code	Reason Phrase

- Text string that represents the information about the status code

HTTP Response Message

<**Status** Line>
<Header Fields>
<Blank Line>
<Message Body>

Hyper Text Transfer Protocol (HTTP)

Header Fields
Same as in the request message

Blank Line
Same as in the request message

Message Body
Same as in the request message

HTTP Response Message

<**Status** Line>
<Header Fields>
<Blank Line>
<Message Body>

Hyper Text Transfer Protocol (HTTP)

HTTP Tunneling

It is a mechanism by which the communication performed by various network protocol is encapsulated by the HTTP protocol.

Hyper Text Transfer Protocol (HTTP)

Features of HTTP

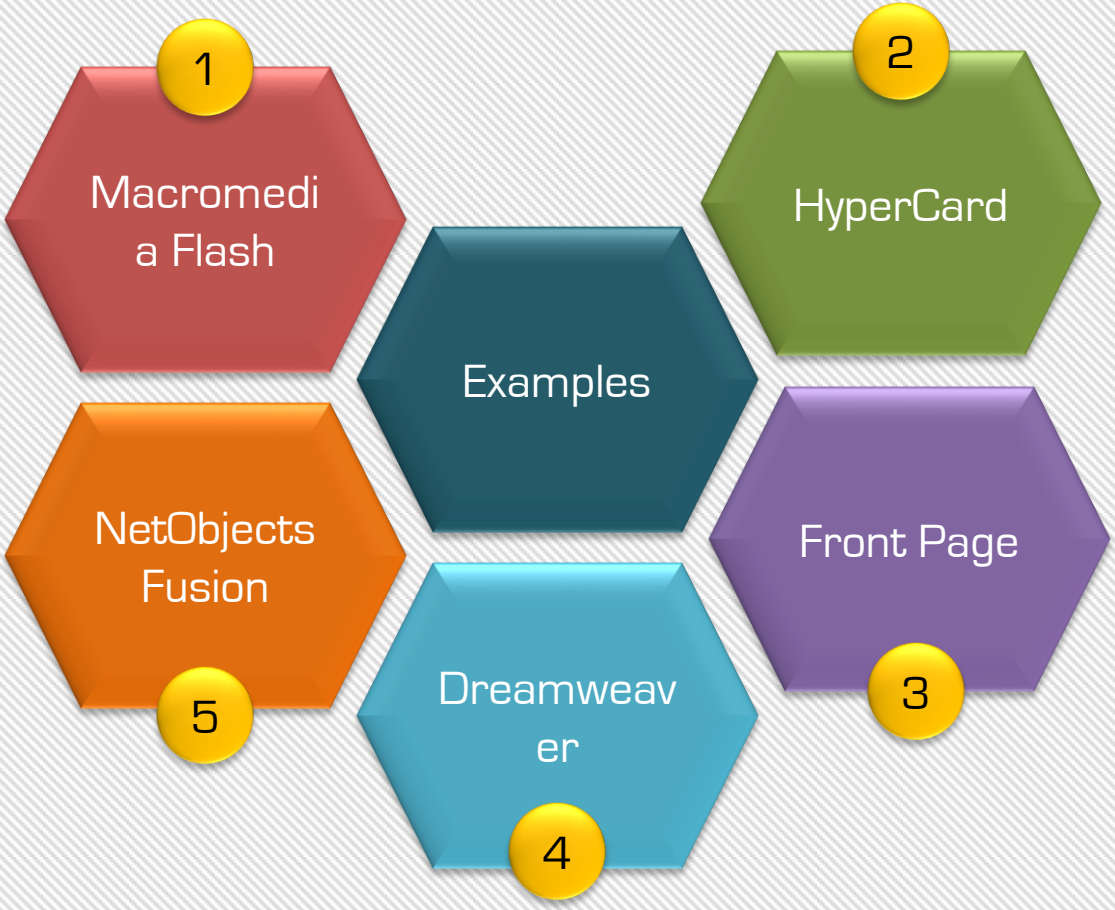
- It is a communication protocol used between web browser and web server
- It works based on request response model
- It is a stateless protocol. It cannot remember the previous users information and it cannot remember the number of times the user visited the page
- It has cache control mechanism. If the user requests the same page that has been visited already then it can be displayed from the cache memory instead of requesting the web server and bringing it from there.

Authoring Tools

- Authoring tool is a software package which developers use to create digital content.
- Example of authoring tools
  - Macromedia Flash
  - Macromedia Director
  - Author Ware
  - Quest

Authoring Tools

Authoring Tools



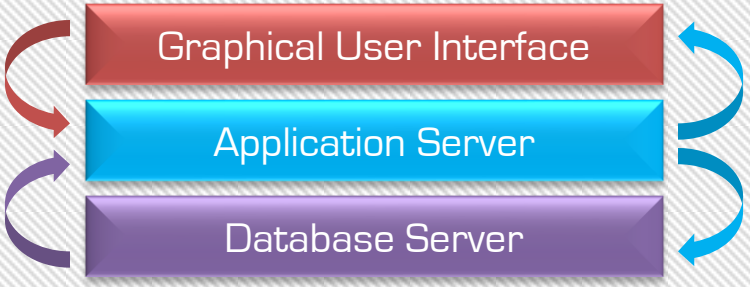
Types of Servers

- A server is a computer or device on a network that manages network resources.
- There are three types of servers

Types of Servers

Application Server

- It is a server program in a computer in a distributed network that provides the business logic for an application program
- It is viewed as a three tier application



GlassFish

Types of Servers

Web Server

- It is a program that uses HTTP to serve files that create web pages to users in response to their requests which are forwarded by the computers HTTP connection
- Always it is connected to internet with an unique address

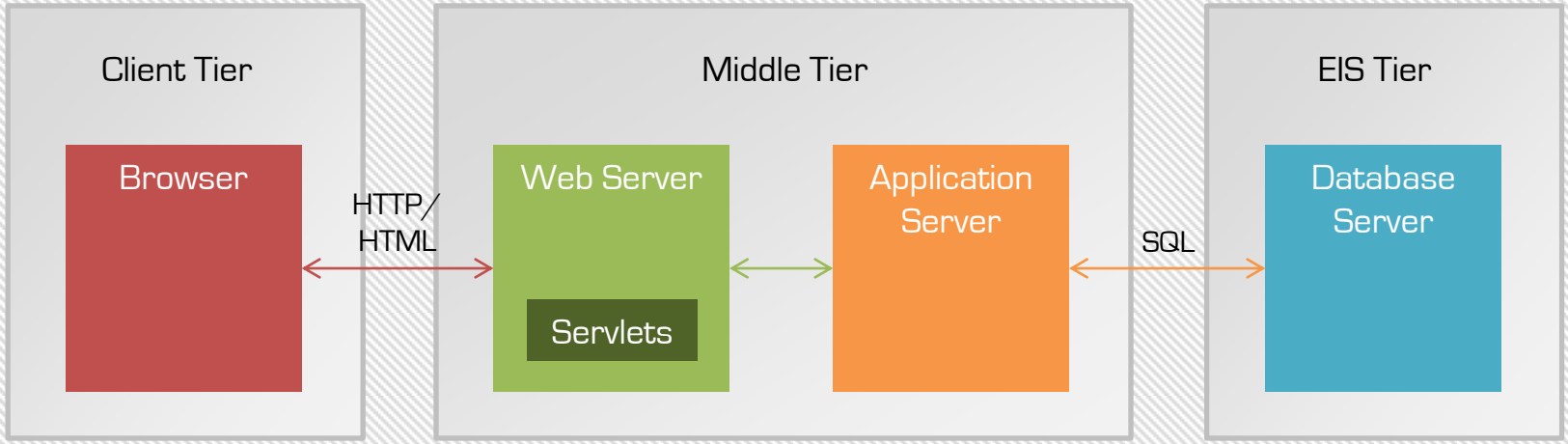
Apache Tomcat

Types of Servers

Database Server

- It is a hardware or software used to run a database according to the context
- It holds the Database Management System (DBMS)
- It maintains storage, retrieval, processing and securing the data

Types of Servers



Server Architecture

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