**Topic: Uniform resource locators (URLs)**

Reading Time: 15 mins

**·        Note\* Highlight important/core points while reading**

·        Read the content and write the answers given in the document in your words, to get the solid grip on topic.

**Uniform Resource Locators (URLs)**

A **Uniform Resource Locator (URL)** is the address used to access resources (such as web pages) on the World Wide Web (WWW). It provides the necessary information for a web browser to locate and retrieve a web resource.

**Structure of a URL**

A typical URL consists of multiple components:

https://www.example.com/section/page.html

1. **Protocol (Scheme)** → http:// or https://
   * Defines the communication rules between the web browser and the server.
   * **HTTP (Hypertext Transfer Protocol)** is used for standard web pages.
   * **HTTPS (Hypertext Transfer Protocol Secure)** provides secure communication using encryption (SSL/TLS).
2. **Domain Host (Subdomain)** → www.
   * This is an optional part of the URL.
   * www (World Wide Web) is a common subdomain, but other subdomains like mail. (for emails) or blog. (for blogs) can also be used.
3. **Domain Name** → example
   * The unique name of the website, chosen by the owner.
   * Example: google, facebook, bbc, wikipedia.

4.**Domain Type (Top-Level Domain - TLD)** → .com

* Indicates the type or purpose of the website.
* Common domain types include:
  + .com → Commercial websites
  + .org → Organizations (non-profits, charities)
  + .net → Networking-related sites
  + .gov → Government sites
  + .edu → Educational institutions

5.**Country Code (Optional - ccTLD)** → .uk

* Specifies the country where the website is registered.
* Examples:
  + .uk → United Kingdom
  + .de → Germany
  + .cy → Cyprus

6.**Path (Optional)** → /section/page.html

* Specifies the exact location of a page or resource within the website.
* Example: /products/shoes.html leads to a specific product page.

**How a URL Works**

1. The user enters a URL into the web browser.
2. The browser sends a request using the protocol (http or https).
3. The **Domain Name System (DNS)** translates the domain name into an **IP address**.
4. The browser connects to the web server at that IP address.
5. The server locates the requested resource (web page, file, etc.) and sends it to the browser.
6. The browser renders the web page for the user to view.

**A-Rated Questions/Answers By Examiner**

**Q1: What is a URL, and why is it important?**

**Answer:**A **Uniform Resource Locator (URL)** is the web address used to access websites and online resources. It is important because it provides the exact location of a resource on the **World Wide Web (WWW)**, allowing users and browsers to retrieve web pages efficiently.

**Q2: Name and explain the main components of a URL.**

**Answer:**

1. **Protocol** → Specifies how data is transferred (e.g., http://, https://).
2. **Domain Host** → Identifies the subdomain (e.g., www.).
3. **Domain Name** → Represents the website's name (e.g., example).
4. **Domain Type (TLD)** → Indicates the type of website (e.g., .com, .org).
5. **Country Code (ccTLD - Optional)** → Shows the country of registration (e.g., .uk, .de).
6. **Path (Optional)** → Defines the specific webpage or resource being accessed (e.g., /contact.html).

**Q3: What is the difference between HTTP and HTTPS?**

**Answer:**

* **HTTP (Hypertext Transfer Protocol)** transmits data without encryption. It is less secure and can be intercepted.
* **HTTPS (Hypertext Transfer Protocol Secure)** encrypts data using **SSL/TLS encryption**, making it more secure and protecting user data from cyber threats.

**Q4: What is a domain name, and how is it different from an IP address?**

**Answer:**

* A **domain name** (e.g., google.com) is a human-friendly address used to access websites.
* An **IP address** (e.g., 192.168.1.1) is a numerical address assigned to devices on the Internet.
* The **Domain Name System (DNS)** translates domain names into IP addresses, allowing users to access websites without remembering numerical IP addresses.

**Q5: What is the purpose of a country code in a URL?**

**Answer:**A **country code top-level domain (ccTLD)** (e.g., .uk, .in, .fr) indicates the country where a website is registered or primarily serves. It helps users identify the geographic origin of a website.

### Write your Answers on your Notebook and Verify it on Next Screen

**Q6: How does the Domain Name System (DNS) help in accessing a website using a URL?**

**Q7: Why is HTTPS preferred over HTTP for modern websites?**

**Q8: What is a subdomain, and how does it differ from a main domain?**

**Q9: How does a URL help in SEO (Search Engine Optimization)?**

**Q10: What is a query string in a URL, and how is it used?**

**6. Answer:**

1. When a user enters a URL, the browser queries a DNS server to resolve the domain name into an IP address.
2. The DNS system searches for the corresponding IP address of the domain name entered.
3. Once the IP address is found, the browser establishes a connection with the web server.
4. The server then sends back the requested webpage, which is displayed in the browser.

**7. Answer:**

1. HTTPS encrypts data using SSL/TLS, ensuring secure communication between the browser and the web server.
2. It protects sensitive information such as login credentials, payment details, and personal data from cyber threats.
3. HTTPS improves trustworthiness, as browsers label HTTP sites as "Not Secure."
4. Search engines like Google prioritize HTTPS websites in search rankings.

**8. Answer:**

1. A subdomain is a prefix added before the main domain to categorize different sections of a website (e.g., blog.example.com).
2. It acts as a separate website under the same domain name but can serve a different purpose.
3. Main domains (e.g., example.com) are the central identifiers of a website, while subdomains help organize content.
4. Examples:
   * **mail.google.com** (Gmail service)
   * **news.bbc.com** (BBC news section)

**9. Answer:**

1. A well-structured URL improves a website's visibility in search engines.
2. Using keywords in the URL (e.g., **example.com/best-laptops-2024**) increases relevance.
3. Short and descriptive URLs improve user experience and click-through rates.
4. HTTPS URLs contribute to better search rankings as they indicate a secure website.

**10. Answer:**

1. A query string is a part of a URL that contains parameters, typically used to pass information to web applications.
2. It starts with a ? and consists of key-value pairs separated by &.
3. Example: https://www.example.com/search?q=laptops&category=electronics
4. Query strings are commonly used in search results, tracking, and dynamic content generation.