The Internet's Secret Language

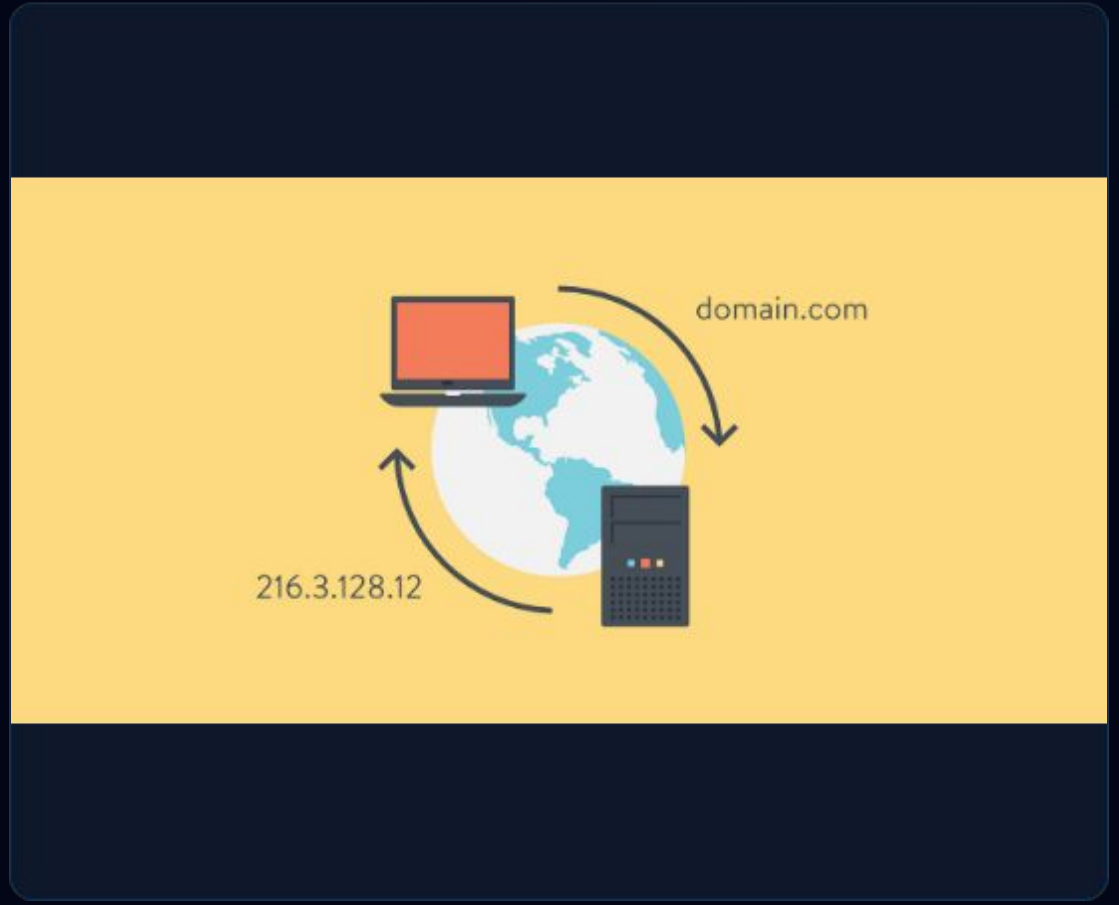
DNS, URL, Client-Server, SSH, and FTP

The fundamental building blocks of modern internet communication.

DNS – The Internet's Phonebook

Translating Names to Numbers

- **The Problem:** Computers love numbers like `192.0.2.172`, but humans love names.
- **The Solution:** Domain Name System (DNS) maps human-friendly names to numeric IP addresses.
- **Global Map:** Managed by authoritative name servers across the globe.



How a DNS Request Works

Step 1: The Request

You type **mozilla.org** into your browser. It's much easier to remember than a string of numbers!

Step 2: Local Check

Your browser first asks your computer's **Local DNS Cache**. If found, the journey ends and the page loads instantly.

Step 3: The DNS Server

If not cached, your computer contacts a **DNS Server**. This acts as a master directory to find the matching IP.

Step 4: Handshake

Once identified, your browser finally talks to the **web server** to fetch the website content.

Read more about DNS

Your Digital GPS: Anatomy of a URL

Scheme

The protocol used to access the site (e.g., **https://**).

Authority

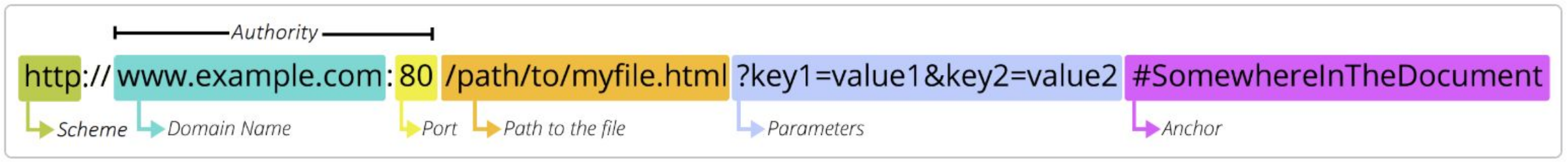
The "Who" and "Where"—Domain and Port identifier.

Path

The "What"—location of a specific file or page.

Parameters (Query string)

Extra data (**?id=123**) and Anchors (**#top**).

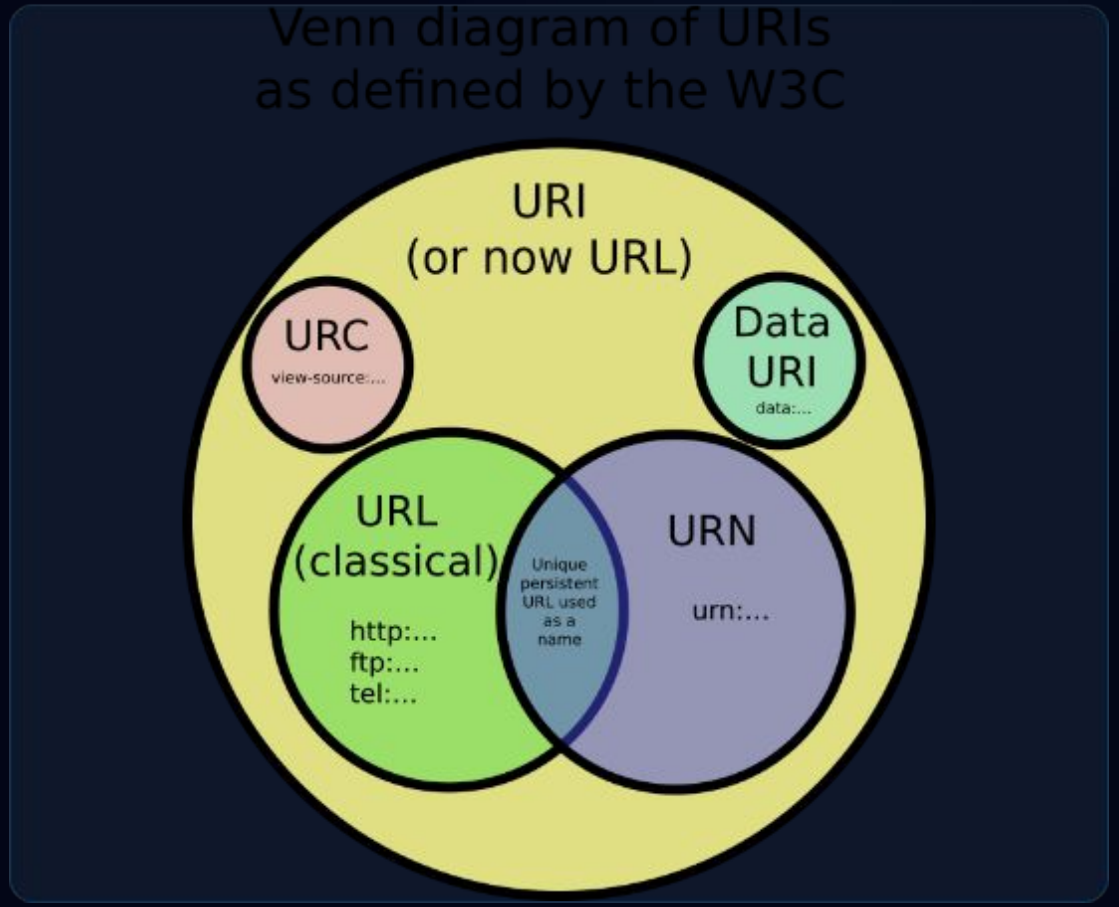


Read more about URL

The "Identity Crisis" Simplified

Names vs. Locations

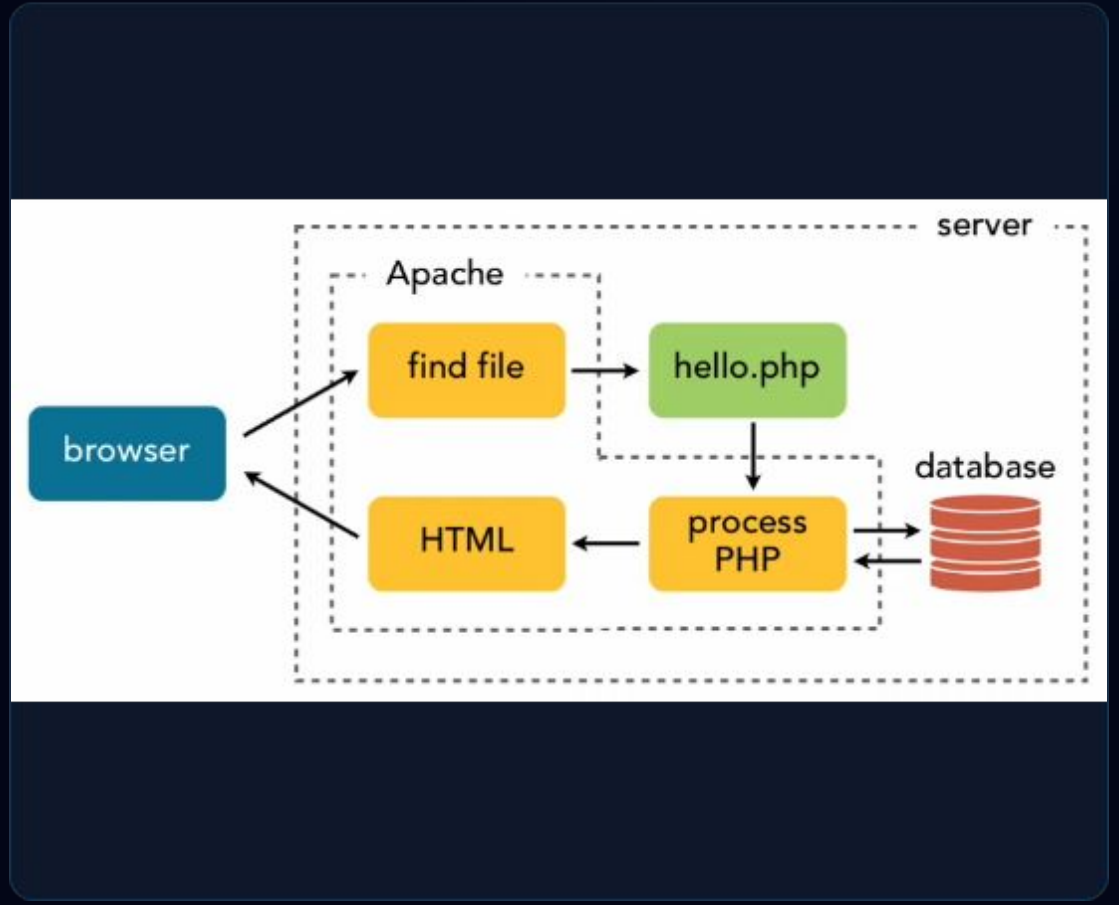
- **URI:** The umbrella term for all identifiers used on the web.
- **URL (Location):** Like a street address—tells you exactly where to go.
- **URN (Name):** Like a book title (ISBN)—identifies the item regardless of location.



The Request-Response Cycle

Orders & Kitchens

- **The Client:** Your browser making the "Order" request.
- **The Server:** The kitchen (Hardware + Software) processing the "Order."
- **The Workflow:** Client asks, server processes (PHP/Database), and returns HTML.



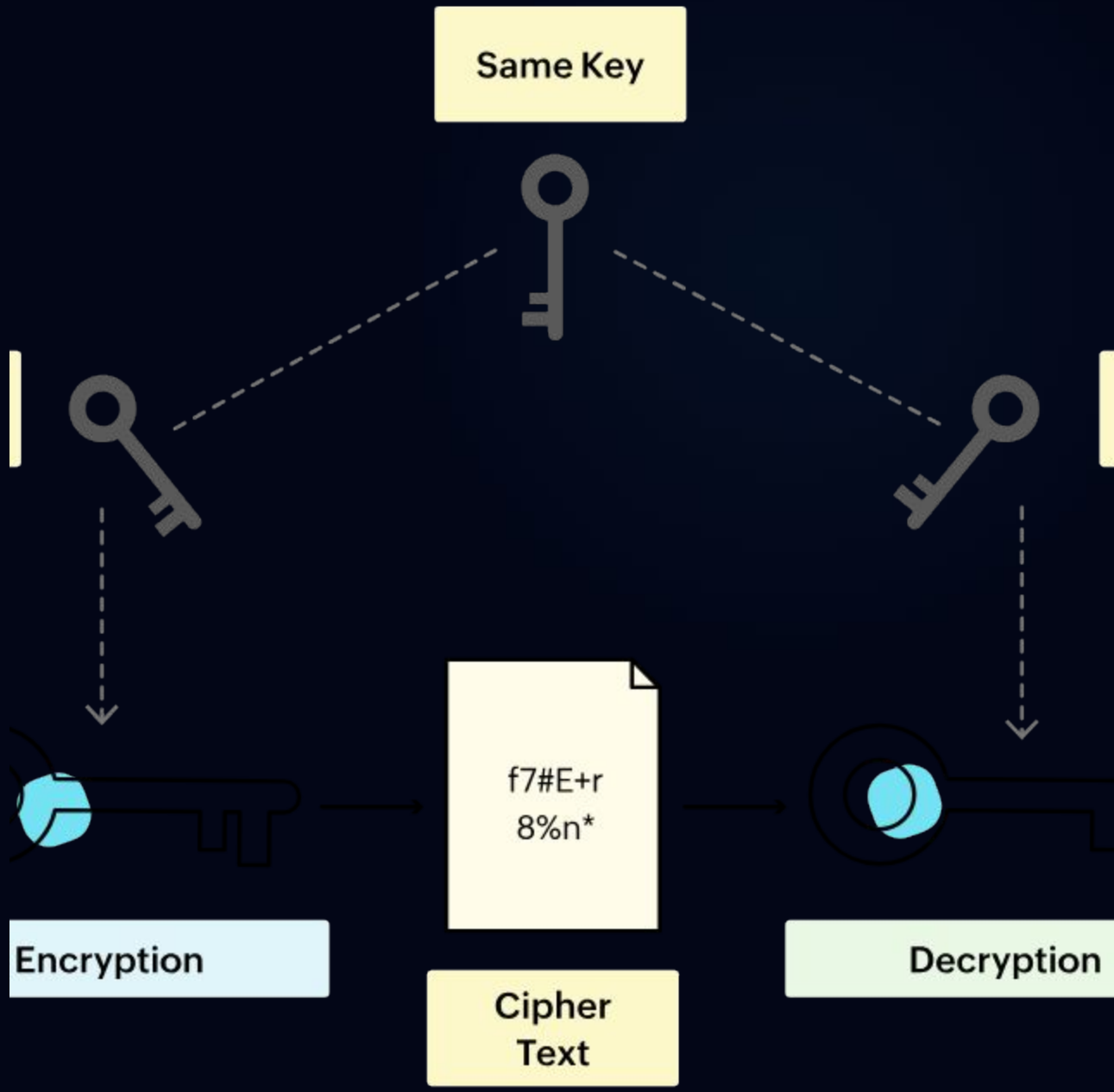
Read more about Client/Server

Remote Access, Fortified

SSH: The Secure Tunnel

- **Secure Shell:** Encrypted communication over public, untrusted networks.
- **Encryption:** Uses Public Key Cryptography—hackers only see gibberish if intercepted.
- **Port 22:** The standard "gate" for secure server management.

Essential for DevOps and secure system administration.



FTP – Moving the Goods

Delivering Files Across the Web

- **Bulk Transfer:** Best for uploading/downloading large batches of data.
- **Dual Lanes:** Uses Port 21 for commands and Port 20 for raw data.
- **Warning:** Standard FTP is unsafe "plain text." Use **SFTP** for encrypted transfers.

Choosing Your Tool

Feature	FTP	SSH / SFTP
Security	Low (Plain Text)	High (Encrypted)
Speed	High (Less overhead)	Moderate (Encryption cost)
Best For	Public data transfers	Server management / Secure files
Icon	⚡ Lightning Bolt	🛡️ Shield

Image Sources

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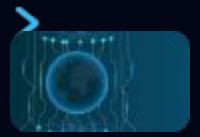

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