

Networking and Server Technologies

1. Understanding Wi-Fi USB Dongles

A **Wi-Fi USB dongle** is a small device that you plug into your computer's USB port to connect to a wireless network.

It's especially useful if:

- Your device doesn't have built-in Wi-Fi.
- You want to upgrade to a faster Wi-Fi standard (e.g., **Wi-Fi 6**).

How it works:

- The dongle has a built-in wireless adapter.
- It communicates with your router to give your PC access to the internet.

Key points:

- Some dongles come with antennas to improve signal strength.
 - Wi-Fi dongles are plug-and-play — easy to set up on most modern operating systems.
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2. Secure Collaboration Across the Internet

Secure collaboration means working together online while protecting sensitive data.

Common tools used:

- Cloud storage (e.g., Google Drive, OneDrive)
- Communication apps (e.g., Microsoft Teams, Slack)
- Project management platforms (e.g., Trello, Asana)

Best practices for secure collaboration:

- Use strong passwords and enable **two-factor authentication (2FA)**
 - Encrypt sensitive documents
 - Use secure Wi-Fi networks (avoid public Wi-Fi)
 - Carefully assign file access permissions (read-only, editor, etc.)
 - Use **VPNs** for secure remote access
 - Organizations often add firewalls and endpoint protection for extra security
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3. Types and Functions of Networking and Wireless Connections

Types of Networks:

- **LAN (Local Area Network):** Connects devices in a small area like a home, office, or school.
- **WAN (Wide Area Network):** Connects LANs over large areas — the internet is the best example.
- **WLAN (Wireless LAN):** A wireless version of a LAN, using Wi-Fi.
- **PAN (Personal Area Network):** Short-range networks, such as Bluetooth between a phone and earbuds.
- **MAN (Metropolitan Area Network):** Covers cities or large campuses — used by governments, universities.

Types of Wireless Connections:

- **Wi-Fi:** Common for home and business internet access.
- **Bluetooth:** Connects nearby devices (e.g., speakers, keyboards).
- **Mobile Networks (3G, 4G, 5G):** Internet access over cellular networks.
- **Infrared:** Older tech used in TV remotes and early mobile phones.

Functions of Networking:

- **File Sharing:** Share documents and files between users.
 - **Printer and Device Sharing:** Use shared hardware across the network.
 - **Internet Access:** Connect multiple devices to the internet via one router.
 - **Centralised Data Management:** Store and manage files on a central server.
 - **Communication Tools:** Enable chat, email, video conferencing, and collaboration.
 - **Remote Access:** Use cloud services or VPNs to access files securely from anywhere.
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4. Common Functionality of Server Networks

Servers are powerful computers that manage resources across a network. They handle file storage, application hosting, email, and more.

Key server functions:

- Store and share files
- Run centralized applications (e.g., databases)
- Share internet access
- Manage email services
- Allow VPN remote access
- Centralize print jobs
- Host internal websites (intranets)
- Run shared tools and business software

Advanced Server Uses:

- Businesses may split heavy workloads across multiple servers
- **Virtualization** allows one physical server to behave like several virtual servers

Heavy Applications That May Require Dedicated Servers:

- Large shared databases
 - Software development environments
 - Complex internal email systems
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Using the Cloud Instead of Traditional Servers

Many businesses are switching to **cloud computing** for flexibility and cost-efficiency.

Benefits of Cloud Services:

- Easier to set up and maintain
- Lower upfront costs — usually billed monthly
- Accessible from anywhere with a browser
- 24/7 support from the provider
- Flexible user management (add/remove users easily)
- Automatic updates and backups
- Enables remote and hybrid working

Important Considerations:

- Choose a **trusted cloud provider**
 - Ensure a **fast and reliable internet connection**
 - Know where your data is stored (important for **GDPR compliance**)
 - Understand the support and service level agreements
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Structure of the HTML Page

The web page is built with semantic HTML5 and includes the following layout:

Page Structure:

- `<header>`
Includes the main title and a short description of the article.
 - `<section>`
 - Section 1: Understanding Wi-Fi USB Dongles
 - Section 2: Secure Collaboration Across the Internet
 - Section 3: Types and Functions of Networking and Wireless Connections
 - Section 4: Common Functionality of Server Networks
 - `<audio>`
Placed under the article to allow users to listen to an MP3 version of the article.
 - `<footer>`
Displays contact information and copyright.
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Network Sharing Setup & Testing Plan

Steps:

1. Open the project folder in **Visual Studio Code**.
2. Use the **Live Server** extension to run `networks-and-servers.html`.
3. Open **Command Prompt** and type `ipconfig` to get your **IPv4 address**.

Share your website with others via:

`http://127.0.0.1:5500/index.html`

4. Test the site on another device or ask a classmate for feedback.