

Introduction to Cyber Security

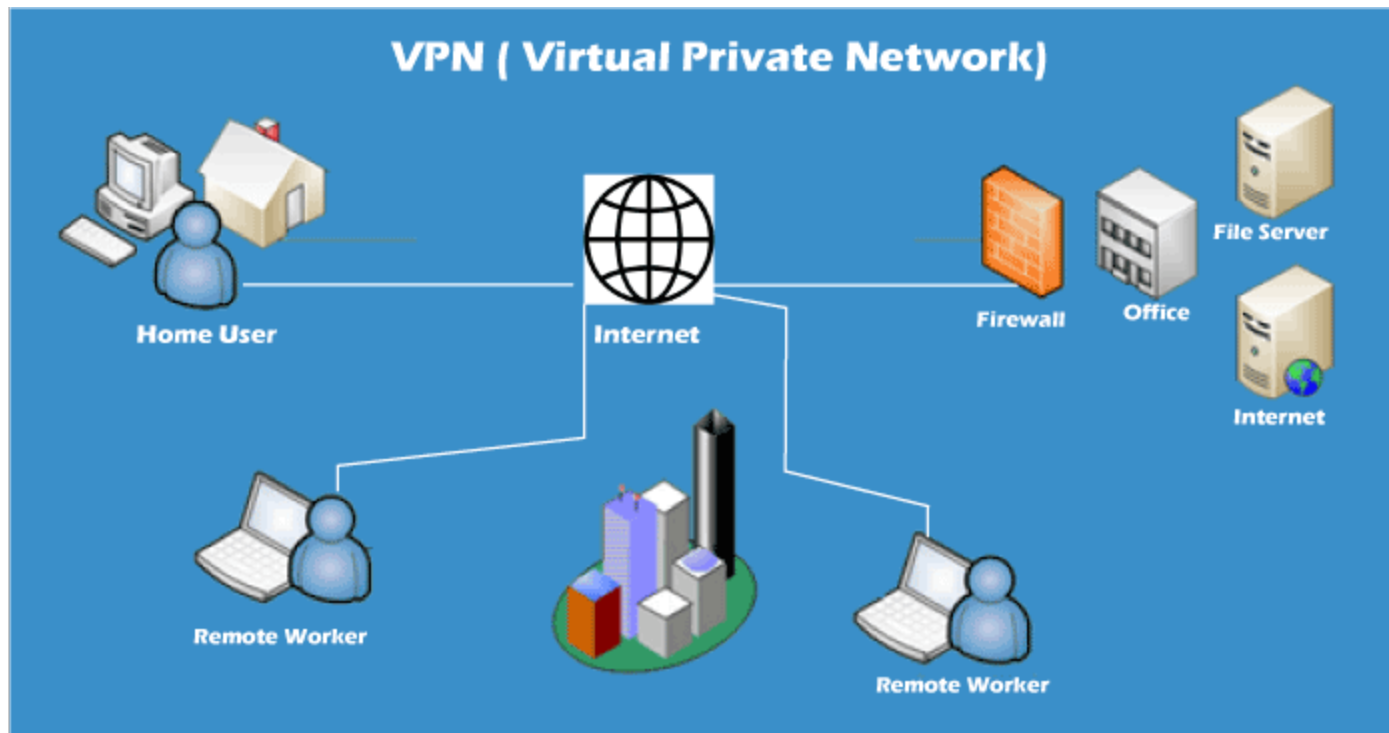


- Definition: Cybersecurity refers to the practice of protecting computer systems, networks, and data from unauthorized access, cyberattacks, and damage.
- Importance: In today's interconnected world, where digital technology plays a vital role in almost every aspect of our lives, cybersecurity is crucial for safeguarding sensitive information, maintaining privacy, and ensuring the smooth functioning of organizations and critical infrastructure.



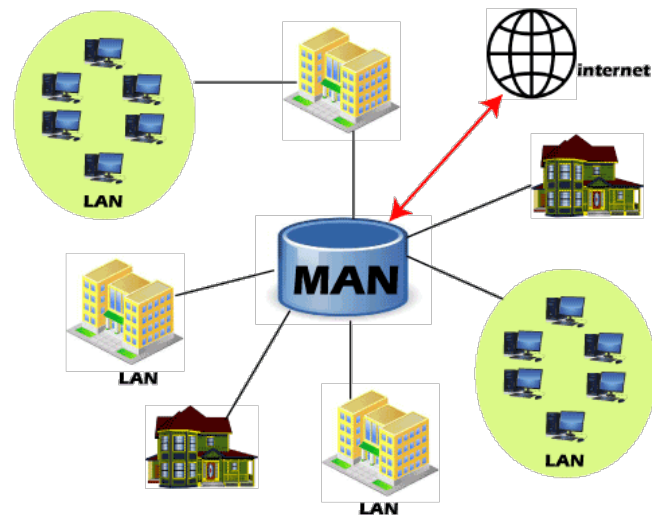
Networking Fundamentals

- **Definition:** Networking refers to the practice of connecting computers, devices, and systems to share resources, communicate, and exchange data.
- **Importance:** Networking enables seamless communication and collaboration, facilitates access to information and resources, and powers various technologies and applications in today's interconnected world.



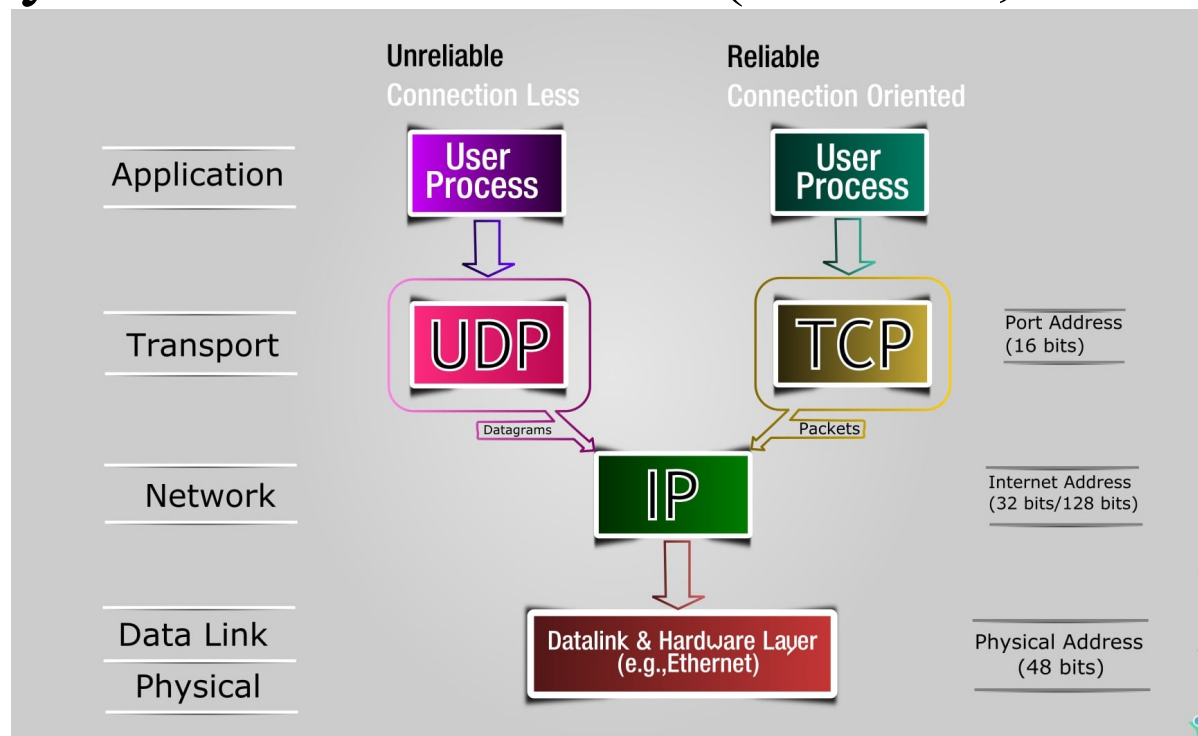
- Overview of Layers: Layer 1: Physical Layer (Hardware, Cables)
- Layer 2: Data Link Layer (Ethernet, MAC Address)
- Layer 3: Network Layer (IP Address, Routing)
- Layer 4: Transport Layer (TCP, UDP)
- Layer 5: Session Layer (Establishes, Maintains, Terminates Connections)
- Layer 6: Presentation Layer (Data Formatting, Encryption)
- Layer 7: Application Layer (Network Services, APIs)

MAN (Metropolitan Area Network)



TCP/IP Model

- Application Layer: Network Applications (HTTP, FTP, SMTP)
- Transport Layer: End-to-End Data Delivery (TCP, UDP)
- Internet Layer: Routing and Addressing (IP, ICMP)
- Link Layer: Network Interface (Ethernet, Wi-Fi)



Port Numbers

- A port number is a way to identify a specific process that receives a network message at a server. Port numbers are used in TCP and UDP-based networks.
- The range of **port numbers** from 1024 to 49151 (2^{10} to $2^{14} + 2^{15} - 1$) are the registered ports.
- HTTP (Port 80), HTTPS (Port 443)
- FTP (Port 21), FTPS (Port 990)
- SMTP (Port 25), POP3 (Port 110), IMAP (Port 143)
- SSH (Port 22), Telnet (Port 23)
- DNS (Port 53), DHCP (Port 67/68)
- SNMP (Port 161/162), LDAP (Port 389)
- MySQL (Port 3306), PostgreSQL (Port 5432)

Protocols

- TCP (Transmission Control Protocol)
- UDP (User Datagram Protocol)
- IP (Internet Protocol)
- ICMP (Internet Control Message Protocol)
- ARP (Address Resolution Protocol)
- DHCP (Dynamic Host Configuration Protocol)
- DNS (Domain Name System)
- SMTP (Simple Mail Transfer Protocol)
- HTTP (Hypertext Transfer Protocol)
- HTTPS (Hypertext Transfer Protocol Secure)

Introduction to Python

- Python is an essential programming language in today's technological landscape. Its simplicity, versatility, and vast ecosystem make it an excellent choice for beginners and professionals alike. Whether you're interested in web development, data science, machine learning, or automation, learning Python opens up a world of possibilities for building innovative applications and solving real-world problems. Python is a high-level, interpreted programming language known for its simplicity, versatility, and readability. It is widely used in various fields such as web development, data analysis, artificial intelligence, automation, scientific computing, and more.

- Python syntax is straightforward and easy to grasp. It uses indentation for code blocks and has clear rules for comments, variables, data types, and operators. You can perform arithmetic operations, manipulate strings, and use conditional statements and loops to control program flow. Python's syntax emphasizes readability, making it accessible to both beginners and experienced programmers.

