SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore-35

Department of Artificial Intelligence and Data Science

23ITT204 – Computer Networks

II B.Tech – AI&DS / IV SEMESTER

UNIT I :INTRODUCTION AND APPLICATION LAYER

Topic 3: TCP/IP Protocol suite

Session’s Agenda:

- Empathize
- Define
- Ideate
- Prototype
- Test
- Real-world Scenario
- Challenges
- Conclusion

Recap

- Sending Messages & Files
- Different Devices
- Various Networks
- Need Fast & Reliable Communication

Empathize – Why Networks?

How do people share information every day?

Define – Problems in Communication

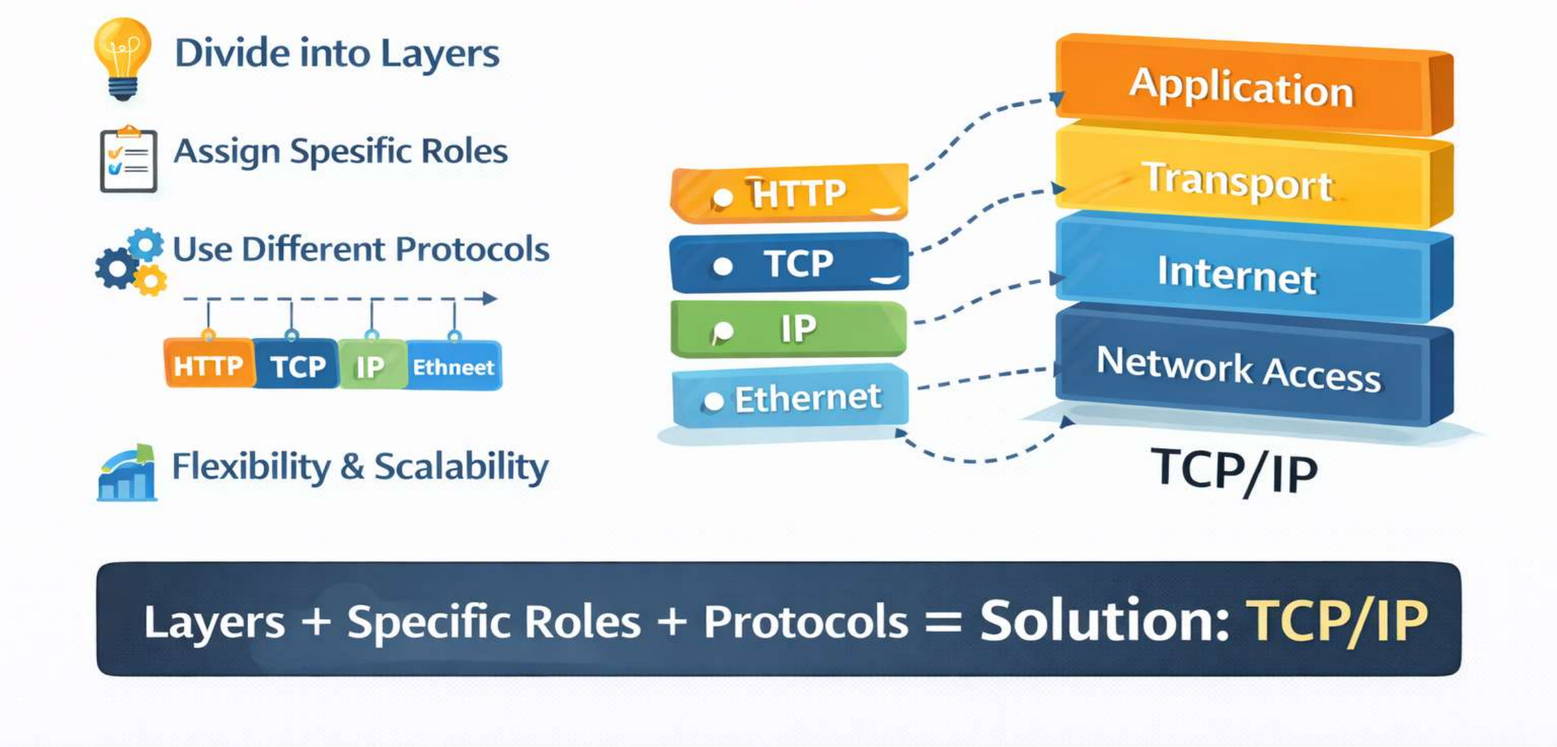
What happens without proper network protocols?

Data could get lost, delayed, or misrouted. Different devices may not understand each other.

Ideate – Designing a Protocol Suite

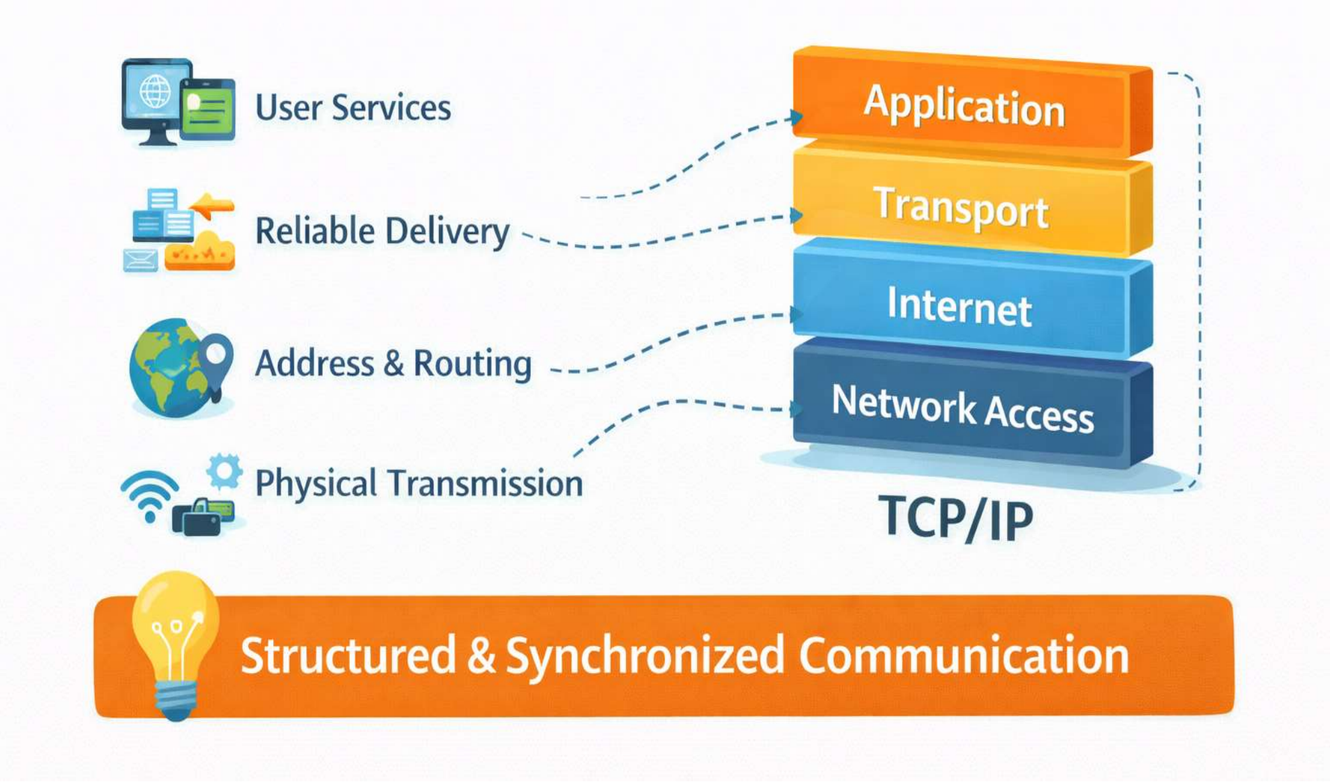
How can we organize communication efficiently?

Break communication into layers: application, transport, internet, and network access. Each layer has a specific role.



Prototype – TCP/IP Layers

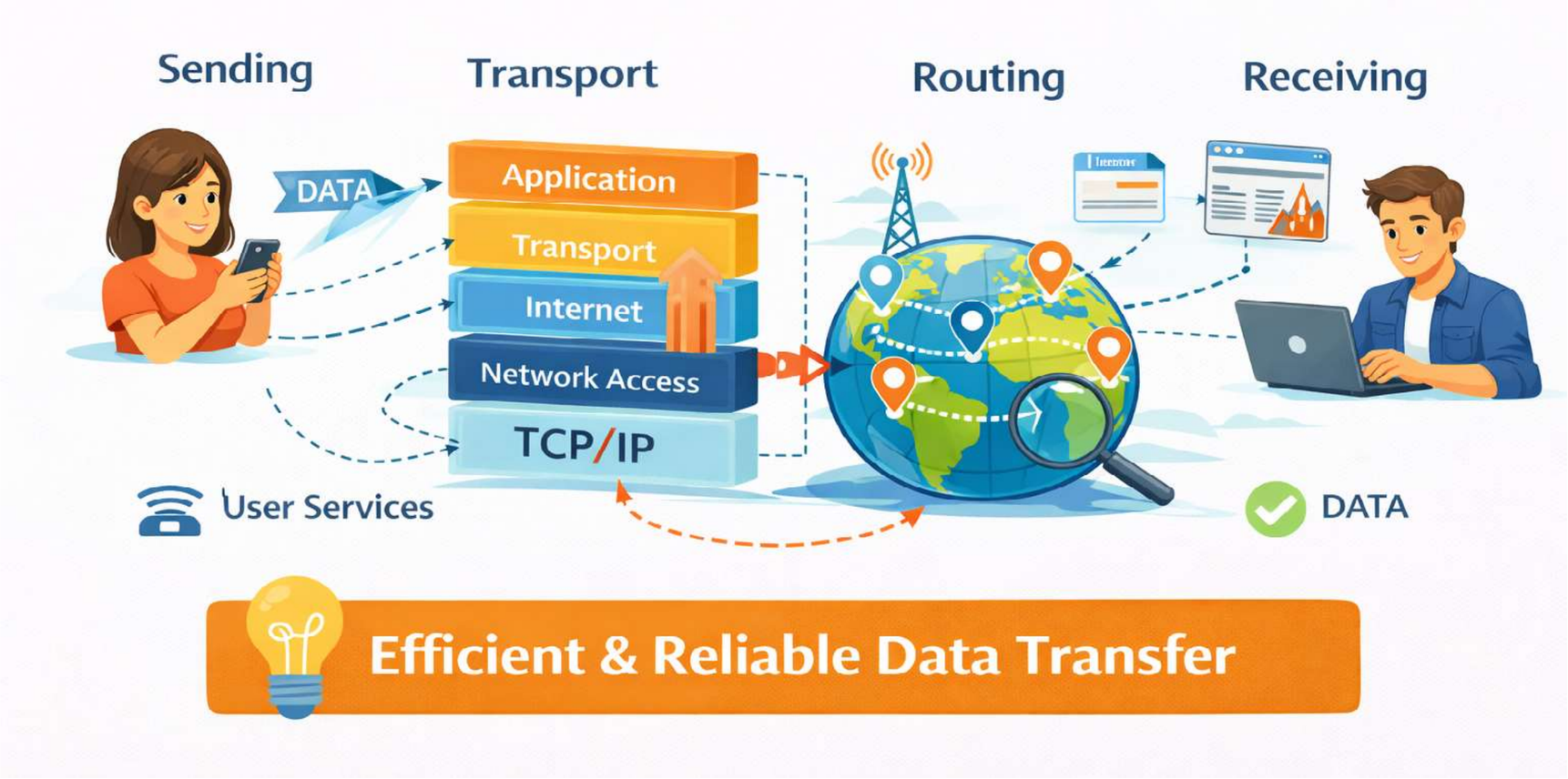
•**Application:** User interaction (Email, Web),**Transport:** Ensures reliable delivery (TCP, UDP),**Internet:** Sends packets across networks (IP),**Network Access:** Hardware communication (Ethernet, Wi-Fi)



Test – How Data Travels

How does a message reach another device?

Data is broken into packets, travels through each layer, and reassembled at the destination.



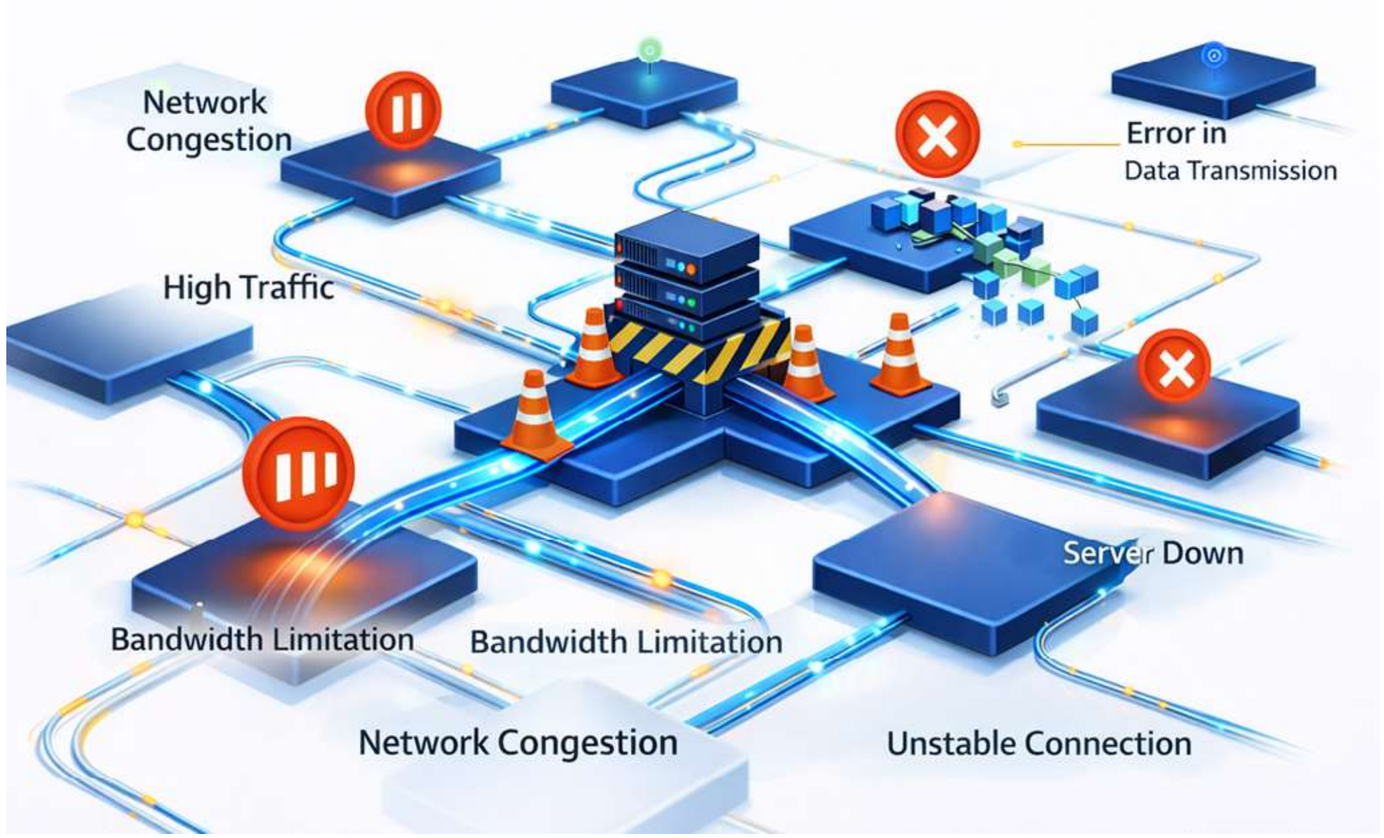
Real-world Scenario – Internet Communication

- Email app → TCP (reliable delivery) → IP (routing) → Internet → Recipient app.

Challenges – Network Problems

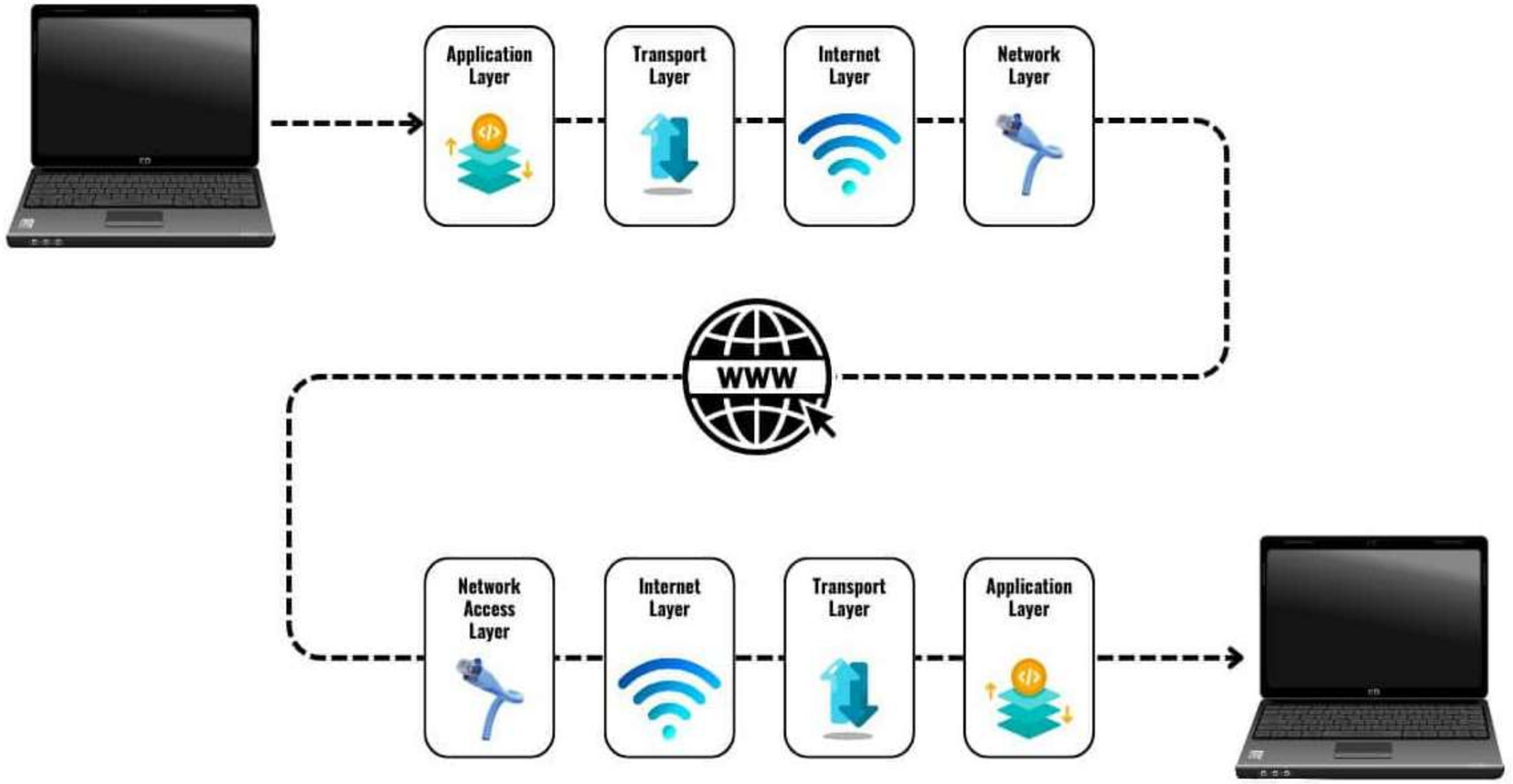
What issues can occur in networks?

Delays, packet loss, congestion, incompatible devices.

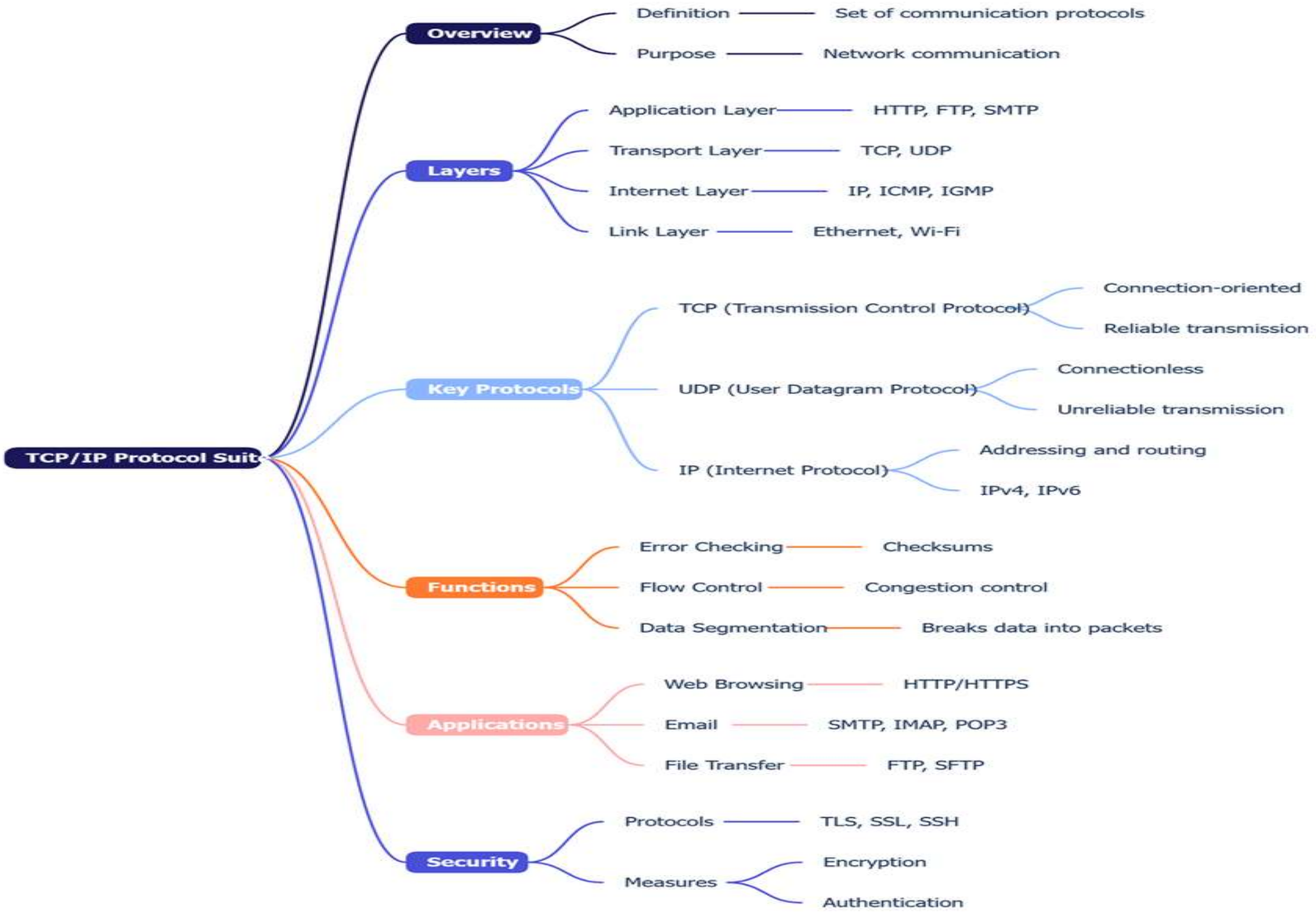


Conclusion – TCP/IP Solves Real Problems

Why is TCP/IP essential?



Mindmap


TCP/IP Protocol Suit
Overview
Definition
Set of communication protocols
Purpose
Network communication
Layers
Application Layer
HTTP, FTP, SMTP
Transport Layer
TCP, UDP
Internet Layer
IP, ICMP, IGMP
Link Layer
Ethernet, Wi-Fi
Key Protocols
TCP (Transmission Control Protocol)
Connection-oriented
Reliable transmission
UDP (User Datagram Protocol)
Connectionless
Unreliable transmission
IP (Internet Protocol)
Addressing and routing
IPv4, IPv6
Functions
Error Checking
Checksums
Flow Control
Congestion control
Data Segmentation
Breaks data into packets
Applications
Web Browsing
HTTP/HTTPS
Email
SMTP, IMAP, POP3
File Transfer
FTP, SFTP
Security
Protocols
TLS, SSL, SSH
Measures
Encryption
Authentication

Thank You