

## Chapter 1.5 - Protocol Layers and Service Models

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### Protocol "Layers"

- Networks are complex. They have many layers, including: *hosts, routers, links, applications, protocols, hardware, software, etc..*
- Each **layer** implements a service. The layers have their own actions, but they also rely on services provided by other layers.
- Advantages of layering:
  - Allows *fast identification* and shows *relationship* between parts of a complex system.
  - Modularization makes maintenance easier. Changes to one layer does not affect the system, and the other layers do not know that a layer has been changed.

### Internet Protocol Stack

- **Applications** support network applications. **ex.** *FTP, SMTP, HTTP*.
- **Transport** handles process-process transfers. **ex.** *TCP, UDP*.
- **Network** routes data from source to destination. **ex.** *IP, routing protocols*.
- **Link** transfers data between neighbouring network elements. **ex.** *Ethernet, 802.111, PPP*.
- **Physical** bits on the wire.

### Encapsulation

- See slide 1-62.