

CS4793 – Network Protocols



Session 1

NETWORK GENERAL GUIDE TO COMMUNICATIONS PROTOCOLS

7 APPLICATION LAYER

- Provides interface to end-user processes
- Provides standardized services to applications

6 PRESENTATION LAYER

- Specifies architecture-independent data transfer format
- Encodes and decodes data; encrypts and decrypts data; compresses data

5 SESSION LAYER

4 TRANSPORT LAYER

- Manages network layer connections
- Provides reliable packet delivery mechanism

3 NETWORK LAYER

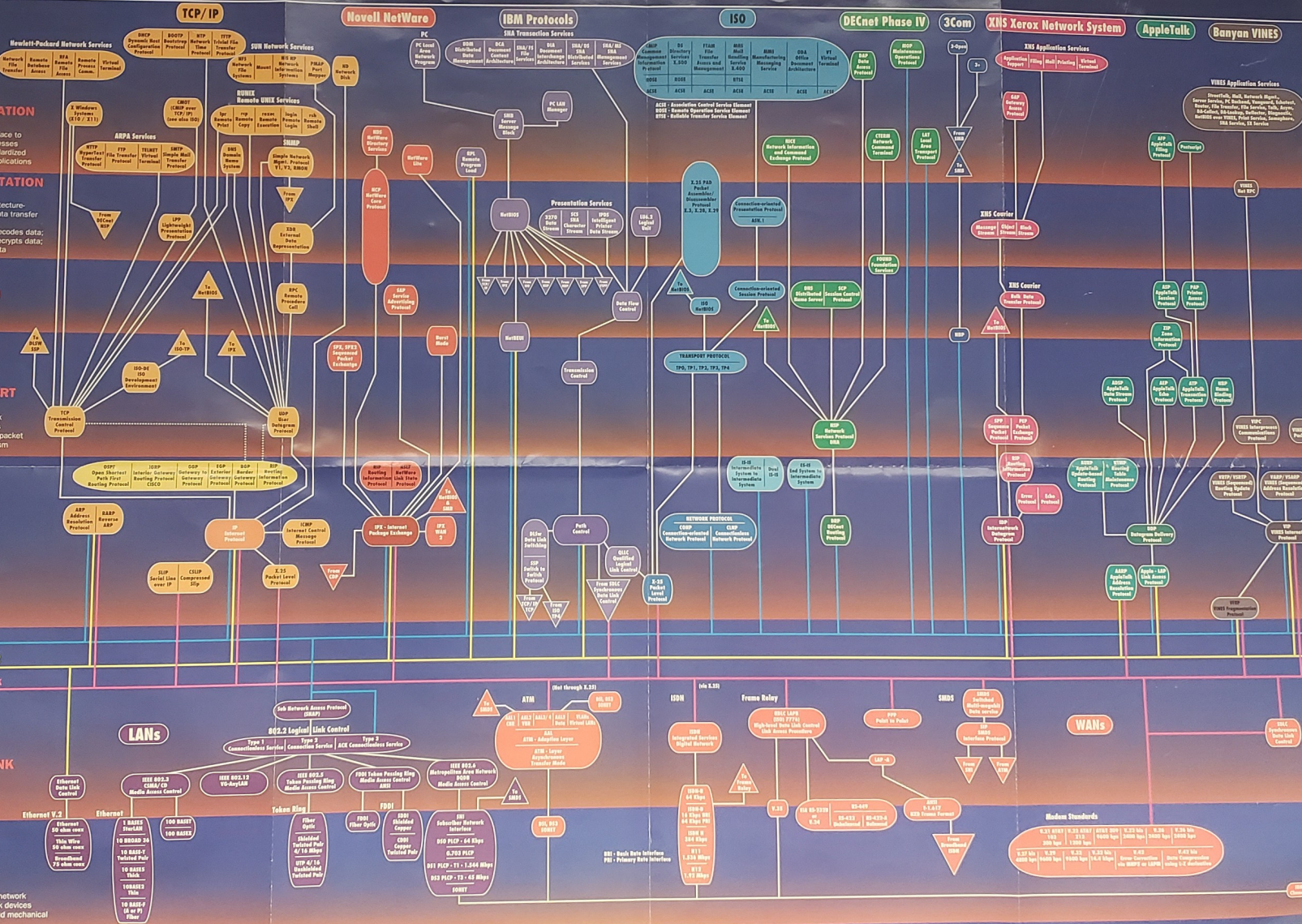
- Addresses and routes packets

2 LOGICAL LINK LAYER

- Frames packets
- Controls physical layer data flow

1 PHYSICAL LAYER

- Interfaces between network medium and network devices
- Defines electrical and mechanical characteristics





Open Systems Interconnection Reference Model (OSI/RM)

- In the 1970's all networks were homogeneous.
- Data could not be shared between networks
- The International Standards Organization (ISO) developed OSI



What does OSI do

- Sets the basis for which all interconnection now takes place
- Provides a way to establish criteria to analyze network protocols



What OSI isn't

- A Network Protocol
- A way to communicate



A look at OSI/RM



The Layered Approach

- Seven layers
- Each layer independent of the other with no interaction except at the SAP
- Changing one layer should have no effect on the responsibilities of another layer



The seven layers

- 7- Application
- 6- Presentation
- 5- Session
- 4- Transport
- 3- Network
- 2- Data Link
- 1- Physical



Application Layer

- This is the first network based layer that an application interacts with.
- It provides a set of services for the application to call on
- Uses the resources of the Presentation Layer



Presentation Layer

- Preserves the meaning of the information
- Provides services to the Application layer
- Uses services of the Session layer



Session Layer

- Coordinates the exchange of data and the multiplexing of sessions
- Provides services to the presentation layer
- Uses services from the transport layer



Transport Layer

- Provides both connection-oriented and/or connection-less services.
- Is responsibly for flow control
- Provides services to the session layer
- Uses services from the network layer



Network Layer

- Provides addressing services and routing services
- Provides services to the Transport layer
- Uses services from the Data Link Layer



Data Link Layer

- Responsible for link to link data transfer
- Provides traffic control and error detection
- Provides services to the Network layer
- Uses services from the Physical layer



Physical Layer

- Usually implemented in hardware
- Provides data transfer across the physical medium, clocking, control and mechanical connections
- Provides services to the Data Link Layer



OSI's shortfalls

- Too wastefull
- Never implemented anywhere
- TCP/IP