

# Protocol Family Encapsulations

## Layer 7—Application

Provides standard services to applications and end-user interfaces.

## Layer 6—Presentation

Performs data format conversion. Provides compression, encoding, and encryption of data.

## Layer 5—Session

Establishes sessions between services. Synchronizes and performs translations for naming services.

## Layer 4—Transport

Manages connections and provides reliable packet delivery. Operates in units of messages.

## Layer 3—Network

Addresses and routes datagrams. Performs fragmentation and reassembly (IP). Operates in units of packets.

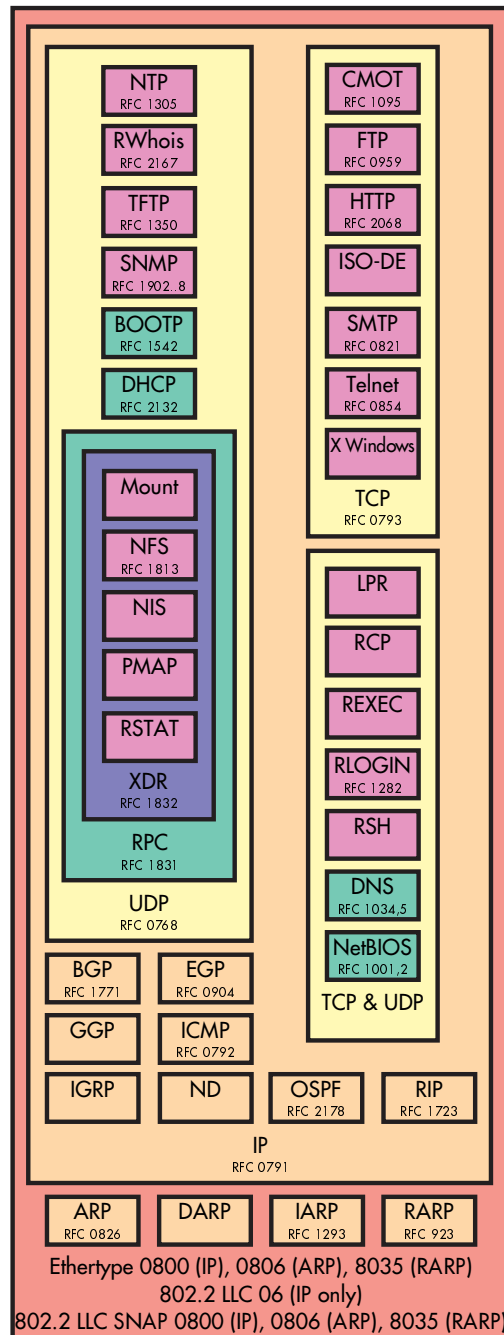
## Layer 2—Logical Link

Provides hardware addressing and error detection/correction. Operates in units of frames.

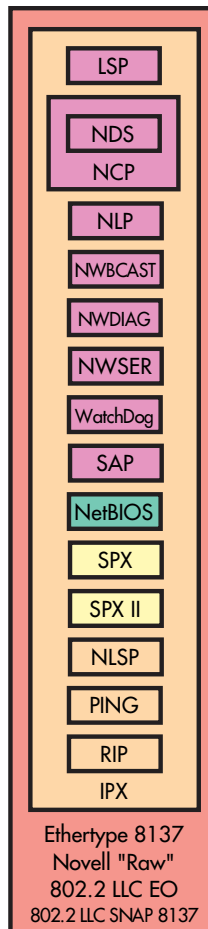
## Layer 1—Physical

Defines connection, electrical, and wiring specifications. Operates in units of bits.

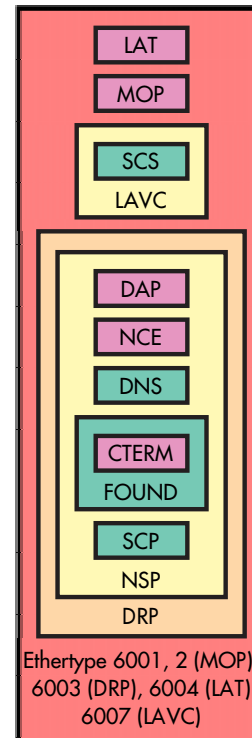
### TCP/IP



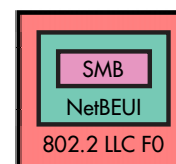
### Novell Network



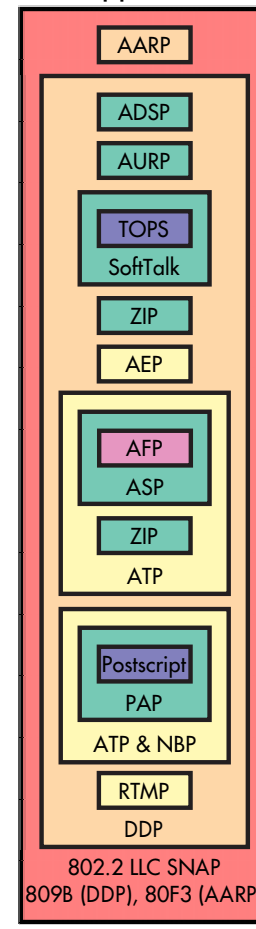
### DECnet



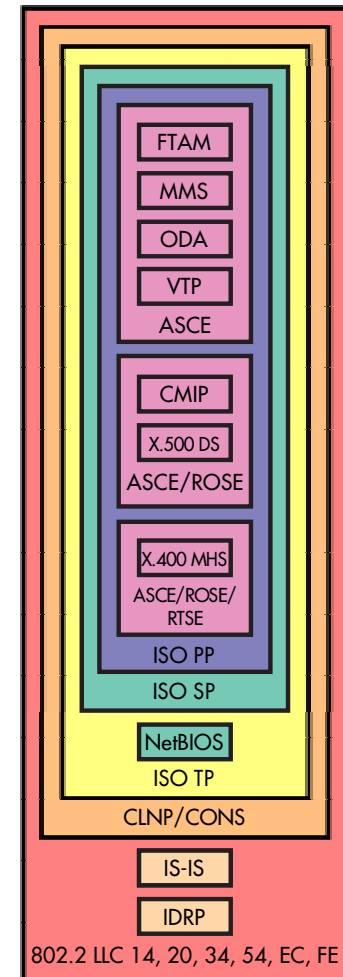
### NetBEUI



### AppleTalk



### ISO



AARP AppleTalk Address Resolution Protocol  
ADSP AppleTalk Data Stream Protocol  
AEP AppleTalk Echo Protocol  
AFP AppleTalk Filing Protocol  
ARP Address Resolution Protocol  
ASCE Association Control Service Element  
ASP AppleTalk Session Protocol  
ATP AppleTalk Transaction Protocol  
AURP AppleTalk Update Routing Protocol  
BGP Border Gateway Protocol  
BOOTP Boot Protocol  
CLNP Connectionless Network Protocol  
CMIP Common Management Information Protocol  
CMOT CMIP over TCP/IP  
CONS Connection Oriented Network Protocol  
DARP Dynamic Address Resolution Protocol  
DDP Datagram Delivery Protocol  
DHCP Dynamic Host Configuration Protocol  
DNS Domain Name System  
EGP Exterior Gateway Protocol  
FTAM File Transfer Access and Management  
FTP File Transfer Protocol  
GGP Gateway to Gateway Protocol

HTTP Hypertext Transfer Protocol  
IARP Inverse Address Resolution Protocol  
ICMP Internet Control Message Protocol  
IDRP Interdomain Routing Protocol  
IGRP Interior Gateway Routing Protocol  
IP Internet Protocol  
IPX Internet Packet Exchange  
IS-IS Intermediate System to Intermediate System Routing  
ISDP Presentation Protocol  
ISDP Session Protocol  
ISDP Transport Protocol  
IS-DE Development Environment  
LPR Remote Print  
LSP NetWare Lite Sideband Protocol  
MMS Manufacturing Message Service  
Mount Mount Server  
NBP Name Binding Protocol  
NCP NetWare Core Protocol  
ND Network Disk  
NDS NetWare Directory Service  
NetBEUI NetBIOS Enhanced User Interface  
NetBIOS Network Basic Input/Output System

NFS Network File System  
NIS Network Information Services  
NLP Network Life Protocol  
NSP NetWare Link State Protocol  
NTP Network Time Protocol  
NWBCAST NetWare Broadcast Message Notification  
NWDIAG NetWare Diagnostic Support Protocol  
NWSE NetWare Session Protocol  
ODA Office Document Architecture  
OSPF Open Shortest Path First  
PAP Password Access Protocol  
PING Packet Internet Groper  
PMAP Port Mapper  
RARP Reverse Address Resolution Protocol  
RCP Remote Copy  
REXEC Remote Execution  
RIP Routing Information Protocol  
RLOGIN Remote Login  
RSG Remote Operations Service Element  
RPC Remote Procedure Call  
RSH Remote Shell

RSTAT Remote Statistics  
RTMP Routing Table Maintenance Protocol  
RIS Reliable Transfer Service Element  
RWhois Remote Whois  
SAP Service Advertisement Protocol  
SMB Server Message Block  
SMTP Simple Mail Transfer Protocol  
SNMP Simple Network Management Protocol  
SPX Sequenced Packet Exchange  
TCP Transmission Control Protocol  
Telnet Telecommunications Network Protocol  
TFTP Trivial File Transfer Protocol  
TOPS Transcendental Operating System  
UDP User Datagram Protocol  
VTP Virtual Terminal Protocol  
WatchDog Station Keep Alive  
X Windows Graphical Windows  
X.400 MHS Message Handling System  
X.500 DS Directory Services  
XDR Exchange Data Represntative Protocol  
ZIP Zone Information Protocol