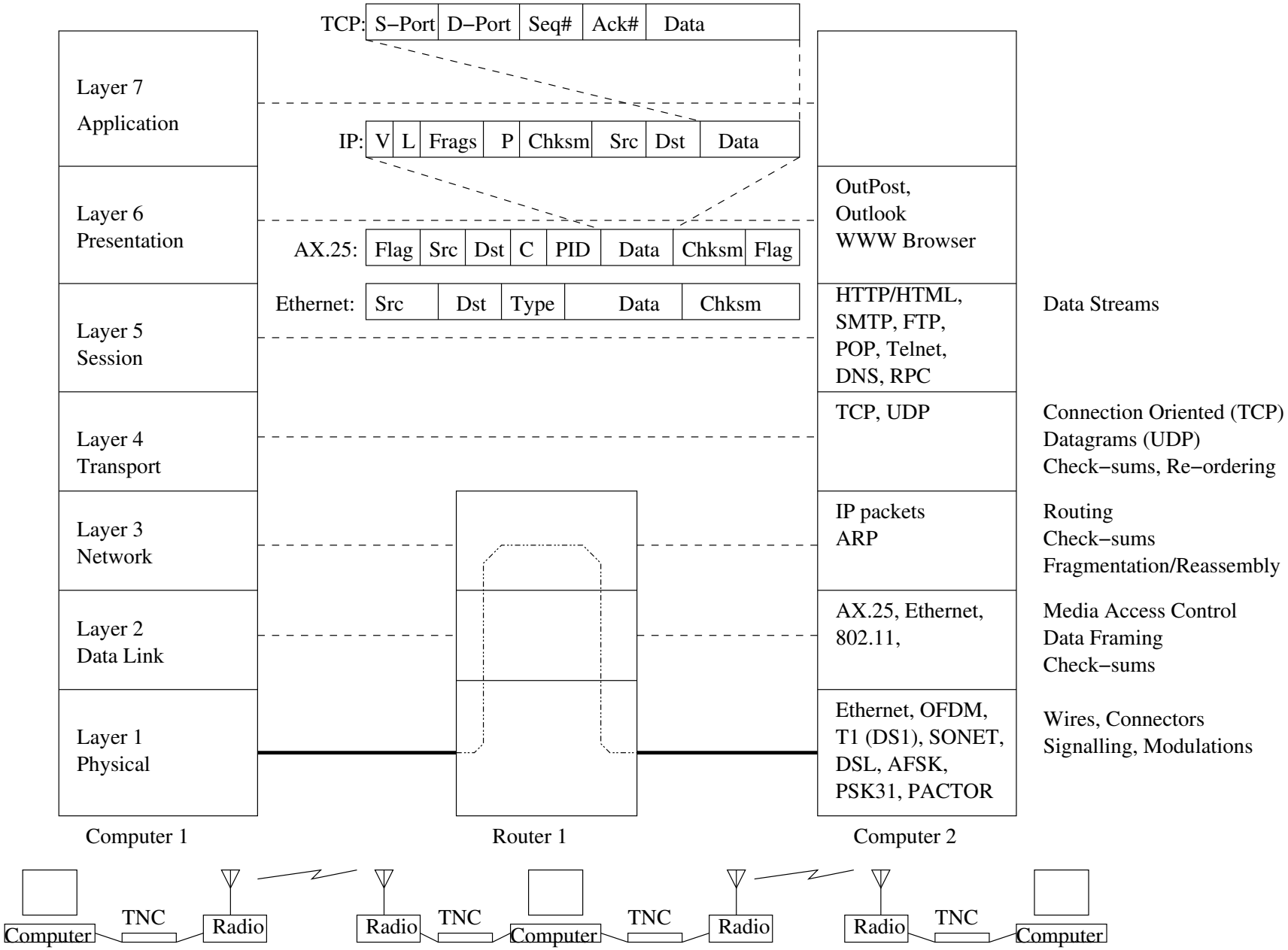
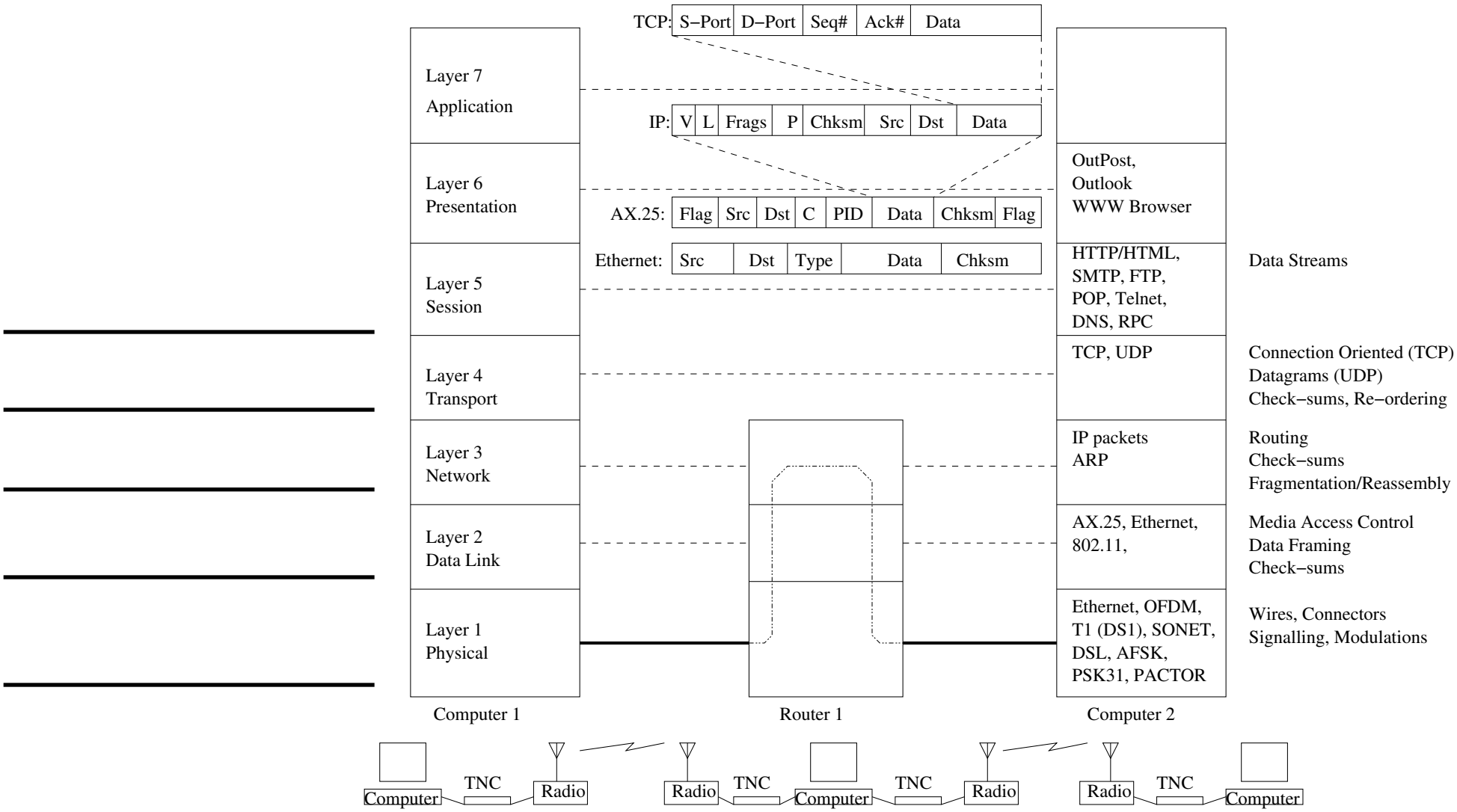
San Jose RACES Internet Networking Overview

How to defend yourself against the technology

“The only difference between ‘Networking’ and ‘Notworking’ is one letter.”


TCP: S−Port D−Port Seq# Ack# Data
IP: V L Frags P Chksm Src Dst Data
AX.25: Flag Src Dst C PID Data Chksm Flag
Ethernet: Src Dst Type Data Chksm
Layer 7
Application
Layer 6
Presentation
Layer 5
Session
Layer 4
Transport
Layer 3
Network
Layer 2
Data Link
Layer 1
Physical
OutPost,
Outlook
WWW Browser
HTTP/HTML,
SMTP, FTP,
POP, Telnet,
DNS, RPC
TCP, UDP
IP packets
ARP
AX.25, Ethernet,
802.11,
Ethernet, OFDM,
T1 (DS1), SONET,
DSL, AFSK,
PSK31, PACTOR
Data Streams
Connection Oriented (TCP)
Datagrams (UDP)
Check−sums, Re−ordering
Routing
Check−sums
Fragmentation/Reassembly
Media Access Control
Data Framing
Check−sums
Wires, Connectors
Signalling, Modulations
Computer 1
Router 1
Computer 2
Computer
TNC
Radio
Radio
TNC
Computer
TNC
Radio
Radio
TNC
Computer

Tools At Each Level



The World of Ethernet

- Thick-Net - CSMA/CD - 3Mb/10Mb
- AX.25 - CSMA without carrier detection
- Twisted Pair Ethernet - 10, 100, 1000, FD, HD,
- WiFi Ethernet

Layer 3 - IP

- IPv4/IPv6 - 32 bit addresses v.s. 128 bit addresses
- 2^32 = 4G, 2^128 = the universe
- Addressing - CIDR Block bitmaps
- 192.168.0.2/29 = 29 bits of network, 3 bits of Host
- Routing Protocols - Distance Vector, Link State
- Routing - Routing Base/Forwarding Base

Layer 4 - TCP/UDP

- A byte stream, text-based protocols
- SMTP -
- HTML -