0pt0.4pt

List of acronyms

ARP Address Resolution Protocol
AS Autonomous System
ASN Autonomous System Number
ATM Asynchronous Transfer Mode
BCC Blocked Calls Cleared
BGP Border Gateway Protocol
BPDU Bridge Protocol Data Unit
CAN Campus Area Network
CIDR Classless Inter-Domain Routing
CSMA Carrier Sense Multiple Access
CSMA/CA CSMA with Collision Avoidance
CSMA/CD CSMA with Collision Detection
DHCP Dynamic Host Configuration Protocol
DDoS Distributed Denial of Service
DoS Denial of Service
DTE Data Terminal Equipment (or Computer)
ECN Explicit Congestion Notification
EGP Exterior Gateway Protocol
EIGRP Enhanced Interior Gateway Routing Protocol
EMULab Ericsson Melbourne University Laboratory
FACK Forward ACKnowledgement
FDDI Fiber Distributed Data Interface
FDM Frequency Division Multiplexing
FDMA Frequency Division Multiple Access
FIB Forwarding Information (data)Base
FTP Fle Transfer Protocol
FTTC Fiber to the Curb
FTTN Fiber to the Node
FTTP Fiber to the Premises
GoS Grade of Service
HTML Hyper Text Markup Language
HTTP Hyper Text Transfer Protocol
IAB Internet Architecture Board
IANA Internet Assigned Numbers Authority
ICANN Internet Corp. for Assigned Names and Numbers
ICMP Internet Control Message Protocol
IDC Infinitely Divisible Cascade
IEEE Inst. of Electrical and Electronic Engineeers
IETF Internet Engineering Task Force
IESG Internet Engineering Steering Group
IGP Interior Gateway Protocol
IGRP (Cisco's) Interior Gateway Routing Protocol
IMAP Internet Message Access Protocol
IP Internet Protocol
IPv4 Internet Protocol version 4
IPv6 Internet Protocol version 6
IRSG Internet Research Steering Group
IRTF Internet Research Task Force
ISDN Integrated Services Digital Network
ISOC Internet Society
ISP Internet Service Provider
ITU International Telecommunications Union
IS-IS Intermediate System to Intermediate System
IXP Internet eXchange Point
LAN Local Area Network
LRD Long Range Dependence
LSA Link State Announcement
MAC Medium Access Control (protocol)
MAN Metropolitan Area Network
MED Multi-Exit Discriminator
MF MultiFractal
MPLS Multi-Protocol Label Switching
MSS Maximum Segment Size
MST Minimum Spanning Tree
MWST Minimum Weight Spanning Tree
NAP Network Access Point
NCC Network Control Center
NFS Network File System
NIC Network Interface Card
NNTP Network News Transfer Protocol
NOC Network Operations Center
NTP Network Time Protocol
OSI Open Systems Intergration
OSPF Open Shortest Path First
PDN Public Data Network
POP Post Office Protocol
POS Packet Over SONET
PPP Point to Point Protocol
PSTN Public Switched Telecommunications Network
PVC Permanent Virtual Circuit
QoS Quality of Service
RED Random Early Detection
RFC Request For Comment
RIB Routing Information (data)Base
RIP Routing Information Protocol
RSVP Resource ReSerVation Protocol
RTO Retransmission TimeOut
RTP Real-time Transport Protocol
RTT Round Trip Times
SACK Selective ACKnowledgement
SDH Synchronous Digital Hierarchy
SMB Server Message Block
SMTP Simple Mail Transfer Protocol
SNMP Simple Network Management Protocol
SONET Synchronous Optical Networking
SPF Shortest Path First
SSH Secure SHell
SSL Secure Sockets Layer
STP Spanning Tree Protocol
TCP Transmission Controls Protocol
TCP/IP Transmission Controls Protocol/Internet Protocol
TDM Time Division Multiplexing
TDMA Time Division Multiple Access
TLA Three Letter Acronym
TSP Travelling Salesman Problem
UDP User Datagram Protocol
UNI User-to-Network Interface
URL Uniform Resource Locator
VC Virtual Circuit
W3C World Wide Web consortium
WAN Wide Area Network
WDM Wavelength Division Multiplexing
WDMA Wavelength Division Multiple Access
WWW World Wide Web

List of units

In contrast to normal computing units for memory, we do things in powers of ten (as in standard scientific notation).

kbps kilobits per second (10^3 bits per second)

Mbps Megabits per second (10^6 bits per second)

Gbps Gigabits per second (10^9 bits per second)

Tbps Gigabits per second (10^{12} bits per second)

B bytes (1 byte = 8 bits)

octet 1 octet = 1 byte = 8 bits

kB kilobytes (10^3 bytes)

MB Megabytes (10^6 bytes)

GB Gigabytes (10^9 bytes)

TB Terabytes (10^{12} bytes)

PB Petabytes (10^{15} bytes)

Some terminology

Some frequently used terminology (see notes for details)

- **a router =** a layer-3 device that forwards packets based on their destination address. Another sometimes synonomous term is gateway, but this usage is obsolete terminology, and we use the term **gateway router** to mean a router connecting two ASes, while a **gateway** itself often means a device that translates between higher level protocols (e.g. IP to IPX).
- **a switch =** a (nominally) layer-2 device that switches data along a virtual circuit (also sometimes called a **cross-connect**).
- **a hub =** a multiport **repeater** = a layer-1 device that repeats a signal to extend its domain.

Typically, though, these days the term "switch" is applied to an Ethernet device (also called a multi-port **bridge**), which really has some characteristics of a layer-2 and some characteristics of a layer-3 device. It forwards packets to Ethernet segments based on their destination address, but this is a layer-2 MAC address, and IP addresses are not used. VLANs complicate things, but I won't talking about them in CND.

You need to understand both definitions of a switch, but when I talk about switches I will typically mean the former, unless the context is Ethernet, or I explicitly say Ethernet switch.

Link speeds

Common link speeds.

dial-up modem up to 56 kbps

T1 1.544Mbps

E1 2.048Mbps

T3 44.736Mbps (=28xT1)

DS3 44.736Mbps

OC3/STM1 155.52 Mbps (=100 T1)

OC12/STM4 622.08 Mbps (=4xOC3)

OC48/STM16 2.488 Gbps (=4xOC12)

OC192/STM64 9.953 Gbps (=4xOC48)

OC768/STM256 39.813 Gbps (=4xOC192)

Ethernet (10BaseT) 10 Mbps

Fast-Ethernet 100 Mbps

Gig-E 1 Gbps

10Gig-E 10 Gbps

FDDI 100 Mbps

IEEE 802.11b (Wi-Fi) <11 Mbps

IEEE 802.11g (Wi-Fi) <54 Mbps

We call the link speed the **link capacity** or the **link bandwidth**. The actual bandwidth available for applications depends on overheads in physical and link layers, and the MAC layer protocol.