

A+ 800 Series Supplemental Study Aid

A+ Essentials (220-801 Exam)

A+ Essentials (220-802 Exam)

What's new?

Exams are now 25% performance based

- XP through Win 7 Enterprise
- Mobile devices
- Virtualization
- Troubleshooting: Wireless and Security

Registered providers are now required to offer Metrics That Matter performance surveys and manage toward continuous improvement and consistent quality.

Government Dept. of Defense Directive 8570

- Possible Qualifying and review questions 30 minutes before and 15 minutes after.

12+ months of field experience. Greater expected knowledge baseline and exposure.

Zylog, Field Solutions, Ricoh, Dell and other corporations provide corporate portals as market places for test vouchers. Vendor neutral, although vendor focused.

NOTE: This document is NOT comprehensive. It is a work in progress, with contributions from instructors, students, and the practicing IT community. It was developed by **Steven M. Fullmer, CTT+** with the sole intent of providing both a CompTIA A+ study aid and a preliminary desktop reference for his students.

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Acronyms

42	The answer to the meaning of life, the universe and everything
A/V	Audio Visual
AC	Alternating Current
ACL	Access Control List
ACPI	Advanced Configuration Power Interface
ACT	Activity
ADSL	Asymmetric Digital Subscriber Line
AGP	Accelerated Graphics Port
ALU	Arithmetic Logic Unit
AMD	Advanced Micro Devices
AMR	Audio Modem Riser
APIPA	Automatic Private Internet Protocol Addressing
APM	Advanced Power Management
ARP	Address Resolution Protocol
ASR	Automated System Recovery
AT	Advanced Technology
ATA	Advanced Technology Attachment
ATAPI	Advanced Technology Attachment Packet Interface
ATM	Asynchronous Transfer Mode
ATX	Advanced Technology Extended
BIOS	Basic Input/output System
BNC	Bayonet-Neill-Concelman or British Naval Connector
BRI	Basic Rate Interface
BTX	Balanced Technology Extended
CAN	Campus Area Network
CAPTCHA	Completely Automated Public Turing Test to Tell Computers and Humans Apart
CCFL	Cold Cathode Fluorescent Lamp
CD	Compact Disk
CDFS	Compact Disc File System
CD-ROM	Compact Disc - Read Only Memory
CD-RW	Compact Disc - Rewriteable
CFS	Central File System, Common File System, Command File System
CGA	Color/Graphics Adapter
CMOS	Complementary Metal-Oxide Semiconductor
CMP	Chip Level Multi-processing
CNR	Communication and Networking Riser
COM1	Communication Port 1
COMx	Communication port (x=port number)
CPU	Central Processing Unit
CRIMM	Continuity-Rambus Inline Memory Module
CRT	Cathode-Ray Tube

DAC	Discretionary Access Control
DAT	Digital Audio Tape
DB-25	Serial Communications D-Shell Connector, 25 Pins
DB-9	9 Pin D shell Connector
DC	Direct Current
DDOS	Distributed Denial of Service
DDR	Double Data-Rate
DDR RAM	Double Data-Rate Random Access Memory
DDR SDRAM	Double Date-rate Synchronous Dynamic Random Access Memory
DFS	Distributed File System
DHCP	Dynamic Host Configuration Protocol
DIMM	Dual Inline Memory Module
DIN	Deutsche Industrie Norm
DIP	Dual Inline Package
DLP	Digital Light Processing
DLT	Digital Linear Tape
DMA	Direct Memory Access
DMZ	Demilitarized Zone
DNS	Domain name Service or Domain Name Server
DOS	Disk Operating System; Denial of Service
DPMS	Display Power Management Signaling
DRAM	Dynamic Random Access Memory
DSL	Digital Subscriber Line
DVD	Digital Video Disc
DVD-R	Digital Video Disc – Recordable
DVD-RAM	Digital Video Disc - Random Access Memory
DVD-ROM	Digital Video Disc - Read Only Memory
DVD-RW	Digital Video Disc - Rewriteable
DVI	Digital Video Interface
ECC	Error Correction Code
ECP	Extended Capabilities Port
EDO SDRAM	Extended Data Out Symmetric Dynamic Random Access Memory
EEPROM	Electronically Erasable Programmable read-only memory
EFS	Encrypting File System
EGA	Enhanced Graphics Adapter
EIDE	Enhanced Integrated Drive Electronics
EISA	Extended Industry Standard Architecture
EMF	(Windows) Enhanced Metafile [print]
EMI	Electromagnetic Interference
EMP	Electromagnetic Pulse
ENET	Ethernet
EPP	Enhanced Parallel Port
EPROM	Erasable Programmable Read-Only Memory

ERD	Emergency Repair Disk
ESD	Electrostatic Discharge
ESDI	Enhanced Small Device Interface
EULA	End User License Agreement
EVDO	Evolution Data Optimized or Evolution Data Only
EVGA	Extended Video Graphics Adapter/Array
FAT	File Allocation Table
FAT12	12 bit File Allocation Table
FAT16	16 bit File Allocation Table
FAT32	32 bit File Allocation Table
FCC	Federal Communications Commission
FDD	Floppy Disk Drive
FERPA	Family Educational Rights and Privacy Act
Fn	Function (keys)
FPM	Fast Page Mode
FPM SDRAM	Fast page Mode Symmetric Dynamic Random Access Memory
FPU	Floating Point (Logic) Unit
FQDN	Fully Qualified Domain Name
FRU	Field Replaceable Unit
FSB	Front Side Bus
FTP	File Transfer Protocol
GB	Gigabyte
Gb	Gigabit
GDI	Graphics Device Interface
GHz	Gigahertz
GPS	Global Positioning System
GPU	Graphics Processing Unit
GRPS	General Radio Packet System
GSM	Global System Manager or Graphic Size Modification or Graphics Screen Manager
GUI	Graphical User Interface
HAL	Hardware Abstraction Layer
HAV	Hardware Assisted Virtualization
HCL	Hardware Compatibility List
HDD	Hard Disk Drive
HDMI	High Definition Media Interface
HPFS	High Performance File System
HTML	Hypertext Markup Language
HTPC	Home theater PC
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol over Secure Sockets Layer
I/O	Input/output
ICMP	Internet Control Message Protocol
ICR	Intelligent Character Recognition

ICS	Internet Connection Sharing
IDE	Integrated Drive Electronics
IDS	Intrusion Detection System
IEEE	Institute of Electrical and Electronics Engineers
IIS	Internet Information Server
IMAP	Internet Mail Access Protocol
IP	Internet Protocol
IPCONFIG	Internet Protocol Configuration (Command line tool)
IPP	Internet Printing Protocol
IPSEC	Internet Protocol Security
IPX	Internetwork Packet Exchange
IPX/SPX	Internet Packet Exchange/Sequenced Packet Exchange
IR	Infrared
IrDA	Infrared Data Association
IRQ	Interrupt Request
ISA	Industry Standard Architecture
ISDN	Integrated Services Digital Network
ISO	Industry Standards Organization
ISP	Internet Service Provider
JBOD	Just a Bunch of Disks
KB	Kilobyte
Kb	Kilobit
LAN	Local Area Network
LAT	Local Area Transport
LBA	Logical Block Addressing
LC	Lucent Connector
LCD	Liquid Crystal Display
LDAP	Lightweight Directory Access Protocol
LED	Light Emitting Diode
LGA	Land Grid Array (no pins)
Li-on	Lithium-ion
LPD/LPR	Line printer daemon / Line printer remote
LPT	Line Printer Terminal
LPT1	Line Printer Terminal 1
LPX	Low Profile Extended
LTO	Linear Tape Open
LVD	Low Voltage Differential
MAC	Media Control Address; Media Access Control; Mandatory Access Control
MAN	Metropolitan Area Network
MAPI	Messaging Application Programming Interface
MAU	Media Access Unit, media attachment unit
Mb	Megabit
MB	Megabyte

MBR	Master Boot Record
MBSA	Microsoft Baseline Security Analyzer
MCA	Micro Channel Architecture
MCE	Media Center Edition
MFD	Multi-function device
MFP	Multi-function product
MHz	Megahertz
MicroDIMM	Micro Dual Inline Memory Module
MIDI	Musical Instrument Digital Interface
MIME	Multipurpose Internet Mail Extension
MIMO	Multiple input Multiple Output
MLI	Multiple Link Interface
MMC	Microsoft Management Console
MMX	Multimedia extensions
MP3	Moving Picture Experts Group Layer 3 Audio
MP4	Moving Picture Experts Group Layer 4
MPEG	Moving Picture Experts Group
MSCONFIG	Microsoft Configuration (management tool)
MSDS	Material Safety Data Sheet
MUI	Multilingual User Interface
NAC	Network Access Control
NAP	Network Access Protection
NAS	Network Attached Storage
NAT	Network Address Translation
NetBEUI	Networked Basic Input/output System Extended User Interface
NetBIOS	Networked Basic Input/output System
NFS	Network File System
NIC	Network Interface Card
NiCd	Nickel Cadmium (battery)
NiMH	Nickel Metal Hydride
NLI	Not Logged In or Natural Language Interface
NLX	New Low-Profile Extended
NNTP	Network News Transfer Protocol
NTFS	New Technology File System
NTLDR	New Technology Loader
NTP	Network Time Protocol
NX	No Execute (bit)
OCR	Optical Character Recognition
OEM	Original Equipment Manufacturer
OLE	Object Linking and Embedding
OLED	Organic Light Emitting Diode
OS	Operating System
OSI	Open System Interconnection (model)

OSR	Original Equipment Manufacturer Service Release
PAN	Personal Area Network
PATA	Parallel Advanced Technology Attachment
PC	Personal Computer
PCI	Peripheral Component Interconnect
PCIe	Peripheral Component Interconnect express
PCIX	Peripheral Component Interconnect Extended
PCL	Printer Control Language
PCMCIA	Personal Computer Memory Card International Association
PDA	Personal Digital Assistant
PGA	Pin Grid Array
PGA2	Pin Grid Array 2
PII	Personally Identifiable Information
PIN	Personal Identification Number
PKI	Public Key Infrastructure
PnP	Plug and Play
POP	Post Office Protocol
Pop3	Post Office Protocol 3
PoS	Point of Sale
POST	Power on Self Test
POTS	Plain Old Telephone Service
PPP	Point-to-Point Protocol
PPTP	Point-to-Point Tunneling Protocol
PRI	Primary Rate Interface
PROM	Programmable Read Only Memory
PS/2 Connector	Personal System/2 Connector
PSTN	Public Switched Telephone Network
PSU	Power Supply Unit
PVC	Permanent Virtual Circuit or Polyvinyl Chloride
PXE	Preboot Execution Environment
QIC	Quarter Inch Cartridge
QoS	Quality of Service
RAID	Redundant Array of Independent (or inexpensive) Discs
RAM	Random Access Memory
RAMBUS	Trademarked term
RAS	Remote Access Service
RDP	Remote Desktop Protocol
RDRAM	Rambus Dynamic Random Access Memory
RF	Radio Frequency
RFI	Radio Frequency Interference
RGB	Red Green Blue
RIMM	Rambus Inline Memory Module
RIP	Routing Information Protocol

RIS	Remote Installation Service
RISC	Reduced Instruction Set Computer
RJ	Registered Jack
RJ-11	Registered Jack - Function 11
RJ-45	Registered Jack-45
RMA	Returned Materials Authorization
ROM	Read Only Memory
RS-232 (c)	Recommended Standard 232
RTC	Real Time Clock
S.M.A.R.T.	Self-monitoring, analysis, and reporting technology
SAM	Security Account Manager
SAN	Storage Area Network
SAS	Serial Attached SCSI
SATA	Serial Advanced Technology Attachment
SC	Subscription Channel
SCP	Secure Copy Protection
SCSI	Small Computer System Interface
SCSI ID	Small Computer System Interface Identifier
SD card	Secure Digital card
SDRAM	Synchronous Dynamic Random Access Memory
SEC	Single Edge Connector
SFC	System File Checker
SFF	Small Form Factor
SGRAM	Synchronous Graphics Random Access Memory
SIMM	Single Inline Memory Module
SkyNet	The Terminators
SLI	Scalable Link Interface or System Level Integration or Scanline Interleave Mode
SMB	Server Message Block; Small to Midsize Business
SMP	Symmetric Multiprocessing
SMTP	Simple Message Transfer Protocol
SNMP	Simple Network Management Protocol
SNR	Signal to Noise Ratio
SoDIMM	Small Outline Dual Inline Memory Module
SOHO	Small Office Home Office
SP	Service Pack
SP1	Service Pack 1
SP2	Service Pack 2
SP3	Service Pack 3
SP4	Service Pack 4
SPDIF	Sony-Phillips Digital Interface Format
SPGA	Staggered Pin Grid Array
SPX	Sequenced Package Exchange
SRAM	Static Random Access Memory

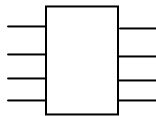
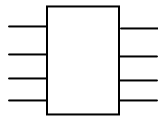
SSE	Streaming SIMD Extensions
SSH	Secure Shell
SSID	Service Set Identifier
SSL	Secure Sockets Layer
ST	Straight Tip
STP	Shielded Twisted Pair
SVGA	Super Video Graphics Array
SXGA	Super Extended Graphics Array
TARDIS	Time and Relative Dimensions in Space
TB	Terabyte
TCO	Total Cost of Ownership
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TDR	Time Domain Reflector
TFTP	Trivial File Transfer Protocol
THD	Total Harmonic Distortion
TKIP	Temporal Key Integrity Protocol
TPM	Trusted Platform Module
UAC	User Account Control
UART	Universal Asynchronous Receiver Transmitter
UDF	User Defined Functions or Universal Disk Format or Universal Data Format
UDMA	Ultra Direct Memory Access
UDP	User Datagram Protocol
UFS	Universal File System
UNC	Universal Naming Convention
UPS	Uninterruptible Power Supply
URI	Uniform Resource Identifier
URL	Universal Resource Locator
USB	Universal Serial Bus
USMT	User State Migration Tool
UTP	Unshielded Twisted Pair
UXGA	Ultra Extended Graphics Array
VESA	Video Electronics Standards Association
VFAT	Virtual File Allocation Table
VGA	Video Graphics Array
VM	Virtual Machine
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network
VRAM	Video Random Access Memory
WAN	Wide Area Network
WAP	Wireless Application Protocol
WEP	Wired Equivalent Privacy
WIFI	Wireless Fidelity

WINS	Windows Internet Name Service
WLAN	Wireless Local Area Network
WPA	Wireless Protected Access
WUXGA	Wide Ultra Extended Graphics Array
XD	eXecute Disable (bit)
XGA	Extended Graphics Array
XPR	(an AIX command line utility)
ZIF	Zero-Insertion-Force
ZIP	Zigzag Inline Package

IRQs

Device signal to processor

IRQ 0 System timer	IRQ8 CMOS/Real time clock
IRQ1 Keyboard	IRQ9 PnP Cascade to 2 (Display Adapter)
IRQ2 Cascade to 9 for 8-15	IRQ10 PnP (Ethernet Card), Sound card
IRQ3 COM 2/4	IRQ11 PnP (modem) and SCSI controller with CDROM/USP
IRQ4 COM1/3	IRQ12 PS/2 Mouse
IRQ5 HD, PnP (), LPT2, Sound card	IRQ13 Math Co-Processor
IRQ6 Floppy Controller	IRQ14 IDE Controller (HD)
IRQ7 Printer Port LPT1	IRQ15 IDE Controller () Secondary IDE channel



DMAs

DMA Channel	8-bit default assignments	16-bit default assignments
0	Dynamic RAM refresh	Available
1	Hard disk controller (XT)	Available
2	Floppy drive controller	Floppy drive controller
3	Available	Available
4	n/a	nd 2 DMA controller
5	n/a	Available
6	n/a	Available
7	n/a	Available

Base Memory /Port Addresses

Port	Base Memory Address
LPT1	378h
LPT2	278h
COM1	3F8h
COM2	2F8h
COM3	3E8h
COM4	2E8h
Primary IDE	1F0
Secondary IDE	170
Floppy disk drive	3F0
Network adapter	300-310

Intel CPUs

Processor	Speed (MHz)	Heat Sink	Cooling Fan	Cache	Package	Pins
8088	5-8	No	No	No	DIP	40
80286	6 10 12	No	No	No	LLC PGA PLCC	68
80386SX	16 - 33	No	No	No	PGA	100
80386DX	16 - 33	No	No	No	PGA	100
80486SX	16 - 33	No	Yes on 33 MHz	0-256K	PGA	100
80486DX	25 - 50	No	Yes on 33 MHz	0-256k	PGA SQFP	168 208
Pentium	60-166	Yes	Yes	256-512k	PGA	296
Pentium Pro	233-266	Yes	Yes	256k-1mb	PGA	387
Pentium II	233-500	Yes	Yes	512k	SEC	242
Pentium III	450mhz-1.13ghz	Yes	Yes	256-512k	SEC/PGA	242/370
Pentium IV	1.30-3.20ghz	Yes	Yes	256-512k	PGA	423/478
Itanium	733-833mhz	Yes	Yes	96k	PAC	418
Itanium II	900mhz-1.0ghz	Yes	Yes	256k	OLGA	611

CPU Bus Sizes

Processor	Register	Data Bus	Address Bus
8088	16-bit	8-bit	20-bit
80286	16-bit	16-bit	24-bit
80386SX	32-bit	16-bit	24-bit
80386DX	32-bit	32-bit	32-bit
80486SX	32-bit	32-bit	32-bit
80486DX	32-bit	32-bit	32-bit
Pentium	64-bit	64-bit	32-bit
Pentium Pro	64-bit	64-bit	36 bit
Pentium II	64-bit	64-bit	36 bit
Pentium III	64-bit	64-bit	36 bit
Pentium IV	64-bit	64-bit	36 bit
Itanium	64-bit	64-bit	44 bit
Itanium II	64-bit	128-bit	44 bit

CPU Socket Type

801/802 Exam	Socket	Pins	Processor
	Socket 4	237 PGA	Pentium 60/66, Pentium Overdrive
	Socket 5	320 PGA	Pentium 75-133, Pentium Overdrive
	Socket 7	321 PGA	Pentium 75-200, Pentium Overdrive
	Socket 8	387 PGA	Pentium Pro
	Slot 1	242 SEC/SEPP	Pentium II, Pentium III, Celeron
	Slot 2	330 SECC-2	Xeon
	Super Socket 7	321 PGA	Pentium MMX, Pentium Pro, AMD K6-2, K6-2+, K6-3, K6-3+
	Socket 370	370 PGA	Celeron, Pentium III, Cyrix III
	Socket 418	418 PAC	Itanium
	Socket 423	423 PGA	Pentium IV
	Socket 478	478 PGA	Pentium IV
	Socket 603	603 PGA	Pentium IV-based Xeon, Xeon MP
	Socket 611	611 OLGA	Itanium II
	Socket A	462 PGA	AMD Athlon, Athlon XP, Duron
	Slot A	242 Slot A	AMD Athlon
X	Socket 940	micro-PGA	AMD Opteron , Athlon 64 FX
X	LGA	Land Grid Array	Intel

X	775	LGA 775	Intel Socket T
X	1155	Core i5, Core i7	Intel aka H2 [DDR3]
X	1156	Core i3, Core i5, Core i7	Intel aka H1
X	1366	Replaces LGA 775, and LGA 771 (Socket J)	Intel Socket B Core i7
	2011	LGA 2011 (replaces 1366)	
X	AM2	Aka M2, replaces 939 and 754	AMD Athlon 64, Sempron, Athlon 64 X2, Athlon 64 FX, Phenom
X	AM2+		AMD
X	AM3	941 pin LGA	AMD Phenom II [DDR3]
X	AM3+	942 pin LGA	AMD
X	FM1		AMD Fusion, Athlon II (July 2011)
X	F		AMD Opteron (2006)
	C32	Entry level server	AMD Opteron (2010)
	G34	High end server	AMD Opteron (2010)

Multiprocessing and MultiCores

Cores	Intel	AMD
2	Core Duo, Core 2 Duo, Core i3, Core i5, Xeon, Celeron, Pentium D	X2 models of Athlon 64, Sempron, Turion 64, Phenom, Phenom II, and Opteron
3		X3 models of Athlon II, Phenom, and Phenom II
4	Cores 2 Quad, Core i5, Core i7, Xeon	X4 models of Athlon II, Phenom II, and Opteron
6		Opteron, Phenom II
8+	Xeon	Opteron

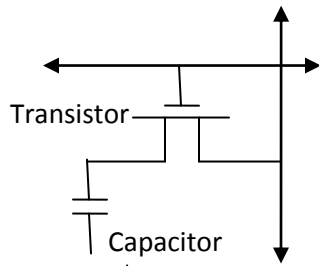
Material Safety Data Sheet Required Elements

- ▶ Physical data
- ▶ Toxicity
- ▶ Health effects
- ▶ First Aid
- ▶ Reactivity
- ▶ Storage
- ▶ Safe-handling and use precautions
- ▶ Disposal
- ▶ Protective Equipment
- ▶ Spill/leak procedures

Trouble Shooting Theory (example)

- ▶ 1. Actively listen while the customer identifies the problem and symptoms. Do not interrupt. Take notes.
- ▶ 2. As necessary, gather documentation and research alternatives.
- ▶ 3. Always backup the user's data or make sure there are a recent set of backups. Put backup on removable storage. Having a recent backup will protect your professional reputation if something goes wrong. Windows XP Professional, 2000, and NT use NTBACKUP which can be found through a shortcut on the system tools folder. If you are troubleshooting Windows XP Home Edition you may install Windows Backup by using the distribution CD. There are also third party backup programs that may provide more features and capabilities.
- ▶ 4. Assess the problem methodically. Divide larger problems into smaller problems then troubleshoot the smaller problems individually. This makes large problems easier to handle.
- ▶ 5. Always look for the most obvious problems. For example always check connectors to make sure they are properly installed. Make sure the computer, monitor, keyboard, printer, and etc. have power.
- ▶ 6. Research the most likely causes of the problem and establish priorities. Start with easiest problems first and work your way up.
- ▶ 7. Once finished always write down your actions, findings, and outcomes, even if they are simple problems. This will greatly help when troubleshooting future problems.

Other Useful Charts and Tables



RAM Chip naming convention formula

Standard name	Memory clock	Cycle time	I/O bus clock	Data transfers per second	JEDEC standard VDDQ voltage	Module name	Peak transfer rate
DDR-200	100 MHz	10 ns	100 MHz	200 Million	2.5±0.2 V	PC-1600	1600 MB/s
DDR-266	133 MHz	7.5 ns	133 MHz	266 Million	2.5±0.2 V	PC-2100	2100 MB/s
DDR-333	166 MHz	6 ns	166 MHz	333 Million	2.5±0.2 V	PC-2700	2700 MB/s
DDR-400	200 MHz	5 ns	200 MHz	400 Million	2.6±0.1 V	PC-3200	3200 MB/s

Memory bus clock rate * data per clock tick * number of bits transferred/ (8bits/byte) = PC-**nnnn**

SO: for a double pumped or 2 transfers/tick, 64 bit transfer

$$\text{Memory clock speed} * 2 * 64/8 = \text{memory clock speed} * 16$$

ALSO Data Transfers/second = memory clock speed * data per tick (pumps)

DDR – pumps =2 at per clock tick via I/O bus

DDR2 – pumps = 2 per clock tick and 2 more due to an I/O buffer or **4**

Modem Attention (AT) commands/codes

AT	ATH0
ATD <i>number</i>	ATM0
ATDT <i>number</i>	ATM1
ATDP <i>number</i>	ATM2
ATDTW <i>number</i>	ATQ
ATDPW <i>number</i>	ATQ1
ATE0	ATV
ATE1	ATV2
ATH	ATZ

Complete AT Command Reference

%Cn : Enable/Disable Data Compression

%En : Auto-Retrain control

&Cn : DCD Control

&Dn : DTR Option

&Fn : Recall Factory Profile

&Gn : Select Guard Tone

&Jn : Telephone Jack Control

&Kn : Data Flow Control

&Qn : Communication (Sync/Async Mode)

&Rn : RTS/CTS (Hardware) Flow Control

&Tn : Test Mode

&V : View Configuration

&Wn : Store User Profile

&Yn : Default User Profile

)Mn : Cellular Power Level Adjustment

*Hn : Link Negotiation Speed

+++ : Escape Sequence

+MS : Select Modulation

:En : Compromise Equalizer Setting

? : Read Currently Selected S Register

@Mn : Initial Cellular Power Level Setting

\An : Select Maximum MNP Block Size

\Bn : Transmit Break

\Gn : Modem to Modem (Software) Flow Control

\Ln : Select MNP Block/Stream Mode

\Nn : Protocol Negotiation Selection

A : Answer

A/ : Re-execute Command

Bn : CCITT or Bell Selection

Cn : Carrier Control

Dn : Dial

En : Command Echo

Fn : Select Modulation

Hn : Disconnect (Hang-up)

In : Identification

Ln : Speaker Volume

Mn : Speaker Control

Nn : Automode Enable (Automatic Line Speed Detection)

On : Return to Online Data Mode

P : Set Pulse Dial Default

Qn : Result Code On/Off

Sn : Select a Specific S Register

Sn? : Read an S Register

T : Set Tone Dial Default

Vn : Result Code Format

Wn : Negotiation Progress (Connect Message) Control

Xn : Extended Result Code

Yn : Long Space Disconnect

Zn : Modem Reset

Sn=x : Write an S Register Value

&Zn=x : Store Phone Number

Disk formats

	Introduced	Size limit
FAT	DOS 2.1	32MB
FAT16		2 GB
FAT32	Win95	2 TB
HPFS		Discontinued after NT 3.51
NTFS4	NT4.0 – no XP support	
NTFS5	Win 2K and beyond	
CDFS		Compact Disk

Bus Speeds

	Speed	Daisy chain limit
USB 1	1.5 Mbps	
USB 1.1	12 Mbps	
USB 2.0	480 Mbps	127
USB 3.0	5 Gbps (625MBps)	
USB 3.1	10 Gbps (1.25 GBps)	
1394 (firewire)	400 Mbps	63
Thunderbolt	10 Gbps/channel	6
Thunderbolt v2	20 Gbps/channel aggregated	
SATA	1.2 Gbps	
PATA	16MBps (33,66,100,133 MBps)	

Highest data transfer rates

802.11a	Up to 54 Mbps
802.11b	Up to 11 Mbps
802.11g	Up to 54 Mbps
802.11n	Up to 150 Mbps
Bluetooth	V1.2 1Mbps, V4. 24Mbps
IrDA	2.4 kbps to 1 Gbps
1394 Firewire	400 Mbps
GPRS	Up to 80 kbps down, Up to 40 kbps upload
USB 1.0	1.5 Mbps
USB 1.1	12 Mbps
USB 2.0	480 Mbps

Broadband Data Transfer Rate

Broadband Data-Transfer Rates			
Typical Service Level	kilobits per second (kbps)	Kilobytes per second (KB/sec)	Estimated Ideal Throughput
28.8K Analog Modem	28.8-kbps	3.6-KB/sec	2.8-KB/sec
33.6K Analog Modem	33.6-kbps	4.2-KB/sec	3.3-KB/sec
56K Analog Modem	53.3-kbps	6.6-KB/sec	5.2-KB/sec
1-channel ISDN	56-kbps	7-KB/sec	5.4-KB/sec
1-channel ISDN	64-kbps	8-KB/sec	6.2-KB/sec
2-channel ISDN	115.2-kbps	14.4-KB/sec	11.2-KB/sec
2-channel ISDN / IDSL	128-kbps	16-KB/sec	12.5-KB/sec
Fractional T-1	256-kbps	32-KB/sec	25-KB/sec
384 S-DSL	384-kbps	48-KB/sec	37.5-KB/sec
Satellite	400-kbps	50-KB/sec	39-KB/sec
Fractional T-1	512-kbps	64-KB/sec	50-KB/sec
Cable / DSL	768-kbps	96-KB/sec	75-KB/sec
1-Mbps / Cable / DSL	1,000-kbps	125-KB/sec	98-KB/sec
T-1 / Cable / DSL	1,544-kbps	193-KB/sec	151-KB/sec

Standard Graphics Adaptors

QVGA	320	x	240	4:3	Quarter Video Graphics Array
HVGA	640	x	240	8:3	Half Video Graphics Array
VGA	640	x	480	4:3	Video Graphics Array
SVGA	800	x	600	4:3	Super Video Graphics Array
XGA	1024	x	768	4:3	Extended Graphics Array
XGA+	1152	x	768	3:2	Extended Graphics Array plus
	1152	x	864	4:3	
SXGA	1280	x	1024	5:4	Super Extended Graphics array
SXGA+	1400	x	1050	4:3	Super Extended Graphics Array plus
UXGA	1600	x	1200	4:3	Ultra Extended Graphics Array
QXGA	2048	x	1536	4:3	Quad Extended Graphics Array

Wide Screen Arrays

Code	Width		Height	Ratio	Description
WXGA	1280	x	768	5:3	Wide Extended Graphics Array
	1280	x	800	16:10	
	1366	x	768	16:9	
WXGA+	1280	x	854	3:2	Wide Extended Graphics Array plus
	1440	x	900	16:10	
	1440	x	960	3:2	
WSXGA	1600	x	900	16:9	Wide Super Extended Graphics Array
	1600	x	1024	16:10	
WSXGA+	1680	x	1050	16:10	Wide Super Extended Graphics Array
WUXGA	1920	x	1200	16:10	Wide Ultra Extended Graphics Array
WQXGA	2560	x	1600	16:10	Wide Quad Extended Graphics Array
WQUXGA	3840	x	2400	16:10	Wide Quad Ultra Extended Graphics

CRT

The tube consists of an electron gun (cathode) which shoots electrons at the screen (anode). The stream of electrons is first focused and then bent using electromagnets to deflect the electrons toward different parts of the screen. The stream of electrons strikes a phosphor on the screen which glows. The intensity of the glow is determined by the number of electrons striking each dot. For a color CRT there are three guns, one for each primary color. Due to the small size of the phosphor dots the eye blends the three color dots into a single colored pixel.

In the US the older CRTs refreshed at 30 frames per second, using an interlaced pattern. Newer CRTs though, use a non-interlaced pattern and so they can refresh at 60 times per second, or higher.

Terminology

Note: The following list is far from comprehensive. This is a good starting point. Add your own terms.

- ▶ Advanced Configuration and Power Interface (ACPI)
- ▶ Basic Input Output System (BIOS)
- ▶ Chipset
- ▶ Direct Memory Access (DMA)
- ▶ Enhanced Integrated Device Electronics
- ▶ Expansion Bus
- ▶ Input/output (I/O) Address
- ▶ Interrupt Request (IRQ)
- ▶ Industry Standard Architecture (ISA)
- ▶ Jumper
- ▶ Motherboard
- ▶ Peripheral Component Interface (PCI)
- ▶ Power On Self Test (POST)
- ▶ Small Computer System Interface (SCSI)
- ▶ Socket
- ▶ Single Edge Connector (SEC)
- ▶ System Bus
- ▶ Universal Serial Bus (USB)
- ▶ Electricity
- ▶ Conductor

- ▶ Insulator
- ▶ Resistance
- ▶ Circuit
- ▶ Voltage (V) - Used to measure potential difference
- ▶ Hertz (Hz)
- ▶ Electromotive force -The force that causes electrons to flow through a conductor
- ▶ Current
- ▶ Power
- ▶ Ground
- ▶ Watt (W) (power) - Measurement of work performed
- ▶ Amperes (A) - Used to measure electrical current
- ▶ Ohms (R) or Ω - Used to measure electrical resistance
- ▶ Track
- ▶ Platter
- ▶ Cylinder
- ▶ Head
- ▶ Sector
- ▶ Cluster
- ▶ Capacity
- ▶ Seek Time
- ▶ Data Transfer Rate
- ▶
- ▶
- ▶



File Extensions

Text Files

.doc Microsoft Word Document
.docx Microsoft Word Open XML Document
.log Log File
.msg Mail Message
.pages Pages Document
.rtf Rich Text Format File
.txt Plain Text File
.wpd WordPerfect Document
.wps Microsoft Works Word Processor Document

Data Files

.123 Lotus 1-2-3 Spreadsheet
.accdb Access 2007 Database File
.csv Comma Separated Values File
.dat Data File
.db Database File
.dll Dynamic Link Library
.mdb Microsoft Access Database
.pps PowerPoint Slide Show
.ppt PowerPoint Presentation
.pptx Microsoft PowerPoint Open XML Document
.sdb OpenOffice.org Base Database File
.sql Structured Query Language Data
.vcf vCard File
.wks Microsoft Works Spreadsheet
.xls Microsoft Excel Spreadsheet
.xlsx Microsoft Excel XML Document
.xml XML File

Image Files

.pct Picture File

Raster Image Files

.bmp Bitmap Image File
.gif Graphical Interchange Format File
.jpg JPEG Image File
.png Portable Network Graphic
.psd Photoshop Document
.psp Paint Shop Pro Image File
.thm Thumbnail Image File
.tif Tagged Image File

Vector Image Files

.ai Adobe Illustrator File
.drw Drawing File
.dxf Drawing Exchange Format File
.eps Encapsulated PostScript File
.ps PostScript File
.svg Scalable Vector Graphics File

3D Image Files

.3dm Rhino 3D Model
.dwg AutoCAD Drawing Database File
.pln ArchiCAD Project File

Page Layout Files

.indd Adobe InDesign File
.pdf Portable Document Format File
.qxd QuarkXPress Document
.qxp QuarkXPress Project File

Audio Files

.aac Advanced Audio Coding File
.aif Audio Interchange File Format
.iff Interchange File Format
.m3u Media Playlist File
.mid MIDI File
.midi MIDI File
.mp3 MP3 Audio File
.mpa MPEG-2 Audio File
.ra Real Audio File
.wav WAVE Audio File
.wma Windows Media Audio File

Video Files

.3g2 3GPP2 Multimedia File
.3gp 3GPP Multimedia File
.asf Advanced Systems Format File
.asx Microsoft ASF Redirector File
.avi Audio Video Interleave File
.flv Flash Video File
.mkv Matroska Video File
.mov Apple QuickTime Movie
.mp4 MPEG-4 Video File
.mpg MPEG Video File
.qt Apple QuickTime Movie
.rm Real Media File
.swf Flash Movie
.vob DVD Video Object File
.wmv Windows Media Video File

Web Files

.asp Active Server Page
.css Cascading Style Sheet
.htm Hypertext Markup Language File
.html Hypertext Markup Language File
.js JavaScript File
.jsp Java Server Page
.php Hypertext Preprocessor File

.rss Rich Site Summary
.xhtml Extensible HTML File

Font Files

.fnt Windows Font File
.fon Generic Font File
.otf OpenType Font
.ttf TrueType Font

Plugin Files

.8bi Photoshop Plug-in
.plugin Mac OS X Plug-in
.xll Excel Add-In File

System Files

.cab Windows Cabinet File
.cpl Windows Control Panel
.cur Windows Cursor
.dmp Windows Memory Dump
.drv Device Driver
.key Security Key
.lnk File Shortcut
.sys Windows System File

Settings Files

.cfg Configuration File
.ini Windows Initialization File
.prf Outlook Profile File

Executable Files

.app Mac OS X Application
.bat DOS Batch File
.cgi Common Gateway Interface Script
.com DOS Command File
.exe Windows Executable File
.pif Program Information File
.vb VBScript File
.ws Windows Script

Compressed Files

.7z 7-Zip Compressed File
.deb Debian Software Package
.gz Gnu Zipped File
.pkg Mac OS X Installer Package
.rar WinRAR Compressed Archive
.sea Self-Extracting Archive
.sit Stuffit Archive
.sitx Stuffit X Archive
.zip Zipped File
.zipx Extended Zip File

Encoded Files

.bin Macbinary II Encoded File
.hqx BinHex 4.0 Encoded File
.mim Multi-Purpose Internet Mail
Message
.uue Uuencoded File

Developer Files

.c C/C++ Source Code File
.cpp C++ Source Code File
.java Java Source Code File
.pl Perl Script

Backup Files

.bak Backup File
.bup Backup File
.gho Norton Ghost Backup File
.ori Original File
.tmp Temporary File

Disk Files

.dmg Mac OS X Disk Image
.iso Disc Image File
.toast Toast Disc Image
.vcd Virtual CD

Game Files

.gam Saved Game File
.nes Nintendo (NES) ROM File
.rom N64 Game ROM File
.sav Saved Game

Misc Files

.msi Windows Installer Package
.part Partially Downloaded File
.torrent Bit Torrent File
.yps Yahoo! Messenger Data File

Command Line Tools

Note: The addition of Powershell to Win 7 (2.0) and Win 8 (3.0) vastly expands and alters the available command line tools.

a

ADDUSERS Add or list users to/from a CSV file

ARP Address Resolution Protocol

ASSOC Change file extension associations

ASSOCIAT One step file association

ATTRIB Change file attributes

b

BOOTCFG Edit Windows boot settings

BROWSTAT Get domain, browser and PDC info

c

CACLS Change file permissions

CALL Call one batch program from another

CD Change Directory - move to a specific Folder

CHANGE Change Terminal Server Session properties

CHKDSK Check Disk - check and repair disk problems

CHKNTFS Check the NTFS file system

CHOICE Accept keyboard input to a batch file

CIPHER Encrypt or Decrypt files/folders

CleanMgr Automated cleanup of Temp files, recycle bin

CLEARMEM Clear memory leaks

CLIP Copy STDIN to the Windows clipboard.

CLS Clear the screen

CLUSTER Windows Clustering

CMD Start a new CMD shell

COLOR Change colors of the CMD window

COMP Compare the contents of two files or sets of files

COMPACT Compress files or folders on an NTFS partition

COMPRESS Compress individual files on an NTFS partition

CON2PRT Connect or disconnect a Printer

CONVERT Convert a FAT drive to NTFS.

COPY Copy one or more files to another location

CSCcmd Client-side caching (Offline Files)

CSVDE Import or Export Active Directory data

d

DATE Display or set the date
DEFRAG Defragment hard drive
DEL Delete one or more files
DELPREF Delete NT user profiles
DELTREE Delete a folder and all subfolders
Devcon Device Manager Command Line Utility
DIR Display a list of files and folders
DIRUSE Display disk usage
DISKCOMP Compare the contents of two floppy disks
DISKCOPY Copy the contents of one floppy disk to another
DISKPART Disk Administration
DNSSTAT DNS Statistics
DOSKEY Edit command line, recall commands, and create macros
DSADD Add user (computer, group..) to active directory
DSQUERY List items in active directory
DSMOD Modify user (computer, group..) in active directory
DSRM Remove items from Active Directory

e

ECHO Display message on screen
ENDLOCAL End localisation of environment changes in a batch file
ERASE Delete one or more files
EXIT Quit the current script/routine and set an errorlevel
EXPAND Uncompress files
EXTRACT Uncompress CAB files

f

FC Compare two files
FIND Search for a text string in a file
FINDSTR Search for strings in files
FOR Loop command: all options Files, Directory, List
FORFILES Batch process multiple files
FORMAT Format a disk
FREEDISK Check free disk space (in bytes)
FSUTIL File and Volume utilities
FTP File Transfer Protocol
FTYPE Display or modify file types used in file extension associations

g

GLOBAL Display membership of global groups

GOTO Direct a batch program to jump to a labelled line

h

HELP Online Help

i

iCACLS Change file and folder permissions

IF Conditionally perform a command

IFMEMBER Is the current user in an NT Workgroup

IPCONFIG Configure IP

k

KILL Remove a program from memory

l

LABEL Edit a disk label

LOCAL Display membership of local groups

LOGEVENT Write text to the NT event viewer.

LOGOFF Log a user off

LOGTIME Log the date and time in a file

m

MAPISEND Send email from the command line

MEM Display memory usage

MD Create new folders

MKLINK Create a symbolic link (linkd)

MODE Configure a system device

MORE Display output, one screen at a time

MOUNTVOL Manage a volume mount point

MOVE Move files from one folder to another

MOVEUSER Move a user from one domain to another

MSG Send a message

MSIEXEC Microsoft Windows Installer

MSINFO Windows NT diagnostics

MSTSC Terminal Server Connection (Remote Desktop Protocol)

MUNGE Find and Replace text within file(s)

MV Copy in-use files

n

NET Manage network resources

NETDOM Domain Manager

NETSH Configure network protocols

NETSVC Command-line Service Controller

NBTSTAT Display networking statistics (NetBIOS over TCP/IP)

NETSTAT Display networking statistics (TCP/IP)

NOW Display the current Date and Time

NSLOOKUP Name server lookup

NTBACKUP Backup folders to tape

NTRIGHTS Edit user account rights

p

PATH Display or set a search path for executable files

PATHPING Trace route plus network latency and packet loss

PAUSE Suspend processing of a batch file and display a message

PERMS Show permissions for a user

PERFMON Performance Monitor

PING Test a network connection

POPD Restore the previous value of the current directory saved by PUSHHD

PORTQRY Display the status of ports and services

POWERCFG Configure power settings

PRINT Print a text file

PRNCNFG Display, configure or rename a printer

PRNMNGR Add, delete, list printers set the default printer

PROMPT Change the command prompt

PsExec Execute process remotely

PsFile Show files opened remotely

PsGetSid Display the SID of a computer or a user

PsInfo List information about a system

PsKill Kill processes by name or process ID

PsList List detailed information about processes

PUSHHD Save and then change the current directory

q

QGREP Search file(s) for lines that match a given pattern.

r

RASDIAL Manage RAS connections

RASPHONE Manage RAS connections

RECOVER Recover a damaged file from a defective disk.

REG Registry: Read, Set, Export, Delete keys and values

REGEDIT Import or export registry settings

REGSVR32 Register or unregister a DLL

REGINI Change Registry Permissions

REM Record comments (remarks) in a batch file

REN Rename a file or files

REPLACE Replace or update one file with another

RD Delete folder(s)

RMTSHARE Share a folder or a printer

ROBOCOPY Robust File and Folder Copy

ROUTE Manipulate network routing tables

RUNAS Execute a program under a different user account

RUNDLL32 Run a DLL command (add/remove print connections)

s

SC Service Control

SCHTASKS Schedule a command to run at a specific time

SCLIST Display NT Services

SET Display, set, or remove environment variables

SETLOCAL Control the visibility of environment variables

SETX Set environment variables permanently

SHARE List or edit a file share or print share

SHIFT Shift the position of replaceable parameters in a batch file

SHORTCUT Create a windows shortcut (.LNK file)

SHOWGRPS List the NT Workgroups a user has joined

SHOWMBRS List the Users who are members of a Workgroup

SHUTDOWN Shutdown the computer

SLEEP Wait for x seconds

SLMGR Software Licensing Management (Vista/2008)

SOON Schedule a command to run in the near future

SORT Sort input

START Start a program or command in a separate window

SU Switch User

SUBINACL Edit file and folder Permissions, Ownership and Domain

SUBST Associate a path with a drive letter

SYSTEMINFO List system configuration

t

TASKLIST List running applications and services

TASKKILL Remove a running process from memory

TIME Display or set the system time

TIMEOUT Delay processing of a batch file

TITLE Set the window title for a CMD.EXE session

TLIST Task list with full path

TOUCH Change file timestamps

TRACERT Trace route to a remote host

TREE Graphical display of folder structure

TYPE Display the contents of a text file

u

USRSTAT List domain usernames and last login

v

VER Display version information

VERIFY Verify that files have been saved

VOL Display a disk label

w

WHERE Locate and display files in a directory tree

WHOAMI Output the current UserName and domain

WINDIFF Compare the contents of two files or sets of files

WINMSD Windows system diagnostics

WINMSDP Windows system diagnostics II

WMIC WMI Commands

x

XCACLS Change file and folder permissions

XCOPY Copy files and folders

:: Comment / Remark

Recovery Console commands

The following commands can be used with the Recovery Console. Note that the creation of the recovery environment, and ability to create a custom PE environment with Windows Vista, Windows 7 and Windows 8 enables IT Technologists the ability to add tools and capabilities to the recovery environment. The following list is a basic set provided with the recovery operating system command line environment:

Attrib	Changes the attributes of a file or directory.
Batch	Executes the commands specified in the text file.
Bootcfg	Boot file (boot.ini) configuration and recovery.
ChDir (CD)	Displays the name of the current directory or changes the current directory.
Chkdsk	Checks a disk and displays a status report.
Cls	Clear the screen.
Copy	Copies a single file to another location.
Delete (Del)	Deletes one or more files.
Dir	Displays a list of files and subdirectories in a directory.
Disable	Disables a system service or a device driver
Diskpart	Manages partitions on your hard drives.
Enable	Starts or enables a system service or a device driver.
Exit	Exits the Recovery Console and restarts your computer.
Expand	Extracts a file from a compressed file.
Fixboot	Writes a new partition boot sector onto the specified partition.
Fixmbr	Repairs the master boot record of the specified disk.
Format	Formats a disk.
Help	Displays a list of the commands you can use in the Recovery Console.
Listsvc	Lists the services and drivers available on the computer.
Logon	Logs on to a Windows installation.
Map	Displays the drive letter mappings.
Mkdir (MD)	Create a directory.
More	Displays a text file.
Net Use	Connects a network share to a drive letter.
Rename (Ren)	Rename a directory.
Rmdir (RM)	Deletes a directory.
Set	Displays and sets environment variables.
Systemroot	Sets the current directory to the systemroot directory of the system you are currently logged on to.
Type;	Displays a text file.

Key Strokes and Combinations

Common Boot process Interrupt Keys

F2	ASR (XP Pro only; XP Home requires manual install of Backup application)
F6	SCSI or other disk device driver install
F8	Safemode
F12	PXE
Shift	Skip POST
Various	BIOS setup – review OEM provided manual

NOTE: The key stroke combinations on the following pages are accurate from Windows XP through Windows 7. The new user interface delivered with Windows 8 dramatically alters Key Stroke combinations.

Windows system key combinations

- F1: Help
- CTRL+ESC: Open **Start** menu
- ALT+TAB: Switch between open programs
- ALT+F4: Quit program
- SHIFT+DELETE: Delete item permanently
- Windows Logo+L: Lock the computer (without using CTRL+ALT+DELETE)

Windows program key combinations

- CTRL+C: Copy
- CTRL+X: Cut
- CTRL+V: Paste
- CTRL+Z: Undo
- CTRL+B: Bold
- CTRL+U: Underline
- CTRL+I: Italic

Mouse click/keyboard modifier combinations for shell objects

- SHIFT+right click: Displays a shortcut menu containing alternative commands
- SHIFT+double click: Runs the alternate default command (the second item on the menu)
- ALT+double click: Displays properties
- SHIFT+DELETE: Deletes an item immediately without placing it in the Recycle Bin

General keyboard-only commands

- F1: Starts Windows Help
- F10: Activates menu bar options
- SHIFT+F10 Opens a shortcut menu for the selected item (this is the same as right-clicking an object)
- CTRL+ESC: Opens the **Start** menu (use the ARROW keys to select an item)
- CTRL+ESC or ESC: Selects the **Start** button (press TAB to select the taskbar, or press SHIFT+F10 for a context menu)
- CTRL+SHIFT+ESC: Opens Windows Task Manager
- ALT+DOWN ARROW: Opens a drop-down list box
- ALT+TAB: Switch to another running program (hold down the ALT key and then press the TAB key to view the task-switching window)
- SHIFT: Press and hold down the SHIFT key while you insert a CD-ROM to bypass the automatic-run feature
- ALT+SPACE: Displays the main window's **System** menu (from the **System** menu, you can restore, move, resize, minimize, maximize, or close the window)
- ALT+- (ALT+hyphen): Displays the Multiple Document Interface (MDI) child window's **System** menu (from the MDI child window's **System** menu, you can restore, move, resize, minimize, maximize, or close the child window)
- CTRL+TAB: Switch to the next child window of a Multiple Document Interface (MDI) program
- ALT+*underlined letter in menu*: Opens the menu
- ALT+F4: Closes the current window
- CTRL+F4: Closes the current Multiple Document Interface (MDI) window
- ALT+F6: Switch between multiple windows in the same program (for example, when the Notepad **Find** dialog box is displayed, ALT+F6 switches between the **Find** dialog box and the main Notepad window)

Shell objects and general folder/Windows Explorer shortcuts

For a selected object:

- F2: Rename object
- F3: Find all files
- CTRL+X: Cut
- CTRL+C: Copy
- CTRL+V: Paste
- SHIFT+DELETE: Delete selection immediately, without moving the item to the Recycle Bin
- ALT+ENTER: Open the properties for the selected object

To copy a file

Press and hold down the CTRL key while you drag the file to another folder.

To create a shortcut

Press and hold down CTRL+SHIFT while you drag a file to the desktop or a folder.

General folder/shortcut control

- F4: Selects the **Go To A Different Folder** box and moves down the entries in the box (if the toolbar is active in Windows Explorer)
- F5: Refreshes the current window.
- F6: Moves among panes in Windows Explorer
- CTRL+G: Opens the Go To Folder tool (in Windows 95 Windows Explorer only)
- CTRL+Z: Undo the last command
- CTRL+A: Select all the items in the current window
- BACKSPACE: Switch to the parent folder
- SHIFT+click+**Close** button: For folders, close the current folder plus all parent folders

Windows Explorer tree control

- Numeric Keypad *: Expands everything under the current selection
- Numeric Keypad +: Expands the current selection
- Numeric Keypad -: Collapses the current selection.
- RIGHT ARROW: Expands the current selection if it is not expanded, otherwise goes to the first child
- LEFT ARROW: Collapses the current selection if it is expanded, otherwise goes to the parent

Properties control

- CTRL+TAB/CTRL+SHIFT+TAB: Move through the property tabs

Accessibility shortcuts

- Press SHIFT five times: Toggles StickyKeys on and off
- Press down and hold the right SHIFT key for eight seconds: Toggles FilterKeys on and off
- Press down and hold the NUM LOCK key for five seconds: Toggles ToggleKeys on and off
- Left ALT+left SHIFT+NUM LOCK: Toggles MouseKeys on and off
- Left ALT+left SHIFT+PRINT SCREEN: Toggles high contrast on and off

Microsoft Natural Keyboard keys

- Windows Logo: **Start** menu
- Windows Logo+R: **Run** dialog box
- Windows Logo+M: Minimize all
- SHIFT+Windows Logo+M: Undo minimize all
- Windows Logo+F1: Help
- Windows Logo+E: Windows Explorer
- Windows Logo+F: Find files or folders
- Windows Logo+D: Minimizes all open windows and displays the desktop
- CTRL+Windows Logo+F: Find computer
- CTRL+Windows Logo+TAB: Moves focus from Start, to the Quick Launch toolbar, to the system tray (use RIGHT ARROW or LEFT ARROW to move focus to items on the Quick Launch toolbar and the system tray)
- Windows Logo+TAB: Cycle through taskbar buttons
- Windows Logo+Break: **System Properties** dialog box
- Application key: Displays a shortcut menu for the selected item

Microsoft Natural Keyboard with IntelliType software installed

- Windows Logo+L: Log off Windows
- Windows Logo+P: Starts Print Manager
- Windows Logo+C: Opens Control Panel
- Windows Logo+V: Starts Clipboard
- Windows Logo+K: Opens **Keyboard Properties** dialog box
- Windows Logo+I: Opens **Mouse Properties** dialog box
- Windows Logo+A: Starts Accessibility Options (if installed)
- Windows Logo+SPACEBAR: Displays the list of Microsoft IntelliType shortcut keys
- Windows Logo+S: Toggles CAPS LOCK on and off

Dialog box keyboard commands

- TAB: Move to the next control in the dialog box
- SHIFT+TAB: Move to the previous control in the dialog box
- SPACEBAR: If the current control is a button, this clicks the button. If the current control is a check box, this toggles the check box. If the current control is an option, this selects the option.
- ENTER: Equivalent to clicking the selected button (the button with the outline)
- ESC: Equivalent to clicking the **Cancel** button
- ALT+*underlined letter in dialog box item*: Move to the corresponding item

Control Panel Applications from Command Line

You can access these applets by hitting the Windows Key+R and typing *Control* and the app that you want. Example: `control hdwwiz.cpl`

(Note: Windows Key +R is the RUN command)

Control panel tool	Command
-----	-----
Accessibility Options	<code>control access.cpl</code>
Add New Hardware	<code>control sysdm.cpl add new hardware</code>
Add/Remove Programs	<code>control appwiz.cpl</code>
Date/Time Properties	<code>control timedate.cpl</code>
Display Properties	<code>control desk.cpl</code>
FindFast	<code>control findfast.cpl</code>
Fonts Folder	<code>control fonts</code>
Internet Properties	<code>control inetcpl.cpl</code>
Joystick Properties	<code>control joy.cpl</code>
Keyboard Properties	<code>control main.cpl keyboard</code>
Microsoft Exchange (or Windows Messaging)	<code>control mlcfg32.cpl</code>
Microsoft Mail Post Office	<code>control wgpocpl.cpl</code>
Modem Properties	<code>control modem.cpl</code>
Mouse Properties	<code>control main.cpl</code>
Multimedia Properties	<code>control mmsys.cpl</code>
Network Properties	<code>control netcpl.cpl</code> NOTE: In Windows NT 4.0, Network properties is Ncpa.cpl, not Netcpl.cpl
Password Properties	<code>control password.cpl</code>
PC Card	<code>control main.cpl pc card (PCMCIA)</code>
Power Management (Windows 95)	<code>control main.cpl power</code>
Power Management (Windows 98)	<code>control powercfg.cpl</code>
Printers Folder	<code>control printers</code>
Regional Settings	<code>control intl.cpl</code>
Scanners and Cameras	<code>control sticpl.cpl</code>
Sound Properties	<code>control mmsys.cpl sounds</code>
System Properties	<code>control sysdm.cpl</code>

Networking

IP port ranges and reservations

0.0.0.0/8	Broadcast messages – local network
1.0.0.0 to 127.255.255.255	Class A
10.0.0.0/8	Private
127.0.0.0/8	Loopback
128.0.0.0 to 191.255.255.255	Class B
169.254.0.0/16	APIPA
172.16.0.0/12	Private
192.0.0.0 to 223.255.255.255	Class C
192.0.0.0/29	Private
224.0.0.0/4	Multi-cast
240.0.0.0/4	Reserved
255.255.255.255/32	Limited broadcast

IPCONFIG command switches

/all	Display full configuration information
/release	Release the IPv4 address for specified adapter
/renew	Renew the IPv4 address for the specified adapter
/release6	Release the IPv6 address for specified adapter
/renew6	Renew the IPv6 address for the specified adapter
/displaydns	Display contents of DNS Resolver Cache
/flushdns	Clear Contents of DNS Resolver Cache
/?	Display Help NOTE: Learn the other options

Well-known Internet Protocol ports: 0–1023

Port	Description
0/TCP,UDP	Reserved
1/TCP,UDP	TCP Port Service Multiplexer
2/TCP,UDP	Management Utility
3/TCP,UDP	Compression Process
5/TCP,UDP	Remote Job Entry
7/TCP,UDP	Echo
8/TCP,UDP	ICMP (Ping)
9/TCP,UDP	Discard
11/TCP,UDP	Active Users
13/TCP,UDP	DAYTIME – (RFC 867)
17/TCP,UDP	Quote of the Day
18/TCP,UDP	Message Send Protocol
19/TCP,UDP	Character Generator
20/TCP	FTP – data
21/TCP	FTP—control (command)
22/TCP,UDP	Secure Shell (SSH)—used for secure logins, file transfers (scp, sftp) and port forwarding
23/TCP	Telnet protocol—unencrypted text communications
25/TCP,UDP	Simple Mail Transfer Protocol (SMTP)—used for e-mail routing between mail servers
34/TCP,UDP	Remote File (RF)—used to transfer files between machines
35/TCP,UDP	Any private printer server protocol
35/TCP,UDP	QMS Magicolor 2 printer server protocol
37/TCP,UDP	TIME protocol
39/TCP,UDP	Resource Location Protocol (RLP)—used for determining the location of higher level services from hosts on a network
41/TCP,UDP	Graphics
42/TCP,UDP	nameserver, ARPA Host Name Server Protocol
42/TCP,UDP	WINS
43/TCP	WHOIS protocol
49/TCP,UDP	TACACS Login Host protocol
52/TCP,UDP	XNS (Xerox Network Services) Time Protocol
53/TCP,UDP	Domain Name System (DNS)
54/TCP,UDP	XNS (Xerox Network Services) Clearinghouse
55/TCP,UDP	ISI-GL (ISI Graphics Language)

56/TCP,UDP	XNS (Xerox Network Services) Authentication
56/TCP,UDP	RAP (Route Access Protocol)
57/TCP	MTP, Mail Transfer Protocol
58/TCP,UDP	XNS (Xerox Network Services) Mail
67/UDP	Bootstrap Protocol (BOOTP) Server; also used by Dynamic Host Configuration Protocol (DHCP)
68/UDP	Bootstrap Protocol (BOOTP) Client; also used by Dynamic Host Configuration Protocol (DHCP)
69/UDP	Trivial File Transfer Protocol (TFTP)
70/TCP	Gopher protocol
79/TCP	Finger protocol
80/TCP,UDP	Hypertext Transfer Protocol (HTTP)
81/TCP	Torpark—Onion routing
82/UDP	Torpark—Control
83/TCP	MIT ML Device
88/TCP,UDP	Kerberos—authentication system
90/TCP,UDP	dnsix (DoD Network Security for Information Exchange) Securit Attribute Token Map
90/TCP,UDP	Pointcast
99/TCP	WIP Message Protocol
101/TCP	NIC host name
102/TCP	ISO-TSAP (Transport Service Access Point) Class 0 protocol
104/TCP,UDP	ACR/NEMA Digital Imaging and Communications in Medicine
107/TCP	Remote TELNET Service protocol
109/TCP	Post Office Protocol 2 (POP2)
110/TCP	Post Office Protocol 3 (POP3)
111/TCP,UDP	Sun Remote Procedure Call
113/UDP	ident—user identification system, used by IRC servers to identify users
113/TCP,UDP	Authentication Service (auth)
115/TCP	Simple File Transfer Protocol (SFTP)
117/TCP	UUCP Path Service
118/TCP,UDP	SQL (Structured Query Language) Services
119/TCP	Network News Transfer Protocol (NNTP)—used for retrieving newsgroup messages
123/UDP	Network Time Protocol (NTP)—used for time synchronization
135/TCP,UDP	DCE endpoint resolution
135/TCP,UDP	Microsoft EPMAP (End Point Mapper), also known as DCE/RPC Locator service, used to

	remotely manage services including DHCP server, DNS server and WINS. Also used by DCOM
137/TCP,UDP	NetBIOS NetBIOS Name Service
138/TCP,UDP	NetBIOS NetBIOS Datagram Service
139/TCP,UDP	NetBIOS NetBIOS Session Service
143/TCP,UDP	Internet Message Access Protocol (IMAP)—used for retrieving, organizing, and synchronizing e-mail messages
152/TCP,UDP	Background File Transfer Program (BFTP)
153/TCP,UDP	SGMP, Simple Gateway Monitoring Protocol
156/TCP,UDP	SQL Service
158/TCP,UDP	DMSP, Distributed Mail Service Protocol
161/TCP,UDP	Simple Network Management Protocol (SNMP)
162/TCP,UDP	Simple Network Management Protocol Trap (SNMPTRAP)
170/TCP	Print-srv, Network PostScript
177/TCP,UDP	X Display Manager Control Protocol (XDMCP)
179/TCP	BGP (Border Gateway Protocol)
194/TCP,UDP	IRC (Internet Relay Chat)
199/TCP,UDP	SMUX, SNMP Unix Multiplexer
201/TCP,UDP	AppleTalk Routing Maintenance
209/TCP,UDP	The Quick Mail Transfer Protocol
213/TCP,UDP	IPX
218/TCP,UDP	MPP, Message Posting Protocol
220/TCP,UDP	IMAP, Interactive Mail Access Protocol, version 3
259/TCP,UDP	ESRO, Efficient Short Remote Operations
264/TCP,UDP	BGMP, Border Gateway Multicast Protocol
311/TCP	Mac OS X Server Admin (officially AppleShare IP Web administration)
308/TCP	Novastor Online Backup
318/TCP,UDP	PKIX TSP, Time Stamp Protocol
323/TCP,UDP	IMMP, Internet Message Mapping Protocol
350/TCP,UDP	MATIP-Type A, Mapping of Airline Traffic over Internet Protocol
351/TCP,UDP	MATIP-Type B, Mapping of Airline Traffic over Internet Protocol
366/TCP,UDP	ODMR, On-Demand Mail Relay
369/TCP,UDP	Rpc2portmap
370/TCP,UDP	codaaauth2 – Coda authentication server
370/TCP,UDP	securecast1 – Outgoing packets to NAI's servers,

	http://www.nai.com/asp_set/anti_virus/alerts/faq.as
371/TCP,UDP	ClearCase albd
383/TCP,UDP	HP data alarm manager
384/TCP,UDP	A Remote Network Server System
387/TCP,UDP	AURP, AppleTalk Update-based Routing Protocol
389/TCP,UDP	Lightweight Directory Access Protocol (LDAP)
401/TCP,UDP	UPS Uninterruptible Power Supply
402/TCP	Altiris, Altiris Deployment Client
411/TCP	Direct Connect Hub
412/TCP	Direct Connect Client-to-Client
427/TCP,UDP	Service Location Protocol (SLP)
443/TCP,UDP	Hypertext Transfer Protocol over TLS/SSL (HTTPS)
444/TCP,UDP	SNPP, Simple Network Paging Protocol (RFC 1568)
445/TCP	Microsoft-DS Active Directory, Windows shares
445/UDP	Microsoft-DS SMB file sharing
464/TCP,UDP	Kerberos Change/Set password
465/TCP	Cisco protocol
465/TCP	SMTP over SSL
475/TCP	tcpnethasprv (Hasp services, TCP/IP version)
497/TCP	Dantz Retrospect
500/UDP	Internet Security Association and Key Management Protocol (ISAKMP)
501/TCP	STMF, Simple Transportation Management Framework – DOT NTCIP 1101
502/TCP,UDP	Modbus, Protocol
504/TCP,UDP	Citadel – multiservice protocol for dedicated clients for the Citadel groupware system
510/TCP	First Class Protocol
512/TCP	Rexec, Remote Process Execution
512/UDP	comsat, together with biff
513/TCP	Login
513/UDP	Who
514/TCP	Shell—used to execute non-interactive commands on a remote system
514/UDP	Syslog—used for system logging
515/TCP	Line Printer Daemon—print service
517/UDP	Talk
518/UDP	NTalk
520/TCP	efs, extended file name server

520/UDP	Routing—RIP
524/TCP,UDP	NCP (NetWare Core Protocol) is used for a variety things such as access to primary NetWare server resources, Time Synchronization, etc.
525/UDP	Timed, Timeserver
530/TCP,UDP	RPC
531/TCP,UDP	AOL Instant Messenger, IRC
532/TCP	netnews
533/UDP	netwall, For Emergency Broadcasts
540/TCP	UUCP (Unix-to-Unix Copy Protocol)
542/TCP,UDP	commerce (Commerce Applications)
543/TCP	klogin, Kerberos login
544/TCP	kshell, Kerberos Remote shell
545/TCP	OSisoft PI (VMS), OSISoft PI Server Client Access
546/TCP,UDP	DHCPv6 client
547/TCP,UDP	DHCPv6 server
548/TCP	Apple Filing Protocol (AFP) over TCP
550/UDP	new-rwho, new-who
554/TCP,UDP	Real Time Streaming Protocol (RTSP)
556/TCP	Remotefs, RFS, rfs_server
560/UDP	rmonitor, Remote Monitor
561/UDP	monitor
563/TCP,UDP	NNTP protocol over TLS/SSL (NNTPS)
587/TCP	e-mail message submission (SMTP)
591/TCP	FileMaker 6.0 (and later) Web Sharing (HTTP Alternate, also see port 80)
593/TCP,UDP	HTTP RPC Ep Map, Remote procedure call over Hypertext Transfer Protocol, often used by Distributed Component Object Model services and Microsoft Exchange Server
604/TCP	TUNNEL profile, a protocol for BEEP peers to form an application layer tunnel
623/UDP	ASF Remote Management and Control Protocol (ASF-RMCP)
631/TCP,UDP	Internet Printing Protocol (IPP)
636/TCP,UDP	Lightweight Directory Access Protocol over TLS/SSL (LDAPS)
639/TCP,UDP	MSDP, Multicast Source Discovery Protocol
641/TCP,UDP	SupportSoft Nexus Remote Command (control/listening): A proxy gateway connecting remote control traffic
646/TCP,UDP	LDP, Label Distribution Protocol, a routing protocol used in MPLS networks
647/TCP	DHCP Failover protocol

648/TCP	RRP (Registry Registrar Protocol)
652/TCP	DTCP, Dynamic Tunnel Configuration Protocol
653/TCP,UDP	SupportSoft Nexus Remote Command (data): A proxy gateway connecting remote control traffic
654/TCP	AODV (Ad-hoc On-demand Distance Vector)
655/TCP	IEEE MMS (IEEE Media Management System)
657/TCP,UDP	IBM RMC (Remote monitoring and Control) protocol, used by System p5 AIX Integrated Virtualization Manager (IVM) and Hardware Management Console to connect managed logical partitions (LPAR) to enable dynamic partition reconfiguration
660/TCP	Mac OS X Server administration
665/TCP	sun-dr, Remote Dynamic Reconfiguration
666/UDP	Doom, first online first-person shooter
674/TCP	ACAP (Application Configuration Access Protocol)
691/TCP	MS Exchange Routing
692/TCP	Hyperwave-ISP
694/UDP	Linux-HA High availability Heartbeat
695/TCP	IEEE-MMS-SSL (IEEE Media Management System over SSL)
698/UDP	OLSR (Optimized Link State Routing)
699/TCP	Access Network
700/TCP	EPP (Extensible Provisioning Protocol), a protocol for communication between domain name registries and registrars (RFC 4934)
701/TCP	LMP (Link Management Protocol (Internet)), a protocol that runs between a pair of nodes and is used to manage traffic engineering (TE) links
702/TCP	IRIS (Internet Registry Information Service) over BEEP (Blocks Extensible Exchange Protocol) (RFC 3983)
706/TCP	SILC, Secure Internet Live Conferencing
711/TCP	Cisco TDP, Tag Distribution Protocol—being replaced by the MPLS Label Distribution Protocol
712/TCP	TBRPF, Topology Broadcast based on Reverse-Path Forwarding routing protocol (RFC 3684)
712/UDP	Promise RAID Controller
720/TCP	SMQP, Simple Message Queue Protocol
749/TCP,UDP	Kerberos administration
750/TCP	rfile
750/UDP	loadav
750/UDP	kerberos-iv, Kerberos version IV

751/TCP,UDP	pump
751/TCP,UDP	kerberos_master, Kerberos authentication
752/TCP	qrh
752/UDP	qrh
752/UDP	userreg_server, Kerberos Password (kpasswd) server
753/TCP	Reverse Routing Header (rrh)
753/UDP	Reverse Routing Header (rrh)
753/UDP	passwd_server, Kerberos userreg server
754/TCP	tell send
754/TCP	krb5_prop, Kerberos v5 slave propagation
754/UDP	tell send
760/TCP,UDP	ns
760/TCP,UDP	krbupdate [kreg], Kerberos registration
782/TCP	Conserver serial-console management server
783/TCP	SpamAssassin spamd daemon
829/TCP	CMP (Certificate Management Protocol)
843/TCP	Adobe Flash socket policy server
860/TCP	iSCSI (RFC 3720)
873/TCP	rsync file synchronisation protocol
888/TCP	cddbp, CD DataBase (CDDb) protocol (CDDBP)—unassigned but widespread use
901/TCP	Samba Web Administration Tool (SWAT)
901/TCP, UDP	VMware Virtual Infrastructure Client (UDP from server being managed to management console)
902/TCP	VMware Server Console (TCP from management console to server being Managed)
902/UDP	VMware Server Console (UDP from server being managed to management console)
903/TCP	VMware Remote Console
904/TCP	VMware Server Alternate (if 902 is in use, i.e. SUSE linux)
909/TCP,UDP	2DEV "2SP" Protocol
911/TCP	Network Console on Acid (NCA)—local tty redirection over OpenSSH
953/TCP,UDP	Domain Name System (DNS) RDNC Service
981/TCP	SofaWare Technologies Remote HTTPS management for firewall devices running embedded Check Point FireWall-1 software
989/TCP,UDP	FTPS Protocol (data): FTP over TLS/SSL
990/TCP,UDP	FTPS Protocol (control): FTP over TLS/SSL
991/TCP,UDP	NAS (Netnews Administration System)

992/TCP,UDP	TELNET protocol over TLS/SSL
993/TCP	Internet Message Access Protocol over SSL (IMAPS)
995/TCP	Post Office Protocol 3 over TLS/SSL (POP3S)
999/TCP	ScimoreDB Database System
1001/TCP	JtoMB
1023/TCP,UDP	Reserved