Network Working Group
Request for Comments: 1010

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ISI

May 1987

Obsoletes RFCs: 990, 960, 943, 923, 900, 870,
820, 790, 776, 770, 762, 758,
755, 750, 739, 604, 503, 433, 349
Obsoletes IENs: 127, 117, 93

ASSIGNED NUMBERS

Status of this Memo

This memo is an official status report on the numbers used in protocols in the Internet community. Distribution of this memo is unlimited.

Introduction

This Network Working Group Request for Comments documents the currently assigned values from several series of numbers used in network protocol implementations. This RFC will be updated periodically, and in any case current information can be obtained from Joyce Reynolds. If you are developing a protocol or application that will require the use of a link, socket, port, protocol, etc., please contact Joyce to receive a number assignment.

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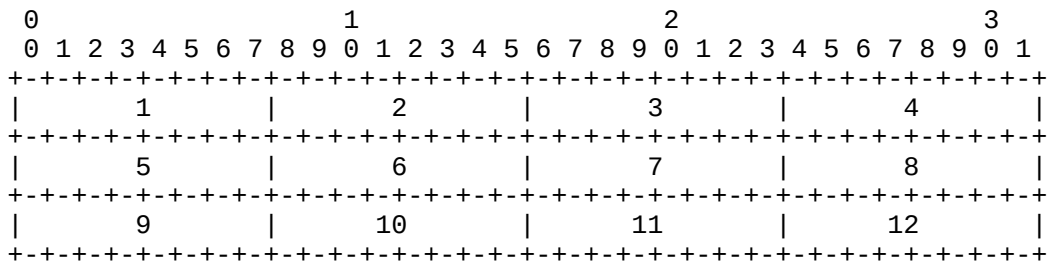
Most of the protocols mentioned here are documented in the RFC series of notes. Some of the items listed are undocumented. Further information on protocols can be found in the memo "Official Internet Protocols" [91]. The more prominent and more generally used are documented in the "DDN Protocol Handbook, Volume Two, DARPA Internet Protocols" [36] prepared by the NIC. Other collections of older or obsolete protocols are contained in the "Internet Protocol Transition Workbook" [57], or in the "ARPANET Protocol Transition Handbook" [38]. For further information on ordering the complete 1985 DDN Protocol Handbook, write: SRI International (SRI-NIC), DDN Network Information Center, Room EJ291, 333 Ravenswood Avenue, Meno Park, CA., 94025; or call: 1-800-235-3155.

In the entries below, the name and mailbox of the responsible individual is indicated. The bracketed entry, e.g., [nn,iii], at the

right hand margin of the page indicates a reference for the listed protocol, where the number ("nn") cites the document and the letters ("iii") cites the person. Whenever possible, the letters are a NIC Ident as used in the WhoIs (NICNAME) service.

The convention in the documentation of Internet Protocols is to express numbers in decimal and to picture data in "big-endian" order [14]. That is, fields are described left to right, with the most significant octet on the left and the least significant octet on the right.

The order of transmission of the header and data described in this document is resolved to the octet level. Whenever a diagram shows a group of octets, the order of transmission of those octets is the normal order in which they are read in English. For example, in the following diagram the octets are transmitted in the order they are numbered.



Transmission Order of Bytes

Whenever an octet represents a numeric quantity the left most bit in the diagram is the high order or most significant bit. That is, the bit labeled 0 is the most significant bit. For example, the following diagram represents the value 170 (decimal).

Significance of Bits

Similarly, whenever a multi-octet field represents a numeric quantity the left most bit of the whole field is the most significant bit. When a multi-octet quantity is transmitted the most significant octet is transmitted first.

VERSION NUMBERS

In the Internet Protocol (IP) [36,80] there is a field to identify the version of the internetwork general protocol. This field is 4 bits in size.

Assigned Internet Version Numbers

Decimal	Keyword	Version	References
0		Reserved	[JBP]
1-3		Unassigned	[JBP]
4	IP	Internet Protocol	[80,JBP]
5	ST	ST Datagram Mode	[41,JWF]
6-14		Unassigned	[JBP]
15		Reserved	[JBP]

PROTOCOL NUMBERS

In the Internet Protocol (IP) [36,80] there is a field, called Protocol, to identify the the next level protocol. This is an 8 bit field.

Assigned Internet Protocol Numbers

Decimal	Keyword	Protocol	References
0		Reserved	[JBP]
1	ICMP	Internet Control Message	[72,JBP]
2	IGMP	Internet Group Management	[34,JBP]
3	GGP	Gateway-to-Gateway	[49,MB]
4		Unassigned	[JBP]
5	ST	Stream	[41,JWF]
6	TCP	Transmission Control	[81,JBP]
7	UCL	UCL	[PK]
8	EGP	Exterior Gateway Protocol	[92,DLM1]
9	IGP	any private interior gateway	[JBP]
10	BBN-RCC-MON	BBN RCC Monitoring	[SGC]
11	NVP-II	Network Voice Protocol	[15,SC3]
12	PUP	PUP	[7,XEROX]
13	ARGUS	ARGUS	[RWS4]
14	EMCON	EMCON	[BN7]
15	XNET	Cross Net Debugger	[47,JFH2]
16	CHAOS	Chaos	[NC3]
17	UDP	User Datagram	[79,JBP]
18	MUX	Multiplexing	[16,JBP]
19	DCN-MEAS	DCN Measurement Subsystems	[DLM1]
20	HMP	Host Monitoring	[48,RH6]
21	PRM	Packet Radio Measurement	[ZSU]
22	XNS-IDP	XEROX NS IDP	[102,XEROX]
23	TRUNK-1	Trunk-1	[SA2]
24	TRUNK-2	Trunk-2	[SA2]
25	LEAF-1	Leaf-1	[SA2]
26	LEAF-2	Leaf-2	[SA2]
27	RDP	Reliable Data Protocol	[106,RH6]
28	IRTP	Internet Reliable Transaction	[59,TXM]
29	ISO-TP4	ISO Transport Protocol Class 4	[51,RC77]
30	NETBLT	Bulk Data Transfer Protocol	[13,DDC1]
31	MFE-NSP	MFE Network Services Protocol	[93,BCH2]
32	MERIT-INP	MERIT Internodal Protocol	[HWB]
33	SEP	Sequential Exchange Protocol	[JC120]
34-60		Unassigned	[JBP]
61		any host internal protocol	[JBP]
62	CFTP	CFTP	[42,HCF2]
63		any local network	[JBP]

64	SAT-EXPAK	SATNET and Backroom EXPAK	[SHB]
65	MIT-SUBNET	MIT Subnet Support	[NC3]
66	RVD	MIT Remote Virtual Disk Protocol	[MBG]
67	IPPC	Internet Pluribus Packet Core	[SHB]
68		any distributed file system	[JBP]
69	SAT-MON	SATNET Monitoring	[SHB]
70		Unassigned	[JBP]
71	IPCV	Internet Packet Core Utility	[SHB]
72-75		Unassigned	[JBP]
76	BR-SAT-MON	Backroom SATNET Monitoring	[SHB]
77		Unassigned	[JBP]
78	WB-MON	WIDEBAND Monitoring	[SHB]
79	WB-EXPAK	WIDEBAND EXPAK	[SHB]
80-254		Unassigned	[JBP]
255		Reserved	[JBP]

PORT NUMBERS

Ports are used in the TCP [36,81] to name the ends of logical connections which carry long term conversations. For the purpose of providing services to unknown callers, a service contact port is defined. This list specifies the port used by the server process as its contact port. The contact port is sometimes called the "well-known port".

To the extent possible, these same port assignments are used with the UDP [37,79].

To the extent possible, these same port assignments are used with the ISO-TP4 [52].

The assigned ports use a small portion of the possible port numbers. The assigned ports have all except the low order eight bits cleared to zero. The low order eight bits are specified here.

Port Assignments:

Decimal	Keyword	Description	References
0		Reserved	[JBP]
1-4		Unassigned	[JBP]
5	RJE	Remote Job Entry	[9,JBP]
7	ECHO	Echo	[70,JBP]
9	DISCARD	Discard	[69,JBP]
11	USERS	Active Users	[65,JBP]
13	DAYTIME	Daytime	[68,JBP]
15		Unassigned	[JBP]
17	QUOTE	Quote of the Day	[75,JBP]
19	CHARGEN	Character Generator	[67,JBP]
20	FTP-DATA	File Transfer [Default Data]	[71,JBP]
21	FTP	File Transfer [Control]	[71,JBP]
23	TELNET	Telnet	[87,JBP]
25	SMTP	Simple Mail Transfer	[77,JBP]
27	NSW-FE	NSW User System FE	[17,RHT]
29	MSG-ICP	MSG ICP	[63,RHT]
31	MSG-AUTH	MSG Authentication	[63,RHT]
33	DSP	Display Support Protocol	[MLC]
35		any private printer server	[JBP]
37	TIME	Time	[83,JBP]
39	RLP	Resource Location Protocol	[MA]
41	GRAPHICS	Graphics	[98,JBP]
42	NAMESERVER	Host Name Server	[74,JBP]
43	NICNAME	Who Is	[46,JAKE]
44	MPM-FLAGS	MPM FLAGS Protocol	[JBP]

45	MPM	Message Processing Module [recv]	[73,JBP]
46	MPM-SND	MPM [default send]	[73,JBP]
47	NI-FTP	NI FTP	[103,SK8]
49	LOGIN	Login Host Protocol	[PHD1]
51	LA-MAINT	IMP Logical Address Maintenance	[58,AGM]
53	DOMAIN	Domain Name Server	[61,70,PM1]
55	ISI-GL	ISI Graphics Language	[6,RB9]
57		any private terminal access	[JBP]
59		any private file service	[JBP]
61	NI-MAIL	NI MAIL	[4,SK8]
63	VIA-FTP	VIA Systems - FTP	[DXD]
65	TACACS-DS	TACACS-Database Service	[3,RHT]
67	BOOTPS	Bootstrap Protocol Server	[29,WJC2]
68	BOOTPC	Bootstrap Protocol Client	[29,WJC2]
69	TFTP	Trivial File Transfer	[95,DDC1]
71	NETRJS-1	Remote Job Service	[8,RTB3]
72	NETRJS-2	Remote Job Service	[8,RTB3]
73	NETRJS-3	Remote Job Service	[8,RTB3]
74	NETRJS-4	Remote Job Service	[8,RTB3]
75		any private dial out service	[JBP]
77		any private RJE service	[JBP]
79	FINGER	Finger	[44,KLH]
81	HOSTS2-NS	HOSTS2 Name Server	[EAK1]
83	MIT-ML-DEV	MIT ML Device	[DPR]
85	MIT-ML-DEV	MIT ML Device	[DPR]
87		any private terminal link	[JBP]
89	SU-MIT-TG	SU/MIT Telnet Gateway	[MRC]
91	MIT-DOV	MIT Dover Spooler	[EBM]
93	DCP	Device Control Protocol	[DT15]
95	SUPDUP	SUPDUP	[20,MRC]
97	SWIFT-RVF	Swift Remote Vitural File Protocol	[MXR]
98	TACNEWS	TAC News	[FRAN]
99	METAGRAM	Metagram Relay	[GEOF]
101	HOSTNAME	NIC Host Name Server	[45,JAKE]
102	ISO-TSAP	ISO-TSAP	[12,MTR]
103	X400	X400	[HCF2]
104	X400-SND	X400-SND	[HCF2]
105	CSNET-NS	Mailbox Name Nameserver	[96,MAS3]
107	RTELNET	Remote Telnet Service	[76,JBP]
109	POP-2	Post Office Protocol - Version 2	[11,JKR1]
111	SUNRPC	SUN Remote Procedure Call	[DXG]
113	AUTH	Authentication Service	[99,MCSJ]
115	SFTP	Simple File Transfer Protocol	[56,MKL1]
117	UUCP-PATH	UUCP Path Service	[35,MAE]
119	NNTP	Network News Transfer Protocol	[53,PL4]
121	ERPC	HYDRA Expedited Remote Procedure Call	[101,JXO]
123	NTP	Network Time Protocol	[60,DLM1]
125	LOCUS-MAP	Locus PC-Interface Net Map Server	[105,BXG]

127	LOCUS-CON	Locus PC-Interface Conn Server	[105,BXG]
129	PWDGEN	Password Generator Protocol	[107,FJW]
130	CISCO-FNA	CISCO FNATIVE	[WXB]
131	CISCO-TNA	CISCO TNATIVE	[WXB]
132	CISCO-SYS	CISCO SYSMAINT	[WXB]
133	STATSRV	Statistics Service	[DLM1]
134	INGRES-NET	INGRES-NET Service	[MXB]
135	LOC-SRV	Location Service	[JXP]
136	PROFILE	PROFILE Naming System	[LLP]
137	NETBIOS-NS	NETBIOS Name Service	[JBP]
138	NETBIOS-DGM	NETBIOS Datagram Service	[JBP]
139	NETBIOS-SSN	NETBIOS Session Service	[JBP]
140	EMFIS-DATA	EMFIS Data Service	[GB7]
141	EMFIS-CNTL	EMFIS Control Service	[GB7]
142	BL-IDM	Britton-Lee IDM	[SXS1]
143-159		Unassigned	[JBP]
160-223		Reserved	[JBP]
224-241		Unassigned	[JBP]
243	SUR-MEAS	Survey Measurement	[5,AV]
245	LINK	LINK	[10,RDB2]
247-255		Unassigned	[JBP]

DOMAIN SYSTEM PARAMETERS

The Internet Domain Naming System (DOMAIN) includes several parameters. These are documented in RFC 883 [61]. The CLASS parameter is listed here. The per CLASS parameters are defined in separate RFCs as indicated.

Domain System Parameters:

Decimal	Name	References
0	Reserved	[PM1]
1	Internet	[61,PM1]
2	Unassigned	[PM1]
3	Chaos	[PM1]
4-65534	Unassigned	[PM1]
65535	Reserved	[PM1]

ARPANET LOGICAL ADDRESSES

The ARPANET facility for "logical addressing" is described in RFC 878 [57] and RFC 1005 [109]. A portion of the possible logical addresses are reserved for standard uses.

There are 49,152 possible logical host addresses. Of these, 256 are reserved for assignment to well-known functions. Assignments for well-known functions are made by Joyce Reynolds. Assignments for other logical host addresses are made by the NIC.

Logical Address Assignments:

Decimal	Description	References
0	Reserved	[JBP]
1	The BBN Core Gateways	[MB]
2-254	Unassigned	[JBP]
255	Reserved	[JBP]

ARPANET LINK NUMBERS

The word "link" here refers to a field in the original ARPANET Host/IMP interface leader. The link was originally defined as an 8-bit field. Later specifications defined this field as the "message-id" with a length of 12 bits. The name link now refers to the high order 8 bits of this 12-bit message-id field. The Host/IMP interface is defined in BBN Report 1822 [2].

The low-order 4 bits of the message-id field are called the sub-link. Unless explicitly specified otherwise for a particular protocol, there is no sender to receiver significance to the sub-link. The sender may use the sub-link in any way he chooses (it is returned in the RFNM by the destination IMP), the receiver should ignore the sub-link.

Link Assignments:

Decimal	Description	References
0	Reserved	[JBP]
1-149	Unassigned	[JBP]
150	Xerox NS IDP	[102,XEROX]
151	Unassigned	[JBP]
152	PARC Universal Protocol	[7,XEROX]
153	TIP Status Reporting	[JGH]
154	TIP Accounting	[JGH]
155	Internet Protocol [regular]	[80,JBP]
156-158	Internet Protocol [experimental]	[80,JBP]
159	Figleaf Link	[JBW1]
160-194	Unassigned	[JBP]
195	ISO-IP	[52,RXM]
196-247	Experimental Protocols	[JBP]
248-255	Network Maintenance	[JGH]

IEEE 802 NUMBERS OF INTEREST

Some of the networks of all classes are IEEE 802 Networks. These systems may use a Link Service Access Point (LSAP) field in much the same way the ARPANET uses the "link" field. Further, there is an extension of the LSAP header called the Sub-Network Access Protocol (SNAP).

The IEEE likes to describe numbers in binary in bit transmission order, which is the opposite of the big-endian order used throughout the Internet protocol documentation.

Assignments:

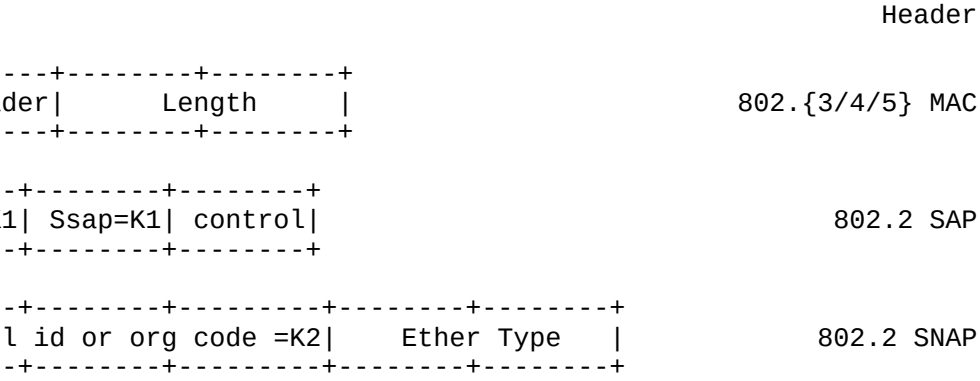
Link Service Access Point			Description	References
IEEE binary	Internet binary	decimal		
00000000	00000000	0	Null LSAP	[IEEE]
01000000	00000010	2	Indiv LLC Sublayer Mgt	[IEEE]
11000000	00000011	3	Group LLC Sublayer Mgt	[IEEE]
00100000	00000100	4	SNA Path Control	[IEEE]
01100000	00000110	6	DOD IP	[79,JBP]
01110000	00001110	14	PROWAY-LAN	[IEEE]
01110010	01001110	78	EIA-RS 511	[IEEE]
01110001	10001110	142	PROWAY-LAN	[IEEE]
01010101	10101010	170	SNAP	[IEEE]
01111111	11111110	254	ISO DIS 8473	[52,JXJ]
11111111	11111111	255	Global DSAP	[IEEE]

These numbers (and others) are assigned by the IEEE Standards Office. The address is: IEEE Standards Office, 345 East 47th Street, New York, N.Y. 10017, Attn: Vince Condello. Phone: (212) 705-7092.

At an ad hoc special session on "IEEE 802 Networks and ARP", held during the TCP Vendors Workshop (August 1986), an approach to a consistent way to send DoD-IP datagrams and other IP related protocols on 802 networks was developed.

Due to some evolution of the IEEE 802.2 standards and the need to provide for a standard way to do additional DoD-IP related protocols (such as the Address Resolution Protocol (ARP) on IEEE 802 network, the following new policy is established, which will replace the old policy (see RFC 960 and RFC 948 [108]).

The new policy is for the Internet community to use the IEEE 802.2 encapsulation on 802.3, 802.4, and 802.5 networks by using the SNAP with an organization code indicating that the following 16 bits specify the EtherType code (where IP = 2048 (0800 hex), see Ethernet Numbers of Interest).



The total length of the SAP Header and the SNAP header is 8-octets, making the 802.2 protocol overhead come out on a nice boundary.

K1 is 170. The IEEE likes to talk about things in little-endian bit transmission order and specifies this value as 01010101. In big-endian order, as used in Internet specifications, this becomes 10101010 binary, or AA hex, or 170 decimal.

K2 is 0 (zero).

The use of the IP LSAP (K1 = 6) is to be phased out as quickly as possible.

ETHERNET NUMBERS OF INTEREST

Many of the networks of all classes are Ethernets (10Mb) or Experimental Ethernets (3Mb). These systems use a message "type" field in much the same way the ARPANET uses the "link" field.

If you need an Ethernet type, contact the XEROX Corporation, 2300 Geng Road, Palo Alto, California 94303, ATTN: Ms. Pam Cance.

Assignments:

Ethernet		Exp. Ethernet		Description	References
decimal	Hex	decimal	octal		
512	0200	512	1000	XEROX PUP	[7,XEROX]
513	0201	-	-	PUP Addr. Trans.	[XEROX]
1536	0600	1536	3000	XEROX NS IDP	[102,XEROX]
2048	0800	513	1001	DOD IP	[80,JBP]
2049	0801	-	-	X.75 Internet	[XEROX]
2050	0802	-	-	NBS Internet	[XEROX]
2051	0803	-	-	ECMA Internet	[XEROX]
2052	0804	-	-	Chaosnet	[XEROX]
2053	0805	-	-	X.25 Level 3	[XEROX]
2054	0806	-	-	ARP	[64,JBP]
2055	0807	-	-	XNS Compatability	[XEROX]
2076	081C	-	-	Symbolics Private	[DCP1]
4096	1000	-	-	Berkeley Trailer	[XEROX]
5632	1600	-	-	Valid	[XEROX]
21000	5208	-	-	BBN Simnet	[XEROX]
24577	6001	-	-	DEC MOP Dump/Load	[XEROX]
24578	6002	-	-	DEC MOP Remote Console	[XEROX]
24579	6003	-	-	DEC DECNET Phase IV	[XEROX]
24580	6004	-	-	DEC LAT	[XEROX]
24581	6005	-	-	DEC	[XEROX]
24582	6006	-	-	DEC	[XEROX]
32771	8003	-	-	Cronus VLN	[100,DT15]
32772	8004	-	-	Cronus Direct	[100,DT15]
32773	8005	-	-	HP Probe	[XEROX]
32774	8006	-	-	Nestar	[XEROX]
32784	8010	-	-	Excelan	[XEROX]
32821	8035	-	-	Reverse ARP	[40,JXM]
32824	8038	-	-	DEC LANBridge	[XEROX]
32859	805B	-	-	Stanford V Kernel experimental	[XEROX]
32860	805C	-	-	Stanford V Kernel production	[XEROX]
32892	807C	-	-	Merit Internodal	[HWB]
32923	809B	-	-	Appletalk	[XEROX]

36864	9000	-	-	Loopback	[XEROX]

The standard for transmission of IP datagrams over Ethernets and Experimental Ethernets is specified in RFC 894 [50] and RFC 895 [66] respectively.

NOTE: Ethernet 48-bit address blocks are now assigned by the IEEE.

IEEE Standards Office, 345 East 47th Street, New York, N.Y. 10017,
Attn: Vince Condello. Phone: (212) 705-7092.

ADDRESS RESOLUTION PROTOCOL PARAMETERS

The Address Resolution Protocol (ARP) specified in RFC 826 [64] has several parameters. The assigned values for these parameters are listed here.

Assignments:

Operation Code (op)

1 REQUEST
2 REPLY

Hardware Type (hrd)

Type	Description	References
1	Ethernet (10Mb)	[JBP]
2	Experimental Ethernet (3Mb)	[JBP]
3	Amateur Radio AX.25	[PXK]
4	Proteon ProNET Token Ring	[JBP]
5	Chaos	[GXP]
6	IEEE 802 Networks	[JBP]
7	ARCNET	[JBP]

Protocol Type (pro)

Use the same codes as listed in the section called "Ethernet Numbers of Interest" (all hardware types use this code set for the protocol type).

PUBLIC DATA NETWORK NUMBERS

One of the Internet Class A Networks is the international system of Public Data Networks. This section lists the mapping between the Internet Addresses and the Public Data Network Addresses (X.121).

The numbers below are assigned for networks that are connected to the Internet, and for independent networks. These independent networks are marked with an asterisk preceding the number.

Assignments:

*	Internet	Public Data Net	Description	References
	014.000.000.000		Reserved	[JBP]
	014.000.000.001	3110-317-00035 00	PURDUE-TN	[CAK]
	014.000.000.002	3110-608-00027 00	UWISC-TN	[CAK]
	014.000.000.003	3110-302-00024 00	UDEL-TN	[CAK]
	014.000.000.004	2342-192-00149 23	UCL-VTEST	[PK]
	014.000.000.005	2342-192-00300 23	UCL-TG	[PK]
	014.000.000.006	2342-192-00300 25	UK-SATNET	[PK]
	014.000.000.007	3110-608-00024 00	UWISC-IBM	[MAS3]
	014.000.000.008	3110-213-00045 00	RAND-TN	[MO2]
	014.000.000.009	2342-192-00300 23	UCL-CS	[PK]
	014.000.000.010	3110-617-00025 00	BBN-VAN-GW	[JD21]
*	014.000.000.011	2405-015-50300 00	CHALMERS	[UXB]
	014.000.000.012	3110-713-00165 00	RICE	[PAM6]
	014.000.000.013	3110-415-00261 00	DECWRL	[PAM6]
	014.000.000.014	3110-408-00051 00	IBM-SJ	[SA1]
	014.000.000.015	2041-117-01000 00	SHAPE	[JFW]
	014.000.000.016	2628-153-90075 00	DFVLR4-X25	[GB7]
	014.000.000.017	3110-213-00032 00	ISI-VAN-GW	[JD21]
	014.000.000.018	2624-522-80900 52	DFVLR5-X25	[GB7]
	014.000.000.019	2041-170-10000 00	SHAPE-X25	[JFW]
	014.000.000.020	5052-737-20000 50	UQNET	[AXH]
	014.000.000.021	3020-801-00057 50	DMC-CRC1	[JR17]
	014.000.000.022	2624-522-80902 77	DFVLRVAX-X25	[GB7]
*	014.000.000.023	2624-589-00908 01	ECRC-X25	[PXD]
	014.000.000.024	2342-905-24242 83	UK-MOD-RSRE	[JXE2]
	014.000.000.025	2342-905-24242 82	UK-VAN-RSRE	[AXM]
	014.000.000.026-014.255.255.254		Unassigned	[JBP]
	014.255.255.255		Reserved	[JBP]

The standard for transmission of IP datagrams over the Public Data Network is specified in RFC 877 [55].

TELNET OPTIONS

The Telnet Protocol has a number of options that may be negotiated. These options are listed here. "Official Internet Protocols" [91] provides more detailed information.

Options	Name	References
0	Binary Transmission	[85,JBP]
1	Echo	[86,JBP]
2	Reconnection	[33,JBP]
3	Suppress Go Ahead	[89,JBP]
4	Approx Message Size Negotiation	[102,JBP]
5	Status	[88,JBP]
6	Timing Mark	[90,JBP]
7	Remote Controlled Trans and Echo	[82,JBP]
8	Output Line Width	[31,JBP]
9	Output Page Size	[32,JBP]
10	Output Carriage-Return Disposition	[21,JBP]
11	Output Horizontal Tab Stops	[25,JBP]
12	Output Horizontal Tab Disposition	[24,JBP]
13	Output Formfeed Disposition	[22,JBP]
14	Output Vertical Tabstops	[27,JBP]
15	Output Vertical Tab Disposition	[26,JBP]
16	Output Linefeed Disposition	[23,JBP]
17	Extended ASCII	[104,JBP]
18	Logout	[18,MRC]
19	Byte Macro	[28,JBP]
20	Data Entry Terminal	[30,JBP]
22	SUPDUP	[19,20,MRC]
22	SUPDUP Output	[43,MRC]
23	Send Location	[54,EAK1]
24	Terminal Type	[97,MAS3]
25	End of Record	[78,JBP]
26	TACACS User Identification	[1,BA4]
27	Output Marking	[94,SXS]
28	Terminal Location Number	[62,RN6]
255	Extended-Options-List	[84,JBP]

MACHINE NAMES

These are the Official Machine Names as they appear in the NIC Host Table. Their use is described in RFC 810 [39].

A machine name or CPU type may be up to 40 characters taken from the set of uppercase letters, digits, and the two punctuation characters hyphen and slash. It must start with a letter, and end with a letter or digit.

ALTO
AMDAHL-V7
APOLLO
ATT-3B20
BBN-C/60
BURROUGHS-B/29
BURROUGHS-B/4800
BUTTERFLY
C/30
C/70
CADLINC
CADR
CDC-170
CDC-170/750
CDC-173
CELERITY-1200
COMTEN-3690
CP8040
CRAY-1
CRAY-X/MP
CRAY-2
CTIWS-117
DANDELION
DEC-10
DEC-1050
DEC-1077
DEC-1080
DEC-1090
DEC-1090B
DEC-1090T
DEC-2020T
DEC-2040
DEC-2040T
DEC-2050T
DEC-2060
DEC-2060T
DEC-2065
DEC-FALCON

DEC-KS10
DORADO
DPS8/70M
ELXSI-6400
FOONLY-F2
FOONLY-F3
FOONLY-F4
GOULD
GOULD-6050
GOULD-6080
GOULD-9050
GOULD-9080
H-316
H-60/68
H-68
H-68/80
H-89
HONEYWELL-DPS-6
HONEYWELL-DPS-8/70
HP3000
HP3000/64
IBM-158
IBM-360/67
IBM-370/3033
IBM-3081
IBM-3084QX
IBM-3101
IBM-4331
IBM-4341
IBM-4361
IBM-4381
IBM-4956
IBM-PC
IBM-PC/AT
IBM-PC/XT
IBM-SERIES/1
IMAGEN
IMAGEN-8/300
IMSAI
INTEGRATED-SOLUTIONS
INTEGRATED-SOLUTIONS-68K
INTEGRATED-SOLUTIONS-CREATOR
INTEGRATED-SOLUTIONS-CREATOR-8
INTEL-IPSC
IS-1
IS-68010
LMI
LSI-11

LSI-11/2
LSI-11/23
LSI-11/73
M68000
MASSCOMP
MC500
MC68000
MICROVAX
MICROVAX-I
MV/8000
NAS3-5
NCR-COMTEN-3690
NOW
ONYX-Z8000
PDP-11
PDP-11/3
PDP-11/23
PDP-11/24
PDP-11/34
PDP-11/40
PDP-11/44
PDP-11/45
PDP-11/50
PDP-11/70
PDP-11/73
PE-7/32
PE-3205
PERQ
PLEXUS-P/60
PLI
PLURIBUS
PRIME-2350
PRIME-2450
PRIME-2755
PRIME-9655
PRIME-9755
PRIME-9955II
PRIME-2250
PRIME-2655
PRIME-9955
PRIME-9950
PRIME-9650
PRIME-9750
PRIME-2250
PRIME-750
PRIME-850
PRIME-550II
PYRAMID-90

PYRAMID-90MX
PYRAMID-90X
RIDGE
RIDGE-32
RIDGE-32C
ROLM-1666
S1-MKIIA
SMI
SEQUENT-BALANCE-8000
SIEMENS
SILICON-GRAPHICS
SILICON-GRAPHICS-IRIS
SPERRY-DCP/10
SUN
SUN-2
SUN-2/50
SUN-2/100
SUN-2/120
SUN-2/140
SUN-2/150
SUN-2/160
SUN-2/170
SUN-3/160
SUN-3/50
SUN-3/75
SUN-3/110
SUN-50
SUN-100
SUN-120
SUN-130
SUN-150
SUN-170
SUN-68000
SYMBOLICS-3600
SYMBOLICS-3670
TANDEM-TXP
TEK-6130
TI-EXPLORER
TP-4000
TRS-80
UNIVAC-1100
UNIVAC-1100/60
UNIVAC-1100/62
UNIVAC-1100/63
UNIVAC-1100/64
UNIVAC-1100/70
UNIVAC-1160
VAX-11/725

Machine Names

VAX-11/730
VAX-11/750
VAX-11/780
VAX-11/785
VAX-11/790
VAX-11/8600
VAX-8600
WANG-PC002
WANG-VS100
WANG-VS400
XEROX-1108
XEROX-8010

SYSTEM NAMES

These are the Official System Names as they appear in the NIC Host Table. Their use is described in RFC 810 [39].

A system name may be up to 40 characters taken from the set of uppercase letters, digits, and the two punctuation characters hyphen and slash. It must start with a letter, and end with a letter or digit.

AEGIS
APOLLO
BS-2000
CEDAR
CGW
CHRYSALIS
CMOS
CMS
COS
CPIX
CTOS
CTSS
DCN
DDNOS
DOMAIN
EDX
ELF
EMBOS
EMMOS
EPOS
FOONEX
FUZZ
GCOS
GPOS
HDOS
IMAGEN
INTERCOM
IMPRESS
INTERLISP
IOS
ITS
LISP
LISPM
LOCUS
MINOS
MOS
MPE5
MSDOS

MULTICS
MVS
MVS/SP
NEXUS
NMS
NONSTOP
NOS-2
OS/DDP
OS4
OS86
OSX
PCDOS
PERQ/OS
PLI
PSDOS/MIT
PRIMOS
RMX/RDOS
ROS
RSX11M
SATOPS
SCS
SIMP
SWIFT
TAC
TANDEM
TENEX
TOPS10
TOPS20
TP3010
TRSDOS
ULTRIX
UNIX
UT2D
V
VM
VM/370
VM/CMS
VM/SP
VMS
VMS/EUNICE
VRTX
WAITS
WANG
XDE
XENIX

PROTOCOL AND SERVICE NAMES

These are the Official Protocol Names. Their use is described in greater detail in RFC 810 [39].

A protocol or service may be up to 40 characters taken from the set of uppercase letters, digits, and the punctuation character hyphen. It must start with a letter, and end with a letter or digit.

```
ARGUS               - ARGUS Protocol
AUTH                - Authentication Service
BBN-RCC-MON         - BBN RCC Monitoring
BL-IDM              - Britton Lee Intelligent Database Machine
BOOTPC              - Bootstrap Protocol Client
BOOTPS              - Bootstrap Protocol Server
BR-SAT-MON          - Backroom SATNET Monitoring
CFTP                - CFTP
CHAOS               - CHAOS Protocol
CHARGEN             - Character Generator Protocol
CISCO-FNA           - CISCO FNATIVE
CISCO-TNA           - CISCO TNATIVE
CISCO-SYS           - CISCO SYSMAINT
CLOCK               - DCNET Time Server Protocol
COOKIE-JAR          - Cookie Jar Authentication Procedure
CSNET-NS            - CSNET Mailbox Nameserver Protocol
DAYTIME             - Daytime Protocol
DCN-MEAS            - DCN Measurement Subsystems Protocol
DCP                 - Device Control Protocol
DISCARD             - Discard Protocol
DOMAIN              - Domain Name Server
ECHO                - Echo Protocol
EGP                 - Exterior Gateway Protocol
EMCON               - Emission Control Protocol
EMFIS-CNTL          - EMFIS Control Service
EMFIS-DATA          - EMFIS Data Service
FINGER              - Finger Protocol
FTP                 - File Transfer Protocol
FTP-DATA            - File Transfer Protocol Data
GGP                 - Gateway Gateway Protocol
GRAPHICS            - Graphics Protocol
HMP                 - Host Monitoring Protocol
HOST2-NS            - Host2 Name Server
HOSTNAME            - Hostname Protocol
ICMP                - Internet Control Message Protocol
IGMP                - Internet Group Management Protocol
IGP                 - Interior Gateway Protocol
INGRES-NET          - INGRES-NET Service
IP                  - Internet Protocol
```

IPCU	- Internet Packet Core Utility
IPPC	- Internet Pluribus Packet Core
IRTP	- Internet Reliable Transaction Protocol
ISI-GL	- ISI Graphics Language Protocol
ISO-TP4	- ISO Transport Protocol Class 4
ISO-TSAP	- ISO TSAP
LA-MAINT	- IMP Logical Address Maintenance
LEAF-1	- Leaf-1 Protocol
LEAF-2	- Leaf-2 Protocol
LINK	- Link Protocol
LOC-SRV	- Location Service
LOGIN	- Login Host Protocol
MERIT-INP	- MERIT Internodal Protocol
METAGRAM	- Metagram Relay
MIT-ML-DEV	- MIT ML Device
MFE-NSP	- MFE Network Services Protocol
MIT-SUBNET	- MIT Subnet Support
MIT-DOV	- MIT Dover Spooler
MPM	- Internet Message Protocol (Multimedia Mail)
MPM-FLAGS	- MPM Flags Protocol
MPM-SND	- MPM Send Protocol
MSG-AUTH	- MSG Authentication Protocol
MSG-ICP	- MSG ICP Protocol
MUX	- Multiplexing Protocol
NAMESERVER	- Host Name Server
NETBIOS-DGM	- NETBIOS Datagram Service
NETBIOS-NS	- NETBIOS Name Service
NETBIOS-SSN	- NETBIOS Session Service
NETBLT	- Bulk Data Transfer Protocol
NETED	- Network Standard Text Editor
NETRJS	- Remote Job Service
NI-FTP	- NI File Transfer Protocol
NI-MAIL	- NI Mail Protocol
NICNAME	- Who Is Protocol
NSW-FE	- NSW User System Front End
NTP	- Network Time Protocol
NVP-II	- Network Voice Protocol
POP2	- Post Office Protocol - Version 2
PRM	- Packet Radio Measurement
PUP	- PUP Protocol
PWDGEN	- Password Generator Protocol
QUOTE	- Quote of the Day Protocol
RDP	- Reliable Data Protocol
RJE	- Remote Job Entry
RLP	- Resource Location Protocol
RTELNET	- Remote Telnet Service
RVD	- Remote Virtual Disk Protocol
SAT-EXPAK	- Satnet and Backroom EXPAK

SAT-MON	- SATNET Monitoring
SEP	- Sequential Exchange Protocol
SFTP	- Simple File Transfer Protocol
SMTP	- Simple Mail Transfer Protocol
ST	- Stream Protocol
STATSRV	- Statistics Service
SU-MIT-TG	- SU/MIT Telnet Gateway Protocol
SUNRPC	- SUN Remote Procedure Call
SUPDUP	- SUPDUP Protocol
SUR-MEAS	- Survey Measurement
SWIFT-RVF	- Remote Virtual File Protocol
TACACS-DS	- TACACS-Database Service
TACNEWS	- TAC News
TCP	- Transmission Control Protocol
TELNET	- Telnet Protocol
TFTP	- Trivial File Transfer Protocol
TIME	- Time Server Protocol
TRUNK-1	- Trunk-1 Protocol
TRUNK-2	- Trunk-2 Protocol
UCL	- University College London Protocol
UDP	- User Datagram Protocol
NNTP	- Network News Transfer Protocol
USERS	- Active Users Protocol
UUCP-PATH	- UUCP Path Service
VIA-FTP	- VIA Systems-File Transfer Protocol
WB-EXPAK	- Wideband EXPAK
WB-MON	- Wideband Monitoring
XNET	- Cross Net Debugger
XNS-IDP	- Xerox NS IDP

TERMINAL TYPE NAMES

These are the Official Terminal Type Names. Their use is described in RFC 930 [97]. The maximum length of a name is 40 characters.

A terminal names may be up to 40 characters taken from the set of uppercase letters, digits, and the two punctuation characters hyphen and slash. It must start with a letter, and end with a letter or digit.

ADDS-CONSUL-980
ADDS-REGENT-100
ADDS-REGENT-20
ADDS-REGENT-200
ADDS-REGENT-25
ADDS-REGENT-40
ADDS-REGENT-60
AMPEX-DIALOGUE-80
ANDERSON-JACOBSON-630
ANDERSON-JACOBSON-832
ANDERSON-JACOBSON-841
ANN-ARBOR-AMBASSADOR
ARDS
BITGRAPH
BUSSIPLEXER
CALCOMP-565
CDC-456
CDI-1030
CDI-1203
CLNZ
COMPUCOLOR-II
CONCEPT-100
CONCEPT-104
CONCEPT-108
DATA-100
DATA-GENERAL-6053
DATAGRAPHIX-132A
DATAMEDIA-1520
DATAMEDIA-1521
DATAMEDIA-2500
DATAMEDIA-3025
DATAMEDIA-3025A
DATAMEDIA-3045
DATAMEDIA-3045A
DATAMEDIA-DT80/1
DATAPOINT-2200
DATAPOINT-3000
DATAPOINT-3300

DATAPOINT-3360
DEC-DECWRITER-I
DEC-DECWRITER-II
DEC-GT40
DEC-GT40A
DEC-GT42
DEC-LA120
DEC-LA30
DEC-LA36
DEC-LA38
DEC-VT05
DEC-VT100
DEC-VT132
DEC-VT50
DEC-VT50H
DEC-VT52
DELTA-DATA-5000
DELTA-TELTERM-2
DIABLO-1620
DIABLO-1640
DIGILOG-333
DTC-300S
EDT-1200
EXECUPORT-4000
EXECUPORT-4080
GENERAL-TERMINAL-100A
GSI
HAZELTINE-1500
HAZELTINE-1510
HAZELTINE-1520
HAZELTINE-2000
HP-2621
HP-2621A
HP-2621P
HP-2626
HP-2626A
HP-2626P
HP-2640
HP-2640A
HP-2640B
HP-2645
HP-2645A
HP-2648
HP-2648A
HP-2649
HP-2649A
IBM-3101
IBM-3101-10

IBM-3275-2
IBM-3276-2
IBM-3276-3
IBM-3276-4
IBM-3277-2
IBM-3278-2
IBM-3278-3
IBM-3278-4
IBM-3278-5
IBM-3279-2
IBM-3279-3
IMLAC
INFOTON-100
INFOTONKAS
ISC-8001
LSI-ADM-3
LSI-ADM-31
LSI-ADM-3A
LSI-ADM-42
MEMOREX-1240
MICROBEE
MICROTERM-ACT-IV
MICROTERM-ACT-V
MICROTERM-MIME-1
MICROTERM-MIME-2
NETRONICS
NETWORK-VIRTUAL-TERMINAL
OMRON-8025AG
PERKIN-ELMER-1100
PERKIN-ELMER-1200
PERQ
PLASMA-PANEL
QUME-SPRINT-5
SOROC
SOROC-120
SOUTHWEST-TECHNICAL-PRODUCTS-CT82
SUPERBEE
SUPERBEE-III-M
TEC
TEKTRONIX-4010
TEKTRONIX-4012
TEKTRONIX-4013
TEKTRONIX-4014
TEKTRONIX-4023
TEKTRONIX-4024
TEKTRONIX-4025
TEKTRONIX-4027
TELERAY-1061

TELERAY-3700
TELERAY-3800
TELETEC-DATASCREEN
TELETERM-1030
TELETYPE-33
TELETYPE-35
TELETYPE-37
TELETYPE-38
TELETYPE-43
TELEVIDEO-912
TELEVIDEO-920
TELEVIDEO-920B
TELEVIDEO-920C
TELEVIDEO-950
TERMINET-1200
TERMINET-300
TI-700
TI-733
TI-735
TI-743
TI-745
TYCOM
UNIVAC-DCT-500
VIDEO-SYSTEMS-1200
VIDEO-SYSTEMS-5000
VISUAL-200
XEROX-1720
ZENITH-H19
ZENTEC-30

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