Network Working Group
Request for Comments: 900

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

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ISI

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ASSIGNED NUMBERS

Status of this Memo

This memo is an official status report on the numbers used in protocols in the ARPA-Internet community.

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. The assignment of numbers is also handled by Joyce. If you are developing a protocol or application that will require the use of a link, socket, port, protocol, network number, etc., please contact Joyce to receive a number assignment.

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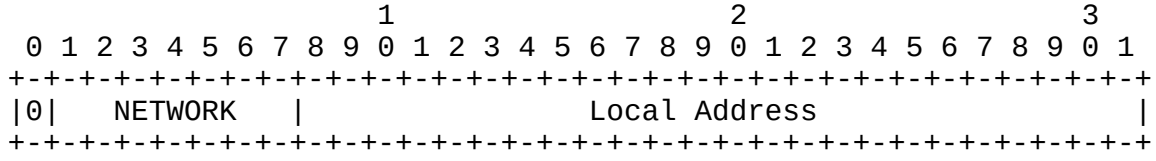
Most of the protocols mentioned here are documented in the RFC series of notes. The more prominent and more generally used are documented in the "Internet Protocol Transition Workbook" [31] or in the old "ARPANET Protocol Handbook" [32] prepared by the NIC. Some of the items listed are undocumented. Further information on protocols can be found in the memo "Official Protocols" [83].

In all cases the name and mailbox of the responsible individual is indicated. In the lists that follow, a bracketed entry, e.g., [31,iii], at the right hand margin of the page indicates a reference for the listed protocol, where the number cites the document and the "iii" cites the person. Whenever possible, this "iii" is a NIC Ident.

ASSIGNED NETWORK NUMBERS

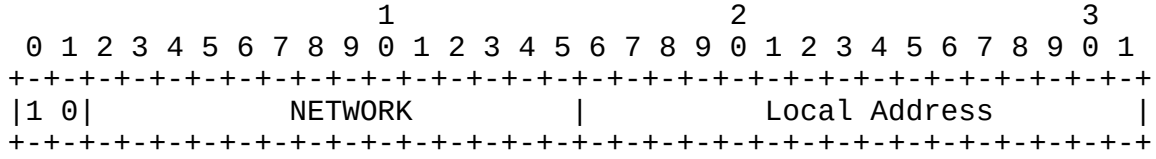
The network numbers listed here are used as internet addresses by the Internet Protocol (IP) [31,71]. The IP uses a 32-bit address field and divides that address into a network part and a "rest" or local address part. The division takes 3 forms or classes.

The first type of address, or class A, has a 7-bit network number and a 24-bit local address. The highest-order bit is set to 0. This allows 128 class A networks.



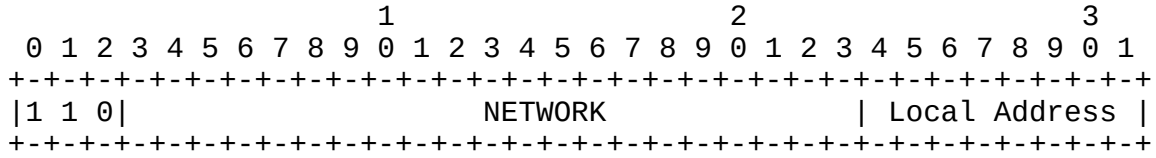
Class A Address

The second type of address, class B, has a 14-bit network number and a 16-bit local address. The two highest-order bits are set to 1-0. This allows 16,384 class B networks.



Class B Address

The third type of address, class C, has a 21-bit network number and a 8-bit local address. The three highest-order bits are set to 1-1-0. This allows 2,097,152 class C networks.



Class C Address

Note: No addresses are allowed with the three highest-order bits set to 1-1-1. These addresses (sometimes called "class D") are reserved.

One commonly used notation for internet host addresses divides the 32-bit address into four 8-bit fields and specifies the value of each field as a decimal number with the fields separated by periods. This is called the "dotted decimal" notation. For example, the internet address of USC-ISIF.ARPA in dotted decimal is 010.002.000.052, or 10.2.0.52.

The dotted decimal notation will be used in the listing of assigned network numbers. The class A networks will have nnn.rrr.rrr.rrr, the class B networks will have nnn.nnn.rrr.rrr, and the class C networks will have nnn.nnn.nnn.rrr, where nnn represents part or all of a network number and rrr represents part or all of a local address.

There are four catagories of users of Internet Addresses: Research, Defense, Government (Non-Defense), and Commercial. To reflect the allocation of network identifiers among the categories, a one-character code is placed to the left of the network number: R for Research, D for Defense, G for Government, and C for Commercial (see Appendix A for further details on this division of the network identification).

Network numbers are assigned for networks that are connected to the ARPA-Internet and DDN-Internet, and for independent networks that use the IP family protocols (these are usually commercial). These independent networks are marked with an asterisk preceeding the number.

The administrators of independent networks must apply separately for permission to interconnect their network with either the ARPA-Internet of the DDN-Internet. Independent networks need not be listed in the working tables of either the ARPA-Internet or DDN-Internet hosts or gateways.

For various reasons, the assigned numbers of networks are sometimes changed. To ease the transition the old number will be listed for a transition period as well. These "old number" entries will be marked with a "T" following the number and preceeding the name, and the network name will be suffixed "-TEMP".

Assigned Network Numbers

Class A Networks

*	Internet Address	Name	Network	References
	000.rrr.rrr.rrr		Reserved	[JBP]
R	004.rrr.rrr.rrr	SATNET	Atlantic Satellite Network	[DM11]
D	006.rrr.rrr.rrr T	YPG-NET-TEMP	Yuma Proving Grounds	[7,BXA]
D	007.rrr.rrr.rrr T	EDN-TEMP	DCEC EDN	[EC5]
R	008.rrr.rrr.rrr T	BBN-NET-TEMP	BBN Network	[JSG5]
R	010.rrr.rrr.rrr	ARPANET	ARPANET	[7,32,REK2]
D	011.rrr.rrr.rrr	DODIIS	DoD INTEL INFO SYS	[AY7]
C	012.rrr.rrr.rrr	ATT	ATT, Bell Labs	[MH13]
C	014.rrr.rrr.rrr	PDN	Public Data Network	[REK4]
R	018.rrr.rrr.rrr T	MIT-TEMP	MIT Network	[15,82,DDC2]
D	023.rrr.rrr.rrr	DDN-TC-NET	DDN-TestCell-Network	[DXH]
D	024.rrr.rrr.rrr	MINET	MINET	[7,DHH]
R	025.rrr.rrr.rrr	RSRE-EXP	RSRE Experimental	[NM]
D	026.rrr.rrr.rrr	MILNET	MILNET	[FLM2]
R	027.rrr.rrr.rrr T	NOSC-LCCN-TEMP	NOSC / LCCN	[RH6]
R	028.rrr.rrr.rrr	WIDEBAND	Wide Band Satellite Net	[CJW2]
R	032.rrr.rrr.rrr	UCL-TAC	UCL TAC	[PK]
R	036.rrr.rrr.rrr T	SU-NET-TEMP	Stanford University Network	[JCM]
R	039.rrr.rrr.rrr T	SRINET-TEMP	SRI Local Network	[GEOF]
R	041.rrr.rrr.rrr	BBN-TEST-A	BBN-GATE-TEST-A	[RH6]
R	044.rrr.rrr.rrr	AMPRNET	Amateur Radio Experiment Net	[HM]
	001.rrr.rrr.rrr-003.rrr.rrr.rrr		Unassigned	[JBP]
	005.rrr.rrr.rrr		Unassigned	[JBP]
	009.rrr.rrr.rrr		Unassigned	[JBP]
	013.rrr.rrr.rrr		Unassigned	[JBP]
	015.rrr.rrr.rrr-017.rrr.rrr.rrr		Unassigned	[JBP]
	019.rrr.rrr.rrr-022.rrr.rrr.rrr		Unassigned	[JBP]
	029.rrr.rrr.rrr-031.rrr.rrr.rrr		Unassigned	[JBP]
	033.rrr.rrr.rrr-035.rrr.rrr.rrr		Unassigned	[JBP]
	037.rrr.rrr.rrr-038.rrr.rrr.rrr		Unassigned	[JBP]
	040.rrr.rrr.rrr		Unassigned	[JBP]
	042.rrr.rrr.rrr-043.rrr.rrr.rrr		Unassigned	[JBP]
	045.rrr.rrr.rrr-126.rrr.rrr.rrr		Unassigned	[JBP]
	127.rrr.rrr.rrr		Reserved	[JBP]

Class B Networks

*	Internet Address	Name	Network	References
	128.000.rrr.rrr		Reserved	[JBP]
R	128.001.rrr.rrr	BBN-TEST-B	BBN-GATE-TEST-B	[RH6]
R	128.002.rrr.rrr	CMU-NET	CMU-Ethernet	[HDW2]
R	128.003.rrr.rrr	LBL-CSAM	LBL-CSAM-RESEARCH	[JS38]
R	128.004.rrr.rrr	DCNET	LINKABIT DCNET	[52,DLM1]
R	128.005.rrr.rrr	FORDNET	FORD DCNET	[52,DLM1]
R	128.006.rrr.rrr	RUTGERS	RUTGERS	[CLH3]
R	128.007.rrr.rrr	DFVLR	DFVLR DCNET Network	[HDC1]
R	128.008.rrr.rrr	UMDNET	Univ of Maryland DCNET	[52,DLM1]
R	128.009.rrr.rrr	ISI-NET	USC-ISI Local Network	[CMR]
R	128.010.rrr.rrr	PURDUE-CS	Purdue Computer Science	[CAK]
R	128.011.rrr.rrr	BBN-CRONUS	BBN DOS Project	[48,WIM]
R	128.012.rrr.rrr	SU-NET	Stanford University Net	[JCM]
D	128.013.rrr.rrr	MATNET	Mobile Access Terminal Net	[DM11]
R	128.014.rrr.rrr	BBN-SAT-TEST	BBN SATNET Test Net	[DM11]
R	128.015.rrr.rrr	S1NET	LLL-S1-NET	[EAK1]
R	128.016.rrr.rrr	UCLNET	University College London	[PK]
D	128.017.rrr.rrr	MATNET-ALT	Mobile Access Terminal Alt	[DM11]
R	128.018.rrr.rrr	SRINET	SRI Local Network	[GEOF]
D	128.019.rrr.rrr	EDN	DCEC EDN	[EC5]
D	128.020.rrr.rrr	BRLNET	BRLNET	[7,MJM2]
R	128.021.rrr.rrr	SF-PR-1	SF-1 Packet Radio Network	[JEM]
R	128.022.rrr.rrr	SF-PR-2	SF-2 Packet Radio Network	[JEM]
R	128.023.rrr.rrr	BBN-PR	BBN Packet Radio Network	[JAW3]
R	128.024.rrr.rrr	ROCKWELL-PR	Rockwell Packet Radio Net	[EHP]
D	128.025.rrr.rrr	BRAGG-PR	Ft. Bragg Packet Radio Net	[JEM]
D	128.026.rrr.rrr	SAC-PR	SAC Packet Radio Network	[BG5]
D	128.027.rrr.rrr	DEMO-PR-1	Demo-1 Packet Radio Network	[LCS]
D	128.028.rrr.rrr	C3-PR	Testbed Development PR NET	[BG5]
R	128.029.rrr.rrr	MITRE	MITRE Cablenet	[86,APS]
R	128.030.rrr.rrr	MIT-NET	MIT Local Network	[DDC2]
R	128.031.rrr.rrr	MIT-RES	MIT Research Network	[DDC2]
R	128.032.rrr.rrr	UCB-ETHER	UC Berkeley Ethernet	[DAM1]
R	128.033.rrr.rrr	BBN-NET	BBN Network	[JSG5]
R	128.034.rrr.rrr	NOSC-LCCN	NOSC / LCCN	[RH6]
R	128.035.rrr.rrr	CISLTESTNET1	Honeywell	[43,44,RK1]
R	128.036.rrr.rrr	YALE-NET	YALE NET	[96,JO5]
D	128.037.rrr.rrr	YPG-NET	Yuma Proving Grounds	[7,BXA]
D	128.038.rrr.rrr	NSWC-NET	NSWC Local Host Net	[RLH2]
R	128.039.rrr.rrr	NTANET	NDRE-TIU	[PS3]
R	128.040.rrr.rrr	UCL-NET-A	UCL	[RC7]
R	128.041.rrr.rrr	UCL-NET-B	UCL	[RC7]
R	128.042.rrr.rrr	RICE-NET	Rice University Net	[52,96,PGM]
R	128.043.rrr.rrr	CRANET	CANADA REF ARPANET	[7,JR17]

D	128.044.rrr.rrr	WSMR-NET	White Sands Network	[TBS]
D	128.045.rrr.rrr	DODIIS-S1	DoD INTEL INFO SYS	[AY5]
D	128.046.rrr.rrr	DODIIS-S2	DoD INTEL INFO SYS	[AY5]
D	128.047.rrr.rrr	TACTNET	Tactical Packet Net	[6,KTP]
C*	128.048.rrr.rrr	UCDLA-NET	UCDLA MELVYL Network	[7,CXL]
R	128.049.rrr.rrr	NOSC-ETHER	NOSC Ethernet	[96,RLB3]
G	128.050.rrr.rrr	COINS Network	COINS On-Line Intel Net	[RXS]
G	128.051.rrr.rrr	COINSTNET	COINS TEST NETWORK	[RXS]
R	128.052.rrr.rrr	MIT-AI-NET	MIT AI NET	[96,MDC]
R	128.053.rrr.rrr	SAC-PR-2	SAC PRNET Number 2	[BG5]
	128.054.rrr.rrr-191.254.rrr.rrr		Unassigned	[JBP]
	191.255.rrr.rrr		Reserved	[JBP]

Class C Networks

*	Internet Address	Name	Network	References
	192.000.000.rrr		Reserved	[JBP]
R	192.000.001.rrr	BBN-TEST-C	BBN-GATE-TEST-C	[RH6]
	192.000.002.rrr-192.000.255.rrr		Unassigned	[JBP]
R	192.001.000.rrr-192.003.255.rrr		BBN local networks	[SGC]
	192.004.000.rrr-192.004.255.rrr		Unassigned	[JBP]
R	192.005.001.rrr	CISLHYPERNET	Honeywell	[RK1]
R	192.005.002.rrr	WISC	Univ of Wisconsin Madison	[RS23]
C	192.005.003.rrr	HP-DESIGN-AIDS	HP Design Aids	[NXK]
C	192.005.004.rrr	HP-TCG-UNIX	Hewlett Packard TCG Unix	[NXK]
R	192.005.005.rrr	DEC-MRNET	DEC Marlboro Ethernet	[92,KWP]
R	192.005.006.rrr	DEC-MRRAD	DEC Marlboro Developmt	[92,KWP]
R	192.005.007.rrr	CIT-CS-NET	Caltech-CS-Net	[95,DSW]
R	192.005.008.rrr	WASHINGTON	University of Washington	[JAR4]
R	192.005.009.rrr	AERONET	Aerospace Labnet	[2,LCN]
R	192.005.010.rrr	ECLNET	USC-ECL-CAMPUS-NET	[MXB]
R	192.005.011.rrr	CSS-RING	SEISMIC-RESEARCH-NET	[RR2]
R	192.005.012.rrr	UTAH-NET	UTAH-COMPUTER-SCIENCE-NET	[RF1]
R	192.005.013.rrr	CCNET	Compion Network	[96,FAS]
R	192.005.014.rrr	RAND-NET	RAND Network	[96,JDG]
R	192.005.015.rrr	NYU-NET	NYU Network	[EF5]
R	192.005.016.rrr	LANL-LAND	Los Alamos Dev LAN	[96,JC11]
R	192.005.017.rrr	NRL-NET	Naval Research Lab	[AP]
R	192.005.018.rrr	IPTO-NET	ARPA-IPTO Office Net	[REK2]
R	192.005.019.rrr	UCIICS	UCI-ICS Res Net	[MXR]
R	192.005.020.rrr	CISLTTYNET	Honeywell	[RK1]
D	192.005.021.rrr	BRLNET1	BRLNET1	[7,MJM2]
D	192.005.022.rrr	BRLNET2	BRLNET2	[7,MJM2]
D	192.005.023.rrr	BRLNET3	BRLNET3	[7,MJM2]
D	192.005.024.rrr	BRLNET4	BRLNET4	[7,MJM2]
D	192.005.025.rrr	BRLNET5	BRLNET5	[7,MJM2]
D	192.005.026.rrr	NSRDCOA-NET	NSRDC Office Auto Net	[TC4]

D	192.005.027.rrr	DTNSRDC-NET	DTNSRDC-NET [TC4]
R	192.005.028.rrr	RSRE-NULL	RSRE-NULL [NM]
R	192.005.029.rrr	RSRE-ACC	RSRE-ACC [NM]
R	192.005.030.rrr	RSRE-PR	RSRE-PR [NM]
R*	192.005.031.rrr	SIEMENS-NET	Siemens Research Network [PXN]
R	192.005.032.rrr	CISLTESTNET2	Honeywell [43,44,RK1]
R	192.005.033.rrr	CISLTESTNET3	Honeywell [27,28,RK1]
R	192.005.034.rrr	CISLTESTNET4	Honeywell [27,28,RK1]
R	192.005.035.rrr	RIACS	USRA [96,RLB1]
R	192.005.036.rrr	CORNELL-CS	CORNELL CS Research [96,DK2]
R	192.005.037.rrr	UR-CS-NET	U of R CS 3Mb Net [51,LB1]
R	192.005.038.rrr	SRI-C3ETHER	SRI-AITAD C3ETHERNET [96,BG5]
R	192.005.039.rrr	UDEL-EECIS	Udel EECIS LAN [93,CC2]
R	192.005.040.rrr	PUCC-NET-A	PURDUE Comp Cntr Net [JXS]
D	192.005.041.rrr	WISLAN	WIS Research LAN [86,JRM1]
D	192.005.042.rrr	AFDSC-HYPER	AFDSC Hypernet [MCSJ]
R	192.005.043.rrr	CUCSNET	Columbia CS Net [96,LH2]
R	192.005.044.rrr	Farber-PC-Net	Farber PC Network [DJF]
R	192.005.045.rrr	AIDS-NET	AI&DS Network [96,HA]
R	192.005.046.rrr	NTA-RING	NDRE-RING [PS3]
R	192.005.047.rrr	NSRDC	NSRDC [PXM]
R	192.005.048.rrr	PURDUE-CS-IL	Purdue CS IL Ethernet [96,CAK]
R	192.005.049.rrr	UCSF	Univ of Calif, San Fran [93,TXF]
R	192.005.050.rrr	CTH-CS-NET	Chalmers CSN Local Net [93,UXB]
R	192.005.051.rrr	Theorynet	Cornell Theory Center [96,AB13]
R	192.005.052.rrr	NLM-ETHER	NLM-LHNCBC-ETHERNET [71,JA1]
R	192.005.053.rrr	UR-CS-ETHER	U of R CS 10Mb Net [51,LB1]
R	192.005.054.rrr	AERO-A6	Aerospace [2,LCN]
R	192.005.055.rrr	UCLA-CECS	UCLA-CECS Network [96,RBW]
C	192.005.056.rrr	TARTAN-NET	Tartan Labs [SXB]
R	192.005.057.rrr	UDEL-CC	UDEL Comp Center [93,RXR]
R	192.005.058.rrr	CSNET-PDN	CSNET X.25 Network [47,RDR4]
R*	192.005.059.rrr	Inria SM90	Inria GIP SM-90 [MXS]
R*	192.005.060.rrr	SM90 X1	Inria SM-90 exp. 1 [MXS]
R*	192.005.061.rrr	SM90 X2	Inria SM-90 exp. 2 [MXS]
R*	192.005.062.rrr	LITP SM90	LITP SM-90 [MXS]
R	192.005.064.rrr	AMES-NAS-NET	NASA ARC NAS LAN [92, MXF]
R	192.005.065.rrr	NPRDC-Ether	NPRDC TRCF Ethernet [LRB]
R	192.005.066.rrr	HARV-NET	Harvard Comp Sci Net [SXB1]
R	192.005.067.rrr	CECOM-ETHER	CECOM ADDCOMPE ETHER [93,GXH]
R	192.005.068.rrr	AERO-130	AEROSPACE-130 [LCN]
R	192.005.069.rrr	UIUC-NET	Univ of IL at Urbana [96,AXC]
G	192.005.070.rrr	CELAN	COINS Exper. LAN [MXM]
R	192.005.071.rrr	SAC-ETHER	SAC C3 Ethernet [96,BG5]
R*	192.005.072.rrr-192.005.087.rrr		U Chicago [TXN]
R	192.005.088.rrr	YALE-EE-NET	YALE-EE-NET [96,AXG1]
R	192.005.089.rrr	UTEXAS	U. Texas Austin Net [96,JSQ1]
	192.005.090.rrr-192.005.255.rrr		Unassigned [JBP]

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   C*192.006.000.rrr-192.006.255.rrr Hewlett Packard            [AXG]
   C*192.007.000.rrr-192.007.255.rrr Computer Consoles, Inc.   [RA11]
   C*192.008.000.rrr-192.008.255.rrr Spartacus Computers, Inc.  [SXM]
   C*192.009.000.rrr-192.009.255.rrr SUN Microsystem, Inc.      [WNJ]
   C*192.010.000.rrr-192.010.040.rrr Symbolics, Inc.            [CH2]
   R 192.010.041.rrr   SCRC-ETHERNET SCRC ETHERNET           [96,CH2]
   C*192.010.042.rrr-192.010.255.rrr Symbolics, Inc.            [CH2]
   C*192.011.000.rrr-192.011.255.rrr ATT, Bell Labs            [MH12]
   C*192.012.000.rrr   CADMUS        CADMUS-NET                 [MS9]
   C*192.012.001.rrr   CADMUS-EXP-1  CADMUS-NET-EXP-1           [MS9]
   C*192.012.002.rrr   CADMUS-EXP-2  CADMUS-NET-EXP-2           [MS9]
   C*192.012.003.rrr   FLAIR         Fairchild AI Lab Net   [96,AMS1]
   C*192.012.004.rrr   SCG-NET       Hughes SCG Net          [96,MXP]
     192.012.005.rrr-223.255.254.rrr Unassigned                 [JBP]
     223.255.255.rrr                 Reserved                   [JBP]
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Other Reserved Internet Addresses

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   * Internet Address  Name          Network              References
   - ----------------  ----          -------              ----------
     224.000.000.000-255.255.255.255 Reserved                  [JBP]
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Network Totals

Assigned for the ARPA-Internet and the DDN-Internet

Class	A	B	C	Total
Research	7	36	824	867
Defense	4	14	9	27
Government	0	2	1	3
Commercial	2	0	3	5
Total	13	52	837	902

Allocated for Internet and Independent Uses

Class	A	B	C	Total
Research	7	36	845	888
Defense	4	14	9	27
Government	0	2	1	3
Commercial	2	1	1543	1546
Total	13	53	2398	2464

Maximum Allowed

Class	A	B	C	Total
Research	8	1024	65536	66568
Defense	24	3072	458752	461848
Government	24	3072	458752	461848
Commercial	74	9214	1114137	1123394
Total	126	16382	2097150	2113658

ASSIGNED VERSION NUMBERS

In the Internet Protocol (IP) [31,71] 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	[31,71,JBP]
5	ST	ST Datagram Mode	[34,JWF]
6-14		Unassigned	[JBP]
15		Reserved	[JBP]

ASSIGNED PROTOCOL NUMBERS

In the Internet Protocol (IP) [31,71] 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	[63,JBP]
2		Unassigned	[JBP]
3	GGP	Gateway-to-Gateway	[42,MB]
4		Unassigned	[JBP]
5	ST	Stream	[34,JWF]
6	TCP	Transmission Control	[31,72,JBP]
7		UCL	[PK]
8	EGP	Exterior Gateway Protocol	[85,DLM1]
9	IGP	any private interior gateway	[JBP]
10		BBN RCC Monitoring	[SGC]
11	NVP-II	Network Voice Protocol	[16,SC3]
12		PUP	[11,HGM]
13		ARGUS	[RWS4]
14		Unassigned	[JBP]
15	XNET	Cross Net Debugger	[40,JFH2]
16		Chaos Stream	[NC3]
17	UDP	User Datagram	[31,70,JBP]
18	MUX	Multiplexing	[17,JBP]
19		DCN Measurement Subsystems	[DLM1]
20	HMP	Host Monitoring	[41,RH6]
21		Packet Radio Measurement	[ZSU]
22		XEROX NS IDP	[97,LLG]
23		Trunk-1	[BML]
24		Trunk-2	[BML]
25		Leaf-1	[BML]
26		Leaf-2	[BML]
27-60		Unassigned	[JBP]
61		any host internal protocol	[JBP]
62		CFTP	[35,HCF2]
63		any local network	[JBP]
64		SATNET and Backroom EXPAK	[DM11]
65		MIT Subnet Support	[NC3]
66	RVD	MIT Remote Virtual Disk Protocol	[MBG]
67		Internet Pluribus Packet Core	[DM11]
68		Unassigned	[JBP]
69		SATNET Monitoring	[DM11]
70		Unassigned	[JBP]

71	Internet Packet Core Utility	[DM11]
72-75	Unassigned	[JBP]
76	Backroom SATNET Monitoring	[DM11]
77	Unassigned	[JBP]
78	WIDEBAND Monitoring	[DM11]
79	WIDEBAND EXPAK	[DM11]
80-254	Unassigned	[JBP]
255	Reserved	[JBP]

ASSIGNED PORT NUMBERS

Ports are used in the TCP [31,72] 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 [31,70].

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	[13,32,JBP]
7	ECHO	Echo	[61,JBP]
9	DISCARD	Discard	[60,JBP]
11	USERS	Active Users	[56,JBP]
13	DAYTIME	Daytime	[59,JBP]
15	NETSTAT	Who is up or NETSTAT	[JBP]
17	QUOTE	Quote of the Day	[66,JBP]
19	CHARGEN	Character Generator	[58,JBP]
20	FTP	File Transfer [Default Data]	[31,62,JBP]
21	FTP	File Transfer [Control]	[31,62,JBP]
23	TELNET	Telnet	[78,JBP]
25	SMTP	Simple Mail Transfer	[31,68,JBP]
27		NSW User System FE	[18,RHT]
29		MSG ICP	[54,RHT]
31		MSG Authentication	[54,RHT]
33		Unassigned	[JBP]
35		Any Printer Server	[JBP]
37	TIME	Time	[74,JBP]
39	RLP	Resource Location Protocol	[1,MA]
41	GRAPHICS	Graphics	[32,90,JBP]
42	NAMESERVER	Host Name Server	[31,65,JBP]
43	NICNAME	Who Is	[31,39,JAKE]
44		MPM FLAGS Protocol	[JBP]
45	MPM	Message Processing Module [recv]	[64,JBP]
46	MPM	MPM [default send]	[64,JBP]
47		NI FTP	[94,SK]

49		Login Host Protocol	[PXD]
51		IMP Logical Address Maintenance	[50,AGM]
53	DOMAIN	Domain Name Server	[PM1]
55		ISI Graphics Language	[10,RB6]
57		Any Private Terminal Access	[JBP]
59		Any Private File Service	[JBP]
61		NI MAIL	[8,SK]
63		VIA Systems - FTP	[DXD]
65		Unassigned	[JBP]
67		Unassigned	[JBP]
69	TFTP	Trivial File Transfer	[31,87,KRS]
71	NETRJS	Remote Job Service	[12,32,RTB]
72	NETRJS	Remote Job Service	[12,32,RTB]
73	NETRJS	Remote Job Service	[12,32,RTB]
74	NETRJS	Remote Job Service	[12,32,RTB]
75		Any Private Dial Out Service	[JBP]
77		Any Private RJE Service	[JBP]
79	FINGER	Finger	[32,37,KLH]
81		HOSTS2 Name Server	[EAK1]
83		MIT ML Device	[DPR]
85		MIT ML Device	[DPR]
87		Any Private Terminal Link	[JBP]
89		SU/MIT Telnet Gateway	[MRC]
91		MIT Dover Spooler	[EBM]
93		Device Control Protocol	[DCT]
95	SUPDUP	SUPDUP	[21,MRC]
97		Unassigned	[JBP]
99		Metagram Relay	[GEOF]
101	HOSTNAME	NIC Host Name Server	[31,38,JAKE]
103		Unassigned	[JBP]
105	CSNET-NS	Mailbox Name Nameserver	[88,MHS1]
107	RTELNET	Remote Telnet Service	[67,JBP]
109	POP	Post Office Protocol	[JBP]
110-129		Unassigned	[JBP]
131		Unassigned	[JBP]
132-223		Reserved	[JBP]
224-241		Unassigned	[JBP]
243		Survey Measurement	[9,AV]
245		LINK	[14,RDB2]
247-255		Unassigned	[JBP]

ASSIGNED AUTONOMOUS SYSTEM NUMBERS

The Exterior Gateway Protocol (EGP) [85,84] specifies that groups of gateways may form autonomous systems. The EGP provides a 16-bit field for identifying such systems. The values of this field are registered here.

Autonomous System Numbers:

Decimal	Name	References
0	Reserved	[JBP]
1	The BBN Gateways	[MB]
2	DCN-AS	[DLM1]
3	The MIT Gateways	[LM8]
4	ISI-AS	[PXK]
5	Symbolics	[CH2]
6	HIS-Multics	[BIM,RK1]
7	UK-MOD	[RNM1]
8	RICE-AS	[PGM]
9	CMU-ROUTER	[MA]
10-65534	Unassigned	[JBP]
65535	Reserved	[JBP]

ASSIGNED ARPANET LOGICAL ADDRESSES

The ARPANET facility for "logical addressing" is described in RFC 878 [49]. A portion of the possible logical addresses are reseved 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 Gateways	[MB]
2-255	Unassigned	[JBP]
256	Reserved	[JBP]

ASSIGNED 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 [7].

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	[97,LLG]
151	Unassigned	[JBP]
152	PARC Universal Protocol	[11,HGM]
153	TIP Status Reporting	[JGH]
154	TIP Accounting	[JGH]
155	Internet Protocol [regular]	[31,71,JBP]
156-158	Internet Protocol [experimental]	[31,71,JBP]
159	Figleaf Link	[JBW1]
160-195	Unassigned	[JBP]
196-247	Experimental Protocols	[JBP]
248-255	Network Maintenance	[JGH]

IEEE 802 SAP NUMBERS OF INTEREST

Many of the networks of all classes are IEEE 802 Networks. These systems use a Service Access Point field in much the same way the ARPANET uses the "link" field.

Assignments:

Service Access Point		Description	References
decimal	binary		
96	01100000	DOD IP	[31,70,JBP]

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.

Assignments:

Ethernet		Exp. Ethernet		Description	References
decimal	Hex	decimal	octal		
512	0200	512	1000	XEROX PUP	[1,HGM]
1536	0600	1536	3000	XEROX NS IDP	[97,LLG]
2048	0800	513	1001	DOD IP	[131,71,JBP]
2049	0801	-	-	X.75 Internet	[LLG]
2050	0802	-	-	NBS Internet	[LLG]
2051	0803	-	-	ECMA Internet	[LLG]
2052	0804	-	-	Chaosnet	[LLG]
2053	0805	-	-	X.25 Level 3	[LLG]
2054	0806	-	-	Address Res	[55,DCP1]
2076	081C	-	-	Symbolics Private	[DCP1]
32771	8003	-	-	Cronus VLN	[91,DCT]
32772	8004	-	-	Cronus Direct	[91,DCT]
32774	8006	-	-	Nestar	[LLG]
36864	9000	-	-	Loopback	[LLG]

The standard for transmission of IP datagrams over Ethernets and Experimental Ethernets is specified in RFC 894 [41] and RFC 895 [57] respectively.

ASSIGNED ADDRESS RESOLUTION PROTOCOL PARAMETERS

The Address Resolution Protocol (ARP) specified in RFC 826 [55] has several parameters. The assigned values for these parameters are listed here.

Assignments:

Operation Code (op)

1	REQUEST
2	REPLY

Hardware Type (hrd)

1	ETHERNET (10Mb)
2	EXPERIMENTAL ETHERNET (3Mb)

Protocol Type (pro)

Use the same codes as listed in the section called "Ethernet Numbers of Interest".

ASSIGNED 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).

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	[MHS1]
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	[PG3]
014.000.000.016	2628-153-90075 00	DFVLR	[HDC1]
014.000.000.017-014.255.255.254		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 [47].

ASSIGNED TELNET OPTIONS

The Telnet Protocol has a number of options that may be negotiated. These options are listed here. The "Official Protocols" document [83] provides more detailed information.

Options	Name	References
0	Binary Transmission	[76,JBP]
1	Echo	[77,JBP]
2	Reconnection	[5,JBP]
3	Suppress Go Ahead	[80,JBP]
4	Approx Message Size Negotiation	[32,JBP]
5	Status	[79,JBP]
6	Timing Mark	[81,JBP]
7	Remote Controlled Trans and Echo	[73,JBP]
8	Output Line Width	[3,JBP]
9	Output Page Size	[4,JBP]
10	Output Carriage-Return Disposition	[22,JBP]
11	Output Horizontal Tab Stops	[26,JBP]
12	Output Horizontal Tab Disposition	[25,JBP]
13	Output Formfeed Disposition	[23,JBP]
14	Output Vertical Tabstops	[28,JBP]
15	Output Vertical Tab Disposition	[27,JBP]
16	Output Linefeed Disposition	[24,JBP]
17	Extended ASCII	[53,JBP]
18	Logout	[19,MRC]
19	Byte Macro	[29,JBP]
20	Data Entry Terminal	[30,JBP]
22	SUPDUP	[21,20,MRC]
22	SUPDUP Output	[36,MRC]
23	Send Location	[46,EAK1]
24	Terminal Type	[89,MHS1]
25	End of Record	[69,JBP]
255	Extended-Options-List	[75,JBP]

OFFICIAL MACHINE NAMES

These are the Official Machine Names as they appear in the NIC Host Table. Their use is described in RFC 810 [33].

ALTO
AMDAHL-V7
BURROUGHS-B/29
C/30
C/70
CADLINC
CADR
CDC-173
DEC-10
DEC-1050
DEC-1080
DEC-1090
DEC-1090B
DEC-1090T
DEC-2020T
DEC-2040
DEC-2040T
DEC-2050T
DEC-2060
DEC-2060T
DEC-FALCON
DPS8/70M
FOONLY-F2
FOONLY-F3
FOONLY-F4
H-316
H-60/68
H-68
H-68/80
H-89
HONEYWELL-DPS-8/70M
IBM-158
IBM-360/67
IBM-370/3033
IBM-4341
IBM-PC
IMSAI
K102
LSI-11
LSI-11/23
M6800
MAXC
MLC

NAS-AS/5
ONYX-09001
ONYX-28000
PDP-11
PDP-11/34
PDP-11/40
PDP-11/44
PDP-11/45
PDP-11/50
PDP-11/70
PERQ
PLURIBUS
ROLM-1666
SMI
SUN-150
SYMBOLICS-3600
UNIVAC-1100
VAX-11/730
VAX-11/750
VAX-11/780
XEROX-8010

OFFICIAL SYSTEM NAMES

These are the Official System Names as they appear in the NIC Host Table. Their use is described in RFC 810 [33].

ASP
AUGUST
BKY
CCP
DOS/360
ELF
EPOS
EXEC-8
GCOS
GPOS
ITS
INTERCOM
INTERLISP
KRONOS
MCP
MOS
MPX-RT
MULTICS
MVT
NOS
NOS/BE
OS/MVS
OS/MVT
RIG
RSX-11M
RT11
SCOPE
SIGNAL
SINTRAN
TENEX
TOPS-10
TOPS-20
TSS
UNIX
VM/370
VM/CMS
VMS
WAITS
XDE

OFFICIAL PROTOCOL AND SERVICE NAMES

These are the Official Protocol Names. Their use is described in greater detail in RFC 810 [33].

CHARGEN	- Character Generator Protocol
CLOCK	- DCNET Time Server Protocol
CSNET-NS	- CSNET Mailbox Nameserver Protocol
DAYTIME	- Daytime Protocol
DISCARD	- Discard Protocol
DOMAIN	- Domain Name Server Protocol
ECHO	- Echo Protocol
EGP	- Exterior Gateway Protocol
FINGER	- Finger Protocol
FTP	- File Transfer Protocol
GGP	- Gateway Gateway Protocol
GRAPHICS	- Graphics Protocol
HMP	- Host Monitoring Protocol
HOSTNAME	- Hostname Protocol
ICMP	- Internet Control Message Protocol
IGP	- Interior Gateway Protocol
IP	- Internet Protocol
MPM	- Internet Message Protocol
MUX	- Multiplexing Protocol
NAMESERVER	- Host Name Server Protocol
NETED	- Network Standard Text Editor
NETRJS	- Remote Job Service
NICNAME	- Who Is Protocol
NVP-II	- Network Voice Protocol
POP	- Post Office Protocol
QUOTE	- Quote of the Day Protocol
RVD	- Remote Virtual Disk Protocol
RLP	- Resource Location Protocol
RJE	- Remote Job Entry Protocol
RTELNET	- Remote Telnet Service
SMTP	- Simple Mail Transfer Protocol
ST	- Stream Protocol
SUPDUP	- SUPDUP Protocol
TELNET	- Telnet Protocol
TCP	- Transmission Control Protocol
TFTP	- Trivial File Transfer Protocol
TIME	- Time Server Protocol
UDP	- User Datagram Protocol
USERS	- Active Users Protocol
XNET	- Cross Net Debugger

OFFICIAL TERMINAL TYPE NAMES

These are the Official Terminal Type Names. Their use is described in RFC 884 [89].

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
COMPUCOLOR-II
CONCEPT-100
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
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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APPENDIX A

Network Numbers

The network numbers in class A, B, and C network addresses are allocated among Research, Defense, Government (Non-Defense) and Commercial uses.

Class A (highest-order bit 0)

Research allocation:	8
Defense allocation:	24
Government allocation:	24
Commercial allocation:	94
Reserved Addresses:	(0, 127)
Total	128

Class B (highest-order bits 1-0)

Research allocation:	1024
Defense allocation:	3072
Government allocation:	3072
Commercial allocation:	12286
Reserved Addresses:	(0, 16383)
Total	16384

Class C (highest-order bits 1-1-0)

Research allocation:	65536
Defense allocation:	458725
Government allocation:	458725
Commercial allocation:	1572862
Reserved Addresses:	(0, 2097151)
Total	2097152

Class D (highest-order bits 1-1-1)

All addresses in this class are reserved for future use.

Within the Research community, network identifiers will only be granted to applicants who show evidence that they are acquiring standard Bolt Beranek and Newman gateway software or have implemented or are acquiring a gateway meeting the Exterior Gateway Protocol requirements. Acquisition of the Berkeley BSD 4.2 UNIX software might be considered evidence of the latter.

Experimental networks which later become operational need not be renumbered. Rather, the identifiers could be moved from Research to Defense, Government or Commercial status. Thus, network identifiers may change state among Research, Defense, Government and Commercial, but the number of identifiers allocated to each use must remain within the limits indicated above. To make possible this fluid assignment, the network identifier spaces are not allocated by simple partition, but rather by specific assignment.

Protocol Identifiers

These assignments are shared by the four communities.

Port Numbers

These assignments are shared by the four communities.

ARPANET Link Numbers

These assignments are shared by the four communities.

IP Version Numbers

These assignments are shared by the four communities.

TCP, IP and Telnet Option Identifiers

These assignments are shared by the four communities.

Implementation:

Joyce Reynolds is the coordinator for all number assignments.