

Network Working Group
Request for Comments: 870

J. Reynolds
J. Postel
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Obsoletes RFCs: 820,
790, 776, 770, 762, 758, 755,
750, 739, 604, 503, 433, 349
Obsoletes IENS: 127, 117, 93

ASSIGNED NUMBERS

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, or network number 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" [16] or in the old "ARPANET Protocol Handbook" [17] prepared by the NIC. Some of the items listed are undocumented. Further information on protocols can be found in the memo "Official Protocols" [52].

In all cases the name and mailbox of the responsible individual is indicated. In the lists that follow, a bracketed entry, e.g., [16,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.

The network numbers listed here are used as internet addresses by the Internet Protocol (IP) [16,47]. 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.

| | | | | | | | | | | 1 | | | | | | | | | | 2 | | | | | | | | | | 3 | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|------------------------------|---|---|---|---|---|---|---|---|---|------------------------------|---|---|---|---|---|---|---|---|---|------------------------------|---|--|--|--|--|--|--|--|--|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | | | | | | | | |
| +--+--+--+--+--+--+--+--+--+ | | | | | | | | | | +--+--+--+--+--+--+--+--+--+ | | | | | | | | | | +--+--+--+--+--+--+--+--+--+ | | | | | | | | | | +--+--+--+--+--+--+--+--+--+ | | | | | | | | | |
| 0 NETWORK | | | | | | | | | | Local 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.

[illegible]

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.

| | | | | | | | | | | 1 | | | | | | | | | | 2 | | | | | | | | | | 3 | | | | | | | | | |
|---|---|---|---|---|---------|---|---|---|---|---|---|---|---|---|---|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | | | | | | | | |
| + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | | | | | | | | |
| | 1 | 1 | 0 | | NETWORK | | | | | | | | | | | Local 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 ISIF 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 three categories of users of Internet Addresses: Research, 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 (in the column marked by an asterisk): R for Research and Development, D for DoD, and C for Commercial.

Numbers assigned for commercial use of IP family protocols, but not for interworking with the ARPA or DoD Internets are marked with an astrisk preceeding the number.

For various reasons, the assigned numbers of networks are sometimes changed. To ease the transition the old number will be listed 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 the suffixed "-TEMP".

Assigned Network Numbers

Class A Networks

| * Internet Address | Name | Network | References |
|---------------------------------|------------------|------------------------------|--------------|
| ----- | ---- | ----- | ----- |
| 000.rrr.rrr.rrr | | Reserved | [JBP] |
| R 003.rrr.rrr.rrr | T RCC-NET-TEMP | BBN RCC Network | [SGC] |
| R 004.rrr.rrr.rrr | SATNET | Atlantic Satellite Network | [DM11] |
| D 005.rrr.rrr.rrr | T DEMO-PR-1-TEMP | Demo-1 Packet Radio Network | [LCS] |
| D 006.rrr.rrr.rrr | T YPG-NET-TEMP | Yuma Proving Grounds | [2,BXA] |
| D 007.rrr.rrr.rrr | T EDN-TEMP | DCEC EDN | [EC5] |
| R 008.rrr.rrr.rrr | T BBN-NET-TEMP | BBN Network | [JSG5] |
| D 009.rrr.rrr.rrr | T BRAGG-PR-TEMP | Ft. Bragg Packet Radio Net | [JEM] |
| R 010.rrr.rrr.rrr | ARPANET | ARPANET | [2,17,REK2] |
| C 012.rrr.rrr.rrr | ATT | ATT, Bell Labs | [MH12] |
| C 014.rrr.rrr.rrr | PDN | Public Data Network | [REK2] |
| R 018.rrr.rrr.rrr | T MIT-TEMP | MIT Network | [11,51,DDC2] |
| R 023.rrr.rrr.rrr | MITRE | MITRE Cablenet | [54,APS] |
| D 024.rrr.rrr.rrr | MINET | MINET | [2,DHH] |
| R 025.rrr.rrr.rrr | RSRE-EXP | RSRE Experimental | [NM] |
| D 026.rrr.rrr.rrr | MILNET | MILNET | [HH6] |
| 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 035.rrr.rrr.rrr | T RSRE-NULL-TEMP | RSRE Null Network | [NM] |
| 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] |
| R 045.rrr.rrr.rrr | T C3-PR-TEMP | Testbed Development PRNET | [BG5] |
| R 046.rrr.rrr.rrr | T Berkeley-TEMP | Berkeley Ethernet | [DAM1] |
| R 047.rrr.rrr.rrr | T SAC-PR-TEMP | SAC Packet Radio Network | [BG5] |
| R 048.rrr.rrr.rrr | NDRE-TIU | NDRE-TIU | [PS3] |
| R 050.rrr.rrr.rrr | NTA-RING | NDRE-RING | [PS3] |
| 001.rrr.rrr.rrr-002.rrr.rrr.rrr | | Unassigned | [JBP] |
| 011.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-034.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] |
| 049.rrr.rrr.rrr | | Unassigned | [JBP] |
| 051.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 | [MO1]<--*** |
| R 128.004.rrr.rrr | DCNET | LINKABIT DCNET | [DLM1] |
| R 128.005.rrr.rrr | FORDNET | FORD DCNET | [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 | [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 | [29,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 | [2,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] |
| 128.029.rrr.rrr | | Unassigned | [JBP] |
| 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 | [25,26,RK1] |
| R 128.036.rrr.rrr | YALE-NET | YALE NET | [61,JO5] |
| D 128.037.rrr.rrr | YPG-NET | Yuma Proving Grounds | [2,BXA] |
| D 128.038.rrr.rrr | NSWC-NET | NSWC Local Host Net | [RLH2] |
| 128.039.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-192.004.255.rrr | | BBN local networks | [SGC] |
| 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] |
| 192.005.005.rrr | | Unassigned | [JBP] |
| 192.005.006.rrr | | Unassigned | [JBP] |
| R 192.005.007.rrr | CIT-CS-NET | Caltech-CS-Net | [60,DSW] |
| R 192.005.008.rrr | WASHINGTON | University of Washington | [JAR4] |
| R 192.005.009.rrr | AERONET | Aerospace Labnet | [1,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 | Compon Network | [61,FAS] |
| R 192.005.014.rrr | RAND-NET | RAND Network | [61,JDG] |
| R 192.005.015.rrr | NYU-NET | NYU Network | [EF5] |
| R 192.005.016.rrr | LANL-LAND | Los Alamos Dev LAN | [61,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 | [2,MJM2] |
| D 192.005.022.rrr | BRLNET2 | BRLNET2 | [2,MJM2] |
| D 192.005.023.rrr | BRLNET3 | BRLNET3 | [2,MJM2] |
| D 192.005.024.rrr | BRLNET4 | BRLNET4 | [2,MJM2] |
| D 192.005.025.rrr | BRLNET5 | BRLNET5 | [2,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-NUL | RSRE-NUL | [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 | [25,26,RK1] |
| R 192.005.033.rrr | CISLTESTNET3 | Honeywell | [25,26,RK1] |
| R 192.005.034.rrr | CISLTESTNET4 | Honeywell | [25,26,RK1] |
| R 192.005.035.rrr | RIACS | USRA | [61,RLB1] |
| R 192.005.036.rrr | CORNELL-CS | CORNELL CS Research | [61,DK2] |
| R 192.005.037.rrr | UR-CS-NET | U of R CS 3Mb Net | [31,LB1] |
| R 192.005.038.rrr | SRI-C3ETHER | SRI-AITAD C3ETHERNET | [61,BG5] |
| R 192.005.039.rrr | UDEL-EECIS | Udel EECIS LAN | [58,CC2] |
| R 192.005.040.rrr | PUCC-NET-A | PURDUE Comp Cntr Net | [JXS] |

| | | | | |
|----|---------------------------------|-------------|---------------------------|-----------|
| D | 192.005.041.rrr | WISLAN | WIS Research LAN | [54,JRM1] |
| D | 192.005.042.rrr | AFDSC-HYPER | AFDSC Hypernet | [MCSJ] |
| R | 192.005.043.rrr | CUCSNET | Columbia CS Net | [61,LH2] |
| | 192.005.044.rrr-192.005.255.rrr | | Unassigned | [JBP] |
| 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] |
| | 192.009.000.rrr-223.255.254.rrr | | Unassigned | [JBP] |
| | 223.255.255.rrr | | Reserved | [JBP] |

Other Reserved Internet Addresses

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

Network Totals

Assigned for the Internet

| Class | A | B | C | Total |
|------------|----|----|------|-------|
| Research | 10 | 27 | 1055 | 1092 |
| Defense | 2 | 10 | 9 | 21 |
| Commercial | 2 | 0 | 2 | 4 |
| Total | 14 | 37 | 1066 | 1117 |

Allocated for Internet and Other Uses

| Class | A | B | C | Total |
|------------|----|----|------|-------|
| Research | 10 | 27 | 1055 | 1092 |
| Defense | 2 | 10 | 9 | 21 |
| Commercial | 2 | 0 | 770 | 772 |
| Total | 14 | 37 | 1834 | 1885 |

Maximum Allowed

| Class | A | B | C | Total |
|------------|-----|-------|---------|---------|
| Research | 8 | 1024 | 65536 | 66568 |
| Defense | 24 | 3072 | 458752 | 461848 |
| Commercial | 94 | 12286 | 1572862 | 1585242 |
| Total | 126 | 16382 | 2097150 | 2113658 |

ASSIGNED INTERNET VERSION NUMBERS

In the Internet Protocol (IP) [16,47] 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 | Octal | Version | References |
|---------|-------|-------------------|-------------|
| ----- | ----- | ----- | ----- |
| 0 | 0 | Reserved | [JBP] |
| 1-3 | 1-3 | Unassigned | [JBP] |
| 4 | 4 | Internet Protocol | [16,47,JBP] |
| 5 | 5 | ST Datagram Mode | [18,JWF] |
| 6-14 | 6-16 | Unassigned | [JBP] |
| 15 | 17 | Reserved | [JBP] |

ASSIGNED INTERNET PROTOCOL NUMBERS

In the Internet Protocol (IP) [16,47] there is a field, called Protocol, to identify the the next level protocol. This is an 8 bit field.

Assigned Internet Protocol Numbers

| Decimal | Octal | Protocol | References |
|---------|-------|---------------------------------|-------------|
| ----- | ----- | ----- | ----- |
| 0 | 0 | Reserved | [JBP] |
| 1 | 1 | ICMP | [16,40,JBP] |
| 2 | 2 | Unassigned | [JBP] |
| 3 | 3 | Gateway-to-Gateway | [24,MB] |
| 4 | 4 | Unassigned | [JBP] |
| 5 | 5 | Stream (ST) | [18,JWF] |
| 6 | 6 | Transmission Control (TCP) | [16,48,JBP] |
| 7 | 7 | UCL | [PK] |
| 8 | 10 | Exterior Gateway Protocol (EGP) | [53,RH6] |
| 9 | 11 | Unassigned | [JBP] |
| 10 | 12 | BBN RCC Monitoring | [SGC] |
| 11 | 13 | NVP | [12,SC3] |
| 12 | 14 | PUP | [6,EAT3] |
| 13-14 | 15-16 | Unassigned | [JBP] |
| 15 | 17 | Cross Net Debugger (XNET) | [23,JFH2] |
| 16 | 20 | Chaos Stream | [NC3] |
| 17 | 21 | User Datagram (UDP) | [16,46,JBP] |
| 18 | 22 | Multiplexing | [13,JBP] |
| 19 | 23 | DCN Measurement Subsystems | [DLM1] |
| 20 | 24 | Host Monitoring (HMP) | [28,RH6] |
| 21 | 25 | Packet Radio Measurement | [ZSU] |

Assigned Numbers
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| | | | |
|--------|---------|-------------------------------|-----------|
| 22 | 26 | XEROX NS IDP | [62,LLG] |
| 23 | 27 | Trunk-1 | [BML] |
| 24 | 30 | Trunk-2 | [BML] |
| 25 | 31 | Leaf-1 | [BML] |
| 26 | 32 | Leaf-2 | [BML] |
| 27-60 | 33-74 | Unassigned | [JBP] |
| 61 | 75 | any host internal protocol | [JBP] |
| 62 | 76 | CFTP | [19,HCF2] |
| 63 | 77 | any local network | [JBP] |
| 64 | 100 | SATNET and Backroom EXPAK | [DM11] |
| 65 | 101 | MIT Subnet Support | [NC3] |
| 66 | 102 | MIT VAX Remote Disk Protocol | [MBG] |
| 67 | 103 | Internet Pluribus Packet Core | [DM11] |
| 68 | 104 | Unassigned | [JBP] |
| 69 | 105 | SATNET Monitoring | [DM11] |
| 70 | 106 | Unassigned | [JBP] |
| 71 | 107 | Internet Packet Core Utility | [DM11] |
| 72-75 | 110-113 | Unassigned | [JBP] |
| 76 | 114 | Backroom SATNET Monitoring | [DM11] |
| 77 | 115 | Unassigned | [JBP] |
| 78 | 116 | WIDEBAND Monitoring | [DM11] |
| 79 | 117 | WIDEBAND EXPAK | [DM11] |
| 80-254 | 120-376 | Unassigned | [JBP] |
| 255 | 377 | Reserved | [JBP] |

ASSIGNED PORT NUMBERS

Ports are used in the TCP [16,48] 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 [16,46].

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 | Octal | Description | References |
|---------|-------|-------------------------------------|--------------|
| ----- | ----- | ----- | ----- |
| 0 | 0 | Reserved | [JBP] |
| 1-4 | 1-4 | Unassigned | [JBP] |
| 5 | 5 | Remote Job Entry | [8,17,JBP] |
| 7 | 7 | Echo | [38,JBP] |
| 9 | 11 | Discard | [37,JBP] |
| 11 | 13 | Active Users | [34,JBP] |
| 13 | 15 | Daytime | [36,JBP] |
| 15 | 17 | Who is up or NETSTAT | [JBP] |
| 17 | 21 | Quote of the Day | [43,JBP] |
| 19 | 23 | Character Generator | [35,JBP] |
| 20 | 24 | File Transfer (Default Data) | [16,39,JBP] |
| 21 | 25 | File Transfer (Control) | [16,39,JBP] |
| 23 | 27 | Telnet | [50,JBP] |
| 25 | 31 | SMTP | [16,45,JBP] |
| 27 | 33 | NSW User System FE | [14,RHT] |
| 29 | 35 | MSG ICP | [32,RHT] |
| 31 | 37 | MSG Authentication | [32,RHT] |
| 33 | 41 | Unassigned | [JBP] |
| 35 | 43 | Any Printer Server | [JBP] |
| 37 | 45 | Time | [49,JBP] |
| 39 | 47 | Unassigned | [JBP] |
| 41 | 51 | Graphics | [17,57,JBP] |
| 42 | 52 | Host Name Server | [16,42,JBP] |
| 43 | 53 | NICNAME (WhoIs) | [16,22,JAKE] |
| 44 | 54 | MPM FLAGS Protocol | [JBP] |
| 45 | 55 | Message Processing Module (receive) | [41,JBP] |
| 46 | 56 | MPM (default send) | [41,JBP] |
| 47 | 57 | NI FTP | [59,SK] |

| | | | |
|---------|---------|-------------------------------------|--------------|
| 49 | 61 | Login Host Protocol | [PXD] |
| 51 | 63 | IMP Logical Address Maintenance | [30,AGM] |
| 53 | 65 | Domain Name Server | [PM1] |
| 55 | 67 | ISI Graphics Language | [5,RB6] |
| 57 | 71 | Any Private Terminal Access | [JBP] |
| 59 | 73 | Any Private File Service | [JBP] |
| 61 | 75 | NIMAIL | [3,SK] |
| 63 | 77 | Unassigned | [JBP] |
| 65 | 101 | Unassigned | [JBP] |
| 67 | 103 | Datacomputer at CCA | [10,JZS] |
| 69 | 105 | Trivial File Transfer | [16,55,KRS] |
| 71 | 107 | NETRJS | [7,17,RTB] |
| 72 | 110 | NETRJS | [7,17,RTB] |
| 73 | 111 | NETRJS | [7,17,RTB] |
| 74 | 112 | NETRJS | [7,17,RTB] |
| 75 | 113 | Any Private Dial Out Service | [JBP] |
| 77 | 115 | Any Private RJE Service | [JBP] |
| 79 | 117 | Finger (Name) | [17,20,KLH] |
| 81 | 121 | HOSTS2 Name Server | [EAK1] |
| 83 | 123 | MIT ML Device | [DPR] |
| 85 | 125 | MIT ML Device | [DPR] |
| 87 | 127 | any terminal link | [JBP] |
| 89 | 131 | SU/MIT Telnet Gateway | [MRC] |
| 91 | 133 | MIT Dover Spooler | [EBM] |
| 93 | 135 | Device Control Protocol | [DCT] |
| 95 | 137 | SUPDUP | [15,MRC] |
| 97 | 141 | Datacomputer Status | [10,JZS] |
| 99 | 143 | Metagram Relay | [GEOF] |
| 101 | 145 | NIC Host Name Server | [16,21,JAKE] |
| 103 | 147 | Unassigned | [JBP] |
| 105 | 151 | CSNET Mailbox Name Server (Program) | [56,MHS1] |
| 107 | 153 | Remote Telnet Service | [44,JBP] |
| 109-129 | 155-201 | Unassigned | [JBP] |
| 131 | 203 | Datacomputer | [10,JZS] |
| 132-223 | 204-337 | Reserved | [JBP] |
| 224-241 | 340-361 | Unassigned | [JBP] |
| 243 | 363 | Survey Measurement | [4,AV] |
| 245 | 365 | LINK | [9,RDB2] |
| 247-255 | 367-377 | Unassigned | [JBP] |

ASSIGNED AUTONOMOUS SYSTEM NUMBERS

The Exterior Gateway Protocol (EGP) [53] 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 | Description | References |
|---------|------------------|------------|
| ----- | ----- | ----- |
| 0 | Reserved | [JBP] |
| 1 | The BBN Gateways | [MB] |
| 2 | The DCN Gateways | [DLM1] |
| 3 | The MIT Gateways | [LM8] |
| 4-65534 | Unassigned | [JBP] |
| 65535 | 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 low order 4 bits of the message-id field are to be zero unless explicitly specified otherwise for the particular protocol used on that link. The Host/IMP interface is defined in BBN Report 1822 [2].

Link Assignments:

| Decimal | Octal | Description | References |
|---------|---------|----------------------------------|-------------|
| ----- | ----- | ----- | ----- |
| 0 | 0 | Reserved | [JBP] |
| 1-149 | 1-225 | Unassigned | [JBP] |
| 150 | 226 | Xerox NS IP | [62,LLG] |
| 151 | 227 | Unassigned | [JBP] |
| 152 | 230 | PARC Universal Protocol | [6,EAT3] |
| 153 | 231 | TIP Status Reporting | [JGH] |
| 154 | 232 | TIP Accounting | [JGH] |
| 155 | 233 | Internet Protocol (regular) | [16,47,JBP] |
| 156-158 | 234-236 | Internet Protocol (experimental) | [16,47,JBP] |
| 159-195 | 237-303 | Unassigned | [JBP] |
| 196-255 | 304-377 | Experimental Protocols | [JBP] |
| 248-255 | 370-377 | Network Maintenance | [JGH] |

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 | 02,00 | 512 | 1000 | XEROX PUP | [6,EAT3] |
| 1536 | 06,00 | 1536 | 3000 | XEROX NS IDP | [62,LLG] |
| 2048 | 08,00 | 513 | 1001 | DOD IP | [16,47,JBP] |
| 2054 | 08,06 | - | - | Address Res | [33,DCP1] |

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] |
| 014.000.000.011-014.255.255.254 | | Unassigned | [JBP] |
| 014.255.255.255 | | Reserved | [JBP] |

The standard for transmission of IP datagrams over the Public Data Network is specified in [27].

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APPENDIX A

This appendix summarizes the agreements reached by the DDN/PMO and DARPA at a September 1982 meeting concerning the allocation and assignment of the various numbers associated with DoD Protocol Standards and the DARPA Experimental Standards.

Recommended policy is summarized for each type of number assignment of concern:

Network Identifiers used by the Internet Protocol

It is recommended that the available number spaces for class A, B, and C network addresses be allocated among R&D, DoD and commercial uses, and that assignments of these addresses be the responsibility respectively of DARPA, DCA PCCO/DDN and the National Bureau of Standards. The recommended allocations are given below.

Class A (highest-order bit 0)

| | |
|------------------------|---------|
| R&D allocation: | 8 nets |
| DoD allocation: | 24 nets |
| Commercial allocation: | 94 nets |
| Reserved Addresses: | 0,127 |

Class B (highest-order bits 1-0)

| | |
|------------------------|------------|
| R&D allocation: | 1024 nets |
| DoD allocation: | 3072 nets |
| Commercial allocation: | 12286 nets |
| Reserved Addresses: | 0,16383 |

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

| | |
|------------------------|--------------|
| R&D allocation: | 65536 nets |
| DoD allocation: | 458725 nets |
| Commercial allocation: | 1572862 nets |
| Reserved Addresses: | 0,2097151 |

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

All addresses in this class are reserved for future use, possibly in support of multicast services. They should be allocated to R&D use for the present.

Within the R&D community, it will be the policy that 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 R&D to DoD or Commercial status. Thus, network identifiers may change state among R&D, DoD and commercial, but the number of identifiers allocated to each use should remain within the limits indicated above. To make possible this fluid assignment, it is recommended that the network identifier spaces not be allocated by simple partition but rather by specific assignment.

Protocol Identifiers

In general, all assignments will be made by the R&D community, but any numbers which become R&D, DoD, national or international standards will be marked as such in this RFC.

Protocol identifiers 0 and 255 are reserved.

95 protocol identifiers are allocated for assignment to DoD standards, 32 for R&D use, and 127 for Commercial, national or international standards.

Port Numbers

A recommendation for allocation and assignment of port numbers is to be developed jointly by representatives of the ICCB and PSTP.

ARPANET Link Numbers

All unnecessary link number usage will be eliminated by joint effort of the ICCB, PSTP and BBN.

BBN will give consideration to the use of link numbers to promote interoperability among various ARPANET interfaces and report to the ICCB, PSTP and DDN/PMO. Examples of possible interoperability issues are:

- (i) interoperability of 1822 and X.25 interfaces
- (ii) interoperability of SIP and other interfaces
- (iii) logical addressing or other special services

IP Version Numbers

These numbers will be assigned only by the R&D community for the purpose of exploring alternatives in internet protocol service expansion, such as inclusion of stream protocol (ST) services.

TCP, IP and Telnet Option Identifiers

These numbers will be assigned by the R&D community. Any permanent or experimental assignments will be identified in the documents specifying those protocols.

Implementation:

This policy recommendation has not been fully implemented as yet. Currently, Joyce Reynolds is acting coordinator for all number assignments.

