OFFICIAL INTERNET PROTOCOLS

STATUS OF THIS MEMO

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

INTRODUCTION

   This RFC identifies the documents specifying the official protocols
   used in the Internet. Comments indicate any revisions or changes
   planned.

   To first order, the official protocols are those specified in the
   "DDN Protocol Handbook" (DPH), dated December 1985 (this is a three
   volume set with a total thickness of about 5 inches).

   Older collections that include many of these specifications are the
   "Internet Protocol Transition Workbook" (IPTW), dated March 1982; the
   "Internet Mail Protocols", dated November 1982; and the "Internet
   Telnet Protocols and Options", dated June 1983. There is also a
   volume of protocol related information called the "Internet Protocol
   Implementers Guide" (IPIG) dated August 1982. An even older
   collection is the "ARPANET Protocol Handbook" (APH) dated
   January 1978. Nearly all the relevant material from these
   collections has been reproduced in the current DPH.

   The following material is organized as a sketchy outline. The
   entries are protocols (e.g., Transmission Control Protocol). In each
   entry there are notes on status, specification, comments, other
   references, dependencies, and contact.

      The STATUS is one of: required, recommended, elective,
      experimental, or none.

      The SPECIFICATION identifies the protocol defining documents.

      The COMMENTS describe any differences from the specification or
      problems with the protocol.

      The OTHER REFERENCES identify documents that comment on or expand
      on the protocol.

The DEPENDENCIES indicate what other protocols are called upon by
this protocol.

The CONTACT indicates a person who can answer questions about the
protocol.

In particular, the status may be:

   required

      - all hosts must implement the required protocol,

   recommended

      - all hosts are encouraged to implement the recommended
      protocol,

   elective

      - hosts may implement or not the elective protocol,

   experimental

      - hosts should not implement the experimental protocol
      unless they are participating in the experiment and have
      coordinated their use of this protocol with the contact
      person, and

      - this is not a protocol.

   For further information about protocols in general, please
   contact:

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      4676 Admiralty Way
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OVERVIEW

   Catenet Model ---

      STATUS: None

      SPECIFICATION: IEN 48 (in DPH)

      COMMENTS:

         Gives an overview of the organization and principles of the
         Internet.

         Could be revised and expanded.

      OTHER REFERENCES:

         Leiner, B., Cole R., Postel, J., and D. Mills, "The DARPA
         Protocol Suite", IEEE INFOCOM 85, Washington, D.C., March 1985.
         Also in IEEE Communications Magazine, and as ISI/RS-85-153,
         March 1985.

         Postel, J., "Internetwork Applications Using the DARPA Protocol
         Suite", IEEE INFOCOM 85, Washington, D.C., March 1985. Also in
         IEEE Communications Magazine, and as ISI/RS-85-151, April 1985.

         Padlipsky, M.A., "The Elements of Networking Style and other
         Essays and Animadversions on the Art of Intercomputer
         Networking", Prentice-Hall, New Jersey, 1985.

         RFC 871 - A Perspective on the ARPANET Reference Model

      DEPENDENCIES:

      CONTACT: Postel@ISI.EDU

NETWORK LEVEL

    Internet Protocol --- (IP)

        STATUS: Required

        SPECIFICATION: RFC 791 (in DPH)

        COMMENTS:

            This is the universal protocol of the Internet. This datagram
            protocol provides the universal addressing of hosts in the
            Internet.

            A few minor problems have been noted in this document.

            The most serious is a bit of confusion in the route options.
            The route options have a pointer that indicates which octet of
            the route is the next to be used. The confusion is between the
            phrases "the pointer is relative to this option" and "the
            smallest legal value for the pointer is 4". If you are
            confused, forget about the relative part, the pointer begins
            at 4. The MIL-STD description of source routing is wrong in
            some of the details.

            Another important point is the alternate reassembly procedure
            suggested in RFC 815.

            Some changes are in the works for the security option.

            Note that ICMP is defined to be an integral part of IP. You
            have not completed an implementation of IP if it does not
            include ICMP.

            The subnet procedures defined in RFC 950 are now considered an
            essential part of the IP architecture and must be implemented
            by all hosts and gateways.

        OTHER REFERENCES:

            RFC 815 (in DPH) - IP Datagram Reassembly Algorithms

            RFC 814 (in DPH) - Names, Addresses, Ports, and Routes

            RFC 816 (in DPH) - Fault Isolation and Recovery

        RFC 817 (in DPH) - Modularity and Efficiency in Protocol
        Implementation

        MIL-STD-1777 (in DPH) - Military Standard Internet Protocol

        RFC 963 - Some Problems with the Specification of the Military
        Standard Internet Protocol

     DEPENDENCIES:

     CONTACT: Postel@ISI.EDU

   Internet Control Message Protocol -------------------------- (ICMP)

     STATUS: Required

     SPECIFICATION: RFC 792 (in DPH)

     COMMENTS:

        The control messages and error reports that go with the
        Internet Protocol.

        A few minor errors in the document have been noted.
        Suggestions have been made for additional types of redirect
        message and additional destination unreachable messages.

        Two additional ICMP message types are defined in RFC 950
        "Internet Subnets", Address Mask Request (A1=17), and Address
        Mask Reply (A2=18).

        Note that ICMP is defined to be an integral part of IP. You
        have not completed an implementation of IP if it does not
        include ICMP.

     OTHER REFERENCES: RFC 950

     DEPENDENCIES: Internet Protocol

     CONTACT: Postel@ISI.EDU

   Internet Group Multicast Protocol ------------------------- (IGMP)

      STATUS: Recommended

      SPECIFICATION: RFC 988

      COMMENTS:

         This protocol specifies the extensions required of a host
         implementation of the Internet Protocol (IP) to support
         internetwork multicasting. This specification supersedes that
         given in RFC 966, and constitutes a proposed protocol standard
         for IP multicasting in the Internet. Reference RFC 966 for a
         discussion of the motivation and rationale behind the
         multicasting extension specified here.

      OTHER REFERENCES: RFC 966

      DEPENDENCIES: Internet Protocol

      CONTACT: Deering@PESCADERO.STANFORD.EDU

HOST LEVEL

   User Datagram Protocol ------------------------------------- (UDP)

      STATUS: Recommended

      SPECIFICATION: RFC 768 (in DPH)

      COMMENTS:

         Provides a datagram service to applications. Adds port
         addressing to the IP services.

         The only change noted for the UDP specification is a minor
         clarification that if in computing the checksum a padding octet
         is used for the computation it is not transmitted or counted in
         the length.

      OTHER REFERENCES:

      DEPENDENCIES: Internet Protocol

      CONTACT: Postel@ISI.EDU

   Transmission Control Protocol ------------------------------- (TCP)

      STATUS: Recommended

      SPECIFICATION: RFC 793 (in DPH)

      COMMENTS:

         Provides reliable end-to-end data stream service.

         Many comments and corrections have been received for the TCP
         specification document. These are primarily document bugs
         rather than protocol bugs.

         Event Processing Section: There are many minor corrections and
         clarifications needed in this section.

         Push: There are still some phrases in the document that give a
         "record mark" flavor to the push. These should be further
         clarified. The push is not a record mark.

Urgent: Page 17 is wrong. The urgent pointer points to the
last octet of urgent data (not to the first octet of non-urgent
data).

Listening Servers: Several comments have been received on
difficulties with contacting listening servers. There should
be some discussion of implementation issues for servers, and
some notes on alternative models of system and process
organization for servers.

Maximum Segment Size: The maximum segment size option should
be generalized and clarified. It can be used to either
increase or decrease the maximum segment size from the default.
The TCP Maximum Segment Size is the IP Maximum Datagram Size
minus forty. The default IP Maximum Datagram Size is 576. The
default TCP Maximum Segment Size is 536. For further
discussion, see RFC 879.

Idle Connections: There have been questions about
automatically closing idle connections. Idle connections are
ok, and should not be closed. There are several cases where
idle connections arise, for example, in Telnet when a user is
thinking for a long time following a message from the server
computer before his next input. There is no TCP "probe"
mechanism, and none is needed.

Queued Receive Data on Closing: There are several points where
it is not clear from the description what to do about data
received by the TCP but not yet passed to the user,
particularly when the connection is being closed. In general,
the data is to be kept to give to the user if he does a RECV
call.

Out of Order Segments: The description says that segments that
arrive out of order, that is, are not exactly the next segment
to be processed, may be kept on hand. It should also point out
that there is a very large performance penalty for not doing
so.

User Time Out: This is the time out started on an open or send
call. If this user time out occurs the user should be
notified, but the connection should not be closed or the TCB
deleted. The user should explicitly ABORT the connection if he
wants to give up.

OTHER REFERENCES:

RFC 813 (in DPH) - Window and Acknowledgement Strategy in TCP

RFC 814 (in DPH) - Names, Addresses, Ports, and Routes

RFC 816 (in DPH) - Fault Isolation and Recovery

RFC 817 (in DPH) - Modularity and Efficiency in Protocol
Implementation

RFC 879 - TCP Maximum Segment Size

RFC 889 - Internet Delay Experiments

RFC 896 - TCP/IP Congestion Control

MIL-STD-1778 (in DPH) - Military Standard Transmission Control
Protocol

RFC 964 - Some Problems with the Specification of the Military
Standard Transmission Control Protocol

Zhang, Lixia, "Why TCP Timers Don't Work Well", Communications
Architectures and Protocols, ACM SIGCOMM Proceedings, Computer
Communications Review, V.16, N.3, August 1986.

DEPENDENCIES: Internet Protocol

CONTACT: Postel@ISI.EDU

Bulk Data Transfer Protocol ----------------------------- (NETBLT)

STATUS: Experimental

SPECIFICATION: RFC 998

COMMENTS:

This is a revised RFC on the discussion of the Network Block
Transfer (NETBLT) protocol.

NETBLT (NETwork BLock Transfer) is a transport level protocol
intended for the rapid transfer of a large quantity of data
between computers. It provides a transfer that is reliable and
flow controlled, and is designed to provide maximum throughput
over a wide variety of networks. Although NETBLT currently

runs on top of the Internet Protocol (IP), it should be able to
operate on top of any datagram protocol similar in function to
IP.

This document is published for discussion and comment, and does
not constitute a standard. The proposal may change and certain
parts of the protocol have not yet been specified;
implementation of this document is therefore not advised.

OTHER REFERENCES: RFC 969

DEPENDENCIES: Transmission Control Protocol, User Datagram
Protocol

CONTACT: markl@PTT.LCS.MIT.EDU

Exterior Gateway Protocol --------------------------------- (EGP)

STATUS: Recommended for Gateways

SPECIFICATION: RFC 888, RFC 904 (in DPH), RFC 975, RFC 985

COMMENTS:

The protocol used between gateways of different administrations
to exchange routing information.

Please discuss any plans for implementation or use of this
protocol with the contact.

OTHER REFERENCES: RFC 827, RFC 890

DEPENDENCIES: Internet Protocol

CONTACT: Mills@UDEL.EDU

   Gateway Gateway Protocol ---------------------------------- (GGP)

      STATUS: Experimental

      SPECIFICATION: RFC 823 (in DPH)

      COMMENTS:

         The gateway protocol now used in the core gateways.

         Please discuss any plans for implementation or use of this
         protocol with the contact.

      OTHER REFERENCES:

      DEPENDENCIES: Internet Protocol

      CONTACT: Brescia@BBN.COM

   Host Monitoring Protocol ---------------------------------- (HMP)

      STATUS: Elective

      SPECIFICATION: RFC 869 (in DPH)

      COMMENTS:

         This is a good tool for debugging protocol implementations in
         remotely located computers.

         This protocol is used to monitor Internet gateways and the
         TACs.

      OTHER REFERENCES:

      DEPENDENCIES: Internet Protocol

      CONTACT: Hinden@BBN.COM

   Reliable Data Protocol ------------------------------------- (RDP)

      STATUS: Experimental

      SPECIFICATION: RFC 908 (in DPH)

      COMMENTS:

         This protocol is designed to efficiently support the bulk
         transfer of data for such host monitoring and control
         applications as loading/dumping and remote debugging. The
         protocol is intended to be simple to implement but still be
         efficient in environments where there may be long transmission
         delays and loss or non-sequential delivery of message segments.

         Please discuss any plans for implementation or use of this
         protocol with the contact.

      OTHER REFERENCES:

      DEPENDENCIES: Internet Protocol

      CONTACT: CWelles@BBN.COM

   Internet Reliable Transaction Protocol --------------------- (IRTP)

      STATUS: Experimental

      SPECIFICATION: RFC 938

      COMMENTS:

         This protocol is a transport level host to host protocol
         designed for an internet environment. While the issues
         discussed may not be directly relevant to the research problems
         of the Internet community, they may be interesting to a number
         of researchers and implementors.

      OTHER REFERENCES:

      DEPENDENCIES: Internet Protocol

      CONTACT: Trudy@ACC.ARPA

   Cross Net Debugger --------------------------------------- (XNET)

      STATUS: Elective

      SPECIFICATION: IEN 158 (in DPH)

      COMMENTS:

         A debugging protocol, allows debugger like access to remote
         systems.

         This specification should be updated and reissued as an RFC.

      OTHER REFERENCES: RFC 643

      DEPENDENCIES: Internet Protocol

      CONTACT: Postel@ISI.EDU

   Multiplexing Protocol -------------------------------------- (MUX)

      STATUS: Experimental

      SPECIFICATION: IEN 90 (in DPH)

      COMMENTS:

         Defines a capability to combine several segments from different
         higher level protocols in one IP datagram.

         No current experiment in progress. There is some question as
         to the extent to which the sharing this protocol envisions can
         actually take place. Also, there are some issues about the
         information captured in the multiplexing header being (a)
         insufficient, or (b) over specific.

         Please discuss any plans for implementation or use of this
         protocol with the contact.

      OTHER REFERENCES:

      DEPENDENCIES: Internet Protocol

      CONTACT: Postel@ISI.EDU

   Stream Protocol --- (ST)

      STATUS: Experimental

      SPECIFICATION: IEN 119 (in DPH)

      COMMENTS:

         A gateway resource allocation protocol designed for use in
         multihost real time applications.

         The implementation of this protocol has evolved and may no
         longer be consistent with this specification. The document
         should be updated and issued as an RFC.

         Please discuss any plans for implementation or use of this
         protocol with the contact.

      OTHER REFERENCES:

      DEPENDENCIES: Internet Protocol

      CONTACT: jwf@LL-EN.ARPA

   Network Voice Protocol ---------------------------------- (NVP-II)

      STATUS: Experimental

      SPECIFICATION: ISI Internal Memo

      COMMENTS:

         Defines the procedures for real time voice conferencing.

         The specification is an ISI Internal Memo which should be
         updated and issued as an RFC.

         Please discuss any plans for implementation or use of this
         protocol with the contact.

      OTHER REFERENCES: RFC 741 (in DPH)

      DEPENDENCIES: Internet Protocol, Stream Protocol

      CONTACT: Casner@ISI.EDU

APPLICATION LEVEL

   Telnet Protocol -- (TELNET)

      STATUS: Recommended

      SPECIFICATION: RFC 854 (in DPH)

      COMMENTS:

         The protocol for remote terminal access.

         This has been revised since the IPTW. RFC 764 in IPTW is now
         obsolete.

      OTHER REFERENCES:

         MIL-STD-1782 (in DPH) - Telnet Protocol

      DEPENDENCIES: Transmission Control Protocol

      CONTACT: Postel@ISI.EDU

   Telnet Options -------------------------------- (TELNET-OPTIONS)

      STATUS: Elective

      SPECIFICATION: General description of options: RFC 855 (in DPH)

Number	Name	RFC	NIC	DPH	USE
0	Binary Transmission	856	-----	yes	yes
1	Echo	857	-----	yes	yes
2	Reconnection	...	15391	yes	no
3	Suppress Go Ahead	858	-----	yes	yes
4	Approx Message Size Negotiation	...	15393	yes	no
5	Status	859	-----	yes	yes
6	Timing Mark	860	-----	yes	yes
7	Remote Controlled Trans and Echo	726	39237	yes	no
8	Output Line Width	...	20196	yes	no
9	Output Page Size	...	20197	yes	no
10	Output Carriage-Return Disposition	652	31155	yes	no
11	Output Horizontal Tabstops	653	31156	yes	no
12	Output Horizontal Tab Disposition	654	31157	yes	no
13	Output Formfeed Disposition	655	31158	yes	no
14	Output Vertical Tabstops	656	31159	yes	no
15	Output Vertical Tab Disposition	657	31160	yes	no
16	Output Linefeed Disposition	658	31161	yes	no
17	Extended ASCII	698	32964	yes	no
18	Logout	727	40025	yes	no
19	Byte Macro	735	42083	yes	no
20	Data Entry Terminal	732	41762	yes	no
21	SUPDUP	734 736	42213	yes	no
22	SUPDUP Output	749	45449	yes	no
23	Send Location	779	-----	yes	no
24	Terminal Type	930	-----	yes	no
25	End of Record	885	-----	yes	no
26	TACACS User Identification	927	-----	yes	no
27	Output Marking	933	-----	yes	no
28	Terminal Location Number	946	-----	no	no
255	Extended-Options-List	861	-----	yes	yes

      The DHP column indicates if the specification is included in the
      DDN Protocol Handbook. The USE column of the table above
      indicates which options are in general use.

      COMMENTS:

         The Binary Transmission, Echo, Suppress Go Ahead, Status,

   Timing Mark, and Extended Options List options have been
   recently updated and reissued. These are the most frequently
   implemented options.

   The remaining options should be reviewed and the useful ones
   should be revised and reissued. The others should be
   eliminated.

   The following are recommended: Binary Transmission, Echo,
   Suppress Go Ahead, Status, Timing Mark, and Extended Options
   List.

      OTHER REFERENCES:

      DEPENDENCIES: Telnet

      CONTACT: Postel@ISI.EDU

   SUPDUP Protocol --- (SUPDUP)

      STATUS: Elective

      SPECIFICATION: RFC 734 (in DPH)

      COMMENTS:

         A special Telnet like protocol for display terminals.

      OTHER REFERENCES:

      DEPENDENCIES: Transmission Control Protocol

      CONTACT: Crispin@SU-SCORE.STANFORD.EDU

   File Transfer Protocol ------------------------------------- (FTP)

      STATUS: Recommended

      SPECIFICATION: RFC 959 (in DPH)

      COMMENTS:

         The protocol for moving files between Internet hosts. Provides
         for access control and negotiation of file parameters.

         The following new optional commands are included in this
         edition of the specification: Change to Parent Directory

(CDUP), Structure Mount (SMNT), Store Unique (STOU), Remove
Directory (RMD), Make Directory (MKD), Print Directory (PWD),
and System (SYST). Note that this specification is compatible
with the previous edition (RFC 765).

A discrepancy has been found in the specification in the
examples of Appendix II. On page 63, a response code of 200 is
shown as the response to a CWD command. Under the list of
Command-Reply Sequences cited on page 50, CWD is shown to only
accept a 250 response code. Therefore, if one would interpret
a CWD command as being excluded from the File System functional
category, one may assume that the response code of 200 is
correct, since CDUP as a special case of CWD does use 200.

OTHER REFERENCES:

RFC 678 (in DPH) - Document File Format Standards

MIL-STD-1780 (in DPH) - File Transfer Protocol

DEPENDENCIES: Transmission Control Protocol

CONTACT: Postel@ISI.EDU

Trivial File Transfer Protocol --------------------------- (TFTP)

STATUS: Elective

SPECIFICATION: RFC 783 (in IPTW)

COMMENTS:

A very simple file moving protocol, no access control is
provided.

This is in use in several local networks.

Ambiguities in the interpretation of several of the transfer
modes should be clarified, and additional transfer modes could
be defined. Additional error codes could be defined to more
clearly identify problems.

Note: The DPH contains IEN-133, which is an obsolete version of
this protocol.

OTHER REFERENCES:

    DEPENDENCIES: User Datagram Protocol

    CONTACT: Postel@ISI.EDU

  Simple File Transfer Protocol ----------------------------- (SFTP)

    STATUS: Experimental

    SPECIFICATION: RFC 913 (in DPH)

    COMMENTS:

       SFTP is a simple file transfer protocol. It fills the need of
       people wanting a protocol that is more useful than TFTP but
       easier to implement (and less powerful) than FTP. SFTP
       supports user access control, file transfers, directory
       listing, directory changing, file renaming and deleting.

       SFTP can be implemented with any reliable 8-bit byte stream
       oriented protocol, this document describes its TCP
       specification. SFTP uses only one TCP connection; whereas TFTP
       implements a connection over UDP, and FTP uses two TCP
       connections (one using the TELNET protocol).

       Please discuss any plans for implementation or use of this
       protocol with the contact.

    OTHER REFERENCES:

    DEPENDENCIES: Transmission Control Protocol

    CONTACT: MKL@SRI-NIC.ARPA

  Simple Mail Transfer Protocol ----------------------------- (SMTP)

    STATUS: Recommended

    SPECIFICATION: RFC 821 (in DPH)

    COMMENTS:

       The procedure for transmitting computer mail between hosts.

       This has been revised since the IPTW, it is in the "Internet
       Mail Protocols" volume of November 1982. RFC 788 (in IPTW) is
       obsolete.

There have been many misunderstandings and errors in the early
implementations. Some documentation of these problems can be
found in the file [C.ISI.EDU]<SMTP>MAIL.ERRORS.

Some minor differences between RFC 821 and RFC 822 should be
resolved.

OTHER REFERENCES:

RFC 822 - Mail Header Format Standards

This has been revised since the IPTW, it is in the "Internet
Mail Protocols" volume of November 1982. RFC 733 (in IPTW)
is obsolete. Further revision of RFC 822 is needed to
correct some minor errors in the details of the
specification.

Note: RFC 822 is not included in the DPH (an accident, it
should have been).

MIL-STD-1781 (in DPH) - Simple Mail Transfer Protocol (SMTP)

DEPENDENCIES: Transmission Control Protocol

CONTACT: Postel@ISI.EDU

Network News Transfer Protocol ---------------------------- (NNTP)

STATUS: Experimental

SPECIFICATION: RFC 977

COMMENTS:

NNTP specifies a protocol for the distribution, inquiry,
retrieval, and posting of news articles using a reliable
stream-based transmission of news among the Internet community.
NNTP is designed so that news articles are stored in a central
database allowing a subscriber to select only those items he
wishes to read. Indexing, cross-referencing, and expiration of
aged messages are also provided.

Please discuss any plans for implementation or use of this
protocol with the contact.

OTHER REFERENCES:

      DEPENDENCIES: Internet Protocol

      CONTACT: Brian@SDCSVAX.UCSD.EDU

   Post Office Protocol - Version 2 -------------------------- (POP2)

      STATUS: Experimental

      SPECIFICATION: RFC 937 (in DPH)

      COMMENTS:

         The intent of the Post Office Protocol - Version 2 (POP2) is to
         allow a user's workstation to access mail from a mailbox
         server. It is expected that mail will be posted from the
         workstation to the mailbox server via the Simple Mail Transfer
         Protocol (SMTP).

         Please discuss any plans for implementation or use of this
         protocol with the contact.

      OTHER REFERENCES: Obsoletes RFC 918

      DEPENDENCIES: Transmission Control Protocol

      CONTACT: JKReynolds@ISI.EDU

   NetBIOS Services Protocol ------------------------------- (NETBIOS)

      STATUS: Recommended

      SPECIFICATION: RFC 1001, 1002

      COMMENTS:

         These documents define a proposed standard protocol to support
         NetBIOS services in a TCP/IP environment. Both local network
         and internet operation are supported. Various node types are
         defined to accomodate local and internet topologies and to
         allow operation with or without the use of IP broadcast

         RFC 1001 describes the NetBIOS-over-TCP protocols in a general
         manner, with emphasis on the underlying ideas and techniques.
         RFC 1002 gives the detailed specifications of the
         NetBIOS-over-TCP packets, protocols, and defined constants and
         variables.

      OTHER REFERENCES:

      DEPENDENCIES: Transmission Control Protocol, User Datagram
      Protocol

      CONTACT: Auerbach@CSL.SRI.COM

   Bootstrap Protocol --------------------------------------- (BOOTP)

      STATUS: Experimental

      SPECIFICATION: RFC 951

      COMMENTS:

         This proposed protocol provides an IP/UDP bootstrap protocol
         which allows a diskless client machine to discover its own IP
         address, the address of a server host, and the name of a file
         to be loaded into memory and executed.

         Please discuss any plans for implementation or use of this
         protocol with the contact.

      OTHER REFERENCES:

      DEPENDENCIES: Internet Protocol, User Datagram Protocol

      CONTACT: Croft@SUMEX-AIM.STANFORD.EDU

   Loader Debugger Protocol ----------------------------------- (LDP)

      STATUS: Experimental

      SPECIFICATION: RFC 909

      COMMENTS:

         Specifies a protocol for loading, dumping and debugging target
         machines from hosts in a network environment. It is also
         designed to accommodate a variety of target CPU types. It
         provides a powerful set of debugging services, while at the
         same time, it is structured so that a simple subset may be
         implemented in applications like boot loading where efficiency
         and space are at a premium.

         Please discuss any plans for implementation or use of this
         protocol with the contact.

       OTHER REFERENCES:

       DEPENDENCIES: Reliable Data Protocol

       CONTACT: Hinden@BBN.COM

    Resource Location Protocol --------------------------------- (RLP)

       STATUS: Elective

       SPECIFICATION: RFC 887 (in DPH)

       COMMENTS:

          A resource location protocol for use in the Internet. This
          protocol utilizes the User Datagram Protocol (UDP) which in
          turn calls on the Internet Protocol to deliver its datagrams.

       OTHER REFERENCES:

       DEPENDENCIES: User Datagram Protocol

       CONTACT: Accetta@A.CS.CMU.EDU

    Remote Job Entry --- (RJE)

       STATUS: Elective

       SPECIFICATION: RFC 407 (in DPH)

       COMMENTS:

          The general protocol for submitting batch jobs and retrieving
          the results.

          Some changes needed for use with TCP.

          No known active implementations.

       OTHER REFERENCES:

       DEPENDENCIES: File Transfer Protocol, Transmission Control
       Protocol

       CONTACT: Postel@ISI.EDU

    Remote Job Service ------------------------------------- (NETRJS)

        STATUS: Elective

        SPECIFICATION: RFC 740 (in DPH)

        COMMENTS:

            A special protocol for submitting batch jobs and retrieving the
            results used with the UCLA IBM OS system.

            Please discuss any plans for implementation or use of this
            protocol with the contact.

            Revision in progress.

        OTHER REFERENCES:

        DEPENDENCIES: Transmission Control Protocol

        CONTACT: Braden@ISI.EDU

    Remote Telnet Service --------------------------------- (RTELNET)

        STATUS: Elective

        SPECIFICATION: RFC 818 (in DPH)

        COMMENTS:

            Provides special access to user Telnet on a remote system.

        OTHER REFERENCES:

        DEPENDENCIES: Telnet, Transmission Control Protocol

        CONTACT: Postel@ISI.EDU

   Graphics Protocol ------------------------------------- (GRAPHICS)

      STATUS: Elective

      SPECIFICATION: NIC 24308 (in DPH)

      COMMENTS:

         The protocol for vector graphics.

         Very minor changes needed for use with TCP.

         No known active implementations.

         Note: The DPH claims that this is RFC 493, but RFC 493 is
         actually a different earlier specification.

      OTHER REFERENCES:

      DEPENDENCIES: Telnet, Transmission Control Protocol

      CONTACT: Postel@ISI.EDU

   Echo Protocol --- (ECHO)

      STATUS: Recommended

      SPECIFICATION: RFC 862 (in DPH)

      COMMENTS:

         Debugging protocol, sends back whatever you send it.

      OTHER REFERENCES:

      DEPENDENCIES: Transmission Control Protocol
                    or User Datagram Protocol

      CONTACT: Postel@ISI.EDU

   Discard Protocol --------------------------------------- (DISCARD)

      STATUS: Elective

      SPECIFICATION: RFC 863 (in DPH)

      COMMENTS:

         Debugging protocol, throws away whatever you send it.

      OTHER REFERENCES:

      DEPENDENCIES: Transmission Control Protocol
                    or User Datagram Protocol

      CONTACT: Postel@ISI.EDU

   Character Generator Protocol --------------------------- (CHARGEN)

      STATUS: Elective

      SPECIFICATION: RFC 864 (in DPH)

      COMMENTS:

         Debugging protocol, sends you ASCII data.

      OTHER REFERENCES:

      DEPENDENCIES: Transmission Control Protocol
                    or User Datagram Protocol

      CONTACT: Postel@ISI.EDU

   Quote of the Day Protocol ------------------------------- (QUOTE)

      STATUS: Elective

      SPECIFICATION: RFC 865 (in DPH)

      COMMENTS:

         Debugging protocol, sends you a short ASCII message.

      OTHER REFERENCES:

      DEPENDENCIES: Transmission Control Protocol
                    or User Datagram Protocol

      CONTACT: Postel@ISI.EDU

   Statistics Server -------------------------------------- (STATSRV)

      STATUS: Recommended

      SPECIFICATION: RFC 996

      COMMENTS:

         This RFC specifies a standard for the Internet community.
         Hosts and gateways on the Internet that choose to implement a
         remote statistics monitoring facility may use this protocol to
         send statistics data upon request to a monitoring center or
         debugging host.

      OTHER REFERENCES:

      DEPENDENCIES: Internet Protocol

      CONTACT: Mills@UDEL.EDU

    Active Users Protocol ----------------------------------- (USERS)

       STATUS: Elective

       SPECIFICATION: RFC 866 (in DPH)

       COMMENTS:

          Lists the currently active users.

       OTHER REFERENCES:

       DEPENDENCIES: Transmission Control Protocol
                     or User Datagram Protocol

       CONTACT: Postel@ISI.EDU

    Finger Protocol -- (FINGER)

       STATUS: Elective

       SPECIFICATION: RFC 742 (in DPH)

       COMMENTS:

          Provides information on the current or most recent activity of
          a user.

          Some extensions have been suggested.

          Some changes are are needed for TCP.

       OTHER REFERENCES:

       DEPENDENCIES: Transmission Control Protocol

       CONTACT: Postel@ISI.EDU

   WhoIs Protocol -- (NICNAME)

      STATUS: Elective

      SPECIFICATION: RFC 954 (in DPH)

      COMMENTS:

         Accesses the ARPANET Directory database. Provides a way to
         find out about people, their addresses, phone numbers,
         organizations, and mailboxes.

      OTHER REFERENCES:

      DEPENDENCIES: Transmission Control Protocol

      CONTACT: Feinler@SRI-NIC.ARPA

   CSNET Mailbox Name Server Protocol --------------------- (CSNET-NS)

      STATUS: Experimental

      SPECIFICATION: CS-DN-2 (in DPH)

      COMMENTS:

         Provides access to the CSNET data base of users to give
         information about users names, affiliations, and mailboxes.

         Please discuss any plans for implementation or use of this
         protocol with the contact.

      OTHER REFERENCES:

      DEPENDENCIES: Transmission Control Protocol

      CONTACT: Solomon@WISC.EDU

    Domain Name Protocol ----------------------------------- (DOMAIN)

       STATUS: Recommended

       SPECIFICATION: RFC 881, RFC 882, RFC 883 (in DPH)

       COMMENTS:

       OTHER REFERENCES:

          RFC 920 - Domain Requirements

          RFC 921 - Domain Name Implementation Schedule - Revised

          RFC 973 - Domain System Changes and Observations

          RFC 974 - Mail Routing and the Domain System

       DEPENDENCIES: Transmission Control Protocol
                     or User Datagram Protocol

       CONTACT: Mockapetris@ISI.EDU

    HOSTNAME Protocol ------------------------------------- (HOSTNAME)

       STATUS: Elective

       SPECIFICATION: RFC 953 (in DPH)

       COMMENTS:

          Accesses the Registered Internet Hosts database (HOSTS.TXT).
          Provides a way to find out about a host in the Internet, its
          Internet Address, and the protocols it implements.

       OTHER REFERENCES:

          RFC 952 - Host Table Specification

       DEPENDENCIES: Transmission Control Protocol

       CONTACT: Feinler@SRI-NIC.ARPA

   Host Name Server Protocol --------------------------- (NAMESERVER)

      STATUS: Experimental

      SPECIFICATION: IEN 116 (in DPH)

      COMMENTS:

         Provides machine oriented procedure for translating a host name
         to an Internet Address.

         This specification has significant problems: 1) The name
         syntax is out of date. 2) The protocol details are ambiguous,
         in particular, the length octet either does or doesn't include
         itself and the op code. 3) The extensions are not supported by
         any known implementation.

         This protocol is now abandoned in favor of the DOMAIN protocol.
         Further implementations of this protocol are not advised.

         Please discuss any plans for implementation or use of this
         protocol with the contact.

      OTHER REFERENCES:

      DEPENDENCIES: User Datagram Protocol

      CONTACT: Postel@ISI.EDU

   Daytime Protocol -------------------------------------- (DAYTIME)

      STATUS: Elective

      SPECIFICATION: RFC 867 (in DPH)

      COMMENTS:

         Provides the day and time in ASCII character string.

      OTHER REFERENCES:

      DEPENDENCIES: Transmission Control Protocol
                    or User Datagram Protocol

      CONTACT: Postel@ISI.EDU

   Network Time Protocol -------------------------------------- (NTP)

      STATUS: Experimental

      SPECIFICATION: RFC 958

      COMMENTS:

         A proposed protocol for synchronizing a set of network clocks
         using a set of distributed clients and servers.

         Please discuss any plans for implementation or use of this
         protocol with the contact.

      OTHER REFERENCES: RFC 778, RFC 891, RFC 956, and RFC 957.

      DEPENDENCIES: User Datagram Protocol

      CONTACT: Mills@UDEL.EDU

   Time Server Protocol -------------------------------------- (TIME)

      STATUS: Elective

      SPECIFICATION: RFC 868 (in DPH)

      COMMENTS:

         Provides the time as the number of seconds from a specified
         reference time.

      OTHER REFERENCES:

      DEPENDENCIES: Transmission Control Protocol
                    or User Datagram Protocol

      CONTACT: Postel@ISI.EDU

    DCNET Time Server Protocol ------------------------------ (CLOCK)

       STATUS: Experimental

       SPECIFICATION: RFC 778

       COMMENTS:

          Provides a mechanism for keeping synchronized clocks.

          Please discuss any plans for implementation or use of this
          protocol with the contact.

       OTHER REFERENCES:

       DEPENDENCIES: Internet Control Message Protocol

       CONTACT: Mills@UDEL.EDU

    Authentication Service ------------------------------------ (AUTH)

       STATUS: Experimental

       SPECIFICATION: RFC 931

       COMMENTS:

          This server provides a means to determine the identity of a
          user of a particular TCP connection. Given a TCP port number
          pair, it returns a character string which identifies the owner
          of that connection on the server's system.

          Please discuss any plans for implementation or use of this
          protocol with the contact.

       OTHER REFERENCES: Supercedes RFC 912

       DEPENDENCIES: Transmission Control Protocol

       CONTACT: StJohns@SRI-NIC.ARPA

    Authentication Scheme ----------------------------- (COOKIE-JAR)

        STATUS: Experimental

        SPECIFICATION: RFC 1004

        COMMENTS:

            This RFC focuses its discussion on authentication problems in
            the Internet and possible methods of solution.

            Please discuss any plans for implementation or use of this
            protocol with the contact.

        OTHER REFERENCES:

        DEPENDENCIES:

        CONTACT: Mills@UDEL.EDU

    Internet Message Protocol ---------------------------------- (MPM)

        STATUS: Experimental

        SPECIFICATION: RFC 759 (in DPH)

        COMMENTS:

            This is an experimental multimedia mail transfer protocol. The
            implementation is called a Message Processing Module or MPM.

            Please discuss any plans for implementation or use of this
            protocol with the contact.

        OTHER REFERENCES:

            RFC 767 - Structured Document Formats

        DEPENDENCIES: Transmission Control Protocol

        CONTACT: Postel@ISI.EDU

   Network Standard Text Editor ---------------------------- (NETED)

      STATUS: Elective

      SPECIFICATION: RFC 569 (in DPH)

      COMMENTS:

         Describes a simple line editor which could be provided by every
         Internet host.

      OTHER REFERENCES:

      DEPENDENCIES:

      CONTACT: Postel@ISI.EDU

APPENDICES

    Internet Numbers --

        STATUS: None

        SPECIFICATION: RFC 997

        COMMENTS:

            Describes the fields of network numbers and autonomous system
            numbers that are assigned specific values for actual use, and
            lists the currently assigned values.

            Issued March 1987, replaces RFC 990, RFC 790 in IPTW, and
            RFC 960.

        OTHER REFERENCES:

        CONTACT: Hostmaster@SRI-NIC.ARPA

    Assigned Numbers --

        STATUS: None

        SPECIFICATION: RFC 1010

        COMMENTS:

            Describes the fields of various protocols that are assigned
            specific values for actual use, and lists the currently
            assigned values.

            Issued May 1987, replaces RFC 990, RFC 790 in IPTW, and
            RFC 960.

        OTHER REFERENCES:

        CONTACT: JKREYNOLDS@ISI.EDU

   Pre-emption ---

      STATUS: Elective

      SPECIFICATION: RFC 794 (in DPH)

      COMMENTS:

         Describes how to do pre-emption of TCP connections.

      OTHER REFERENCES:

      CONTACT: Postel@ISI.EDU

   Service Mappings ---

      STATUS: None

      SPECIFICATION: RFC 795 (in DPH)

      COMMENTS:

         Describes the mapping of the IP type of service field onto the
         parameters of some specific networks.

         Out of date, needs revision.

      OTHER REFERENCES:

      CONTACT: Postel@ISI.EDU

   Address Mappings ---

      STATUS: None

      SPECIFICATION: RFC 796 (in DPH)

      COMMENTS:

         Describes the mapping between Internet Addresses and the
         addresses of some specific networks.

         Out of date, needs revision.

      OTHER REFERENCES:

      CONTACT: Postel@ISI.EDU

   Document Formats --

      STATUS: None

      SPECIFICATION: RFC 678 (in DPH)

      COMMENTS:

         Describes standard format rules for several types of documents.

      OTHER REFERENCES:

      CONTACT: Postel@ISI.EDU

   Equations Representation ---------------------------------------

      STATUS: None

      SPECIFICATION: RFC 1003

      COMMENTS:

         Identifies and explores issues in defining a standard for the
         exchange of mathematical equations.

      OTHER REFERENCES:

      CONTACT: Katz@ISI.EDU

   Bitmap Formats --

      STATUS: None

      SPECIFICATION: RFC 797 (in DPH)

      COMMENTS:

         Describes a standard format for bitmap data.

      OTHER REFERENCES:

      CONTACT: Postel@ISI.EDU

    Facsimile Formats ---

       STATUS: None

       SPECIFICATION: RFC 804

       COMMENTS:

          Describes a standard format for facsimile data.

       OTHER REFERENCES: RFC 769 (in DPH)

       CONTACT: Postel@ISI.EDU

    Host-Front End Protocol ------------------------------------ (HFEP)

       STATUS: Experimental

       SPECIFICATION: RFC 929

       COMMENTS:

          Please discuss any plans for implementation or use of this
          protocol with the contact.

       OTHER REFERENCES: RFC 928

       DEPENDENCIES:

       CONTACT: Padlipsky@ISI.EDU

    Internet Protocol on ARPANET ----------------------------- (IP-ARPA)

       STATUS: Recommended

       SPECIFICATION: BBN Report 1822

       COMMENTS:

          Describes the interface between a Host and an IMP, and by
          implication the transmission of IP Datagrams over the ARPANET.

       OTHER REFERENCES: RFC 851, RFC 852, RFC 878 (in DPH), RFC 979,
       RFC 1005

       CONTACT: Malis@BBN.COM

    Internet Protocol on WBNET ------------------------------ (IP-WB)

       STATUS: Recommended

       SPECIFICATION: RFC 907 (in DPH)

       COMMENTS:

          Describes a standard for the transmission of IP Datagrams over
          the Wideband Net.

          This protocol specifies the network-access level communication
          between an arbitrary computer, called a host, and a
          packet-switched satellite network, e.g., SATNET or WBNET.

          Note: Implementations of HAP should be performed in
          coordination with satellite network development and operations
          personnel.

       OTHER REFERENCES:

       CONTACT: Blumenthal@BBN.COM

    Internet Protocol on Wideband Network --------------------- (IP-WB)

       STATUS: Recommended

       SPECIFICATION: RFC 907 (in DPH)

       COMMENTS:

          Describes a standard for the transmission of IP Datagrams over
          the WBNET.

          This protocol specifies the network-access level communication
          between an arbitrary computer, called a host, and a
          packet-switched satellite network, e.g., SATNET or WBNET.

          Note: Implementations of HAP should be performed in
          coordination with satellite network development and operations
          personnel.

       OTHER REFERENCES:

       DEPENDENCIES:

       CONTACT: Schoen@BBN.COM

   Internet Protocol on X.25 Networks ---------------------- (IP-X25)

      STATUS: Recommended

      SPECIFICATION: RFC 877 (in DPH)

      COMMENTS:

         Describes a standard for the transmission of IP Datagrams over
         Public Data Networks.

      OTHER REFERENCES:

      CONTACT: jtk@PURDUE.EDU

   Internet Protocol on DC Networks ------------------------- (IP-DC)

      STATUS: Elective

      SPECIFICATION: RFC 891 (in DPH)

      COMMENTS:

      OTHER REFERENCES:

         RFC 778 - DCNET Internet Clock Service

      CONTACT: Mills@UDEL.EDU

   Internet Protocol on Ethernet Networks --------------------- (IP-E)

      STATUS: Recommended

      SPECIFICATION: RFC 894 (in DPH)

      COMMENTS:

      OTHER REFERENCES: RFC 893

      CONTACT: Postel@ISI.EDU

Internet Protocol on Experimental Ethernet Networks -------- (IP-EE)

   STATUS: Recommended

   SPECIFICATION: RFC 895 (in DPH)

   COMMENTS:

   OTHER REFERENCES:

   CONTACT: Postel@ISI.EDU

Internet Protocol on IEEE 802 --------------------------- (IP-IEEE)

   STATUS: Recommended
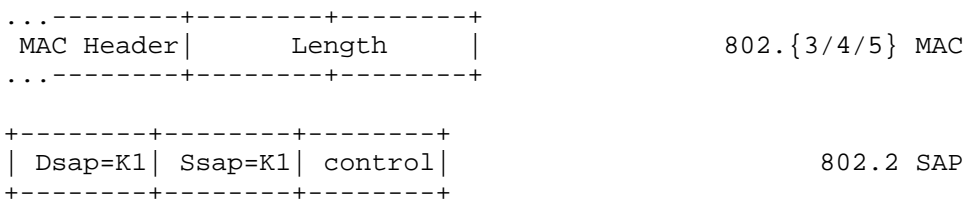
   SPECIFICATION: see comments

   COMMENTS:

      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 sent 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 Address Resolution Protocol (ARP)) on IEEE
      802 networks, the following new policy is established, which
      will replace the current policy (see RFC-990 section on IEEE
      802 Numbers of Interest, and RFC-948).

      The policy is for DDN and Internet community to use 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 RFC-1010 section on Ethernet Numbers of Interest).

```
                                                      Header

        ...--------+--------+--------+
         MAC Header|    Length      |                802.{3/4/5} MAC
        ...--------+--------+--------+

        +--------+--------+--------+
        | Dsap=K1| Ssap=K1| control|                802.2 SAP
        +--------+--------+--------+
```

```
+--------+--------+---------+--------+--------+
|protocol id or org code =K2|   Ether Type  |    802.2 SNAP
+--------+--------+---------+--------+--------+
```

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 like to talk about things in 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).

Note: The method described in RFC 948 (in DPH) is no longer to
be used.

OTHER REFERENCES:

CONTACT: Postel@ISI.EDU

Internet Subnet Protocol -------------------------------- (IP-SUB)

STATUS: Required

SPECIFICATION: RFC 950

COMMENTS:

This is a very important feature and must be included in all IP
implementations.

Specifies procedures for the use of subnets, which are logical
sub-sections of a single Internet network.

OTHER REFERENCES: RFC 940, RFC 917, RFC 925, RFC 932, RFC 936,
RFC 922

DEPENDENCIES:

CONTACT: Mogul@SU-SCORE.STANFORD.EDU

   Address Resolution Protocol ------------------------------- (ARP)

      STATUS: Recommended

      SPECIFICATION: RFC 826 (IN DPH)

      COMMENTS:

         This is a procedure for finding the network hardware address
         corresponding to an Internet Address.

      OTHER REFERENCES:

      CONTACT: Postel@ISI.EDU

   A Reverse Address Resolution Protocol ---------------------- (RARP)

      STATUS: Elective

      SPECIFICATION: RFC 903 (IN DPH)

      COMMENTS:

         This is a procedure for workstations to dynamically find their
         protocol address (e.g., their Internet Address), when they only
         only know their hardware address (e.g., their attached physical
         network address).

      OTHER REFERENCES:

      CONTACT: Mogul@SU-SCORE.STANFORD.EDU

   Multi-LAN Address Resolution Protocol ---------------------- (MARP)

      STATUS: Experimental

      SPECIFICATION: RFC 925

      COMMENTS:

         Discussion of the various problems and potential solutions of
         "transparent subnets" in a multi-LAN environment.

         Please discuss any plans for implementation or use of this
         protocol with the contact.

      OTHER REFERENCES: RFC 917, RFC 826

        DEPENDENCIES:

        CONTACT: Postel@ISI.EDU

    Broadcasting Internet Datagrams ------------------------ (IP-BROAD)

        STATUS: Recommended

        SPECIFICATION: RFC 919

        COMMENTS:

            A proposed protocol of simple rules for broadcasting Internet
            datagrams on local networks that support broadcast, for
            addressing broadcasts, and for how gateways should handle them.

            Recommended in the sense of "if you do broadcasting at all then
            do it this way".

            Please discuss any plans for implementation or use of this
            protocol with the contact.

        OTHER REFERENCES: RFC 922

        DEPENDENCIES:

        CONTACT: Mogul@SU-SCORE.STANFORD.EDU

    Broadcasting Internet Datagrams with Subnets --------- (IP-SUB-BROAD)

        STATUS: Recommended

        SPECIFICATION: RFC 922

        COMMENTS:

            A proposed protocol of simple rules for broadcasting Internet
            datagrams on local networks that support broadcast, for
            addressing broadcasts, and for how gateways should handle them.

            Recommended in the sense of "if you do broadcasting with
            subnets at all then do it this way".

            Please discuss any plans for implementation or use of this
            protocol with the contact.

        OTHER REFERENCES: RFC 919

        DEPENDENCIES:

        CONTACT: Mogul@SU-SCORE.STANFORD.EDU

    Reliable Asynchronous Transfer Protocol -------------------- (RATP)

        STATUS: Experimental

        SPECIFICATION: RFC 916

        COMMENTS:

            This paper specifies a protocol which allows two programs to
            reliably communicate over a communication link. It ensures
            that the data entering one end of the link if received arrives
            at the other end intact and unaltered. This proposed protocol
            is designed to operate over a full duplex point-to-point
            connection. It contains some features which tailor it to the
            RS-232 links now in current use.

            Please discuss any plans for implementation or use of this
            protocol with the contact.

        OTHER REFERENCES:

        DEPENDENCIES: Transmission Control Protocol

        CONTACT: Finn@ISI.EDU

    Thinwire Protocol ------------------------------------- (THINWIRE)

        STATUS: Experimental

        SPECIFICATION: RFC 914

        COMMENTS:

            This paper discusses a Thinwire Protocol for connecting
            personal computers to the Internet. It primarily focuses on
            the particular problems in the Internet of low speed network
            interconnection with personal computers, and possible methods
            of solution.

            Please discuss any plans for implementation or use of this
            protocol with the contact.

        OTHER REFERENCES:

DEPENDENCIES:

CONTACT: Farber@UDEL.EDU

ISO and CCITT PROTOCOLS

   The International Standards Organization (ISO) and the International
   Telegraph and Telephone Consultative Committee (CCITT) are defining a
   set of protocols that may be of interest to the Internet community.
   Some of these have been published as RFCs for information purposes.
   This section lists these protocols.

   End System to Intermediate System Routing Exchange Protocol --------

      STATUS:

      SPECIFICATION: RFC 995

      COMMENTS:

         This protocol is one of a set of International Standards
         produced to facilitate the interconnection of open systems.
         The set of standards covers the services and protocols required
         to achieve such interconnection. This protocol is positioned
         with respect to other related standards by the layers defined
         in the Reference Model for Open Systems Interconnection (ISO
         7498) and by the structure defined in the Internal Organization
         of the Network Layer (DIS 8648). In particular, it is a
         protocol of the Network Layer. This protocol permits End
         Systems and Intermediate Systems to exchange configuration and
         routing information to facilitate the operation of the routing
         and relaying functions of the Network Layer.

      OTHER REFERENCES: RFC 994

      DEPENDENCIES:

      CONTACT: ANSI

   Connectionless Mode Network Service -------------------- (ISO-8473)

      STATUS:

      SPECIFICATION: RFC 994

      COMMENTS:

         This Protocol Standard is one of a set of International
         Standards produced to facilitate the interconnection of open
         systems. The set of standards covers the services and
         protocols required to achieve such interconnection. This

Protocol Standard is positioned with respect to other related
standards by the layers defined in the Reference Model for Open
Systems Interconnection (ISO 7498). In particular, it is a
protocol of the Network Layer. This Protocol may be used
between network-entities in end systems or in Network Layer
relay systems (or both). It provides the Connectionless-mode
Network Service as defined in Addendum 1 to the Network Service
Definition Covering Connectionless-mode Transmission (ISO
8348/AD1).

OTHER REFERENCES: RFC 926

DEPENDENCIES:

CONTACT: ANSI

Internet-IP Addressing in ISO-IP ---------------------------------

STATUS:

SPECIFICATION: RFC 986

COMMENTS:

This RFC suggests a method to allow the existing IP addressing,
including the IP protocol field, to be used for the ISO
Connectionless Network Protocol (CLNP). This is a draft
solution to one of the problems inherent in the use of
"ISO-grams" in the DoD Internet. Related issues will be
discussed in subsequent RFCs. This RFC suggests a proposed
protocol for the Internet community, and requests discussion
and suggestions for improvements.

Please discuss any plans for implementation or use of this
protocol with the contact.

OTHER REFERENCES:

DEPENDENCIES:

CONTACT: RCallon@BBN.COM

    Network Layer Addressing --

        STATUS:

        SPECIFICATION: RFC 941

        COMMENTS:

            This Addendum to the Network Service Definition Standard, ISO
            8348, defines the abstract syntax and semantics of the Network
            Address (Network Service Access Point Address). The Network
            Address defined in this Addendum is the address that appears in
            the primitives of the connection-mode Network Service as the
            calling address, called address, and responding address
            parameters, and in the primitives of the connectionless-mode
            Network Service as the source address and destination
            address parameters.

            Please discuss any plans for implementation or use of this
            protocol with the contact.

        OTHER REFERENCES:

        DEPENDENCIES:

        CONTACT: ISO

    Transport Protocol Specification ----------------------- (ISO-8073)

        STATUS:

        SPECIFICATION: RFC 905

        COMMENTS:

            This is the current specification of the ISO Transport
            Protocol. This document is the text of ISO/TC97/SC16/N1576 as
            corrected by ISO/TC97/SC16/N1695. This is the specification
            currently being voted on in ISO as a Draft International
            Standard (DIS).

        OTHER REFERENCES: RFC 892

        DEPENDENCIES:

        CONTACT: ISO

   ISO Transport Services on Top of the TCP --------------------------

      STATUS:

      SPECIFICATION: RFC 1006

      COMMENTS:

         This memo describes a proposed protocol standard for the
         Internet community. The CCITT and the ISO have defined various
         session, presentation, and application recommendations which
         have been adopted by the international community and numerous
         vendors. To the largest extent possible, it is desirable to
         offer these higher level services directly to the Internet,
         without disrupting existing facilities. This permits users to
         develop expertise with ISO and CCITT applications which
         previously were not available in the Internet. The intention
         is that hosts within the Internet that choose to implement ISO
         TSAP services on top of the TCP be expected to adopt and
         implement this standard. Suggestions for improvement are
         encouraged.

         Please discuss any plans for implementation or use of this
         protocol with the contact.

      OTHER REFERENCES: RFC 983

      DEPENDENCIES:

      CONTACT: DCass@NRTC.NORTHROP.COM

   Mapping Between X.400 and RFC 822 -------------------------- (X.400)

      STATUS:

      SPECIFICATION: RFC 987

      COMMENTS:

         The X.400 series of protocols have been defined by CCITT to
         provide an Interpersonal Messaging Service (IPMS), making use
         of a store and forward Message Transfer Service. It is
         expected that this standard will be implemented very widely.
         This document describes a set of mappings which will enable
         interworking between systems operating the X.400 protocols and
         systems using RFC 822 mail protocol or protocols derived from
         RFC 822.

Please discuss any plans for implementation or use of this
protocol with the contact.

OTHER REFERENCES:

DEPENDENCIES:

CONTACT: Kille@CS.UCL.AC.UK