OFFICIAL ARPA-INTERNET PROTOCOLS

Status of this Memo

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

Introduction

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

   To first order, the official protocols are those in the "Internet
   Protocol Transition Workbook" (IPTW) dated March 1982. There are
   several protocols in use that are not in the IPTW. A few of the
   protocols in the IPTW have been revised. Notably, the mail protocols
   have been revised and issued as a volume titled "Internet Mail
   Protocols" dated November 1982. Telnet and the most useful option
   protocols were issued by the NIC in a booklet entitled "Internet
   Telnet Protocol and Options" (ITP), dated June 1983. Some protocols
   have not been revised for many years, these are found in the old
   "ARPANET Protocol Handbook" (APH) dated January 1978. There is also
   a volume of protocol related information called the "Internet
   Protocol Implementers Guide" (IPIG) dated August 1982.

   This document 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, or
      experimental.

      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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   ARPA mail: JKREYNOLDS@USC-ISIF.ARPA

Overview

    Catenet Model   --

        STATUS: None

        SPECIFICATION: IEN 48 (in IPTW)

        COMMENTS:

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

            Could be revised and expanded.

        OTHER REFERENCES:

            RFC 871 - A Perspective on the ARPANET Reference Model

        DEPENDENCIES:

        CONTACT: Postel@USC-ISIF.ARPA

Network Level

    Internet Protocol (IP) --

        STATUS: Required

        SPECIFICATION: RFC 791 (in IPTW)

        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.

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

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 815 (in IPIG) - IP Datagram Reassembly Algorithms

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

RFC 816 (in IPIG) - Fault Isolation and Recovery

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

MIL-STD-1777 - Military Standard Internet Protocol

DEPENDENCIES:

CONTACT: Postel@USC-ISIF.ARPA

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

STATUS: Required

SPECIFICATION: RFC 792 (in IPTW)

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.

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:

DEPENDENCIES: Internet Protocol

CONTACT: Postel@USC-ISIF.ARPA

Host Level

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

        STATUS: Recommended

        SPECIFICATION: RFC 768 (in IPTW)

        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@USC-ISIF.ARPA

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

        STATUS: Recommended

        SPECIFICATION: RFC 793 (in IPTW)

        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.

            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 if 576. The default TCP Maximum Segement 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 IPIG) - Window and Acknowledgement Strategy in TCP

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

RFC 816 (in IPIG) - Fault Isolation and Recovery

RFC 817 (in IPIG) - 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 - Military Standard Transmission Control Protocol

        DEPENDENCIES: Internet Protocol

        CONTACT: Postel@USC-ISIF.ARPA

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

        STATUS: Elective

        SPECIFICATION: RFC 869

        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-UNIX.ARPA

    Cross Net Debugger (XNET) --

        STATUS: Elective

        SPECIFICATION: IEN 158

        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@USC-ISIF.ARPA

"Stub" Exterior Gateway Protocol ----------------------------------

STATUS: Recommended for Gateways

SPECIFICATION: RFC 888

COMMENTS:

The gateway protocol now under development.

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@USC-ISID.ARPA

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

STATUS: Experimental

SPECIFICATION: RFC 823

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-UNIX.ARPA

Multiplexing Protocol (MUX) --

    STATUS: Experimental

    SPECIFICATION: IEN 90

    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@USC-ISIF.ARPA

Stream Protocol (ST) ---

    STATUS: Experimental

    SPECIFICATION: IEN 119

    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: RFC xxx

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:

DEPENDENCIES: Internet Protocol, Stream Protocol

CONTACT: Casner@USC-ISIB.ARPA

Application Level

Telnet Protocol (TELNET) --

STATUS: Recommended

SPECIFICATION: RFC 854 (in "Internet Telnet Protocol and
Options")

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 - Telnet Protocol and Options (TELNET)

DEPENDENCIES: Transmission Control Protocol

CONTACT: Postel@USC-ISIF.ARPA

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

STATUS: Elective

SPECIFICATION: General description of options: RFC 855
(in "Internet Telnet Protocol and Options")

Number	Name	RFC	NIC	ITP	APH	USE
0	Binary Transmission	856	-----	yes	obs	yes
1	Echo	857	-----	yes	obs	yes
2	Reconnection	...	15391	no	yes	no
3	Suppress Go Ahead	858	-----	yes	obs	yes
4	Approx Message Size Negotiation	...	15393	no	yes	no
5	Status	859	-----	yes	obs	yes
6	Timing Mark	860	-----	yes	obs	yes
7	Remote Controlled Trans and Echo	726	39237	no	yes	no
8	Output Line Width	...	20196	no	yes	no
9	Output Page Size	...	20197	no	yes	no
10	Output Carriage-Return Disposition	652	31155	no	yes	no
11	Output Horizontal Tabstops	653	31156	no	yes	no
12	Output Horizontal Tab Disposition	654	31157	no	yes	no
13	Output Formfeed Disposition	655	31158	no	yes	no
14	Output Vertical Tabstops	656	31159	no	yes	no
15	Output Vertical Tab Disposition	657	31160	no	yes	no
16	Output Linefeed Disposition	658	31161	no	yes	no
17	Extended ASCII	698	32964	no	yes	no
18	Logout	727	40025	no	yes	no
19	Byte Macro	735	42083	no	yes	no
20	Data Entry Terminal	732	41762	no	yes	no
21	SUPDUP	734 736	42213	no	yes	no
22	SUPDUP Output	749	45449	no	no	no
23	Send Location	779	-----	no	no	no
24	Terminal Type	884	-----	no	no	yes
25	End of Record	885	-----	no	no	yes
255	Extended-Options-List	861	-----	yes	obs	yes

                                                (obs = obsolete)

The ITP column indicates if the specification is included in the
Internet Telnet Protocol and Options. The APH column indicates if
the specification is included in the ARPANET 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@USC-ISIF.ARPA

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

STATUS: Recommended

SPECIFICATION: RFC 765 (in IPTW)

COMMENTS:

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

There are a number of minor corrections to be made. A major
change is the deletion of the mail commands, and a major
clarification is needed in the discussion of the management of
the data connection. Also, a suggestion has been made to
include some directory manipulation commands (RFC 775).

Even though the MAIL features are defined in this document,
they are not to be used. The SMTP protocol is to be used for
all mail service in the Internet.

Data Connection Management:

   a. Default Data Connection Ports: All FTP implementations
   must support use of the default data connection ports, and
   only the User-PI may initiate the use of non-default ports.

   b. Negotiating Non-Default Data Ports: The User-PI may
   specify a non-default user side data port with the PORT
   command. The User-PI may request the server side to
   identify a non-default server side data port with the PASV
   command. Since a connection is defined by the pair of

addresses, either of these actions is enough to get a
different data connection, still it is permitted to do both
commands to use new ports on both ends of the data
connection.

c. Reuse of the Data Connection: When using the stream
mode of data transfer the end of the file must be indicated
by closing the connection. This causes a problem if
multiple files are to be transfered in the session, due to
need for TCP to hold the connection record for a time out
period to guarantee the reliable communication. Thus the
connection can not be reopened at once.

   There are two solutions to this problem. The first is to
   negotiate a non-default port (as in (b) above). The
   second is to use another transfer mode.

   A comment on transfer modes. The stream transfer mode is
   inherently unreliable, since one can not determine if the
   connection closed prematurely or not. The other transfer
   modes (Block, Compressed) do not close the connection to
   indicate the end of file. They have enough FTP encoding
   that the data connection can be parsed to determine the
   end of the file. Thus using these modes one can leave
   the data connection open for multiple file transfers.

   Why this was not a problem with the old NCP FTP:

      The NCP was designed with only the ARPANET in mind.
      The ARPANET provides very reliable service, and the
      NCP counted on it. If any packet of data from an NCP
      connection were lost or damaged by the network the NCP
      could not recover. It is a tribute to the ARPANET
      designers that the NCP FTP worked so well.

      The TCP is designed to provide reliable connections
      over many different types of networks and
      interconnections of networks. TCP must cope with a
      set of networks that can not promise to work as well
      as the ARPANET. TCP must make its own provisions for
      end-to-end recovery from lost or damaged packets.
      This leads to the need for the connection phase-down
      time-out. The NCP never had to deal with
      acknowledgements or retransmissions or many other
      things the TCP must do to make connection reliable in
      a more complex world.

      LIST and NLST:

There is some confusion about the LIST an NLST commands, and
what is appropriate to return. Some clarification and
motivation for these commands should be added to the
specification.

   OTHER REFERENCES:

      RFC 678 - Document File Format Standards

      MIL-STD-1780 - File Transfer Protocol (FTP)

   DEPENDENCIES: Transmission Control Protocol

   CONTACT: Postel@USC-ISIF.ARPA

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

   STATUS: Elective

   SPECIFICATION: RFC 783 (in IPTW)

   COMMENTS:

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

      No known problems with this specification. This is in use in
      several local networks.

   OTHER REFERENCES:

   DEPENDENCIES: User Datagram Protocol

   CONTACT: Postel@USC-ISIF.ARPA

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

   STATUS: Recommended

   SPECIFICATION: RFC 821 (in "Internet Mail Protocols")

   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 [ISIF]<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.

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

DEPENDENCIES: Transmission Control Protocol

CONTACT: Postel@USC-ISIF.ARPA

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

STATUS: Elective

SPECIFICATION: RFC 887

COMMENTS:

A resource location protocol for use in the ARPA-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@CMU-CS-A.ARPA

Remote Job Entry (RJE) --

   STATUS: Elective

   SPECIFICATION: RFC 407 (in APH)

   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@USC-ISIF.ARPA

Remote Job Service (NETRJS) --

   STATUS: Elective

   SPECIFICATION: RFC 740 (in APH)

   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@USC-ISIA.ARPA

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

    STATUS: Elective

    SPECIFICATION: RFC 818

    COMMENTS:

       Provides special access to user Telnet on a remote system.

    OTHER REFERENCES:

    DEPENDENCIES: Telnet, Transmission Control Protocol

    CONTACT: Postel@USC-ISIF.ARPA

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

    STATUS: Elective

    SPECIFICATION: NIC 24308 (in APH)

    COMMENTS:

       The protocol for vector graphics.

       Very minor changes needed for use with TCP.

       No known active implementations.

    OTHER REFERENCES:

    DEPENDENCIES: Telnet, Transmission Control Protocol

    CONTACT: Postel@USC-ISIF.ARPA

Echo Protocol (ECHO) ---

   STATUS: Recommended

   SPECIFICATION: RFC 862

   COMMENTS:

      Debugging protocol, sends back whatever you send it.

   OTHER REFERENCES:

   DEPENDENCIES: Transmission Control Protocol
                 or User Datagram Protocol

   CONTACT: Postel@USC-ISIF.ARPA

Discard Protocol (DISCARD) --

   STATUS: Elective

   SPECIFICATION: RFC 863

   COMMENTS:

      Debugging protocol, throws away whatever you send it.

   OTHER REFERENCES:

   DEPENDENCIES: Transmission Control Protocol
                 or User Datagram Protocol

   CONTACT: Postel@USC-ISIF.ARPA

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

   STATUS: Elective

   SPECIFICATION: RFC 864

   COMMENTS:

      Debugging protocol, sends you ASCII data.

   OTHER REFERENCES:

   DEPENDENCIES: Transmission Control Protocol
                 or User Datagram Protocol

    CONTACT: Postel@USC-ISIF.ARPA

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

    STATUS: Elective

    SPECIFICATION: RFC 865

    COMMENTS:

       Debugging protocol, sends you a short ASCII message.

    OTHER REFERENCES:

    DEPENDENCIES: Transmission Control Protocol
                  or User Datagram Protocol

    CONTACT: Postel@USC-ISIF.ARPA

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

    STATUS: Elective

    SPECIFICATION: RFC 866

    COMMENTS:

       Lists the currently active users.

    OTHER REFERENCES:

    DEPENDENCIES: Transmission Control Protocol
                  or User Datagram Protocol

    CONTACT: Postel@USC-ISIF.ARPA

  Finger Protocol (FINGER) --

    STATUS: Elective

    SPECIFICATION: RFC 742 (in APH)

    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@USC-ISIF.ARPA

WhoIs Protocol (NICNAME) ---

STATUS: Elective

SPECIFICATION: RFC 812 (in IPTW)

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

Domain Name Protocol (DOMAIN)

STATUS: Experimental

SPECIFICATION: RFC 881, 882, 883

COMMENTS:

OTHER REFERENCES:

RFC 897 - Domain Name Implementation Schedule

DEPENDENCIES: Transmission Control Protocol

CONTACT: Mockapetris@USC-ISIF.ARPA

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

STATUS: Elective

SPECIFICATION: RFC 811 (in IPTW)

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 810 - Host Table Specification

DEPENDENCIES: Transmission Control Protocol

CONTACT: Feinler@SRI-NIC.ARPA

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

STATUS: Experimental

SPECIFICATION: IEN 116 (in IPTW)

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.

Work is in progress on a significant revision. 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@USC-ISIF.ARPA

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

    STATUS: Experimental

    SPECIFICATION: CS-DN-2

    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@UWISC.ARPA

Daytime Protocol (DAYTIME) --

    STATUS: Elective

    SPECIFICATION: RFC 867

    COMMENTS:

        Provides the day and time in ASCII character string.

    OTHER REFERENCES:

    DEPENDENCIES: Transmission Control Protocol
                  or User Datagram Protocol

    CONTACT: Postel@USC-ISIF.ARPA

Time Server Protocol (TIME) ---

    STATUS: Recommended

    SPECIFICATION: RFC 868

    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@USC-ISIF.ARPA

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

       STATUS: Elective

       SPECIFICATION: RFC 778

       COMMENTS:

          Provides a mechanism for keeping synchronized clocks.

       OTHER REFERENCES:

       DEPENDENCIES: Internet Control Message Protocol

       CONTACT: Mills@USC-ISID.ARPA

   SUPDUP Protocol (SUPDUP) ---

       STATUS: Elective

       SPECIFICATION: RFC 734 (in APH)

       COMMENTS:

          A special Telnet like protocol for display terminals.

       OTHER REFERENCES:

       DEPENDENCIES: Transmission Control Protocol

       CONTACT: Admin.MRC@SU-SCORE.ARPA

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

    STATUS: Experimental

    SPECIFICATION: RFC 759

    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@USC-ISIF.ARPA

Post Office Protocol (POP) --

    STATUS: Experimental

    SPECIFICATION: RFC xxx

    COMMENTS:

        This is an experimental procedure for accessing mailbox
        services from personal workstations.

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

    OTHER REFERENCES:

    DEPENDENCIES: Transmission Control Protocol

    CONTACT: Postel@USC-ISIF.ARPA

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

      STATUS: Elective

      SPECIFICATION: RFC 569

      COMMENTS:

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

      OTHER REFERENCES:

      DEPENDENCIES:

      CONTACT: Postel@USC-ISIF.ARPA

Appendices

   Assigned Numbers ---

      STATUS: None

      SPECIFICATION: RFC 900

      COMMENTS:

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

         Issued June 1984, replaces RFC 870, RFC 790 in IPTW, and
         RFC 820 of January 1983.

      OTHER REFERENCES:

      CONTACT: JKReynolds@USC-ISIF.ARPA

   Pre-emption ---

      STATUS: Elective

      SPECIFICATION: RFC 794 (in IPTW)

      COMMENTS:

         Describes how to do pre-emption of TCP connections.

      OTHER REFERENCES:

      CONTACT: Postel@USC-ISIF.ARPA

   Service Mappings --

      STATUS: None

      SPECIFICATION: RFC 795 (in IPTW)

      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@USC-ISIF.ARPA

   Address Mappings --

      STATUS: None

      SPECIFICATION: RFC 796 (in IPTW)

      COMMENTS:

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

         Out of date, needs revision.

      OTHER REFERENCES:

      CONTACT: Postel@USC-ISIF.ARPA

Internet Protocol on X.25 Networks --------------------------------

    STATUS: Recommended

    SPECIFICATION: RFC 877

    COMMENTS:

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

    OTHER REFERENCES:

    CONTACT: jtk@PURDUE.ARPA

Internet Protocol on DC Networks ----------------------------------

    STATUS: Elective

    SPECIFICATION: RFC 891

    COMMENTS:

    OTHER REFERENCES:

        RFC 778 - DCNET Internet Clock Service

    CONTACT: Mills@USC-ISID.ARPA

Internet Protocol on Ethernet Networks ----------------------------

    STATUS: Recommended

    SPECIFICATION: RFC 894

    COMMENTS:

    OTHER REFERENCES:

        RFC 893

    CONTACT: Postel@USC-ISIF.ARPA

Internet Protocol on Experimental Ethernet Networks ----------------

    STATUS: Recommended

    SPECIFICATION: RFC 895

    COMMENTS:

    OTHER REFERENCES:

    CONTACT: Postel@USC-ISIF.ARPA

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

    STATUS: Recommended

    SPECIFICATION: RFC 826

    COMMENTS:

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

    OTHER REFERENCES:

    CONTACT: Postel@USC-ISIF.ARPA