INTERNET OFFICIAL PROTOCOL STANDARDS

Status of this Memo

   This memo describes the state of standardization of protocols used in
   the Internet as determined by the Internet Architecture Board (IAB).
   This memo is an Internet Standard. Distribution of this memo is
   unlimited.

Copyright Notice

Table of Contents

Introduction

   A discussion of the standardization process and the RFC document
   series is presented first, followed by an explanation of the terms.
   Sections 6.2 - 6.10 contain the lists of protocols in each stage of
   standardization. Finally, there are pointers to references and
   contacts for further information.

   This memo is intended to be issued every one hundred RFCs; please be
   sure the copy you are reading is current. Current copies may be
   obtained from the Requests for Comments Editor (RFC-EDITOR) or from
   the Internet Assigned Numbers Authority (IANA) (see the contact
   information at the end of this memo).

   See Section 6.1 for a description of recent changes. In the official
   lists in sections 6.2 - 6.10, an asterisk (*) next to a protocol
   denotes that it is new to this document or has been moved from one
   protocol level to another, or differs from the previous edition of
   this document.

1. The Standardization Process

   The Internet Architecture Board maintains this list of documents that
   define standards for the Internet protocol suite. See RFC-1601 for
   the charter of the IAB and RFC-1160 for an explanation of the role
   and organization of the IAB and its subsidiary groups, the Internet
   Engineering Task Force (IETF) and the Internet Research Task Force
   (IRTF). Each of these groups has a steering group called the IESG
   and IRSG, respectively. The IETF develops these standards with the
   goal of co-ordinating the evolution of the Internet protocols; this
   co-ordination has become quite important as the Internet protocols
   are increasingly in general commercial use. The definitive
   description of the Internet standards process is found in RFC-2026.

   The majority of Internet protocol development and standardization
   activity takes place in the working groups of the IETF.

   Protocols which are to become standards in the Internet go through a
   series of states or maturity levels (proposed standard, draft
   standard, and standard) involving increasing amounts of scrutiny and
   testing. When a protocol completes this process it is assigned a STD
   number (see RFC-1311). At each step, the Internet Engineering
   Steering Group (IESG) of the IETF must make a recommendation for
   advancement of the protocol.

   To allow time for the Internet community to consider and react to
   standardization proposals, a minimum delay of 6 months before a
   proposed standard can be advanced to a draft standard and 4 months
   before a draft standard can be promoted to standard.

   It is general practice that no proposed standard can be promoted to
   draft standard without at least two independent implementations (and
   the recommendation of the IESG). Promotion from draft standard to
   standard generally requires operational experience and demonstrated
   interoperability of two or more implementations (and the
   recommendation of the IESG).

   In cases where there is uncertainty as to the proper decision
   concerning a protocol a special review committee may be appointed
   consisting of experts from the IETF, IRTF and the IAB with the
   purpose of recommending an explicit action.

   Advancement of a protocol to proposed standard is an important step
   since it marks a protocol as a candidate for eventual standardization
   (it puts the protocol "on the standards track"). Advancement to
   draft standard is a major step which warns the community that, unless
   major objections are raised or flaws are discovered, the protocol is
   likely to be advanced to standard.

Some protocols have been superseded by better ones or are otherwise
unused. Such protocols are still documented in this memorandum with
the designation "historic".

Because it is useful to document the results of early protocol
research and development work, some of the RFCs document protocols
which are still in an experimental condition. The protocols are
designated "experimental" in this memorandum. They appear in this
report as a convenience to the community and not as evidence of their
standardization.

Other protocols, such as those developed by other standards
organizations, or by particular vendors, may be of interest or may be
recommended for use in the Internet. The specifications of such
protocols may be published as RFCs for the convenience of the
Internet community. These protocols are labeled "informational" in
this memorandum.

In addition to the working groups of the IETF, protocol development
and experimentation may take place as a result of the work of the
research groups of the Internet Research Task Force, or the work of
other individuals interested in Internet protocol development. The
the documentation of such experimental work in the RFC series is
encouraged, but none of this work is considered to be on the track
for standardization until the IESG has made a recommendation to
advance the protocol to the proposed standard state.

A few protocols have achieved widespread implementation without the
approval of the IESG. For example, some vendor protocols have become
very important to the Internet community even though they have not
been recommended by the IESG. However, the IAB strongly recommends
that the standards process be used in the evolution of the protocol
suite to maximize interoperability (and to prevent incompatible
protocol requirements from arising). The use of the terms
"standard", "draft standard", and "proposed standard" are reserved in
any RFC or other publication of Internet protocols to only those
protocols which the IESG has approved.

In addition to a state (like "Proposed Standard"), a protocol is also
assigned a status, or requirement level, in this document. The
possible requirement levels ("Required", "Recommended", "Elective",
"Limited Use", and "Not Recommended") are defined in Section 4.2.
When a protocol is on the standards track, that is in the proposed
standard, draft standard, or standard state (see Section 5), the
status shown in Section 6 is the current status.

Few protocols are required to be implemented in all systems; this is
because there is such a variety of possible systems, for example,
gateways, routers, terminal servers, workstations, and multi-user
hosts. The requirement level shown in this document is only a one
word label, which may not be sufficient to characterize the
implementation requirements for a protocol in all situations. For
some protocols, this document contains an additional status paragraph
(an applicability statement). In addition, more detailed status
information may be contained in separate requirements documents (see
Section 3).

2. The Request for Comments Documents

   The documents called Request for Comments (or RFCs) are the working
   notes of the "Network Working Group", that is the Internet research
   and development community. A document in this series may be on
   essentially any topic related to computer communication, and may be
   anything from a meeting report to the specification of a standard.

   Notice:

      All standards are published as RFCs, but not all RFCs specify
      standards.

   Anyone can submit a document for publication as an RFC. Submissions
   must be made via electronic mail to the RFC Editor (see the contact
   information at the end of this memo, and see RFC 2223).

   While RFCs are not refereed publications, they do receive technical
   review from the task forces, individual technical experts, or the RFC
   Editor, as appropriate.

   The RFC series comprises a wide range of documents, ranging from
   informational documents of general interests to specifications of
   standard Internet protocols. In cases where submission is intended
   to document a proposed standard, draft standard, or standard
   protocol, the RFC Editor will publish the document only with the
   approval of the IESG. For documents describing experimental work,
   the RFC Editor will notify the IESG before publication, allowing for
   the possibility of review by the relevant IETF working group or IRTF
   research group and provide those comments to the author. See Section
   5.1 for more detail.

   Once a document is assigned an RFC number and published, that RFC is
   never revised or re-issued with the same number. There is never a
   question of having the most recent version of a particular RFC.
   However, a protocol (such as File Transfer Protocol (FTP)) may be
   improved and re-documented many times in several different RFCs. It

   is important to verify that you have the most recent RFC on a
   particular protocol. This "Internet Official Protocol Standards"
   memo is the reference for determining the correct RFC for the current
   specification of each protocol.

   The RFCs are available from the RFC-EDITOR, and a number of other
   sites. For more information about obtaining RFCs, see Sections 7.4
   and 7.5.

3. Other Reference Documents

   There are three other reference documents of interest in checking the
   current status of protocol specifications and standardization. These
   are the Assigned Numbers, the Gateway Requirements, and the Host
   Requirements. Note that these documents are revised and updated at
   different times; in case of differences between these documents, the
   most recent must prevail.

   Also, one should be aware of the MIL-STD publications on IP, TCP,
   Telnet, FTP, and SMTP. These are described in Section 3.4.

3.1. Assigned Numbers

   The "Assigned Numbers" document lists the assigned values of the
   parameters used in the various protocols. For example, IP protocol
   codes, TCP port numbers, Telnet Option Codes, ARP hardware types, and
   Terminal Type names. Assigned Numbers was most recently issued as
   RFC-1700.

3.2. Requirements for IP Version 4 Routers

   This document reviews the specifications that apply to gateways and
   supplies guidance and clarification for any ambiguities.
   Requirements for IP Version 4 Routers is RFC-1812.

3.3. Host Requirements

   This pair of documents reviews and updates the specifications that
   apply to hosts, and it supplies guidance and clarification for any
   ambiguities. Host Requirements was issued as RFC-1122 and RFC-1123.

3.4. The MIL-STD Documents

   The DoD MIL-STD Internet specifications are out of date and have been
   discontinued. The DoD's Joint Technical Architecture (JTA) lists the
   current set of IETF STDs and RFCs that the DoD intends to use in all
   new and upgraded Command, Control, Communications, Computers, and
   Intelligence (C4I) acquisitions. A copy of the JTA can be obtained
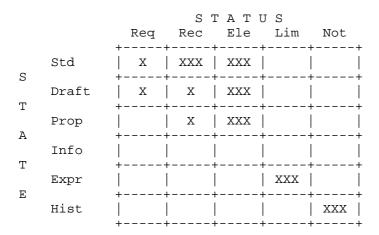
from http://www-jta.itsi.disa.mil.

4. Explanation of Terms

   There are two independent categorization of protocols. The first is
   the "maturity level" or STATE of standardization, one of "standard",
   "draft standard", "proposed standard", "experimental",
   "informational" or "historic". The second is the "requirement level"
   or STATUS of this protocol, one of "required", "recommended",
   "elective", "limited use", or "not recommended".

   The status or requirement level is difficult to portray in a one word
   label. These status labels should be considered only as an
   indication, and a further description, or applicability statement,
   should be consulted.

   When a protocol is advanced to proposed standard or draft standard,
   it is labeled with a current status.

   At any given time a protocol occupies a cell of the following matrix.
   Protocols are likely to be in cells in about the following
   proportions (indicated by the relative number of Xs). A new protocol
   is most likely to start in the (proposed standard, elective) cell, or
   the (experimental, limited use) cell.

```
                          S T A T U S
                     Req   Rec   Ele   Lim   Not
                   +-----+-----+-----+-----+-----+
           Std     |  X  | XXX | XXX |     |     |
       S           +-----+-----+-----+-----+-----+
           Draft   |  X  |  X  | XXX |     |     |
       T           +-----+-----+-----+-----+-----+
           Prop    |     |  X  | XXX |     |     |
       A           +-----+-----+-----+-----+-----+
           Info    |     |     |     |     |     |
       T           +-----+-----+-----+-----+-----+
           Expr    |     |     |     | XXX |     |
       E           +-----+-----+-----+-----+-----+
           Hist    |     |     |     |     | XXX |
                   +-----+-----+-----+-----+-----+
```

   What is a "system"?

      Some protocols are particular to hosts and some to gateways; a few
      protocols are used in both. The definitions of the terms below
      will refer to a "system" which is either a host or a gateway (or
      both). It should be clear from the context of the particular
      protocol which types of systems are intended.

4.1. Definitions of Protocol State

   Every protocol listed in this document is assigned to a "maturity
   level" or STATE of standardization: "standard", "draft standard",
   "proposed standard", "experimental", or "historic".

   4.1.1. Standard Protocol

      The IESG has established this as an official standard protocol for
      the Internet. These protocols are assigned STD numbers (see RFC-
      1311). These are separated into two groups: (1) IP protocol and
      above, protocols that apply to the whole Internet; and (2)
      network-specific protocols, generally specifications of how to do
      IP on particular types of networks.

   4.1.2. Draft Standard Protocol

      The IESG is actively considering this protocol as a possible
      Standard Protocol. Substantial and widespread testing and comment
      are desired. Comments and test results should be submitted to the
      IESG. There is a possibility that changes will be made in a Draft
      Standard Protocol before it becomes a Standard Protocol.

   4.1.3. Proposed Standard Protocol

      These are protocol proposals that may be considered by the IESG
      for standardization in the future. Implementation and testing by
      several groups is desirable. Revision of the protocol
      specification is likely.

   4.1.4. Experimental Protocol

      A system should not implement an experimental protocol unless it
      is participating in the experiment and has coordinated its use of
      the protocol with the developer of the protocol.

      Typically, experimental protocols are those that are developed as
      part of an ongoing research project not related to an operational
      service offering. While they may be proposed as a service
      protocol at a later stage, and thus become proposed standard,
      draft standard, and then standard protocols, the designation of a
      protocol as experimental may sometimes be meant to suggest that
      the protocol, although perhaps mature, is not intended for
      operational use.

   4.1.5. Informational Protocol

      Protocols developed by other standard organizations, or vendors,
      or that are for other reasons outside the purview of the IESG, may
      be published as RFCs for the convenience of the Internet community
      as informational protocols.

   4.1.6. Historic Protocol

      These are protocols that are unlikely to ever become standards in
      the Internet either because they have been superseded by later
      developments or due to lack of interest.

4.2. Definitions of Protocol Status

      This document lists a "requirement level" or STATUS for each
      protocol. The status is one of "required", "recommended",
      "elective", "limited use", or "not recommended".

   4.2.1. Required Protocol

      A system must implement the required protocols.

   4.2.2. Recommended Protocol

      A system should implement the recommended protocols.

   4.2.3. Elective Protocol

      A system may or may not implement an elective protocol. The
      general notion is that if you are going to do something like this,
      you must do exactly this. There may be several elective protocols
      in a general area, for example, there are several electronic mail
      protocols, and several routing protocols.

   4.2.4. Limited Use Protocol

      These protocols are for use in limited circumstances. This may be
      because of their experimental state, specialized nature, limited
      functionality, or historic state.

   4.2.5. Not Recommended Protocol

      These protocols are not recommended for general use. This may be
      because of their limited functionality, specialized nature, or
      experimental or historic state.

5. The Standards Track

   This section discusses in more detail the procedures used by the RFC
   Editor and the IESG in making decisions about the labeling and
   publishing of protocols as standards.

5.1. The RFC Processing Decision Table

   Here is the current decision table for processing submissions by the
   RFC Editor. The processing depends on who submitted it, and the
   status they want it to have.

```
+==============================================================+
|**************|                 S O U R C E                  |
+==============================================================+
| Desired      |   IAB   |   IESG  |   IRSG  |   Other  |
| Status       |         |         |         |          |
+==============================================================+
|              |         |         |         |          |
| Standard     |  Bogus  | Publish |  Bogus  |  Bogus   |
| or           |   (2)   |   (1)   |   (2)   |   (2)    |
| Draft        |         |         |         |          |
| Standard     |         |         |         |          |
+--------------+---------+---------+---------+----------+
|              |         |         |         |          |
|              |  Refer  | Publish |  Refer  |  Refer   |
| Proposed     |   (3)   |   (1)   |   (3)   |   (3)    |
| Standard     |         |         |         |          |
|              |         |         |         |          |
+--------------+---------+---------+---------+----------+
|              |         |         |         |          |
|              |  Notify | Publish |  Notify |  Notify  |
| Experimental |   (4)   |   (1)   |   (4)   |   (4)    |
| Protocol     |         |         |         |          |
|              |         |         |         |          |
+--------------+---------+---------+---------+----------+
|              |         |         |         |          |
| Information  | Publish | Publish |Discretion|Discretion|
| or Opinion   |   (1)   |   (1)   |   (5)   |   (5)    |
| Paper        |         |         |         |          |
|              |         |         |         |          |
+==============================================================+
```

   (1) Publish.

   (2) Bogus. Inform the source of the rules. RFCs specifying
       Standard, or Draft Standard must come from the IESG, only.

      (3) Refer to an Area Director for review by a WG. Expect to see
          the document again only after approval by the IESG.

      (4) Notify both the IESG and IRSG. If no concerns are raised in
          two weeks then do Discretion (5), else RFC Editor to resolve
          the concerns or do Refer (3).

      (5) RFC Editor's discretion. The RFC Editor decides if a review
          is needed and if so by whom. RFC Editor decides to publish or
          not.

   Of course, in all cases the RFC Editor can request or make minor
   changes for style, format, and presentation purposes.

   The IESG has designated the IESG Secretary as its agent for
   forwarding documents with IESG approval and for registering concerns
   in response to notifications (4) to the RFC Editor. Documents from
   Area Directors or Working Group Chairs may be considered in the same
   way as documents from "other".

5.2. The Standards Track Diagram

   There is a part of the STATUS and STATE categorization that is called
   the standards track. Actually, only the changes of state are
   significant to the progression along the standards track, though the
   status assignments may change as well.

   The states illustrated by single line boxes are temporary states,
   those illustrated by double line boxes are long term states. A
   protocol will normally be expected to remain in a temporary state for
   several months (minimum six months for proposed standard, minimum
   four months for draft standard). A protocol may be in a long term
   state for many years.

   A protocol may enter the standards track only on the recommendation
   of the IESG; and may move from one state to another along the track
   only on the recommendation of the IESG. That is, it takes action by
   the IESG to either start a protocol on the track or to move it along.

   Generally, as the protocol enters the standards track a decision is
   made as to the eventual STATUS, requirement level or applicability
   (elective, recommended, or required) the protocol will have, although
   a somewhat less stringent current status may be assigned, and it then
   is placed in the the proposed standard STATE with that status. So
   the initial placement of a protocol is into state 1. At any time the
   STATUS decision may be revisited.

```
        |
        +<-------------------------------------------+
        |                                            ^
        V   0                                        |   4
  +----------+                            +==========+
  |  enter   |-->--------------+------------->|experiment |
  +----------+                 |            +=====+=====+
                               |                  |
                               V   1              |
                         +----------+             V
                         | proposed |------------->+
                   +--->+-----+-----+             |
                   |     |     |                  |
                   |     V   2                    |
                   +<---+-----+-----+             V
                         | draft std |------------->+
                   +--->+-----+-----+             |
                   |     |     |                  |
                   |     V   3                    |
                   +<---+=====+=====+             V
                         | standard |------------->+
                         +=====+=====+             |
                                                   |
                                                   V   5
                                            +=====+=====+
                                            | historic  |
                                            +==========+
```

The transition from proposed standard (1) to draft standard (2) can
only be by action of the IESG and only after the protocol has been
proposed standard (1) for at least six months.

The transition from draft standard (2) to standard (3) can only be by
action of the IESG and only after the protocol has been draft
standard (2) for at least four months.

Occasionally, the decision may be that the protocol is not ready for
standardization and will be assigned to the experimental state (4).
This is off the standards track, and the protocol may be resubmitted
to enter the standards track after further work. There are other
paths into the experimental and historic states that do not involve
IESG action.

Sometimes one protocol is replaced by another and thus becomes
historic, or it may happen that a protocol on the standards track is
in a sense overtaken by another protocol (or other events) and
becomes historic (state 5).

6. The Protocols

     Subsection 6.1 lists recent RFCs and other changes. Subsections 6.2
     - 6.10 list the standards in groups by protocol state.

6.1. Recent Changes

6.1.1. New RFCs:

     2428 - FTP Extensions for IPv6 and NATs

             A Proposed Standard protocol.

     2427 - Multiprotocol Interconnect over Frame Relay

             A Standard protocol.

     2426 - vCard MIME Directory Profile

             A Proposed Standard protocol.

     2425 - A MIME Content-Type for Directory Information

             A Proposed Standard protocol.

     2424 - Content Duration MIME Header Definition

             A Proposed Standard protocol.

     2423 - VPIM Voice Message MIME Sub-type Registration

             A Proposed Standard protocol.

     2422 - Toll Quality Voice - 32 kbit/s ADPCM MIME Sub-type
            Registration

             A Proposed Standard protocol.

     2421 - Voice Profile for Internet Mail - version 2

             A Proposed Standard protocol.

     2420 - The PPP Triple-DES Encryption Protocol (3DESE)

             A Proposed Standard protocol.

     2419 - The PPP DES Encryption Protocol, Version 2 (DESE-bis)

            A Proposed Standard protocol.

     2418 - IETF Working Group Guidelines and Procedures

            This is a Best Current Practices document and does not
            specify any level of standard.

     2417 - Definitions of Managed Objects for Multicast over UNI
            3.0/3.1 based ATM Network

            A Proposed Standard protocol.

     2416 - When TCP Starts Up With Four Packets Into Only Three
            Buffers

            This is an information document and does not specify any
            level of standard.

     2415 - Simulation Studies of Increased Initial TCP Window Size

            This is an information document and does not specify any
            level of standard.

     2414 - Increasing TCP's Initial Window

            An Experimental protocol.

     2413 - Dublin Core Metadata for Resource Discovery

            This is an information document and does not specify any
            level of standard.

     2412 - Not yet issued.

     2411 - Not yet issued.

     2410 - Not yet issued.

     2409 - Not yet issued.

     2408 - Not yet issued.

     2407 - Not yet issued.

      2406 - Not yet issued.

      2405 - Not yet issued.

      2404 - Not yet issued.

      2403 - Not yet issued.

      2402 - Not yet issued.

      2401 - Not yet issued.

      2400 - This memo.

      2399 - Not yet issued.

      2398 - Some Testing Tools for TCP Implementors

             This is an information document and does not specify any
             level of standard.

      2397 - The "data" URL scheme

             A Proposed Standard protocol.

      2396 - Uniform Resource Identifiers (URI): Generic Syntax

             A Draft Standard protocol.

      2395 - Not yet issued.

      2394 - Not yet issued.

      2393 - Not yet issued.

      2392 - Content-ID and Message-ID Uniform Resource Locators

             A Proposed Standard protocol.

      2391 - Load Sharing using IP Network Address Translation (LSNAT)

             This is an information document and does not specify any
             level of standard.

      2390 - Inverse Address Resolution Protocol

             A Draft Standard protocol.

2389 - Feature negotiation mechanism for the File Transfer
       Protocol

       A Proposed Standard protocol.

2388 - Returning Values from Forms: multipart/form-data

       A Proposed Standard protocol.

2387 - The MIME Multipart/Related Content-type

       A Proposed Standard protocol.

2386 - A Framework for QoS-based Routing in the Internet

       This is an information document and does not specify any
       level of standard.

2385 - Protection of BGP Sessions via the TCP MD5 Signature Option

       A Proposed Standard protocol.

2384 - POP URL Scheme

       A Proposed Standard protocol.

2383 - ST2+ over ATM Protocol Specification - UNI 3.1 Version

       This is an information document and does not specify any
       level of standard.

2382 - A Framework for Integrated Services and RSVP over ATM

       This is an information document and does not specify any
       level of standard.

2381 - Interoperation of Controlled-Load Service and Guaranteed
       Service with ATM

       A Proposed Standard protocol.

2380 - RSVP over ATM Implementation Requirements

       A Proposed Standard protocol.

      2379 - RSVP over ATM Implementation Guidelines

             This is a Best Current Practices document and does not
             specify any level of standard.

      2378 - Not yet issued.

      2377 - Not yet issued.

      2376 - XML Media Types

             This is an information document and does not specify any
             level of standard.

      2375 - IPv6 Multicast Address Assignments

             This is an information document and does not specify any
             level of standard.

      2374 - An IPv6 Aggregatable Global Unicast Address Format

             A Proposed Standard protocol.

      2373 - IP Version 6 Addressing Architecture

             A Proposed Standard protocol.

      2372 - Transaction Internet Protocol - Requirements and
             Supplemental Information

             This is an information document and does not specify any
             level of standard.

      2371 - Transaction Internet Protocol Version 3.0

             A Proposed Standard protocol.

      2370 - The OSPF Opaque LSA Option

             A Proposed Standard protocol.

      2369 - The Use of URLs as Meta-Syntax for Core Mail List Commands
             and their Transport through Message Header Field

             A Proposed Standard protocol.

   2368 - The mailto URL scheme

         A Proposed Standard protocol.

   2367 - PF_KEY Key Management API, Version 2

         This is an information document and does not specify any
         level of standard.

   2366 - Definitions of Managed Objects for Multicast over UNI
          3.0/3.1 based ATM Networks

         A Proposed Standard protocol.

   2365 - Administratively Scoped IP Multicast

         This is a Best Current Practices document and does not
         specify any level of standard.

   2364 - PPP Over AAL

         A Proposed Standard protocol.

   2363 - PPP Over FUNI

         A Proposed Standard protocol.

   2362 - Protocol Independent Multicast-Sparse Mode (PIM-SM):
          Protocol Specification

         An Experimental protocol.

   2361 - WAVE and AVI Codec Registries

         This is an information document and does not specify any
         level of standard.

   2360 - Guide for Internet Standards Writers

         This is a Best Current Practices document and does not
         specify any level of standard.

   2359 - IMAP4 UIDPLUS extension

         A Proposed Standard protocol.

   2358 - Definitions of Managed Objects for the Ethernet-like
          Interface Types

          A Proposed Standard protocol.

   2357 - IETF Criteria for Evaluating Reliable Multicast Transport
          and Application Protocols

          This is an information document and does not specify any
          level of standard.

   2356 - Sun's SKIP Firewall Traversal for Mobile IP

          This is an information document and does not specify any
          level of standard.

   2355 - TN3270 Enhancements

          A Draft Standard protocol.

   2354 - Options for Repair of Streaming Media

          This is an information document and does not specify any
          level of standard.

   2353 - APPN/HPR in IP Networks APPN Implementers' Workshop Closed
          Pages Document

          This is an information document and does not specify any
          level of standard.

   2350 - Expectations for Computer Security Incident Response

          This is a Best Current Practices document and does not
          specify any level of standard.

   2340 - Nortel's Virtual Network Switching (VNS) Overview

          This is an information document and does not specify any
          level of standard.

   2336 - Classical IP and ARP over ATM to NHRP Transition

          This is an information document and does not specify any
          level of standard.

6.1.2. Other Changes:

   The following are changes to protocols listed in the previous
   edition.

      2073 - An IPv6 Provider-Based Unicast Address Format

            Moved to Historic.

      1884 - IP Version 6 Addressing Architecture

            Moved to Historic.

      0658 - Telnet Output Linefeed Disposition

            Moved to Historic.

      0657 - Telnet Output Vertical Tab Disposition Option

            Moved to Historic.

      0656 - Telnet Output Vertical Tabstops Option

            Moved to Historic.

      0655 - Telnet Output Formfeed Disposition Option

            Moved to Historic.

      0654 - Telnet Output Horizontal Tab Disposition Option

            Moved to Historic.

      0653 - Telnet Output Horizontal Tabstops Option

            Moved to Historic.

      0652 - Telnet Output Carriage-Return Disposition Option

            Moved to Historic.

6.2. Standard Protocols

Protocol	Name	Status	RFC	STD	*
--------	Internet Official Protocol Standards	Req	2400	1	
--------	Assigned Numbers	Req	1700	2	
--------	Host Requirements - Communications	Req	1122	3	
--------	Host Requirements - Applications	Req	1123	3	
IP	Internet Protocol	Req	791	5	
	as amended by:--------				
--------	IP Subnet Extension	Req	950	5	
--------	IP Broadcast Datagrams	Req	919	5	
--------	IP Broadcast Datagrams with Subnets	Req	922	5	
ICMP	Internet Control Message Protocol	Req	792	5	
IGMP	Internet Group Multicast Protocol	Rec	1112	5	
UDP	User Datagram Protocol	Rec	768	6	
TCP	Transmission Control Protocol	Rec	793	7	
TELNET	Telnet Protocol	Rec	854,855	8	
FTP	File Transfer Protocol	Rec	959	9	
SMTP	Simple Mail Transfer Protocol	Rec	821	10	
SMTP-SIZE	SMTP Service Ext for Message Size	Rec	1870	10	
SMTP-EXT	SMTP Service Extensions	Rec	1869	10	
MAIL	Format of Electronic Mail Messages	Rec	822	11	
CONTENT	Content Type Header Field	Rec	1049	11	
NTPV2	Network Time Protocol (Version 2)	Rec	1119	12	
DOMAIN	Domain Name System	Rec	1034,1035	13	
DNS-MX	Mail Routing and the Domain System	Rec	974	14	
SNMP	Simple Network Management Protocol	Rec	1157	15	
SMI	Structure of Management Information	Rec	1155	16	
Concise-MIB	Concise MIB Definitions	Rec	1212	16	
MIB-II	Management Information Base-II	Rec	1213	17	
NETBIOS	NetBIOS Service Protocols	Ele	1001,1002	19	
ECHO	Echo Protocol	Rec	862	20	
DISCARD	Discard Protocol	Ele	863	21	
CHARGEN	Character Generator Protocol	Ele	864	22	
QUOTE	Quote of the Day Protocol	Ele	865	23	
USERS	Active Users Protocol	Ele	866	24	
DAYTIME	Daytime Protocol	Ele	867	25	
TIME	Time Server Protocol	Ele	868	26	
TFTP	Trivial File Transfer Protocol	Ele	1350	33	
TP-TCP	ISO Transport Service on top of the TCP	Ele	1006	35	
ETHER-MIB	Ethernet MIB	Ele	1643	50	
PPP	Point-to-Point Protocol (PPP)	Ele	1661	51	
PPP-HDLC	PPP in HDLC Framing	Ele	1662	51	
IP-SMDS	IP Datagrams over the SMDS Service	Ele	1209	52	
POP3	Post Office Protocol, Version 3	Ele	1939	53	
OSPF2	Open Shortest Path First Routing V2	Ele	2328	54	
IP-FR	Multiprotocol over Frame Relay	Ele	2427	55	*

[Note: an asterisk at the end of a line indicates a change from the
previous edition of this document.]

Applicability Statements:

   IGMP -- The Internet Architecture Board intends to move towards
   general adoption of IP multicasting, as a more efficient solution
   than broadcasting for many applications. The host interface has been
   standardized in RFC-1112; however, multicast-routing gateways are in
   the experimental stage and are not widely available. An Internet
   host should support all of RFC-1112, except for the IGMP protocol
   itself which is optional; see RFC-1122 for more details. Even
   without IGMP, implementation of RFC-1112 will provide an important
   advance: IP-layer access to local network multicast addressing. It
   is expected that IGMP will become recommended for all hosts and
   gateways at some future date.

   SMI, MIB-II SNMP -- The Internet Architecture Board recommends that
   all IP and TCP implementations be network manageable. At the current
   time, this implies implementation of the Internet MIB-II (RFC-1213),
   and at least the recommended management protocol SNMP (RFC-1157).

   RIP -- The Routing Information Protocol (RIP) is widely implemented
   and used in the Internet. However, both implementors and users
   should be aware that RIP has some serious technical limitations as a
   routing protocol. The IETF is currently devpeloping several
   candidates for a new standard "open" routing protocol with better
   properties than RIP. The IAB urges the Internet community to track
   these developments, and to implement the new protocol when it is
   standardized; improved Internet service will result for many users.

   TP-TCP -- As OSI protocols become more widely implemented and used,
   there will be an increasing need to support interoperation with the
   TCP/IP protocols. The Internet Engineering Task Force is formulating
   strategies for interoperation. RFC-1006 provides one interoperation
   mode, in which TCP/IP is used to emulate TP0 in order to support OSI
   applications. Hosts that wish to run OSI connection-oriented
   applications in this mode should use the procedure described in RFC-
   1006. In the future, the IAB expects that a major portion of the
   Internet will support both TCP/IP and OSI (inter-)network protocols
   in parallel, and it will then be possible to run OSI applications
   across the Internet using full OSI protocol "stacks".

   OSPF -- RFC 1370 is an applicability statement for OSPF.

6.3. Network-Specific Standard Protocols

All Network-Specific Standards have Elective status.

Protocol	Name	State	RFC	STD	*
IP-ATM	Classical IP and ARP over ATM	Prop	2225		
ATM-ENCAP	Multiprotocol Encapsulation over ATM	Prop	1483		
IP-TR-MC	IP Multicast over Token-Ring LANs	Prop	1469		
IP-FDDI	Transmission of IP and ARP over FDDI Net	Std	1390	36	
IP-X.25	X.25 and ISDN in the Packet Mode	Draft	1356		
ARP	Address Resolution Protocol	Std	826	37	
RARP	A Reverse Address Resolution Protocol	Std	903	38	
IP-ARPA	Internet Protocol on ARPANET	Std	BBN1822	39	
IP-WB	Internet Protocol on Wideband Network	Std	907	40	
IP-E	Internet Protocol on Ethernet Networks	Std	894	41	
IP-EE	Internet Protocol on Exp. Ethernet Nets	Std	895	42	
IP-IEEE	Internet Protocol on IEEE 802	Std	1042	43	
IP-DC	Internet Protocol on DC Networks	Std	891	44	
IP-HC	Internet Protocol on Hyperchannel	Std	1044	45	
IP-ARC	Transmitting IP Traffic over ARCNET Nets	Std	1201	46	
IP-SLIP	Transmission of IP over Serial Lines	Std	1055	47	
IP-NETBIOS	Transmission of IP over NETBIOS	Std	1088	48	
IP-IPX	Transmission of 802.2 over IPX Networks	Std	1132	49	
IP-HIPPI	IP over HIPPI	Draft	2067		

[Note: an asterisk at the end of a line indicates a change from the
previous edition of this document.]

Applicability Statements:

   It is expected that a system will support one or more physical
   networks and for each physical network supported the appropriate
   protocols from the above list must be supported. That is, it is
   elective to support any particular type of physical network, and for
   the physical networks actually supported it is required that they be
   supported exactly according to the protocols in the above list. See
   also the Host and Gateway Requirements RFCs for more specific
   information on network-specific ("link layer") protocols.

6.4. Draft Standard Protocols

```
Protocol   Name                                 Status         RFC
========   ==================================   ============== =====
URI-GEN    URI: Generic Syntax                  Elective       2396*
IARP       Inverse Address Resolution Protocol  Elective       2390*
TFTP-Opt   TFTP Options                         Elective       2349
TFTP-Blk   TFTP Blocksize Option                Elective       2348
TFTP-Ext   TFTP Option Extension                Elective       2347
ONE-PASS   One-Time Password System             Elective       2289
SMTP-Pipe  SMTP Serv. Ext. for Command Pipelining Elective     2197
DHCP-BOOTP DHCP Options and BOOTP Extensions     Recommended    2132
DHCP       Dynamic Host Configuration Protocol  Elective       2131
FRAME-MIB  Management Information Base for Frame Elective       2115
-------    Clarifications and Extensions BOOTP   Elective       1542
DHCP-BOOTP Interoperation Between DHCP and BOOTP Elective       1534
BOOTP      Bootstrap Protocol                   Recommended 951,2132
MIME-CONF  MIME Conformance Criteria            Elective       2049
MIME-MSG   MIME Msg Header Ext for Non-ASCII     Elective       2047
MIME-MEDIA MIME Media Types                     Elective       2046
MIME       Multipurpose Internet Mail Extensions Elective      2045
PPP-CHAP   PPP Challenge Handshake Authentication Elective     1994
PPP-MP     PPP Multilink Protocol               Elective       1990
PPP-LINK   PPP Link Quality Monitoring          Elective       1989
COEX-MIB   Coexistence between SNMPV1 & SNMPV2   Elective       1908
SNMPv2-MIB MIB for SNMPv2                       Elective       1907
TRANS-MIB  Transport Mappings for SNMPv2        Elective       1906
OPS-MIB    Protocol Operations for SNMPv2       Elective       1905
CONF-MIB   Conformance Statements for SNMPv2     Elective       1904
CONV-MIB   Textual Conventions for SNMPv2       Elective       1903
SMIV2      SMI for SNMPv2                       Elective       1902
CON-MD5    Content-MD5 Header Field             Elective       1864
OSPF-MIB   OSPF Version 2 MIB                   Elective       1850
STR-REP    String Representation ...            Elective       1779
X.500syn   X.500 String Representation ...      Elective       1778
X.500lite  X.500 Lightweight ...                Elective       1777
BGP-4-APP  Application of BGP-4                 Elective       1772
BGP-4      Border Gateway Protocol 4            Elective       1771
PPP-DNCP   PPP DECnet Phase IV Control Protocol Elective       1762
RMON-MIB   Remote Network Monitoring MIB        Elective       1757
802.5-MIB  IEEE 802.5 Token Ring MIB            Elective       1748
RIP2-MIB   RIP Version 2 MIB Extension          Elective       1724
RIP2       RIP Version 2-Carrying Additional Info. Elective    1723
RIP2-APP   RIP Version 2 Protocol App. Statement Elective      1722
SIP-MIB    SIP Interface Type MIB               Elective       1694
-------    Def Man Objs Parallel-printer-like   Elective       1660
-------    Def Man Objs RS-232-like             Elective       1659
-------    Def Man Objs Character Stream        Elective       1658
```

```
BGP-4-MIB  BGP-4 MIB                                  Elective      1657
SMTP-8BIT  SMTP Service Ext or 8bit-MIMEtransport     Elective      1652
OSI-NSAP   Guidelines for OSI NSAP Allocation         Elective      1629
ISO-TS-ECHO Echo for ISO-8473                         Elective      1575
DECNET-MIB DECNET MIB                                 Elective      1559
BRIDGE-MIB BRIDGE-MIB                                 Elective      1493
NTPV3      Network Time Protocol (Version 3)          Elective      1305
IP-MTU     Path MTU Discovery                         Elective      1191
FINGER     Finger Protocol                            Elective      1288
NICNAME    WhoIs Protocol                             Elective       954
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[Note: an asterisk at the end of a line indicates a change from the
previous edition of this document.]

Applicability Statements:

   PPP -- Point to Point Protocol is a method of sending IP over serial
   lines, which are a type of physical network. It is anticipated that
   PPP will be advanced to the network-specifics standard protocol state
   in the future.

6.5. Proposed Standard Protocols

```
Protocol   Name                                 Status         RFC
========   =================================    ============== =====
--------   FTP Extensions for IPv6 and NATs     Elective       2428*
MIME-VCARD vCard MIME Directory Profile          Elective       2426*
TXT-DIR    MIME Content-Type for Directory Info  Elective       2425*
CONT-DUR   Content-Duration MIME Header          Elective       2424*
MIME-VPIM  VPIM Voice Message                    Elective       2423*
MIME-ADPCM Toll Quality Voice - 32 kbit/s ADPC   Elective       2422*
MIME-VP2   Voice Profile for Internet Mail V2    Elective       2421*
--------   Multicast/UNI 3.0/3.1 based ATM MIB   Elective       2417*
DATA-URL   "data" URL scheme                     Elective       2397*
CIDMID-URL Content-ID and Message-ID URLs        Elective       2392*
FTP-FNEGO  Feature negotiation mechanism for FTP Elective       2389*
--------   MIME Multipart/form-data              Elective       2388*
MIME-RELAT MIME Multipart/Related Content-type   Elective       2387*
--------   Protection of BGP Sessions via TCP MD5 Elective      2385*
POP-URL    POP URL Scheme                        Elective       2384*
--------   Interoperation of CLS and GS with ATM Elective       2381*
--------   RSVP over ATM Imple. Requirements     Elective       2380*
--------   IPv6 Aggreg. Global Unicast Addr. Format Elective    2374*
--------   IPv6 Addressing Architecture          Elective       2373*
TIPV3      Transaction Internet Protocol V3      Elective       2371*
OSPF-LSA   OSPF Opaque LSA Option                Elective       2370*
--------   Use of URLs as Meta-Syntax...         Elective       2369*
URLMAILTO  mailto URL scheme                     Elective       2368*
PPP-AAL    PPP Over AAL                          Elective       2364*
PPP-FUNI   PPP Over FUNI                         Elective       2363*
IMAP4UIDPL IMAP4 UIDPLUS Extension               Elective       2359*
--------   Ethernet-like Interface Types MIB     Elective       2358*
MOBILIPREV Reverse Tunneling for Mobile IP       Elective       2344
IMAP4NAME  IMAP4 Namespace                       Elective       2342
VRRP       Virtual Router Redundancy Protocol    Elective       2338
NHRP-SCSP  Distributed NHRP Service Using SCSP   Elective       2335
SCSP       Server Cache Synchronization Protocol Elective       2334
NHRP-APP   NHRP Protocol Applicability Statement Elective       2333
NHRP       NBMA Next Hop Resolution Protocol     Elective       2332
UNI-SIG    ATM Sig Support (IPOA) UNI Signalling Elective       2331
SDP        Session Description Protocol          Elective       2327
RTSP       Real Time Streaming Protocol          Elective       2326
IPOA-MIB   Classical IP and ARP Over ATM MIB     Elective       2320
DNS-NCACHE Negative Caching of DNS Queries       Elective       2308
SMFAX-IM   Simple Mode of FAX Using Internet Mail Elective      2305
MINFAX-IM  Minimal FAX addr format in Internet Mail Elective    2304
MIN-PSTN   Min. PSTN addr format in Internet Mail Elective      2303
TIFF       Tag Image File Format                 Elective       2302
FFIF       File Format for Internet Fax          Elective       2301
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EMF-MDN    Extensible Message Format for MDN      Elective     2298
OR-ADD     O/R Address hierarchy in X.500         Elective     2294
SUBTABLE   Tables and Subtrees in X.500           Elective     2293
--------   Mobile-IPv4 Config Opt for PPP IPCP    Elective     2290
SLM-APP    System-Level Managed Objects for Apps  Elective     2287
PPP-EAP    PPP Extensible Authentication Protocol Elective     2284
MEXT-BGP4  Multiprotocol Extensions for BGP-4     Elective     2283
RPSL       Routing Policy Specification Language  Elective     2280
UTF-8      UTF-8 transformation format of ISO 10646 Elective   2279
VACM-SNMP  View-based Access Control Model for SMMP Elective   2275
USM-SNMPV3 User-based Security Model for SNMPv3   Elective     2274
SNMPV3-APP SNMPv3 Applications                    Elective     2273
MPD-SNMP   Message Processing & Dispatching SNMP  Elective     2272
ARCH-SNMP  Architecture Describing SNMP Frameworks Elective    2271
--------   IEEE 802.12 Repeater MIB               Elective     2266
AGENTX     Agent Extensibility Protocol           Elective     2257
--------   Summary of the X.500(96) with LDAPv3   Elective     2256
LDAP-URL   LDAP URL Format                        Elective     2255
STR-LDAP   String Rep of LDAP Search Filters      Elective     2254
LDAP3-UTF8 LDAPv3: UTF-8 String Rep               Elective     2253
LDAP3-ATD  LDAP3-: Attribute Syntax Definitions   Elective     2252
LDAPV3     Lightweight Directory Access Protocol  Elective     2251
RTP-MPEG   RTP Payload Format for MPEG1/MPEG2     Elective     2250
MAIL-MIB   Mail Monitoring MIB                    Elective     2249
NSM-MIB    Network Services Monitoring MIB        Elective     2248
--------   Using Domains LDAP/X.500 Dist. Names   Elective     2247
SASL-ANON  Anonymous SASL Mechanism               Elective     2245
ACAP       Application Configuration Access       Elective     2244
OTP-ER     OTP Extended Responses                 Elective     2243
NETWAREIP  NetWare/IP Domain Name and Information Elective     2242
DHCP-NDS   DHCP Options for Novell Directory Serv. Elective    2241
MAUS-MIB   IEEE 802.3 Medium Attachment Units MIB Elective     2239
HPR-MIB    Definitions of Managed Objects for HPR Elective     2238
IGMP       Internet Group Management Protocol V2  Elective     2236
ABNF       Augmented BNF for Syntax Specifications Elective    2234
INTERGRMIB Interfaces Group MIB                   Elective     2233
DLUR-MIB   Definitions of Managed Objects for DLUR Elective    2232
MIME-EXT   MIME Parameter Value & Encoded Word Ext Elective    2231
FTPSECEXT  FTP Security Extensions                Elective     2228
---------  Simple Hit-Metering, Usage-Limiting HTTP Elective   2227
---------  IP Broadcast over ATM Networks         Elective     2226
SASL       Simple Authentication and Security Layer Elective   2222
IMAP4LOGIN IMAP4 Login Referrals                  Elective     2221
---------  Schema for Internet White Pages Service Elective    2218
---------  Characterization Parameters for ISNE   Elective     2215
---------  Integrated Services MIB Guar Serv Ext  Elective     2214
---------  Integrated Services MIB using SMIv2    Elective     2213
GQOS       Spec. of Guaranteed Quality of Service Elective     2212
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---------  Spec. of Controlled-Load Net Ele Serv   Elective    2211
RSVP-IS    Use of RSVP with IETF Integrated Serv   Elective    2210
RSVP-MPR   RSVP Messaging Processing Rules         Elective    2209
RSVP-APP   RSVP Applicability Statement            Elective    2208
RSVP-IPSEC RSVP Extensions for IPSEC Data Flows    Elective    2207
RSVP-MIB   RSVP Management Information Base         Elective    2206
RSVP       Resource ReSerVation Protocol V1        Elective    2205
RPCSEC-GSS RPCSEC_GSS Protocol Specification       Elective    2203
RTP-RAD    RTP Payload for Redundant Audio Data    Elective    2198
IMAPPOPAU  IMAP/POP AUTHorize Extension            Elective    2195
IMAP4MAIL  IMAP4 Mailbox Referrals                 Elective    2193
IMAP-URL   IMAP URL Scheme                         Elective    2192
---------  RTP Payload Format for H.263 Video ST   Elective    2190
---------  The Content-Disposition Header Field    Elective    2183
DNS-CLAR   Clarifications to the DNS Specification  Elective    2181
IMAP4-IDLE IMAP4 IDLE command                      Elective    2177
SLP        Service Location Protocol               Elective    2165
---------  X.500/LDAP Directory/MIXER Address Map.  Elective    2164
DNS-MCGAM  Using DNS to Distribute MCGAM           Elective    2163
---------  Carrying PostScript in X.400 and MIME   Elective    2160
---------  A MIME Body Part for FAX                Elective    2159
---------  X.400 Image Body Parts                  Elective    2158
---------  Mapping between X.400 and RFC-822/MIME   Elective    2157
MIXER      Mime Internet X.400 Enhanced Relay      Elective    2156
APPN-MIB   Definitions of Managed Objects for APPN  Elective    2155
IPv6-Jumbo TCP and UDP over IPv6 Jumbograms        Elective    2147
MAIL-SERV  Mailbox Names for Common Services       Elective    2142
URN-SYNTAX URN Syntax                              Elective    2141
RADIUS     Remote Authentication Dial In Service   Elective    2138
SDNSDU     Secure Domain Name System Dynamic Update Elective    2137
DNS-UPDATE Dynamic Updates in the DNS              Elective    2136
DC-MIB     Dial Control MIB using SMIv2            Elective    2128
ISDN-MIB   ISDN MIB using SMIv2                    Elective    2127
ITOT       ISO Transport Service on top of TCP     Elective    2126
BAP-BACP   PPP-BAP, PPP-BACP                       Elective    2125
VEMMI-URL  VEMMI URL Specification                 Elective    2122
ROUT-ALERT IP Router Alert Option                  Elective    2113
MHTML      MIME E-mail Encapsulation               Elective    2110
HTTP-STATE HTTP State Management Mechanism         Elective    2109
802.3-MIB  802.3 Repeater MIB using SMIv2          Elective    2108
PPP-NBFCP  PPP NetBIOS Frames Control Protocol     Elective    2097
TABLE-MIB  IP Forwarding Table MIB                 Elective    2096
RIP-TRIG   Trigger RIP                             Elective    2091
IMAP4-LIT  IMAP4 non-synchronizing literals        Elective    2088
IMAP4-QUO  IMAP4 QUOTA extension                   Elective    2087
IMAP4-ACL  IMAP4 ACL Extension                     Elective    2086
HMAC-MD5   HMAC-MD5 IP Auth. with Replay Prevention Elective    2085
RIP2-MD5   RIP-2 MD5 Authentication                Elective    2082
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RIPNG-IPV6 RIPng for IPv6                            Elective      2080
URI-ATT    URI Attribute Type and Object Class      Elective      2079
GSSAP      Generic Security Service Application      Elective      2078
MIME-MODEL Model Primary MIME Types                  Elective      2077
RMON-MIB   Remote Network Monitoring MIB             Elective      2074
HTML-INT   HTML Internationalization                 Elective      2070
DAA        Digest Access Authentication              Elective      2069
HTTP-1.1   Hypertext Transfer Protocol -- HTTP/1.1   Elective      2068
DNS-SEC    Domain Name System Security Extensions    Elective      2065
IMAPV4     Internet Message Access Protocol v4rev1   Elective      2060
URLZ39.50  Uniform Resource Locators for Z39.50      Elective      2056
SNANAU-APP SNANAU APPC MIB using SMIv2               Elective      2051
PPP-SNACP  PPP SNA Control Protocol                  Elective      2043
ENTITY-MIB Entity MIB using SMIv2                    Elective      2037
RTP-JPEG   RTP Payload Format for JPEG-compressed    Elective      2035
SMTP-ENH   SMTP Enhanced Error Codes                 Elective      2034
RTP-H.261  RTP Payload Format for H.261              Elective      2032
RTP-CELLB  RTP Payload Format of Sun's CellB         Elective      2029
SPKM       Simple Public-Key GSS-API Mechanism       Elective      2025
DLSW-MIB   DLSw MIB using SMIv2                       Elective      2024
IPV6-PPP   IP Version 6 over PPP                      Elective      2023
MULTI-UNI  Multicast over UNI 3.0/3.1 based ATM      Elective      2022
RMON-MIB   RMON MIB using SMIv2                       Elective      2021
802.12-MIB IEEE 802.12 Interface MIB                 Elective      2020
IPV6-FDDI  Transmission of IPv6 Packets Over FDDI    Elective      2019
TCP-ACK    TCP Selective Acknowledgement Options     Elective      2018
URL-ACC    URL Access-Type                           Elective      2017
MIME-PGP   MIME Security with PGP                     Elective      2015
MIB-UDP    SNMPv2 MIB for UDP                         Elective      2013
MIB-TCP    SNMPv2 MIB for TCP                         Elective      2012
MIB-IP     SNMPv2 MIB for IP                          Elective      2011
MOBILEIPMIBMobile IP MIB Definition using SMIv2      Elective      2006
MOBILEIPAPPApplicability Statement for IP Mobility   Elective      2005
MINI-IP    Minimal Encapsulation within IP           Elective      2004
IPENCAPIP  IP Encapsulation within IP                Elective      2003
MOBILEIPSUPIP Mobility Support                       Elective      2002
TCPSLOWSRT TCP Slow Start, Congestion Avoidance...   Elective      2001
BGP-COMM   BGP Communities Attribute                 Elective      1997
DNS-NOTIFY Mech. for Notification of Zone Changes    Elective      1996
DNS-IZT    Incremental Zone Transfer in DNS          Elective      1995
SMTP-ETRN  SMTP Service Extension ETRN               Elective      1985
SNA        Serial Number Arithmetic                  Elective      1982
MTU-IPV6   Path MTU Discovery for IP version 6       Elective      1981
PPP-FRAME  PPP in Frame Relay                         Elective      1973
IPV6-ETHER Transmission IPv6 Packets Over Ethernet    Elective      1972
IPV6-AUTO  IPv6 Stateless Address Autoconfiguation    Elective      1971
IPV6-ND    Neighbor Discovery for IP Version 6       Elective      1970
PPP-ECP    PPP Encryption Control Protocol           Elective      1968
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GSSAPI-KER Kerberos Version 5 GSS-API Mechanism    Elective      1964
PPP-CCP    PPP Compression Control Protocol        Elective      1962
GSSAPI-SOC GSS-API Auth for SOCKS Version 5        Elective      1961
LDAP-STR   String Rep. of LDAP Search Filters      Elective      1960
LDAP-URL   LDAP URL Format                         Elective      1959
TRANS-IPV6 Transition Mechanisms IPv6 Hosts/Routers Elective     1933
AUTH-SOCKS Username Authentication for SOCKS V5     Elective      1929
SOCKSV5    SOCKS Protocol Version 5                Elective      1928
WHOIS++M   How to Interact with a Whois++ Mesh     Elective      1914
WHOIS++A   Architecture of Whois++ Index Service   Elective      1913
DSN        Delivery Status Notifications           Elective      1894
EMS-CODE   Enhanced Mail System Status Codes       Elective      1893
MIME-RPT   Multipart/Report                        Elective      1892
SMTP-DSN   SMTP Delivery Status Notifications      Elective      1891
RTP-AV     RTP Audio/Video Profile                 Elective      1890
RTP        Transport Protocol for Real-Time Apps   Elective      1889
DNS-IPV6   DNS Extensions to support IPv6          Elective      1886
ICMPv6     ICMPv6 for IPv6                         Elective      1885
IPV6       IPv6 Specification                      Elective      1883
HTML       Hypertext Markup Language - 2.0         Elective      1866
MIME-Sec   MIME Object Security Services           Elective      1848
MIME-Encyp MIME: Signed and Encrypted              Elective      1847
WHOIS++    Architecture of the WHOIS++ service     Elective      1835
--------   Binding Protocols for ONC RPC Version 2 Elective      1833
XDR        External Data Representation Standard    Elective      1832
RPC        Remote Procedure Call Protocol V. 2     Elective      1831
--------   ESP DES-CBC Transform                   Ele/Req       1829
--------   IP Authentication using Keyed MD5       Ele/Req       1828
ESP        IP Encapsulating Security Payload       Ele/Req       1827
IPV6-AH    IP Authentication Header                Ele/Req       1826
--------   Security Architecture for IP            Ele/Req       1825
RREQ       Requirements for IP Version 4 Routers   Elective      1812
URL        Relative Uniform Resource Locators      Elective      1808
CLDAP      Connection-less LDAP                    Elective      1798
OSPF-DC    Ext. OSPF to Support Demand Circuits    Elective      1793
OSI-Dir    OSI User Friendly Naming ...            Elective      1781
MIME-EDI   MIME Encapsulation of EDI Objects       Elective      1767
Lang-Tag   Tags for Identification of Languages    Elective      1766
XNSCP      PPP XNS IDP Control Protocol            Elective      1764
BVCP       PPP Banyan Vines Control Protocol       Elective      1763
Print-MIB  Printer MIB                             Elective      1759
ATM-SIG    ATM Signaling Support for IP over ATM   Elective      1755
IPNG       Recommendation for IP Next Generation   Elective      1752
802.5-SSR  802.5 SSR MIB using SMIv2               Elective      1749
SDLCSMIv2  SNADLC SDLC MIB using SMIv2             Elective      1747
BGP4/IDRP  BGP4/IDRP for IP/OSPF Interaction       Elective      1745
AT-MIB     Appletalk MIB                           Elective      1742
MacMIME    MIME Encapsulation of Macintosh files   Elective      1740
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URL         Uniform Resource Locators            Elective      1738
POP3-AUTH   POP3 AUTHentication command          Elective      1734
IMAP4-AUTH  IMAP4 Authentication Mechanisms      Elective      1731
RDBMS-MIB   RDMS MIB - using SMIv2               Elective      1697
MODEM-MIB   Modem MIB - using SMIv2              Elective      1696
ATM-MIB     ATM Management Version 8.0 using SMIv2 Elective    1695
TMUX        Transport Multiplexing Protocol      Elective      1692
SNANAU-MIB  SNA NAUs MIB using SMIv2             Elective      1666
PPP-TRANS   PPP Reliable Transmission            Elective      1663
--------    Postmaster Convention X.400 Operations Elective    1648
PPP-BCP     PPP Bridging Control Protocol        Elective      1638
UPS-MIB     UPS Management Information Base       Elective      1628
PPP-SONET   PPP over SONET/SDH                   Elective      1619
PPP-ISDN    PPP over ISDN                       Elective      1618
DNS-R-MIB   DNS Resolver MIB Extensions          Elective      1612
DNS-S-MIB   DNS Server MIB Extensions            Elective      1611
FR-MIB      Frame Relay Service MIB              Elective      1604
PPP-X25     PPP in X.25                         Elective      1598
OSPF-NSSA   The OSPF NSSA Option                Elective      1587
OSPF-Multi  Multicast Extensions to OSPF         Elective      1584
SONET-MIB   MIB SONET/SDH Interface Type         Elective      1595
RIP-DC      Extensions to RIP to Support Demand Cir. Elective  1582
--------    Evolution of the Interfaces Group of MIB-II Elective 1573
PPP-LCP     PPP LCP Extensions                  Elective      1570
X500-MIB    X.500 Directory Monitoring MIB       Elective      1567
CIPX        Compressing IPX Headers Over WAM Media Elective    1553
IPXCP       PPP Internetworking Packet Exchange Control Elective 1552
SRB-MIB     Source Routing Bridge MIB            Elective      1525
CIDR-STRA   CIDR Address Assignment...           Elective      1519
CIDR-ARCH   CIDR Architecture...                Elective      1518
CIDR-APP    CIDR Applicability Statement         Elective      1517
--------    802.3 MAU MIB                       Elective      1515
HOST-MIB    Host Resources MIB                  Elective      1514
--------    Token Ring Extensions to RMON MIB    Elective      1513
FDDI-MIB    FDDI Management Information Base      Elective      1512
KERBEROS    Kerberos Network Authentication Ser (V5) Elective  1510
GSSAPI      Generic Security Service API: C-bindings Elective  1509
DASS        Distributed Authentication Security... Elective    1507
--------    X.400 Use of Extended Character Sets  Elective     1502
HARPOON     Rules for Downgrading Messages...    Elective      1496
Equiv       X.400/MIME Body Equivalences         Elective      1494
IDPR        Inter-Domain Policy Routing Protocol  Elective     1479
IDPR-ARCH   Architecture for IDPR               Elective      1478
PPP/Bridge MIB Bridge PPP MIB                   Elective      1474
PPP/IP MIB  IP Network Control Protocol of PPP MIB Elective    1473
PPP/SEC MIB Security Protocols of PPP MIB         Elective      1472
PPP/LCP MIB Link Control Protocol of PPP MIB      Elective      1471
X25-MIB     Multiprotocol Interconnect on X.25 MIB Elective    1461
```

```
SNMPv2     Introduction to SNMPv2               Elective      1441
PEM-KEY    PEM - Key Certification              Elective      1424
PEM-ALG    PEM - Algorithms, Modes, and Identifiers Elective  1423
PEM-CKM    PEM - Certificate-Based Key Management Elective     1422
PEM-ENC    PEM - Message Encryption and Auth    Elective      1421
SNMP-IPX   SNMP over IPX                        Elective      1420
SNMP-AT    SNMP over AppleTalk                  Elective      1419
SNMP-OSI   SNMP over OSI                        Elective      1418
FTP-FTAM   FTP-FTAM Gateway Specification       Elective      1415
IDENT-MIB  Identification MIB                   Elective      1414
IDENT      Identification Protocol              Elective      1413
DS3/E3-MIB DS3/E3 Interface Type                Elective      1407
DS1/E1-MIB DS1/E1 Interface Type                Elective      1406
BGP-OSPF   BGP OSPF Interaction                 Elective      1403
--------   Route Advertisement In BGP2 And BGP3 Elective      1397
SNMP-X.25  SNMP MIB Extension for X.25 Packet Layer Elective  1382
SNMP-LAPB  SNMP MIB Extension for X.25 LAPB     Elective      1381
PPP-ATCP   PPP AppleTalk Control Protocol       Elective      1378
PPP-OSINLCP PPP OSI Network Layer Control Protocol Elective    1377
SNMP-PARTY-MIB Administration of SNMP           Elective      1353
SNMP-SEC   SNMP Security Protocols              Elective      1352
SNMP-ADMIN SNMP Administrative Model            Elective      1351
TOS        Type of Service in the Internet      Elective      1349
PPP-IPCP   PPP Control Protocol                 Elective      1332
-------    X.400 1988 to 1984 downgrading       Elective      1328
TCP-EXT    TCP Extensions for High Performance  Elective      1323
NETFAX     File Format for the Exchange of Images Elective    1314
FDDI-MIB   FDDI-MIB                             Elective      1285
-------    Encoding Network Addresses           Elective      1277
-------    Replication and Distributed Operations Elective    1276
-------    COSINE and Internet X.500 Schema     Elective      1274
BGP-MIB    Border Gateway Protocol MIB (Version 3) Elective   1269
ICMP-ROUT  ICMP Router Discovery Messages       Elective      1256
OSI-UDP    OSI TS on UDP                        Elective      1240
STD-MIBs   Reassignment of Exp MIBs to Std MIBs Elective      1239
IPX-IP     Tunneling IPX Traffic through IP Nets Elective     1234
IS-IS      OSI IS-IS for TCP/IP Dual Environments Elective    1195
IP-CMPRS   Compressing TCP/IP Headers           Elective      1144
NNTP       Network News Transfer Protocol       Elective       977
```

[Note: an asterisk at the end of a line indicates a change from the
previous edition of this document.]

[Note: Ele/Req indicates elective for use with IPv4 and required for use
with IPv6.]

Applicability Statements:

6.6. Telnet Options

For convenience, all the Telnet Options are collected here with both
their state and status.

```
Protocol   Name                              Number  State Status  RFC STD
========   ===================================  =====  ===== ======  ==== ===
TOPT-BIN   Binary Transmission                  0  Std   Rec     856  27
TOPT-ECHO  Echo                                 1  Std   Rec     857  28
TOPT-RECN  Reconnection                         2  Prop  Ele     ...
TOPT-SUPP  Suppress Go Ahead                    3  Std   Rec     858  29
TOPT-APRX  Approx Message Size Negotiation      4  Prop  Ele     ...
TOPT-STAT  Status                               5  Std   Rec     859  30
TOPT-TIM   Timing Mark                          6  Std   Rec     860  31
TOPT-REM   Remote Controlled Trans and Echo     7  Prop  Ele     726
TOPT-OLW   Output Line Width                    8  Prop  Ele     ...
TOPT-OPS   Output Page Size                     9  Prop  Ele     ...
TOPT-OCRD  Output Carriage-Return Disposition  10  Hist  Ele     652    *
TOPT-OHT   Output Horizontal Tabstops          11  Hist  Ele     653    *
TOPT-OHTD  Output Horizontal Tab Disposition   12  Hist  Ele     654    *
TOPT-OFD   Output Formfeed Disposition         13  Hist  Ele     655    *
TOPT-OVT   Output Vertical Tabstops            14  Hist  Ele     656    *
TOPT-OVTD  Output Vertical Tab Disposition     15  Hist  Ele     657    *
TOPT-OLD   Output Linefeed Disposition         16  Hist  Ele     658    *
TOPT-EXT   Extended ASCII                      17  Prop  Ele     698
TOPT-LOGO  Logout                              18  Prop  Ele     727
TOPT-BYTE  Byte Macro                          19  Prop  Ele     735
TOPT-DATA  Data Entry Terminal                 20  Prop  Ele    1043
TOPT-SUP   SUPDUP                              21  Prop  Ele     736
TOPT-SUPO  SUPDUP Output                       22  Prop  Ele     749
TOPT-SNDL  Send Location                       23  Prop  Ele     779
TOPT-TERM  Terminal Type                       24  Prop  Ele    1091
TOPT-EOR   End of Record                       25  Prop  Ele     885
TOPT-TACACS  TACACS User Identification        26  Prop  Ele     927
TOPT-OM    Output Marking                      27  Prop  Ele     933
TOPT-TLN   Terminal Location Number            28  Prop  Ele     946
TOPT-3270  Telnet 3270 Regime                  29  Prop  Ele    1041
TOPT-X.3   X.3 PAD                             30  Prop  Ele    1053
TOPT-NAWS  Negotiate About Window Size         31  Prop  Ele    1073
TOPT-TS    Terminal Speed                      32  Prop  Ele    1079
TOPT-RFC   Remote Flow Control                 33  Prop  Ele    1372
TOPT-LINE  Linemode                            34  Draft Ele    1184
TOPT-XDL   X Display Location                  35  Prop  Ele    1096
TOPT-ENVIR Telnet Environment Option           36  Hist  Not    1408
TOPT-AUTH  Telnet Authentication Option        37  Exp   Ele    1416
TOPT-ENVIR Telnet Environment Option           39  Prop  Ele    1572
TOPT-TN3270E TN3270 Enhancements               40  Draft Ele    2355    *
TOPT-AUTH  Telnet XAUTH                         41  Exp
```

```
TOPT-CHARSET Telnet CHARSET               42  Exp           2066
TOPR-RSP   Telnet Remote Serial Port      43  Exp
TOPT-COMPORT Telnet Com Port Control      44  Exp           2217
TOPT-SLE   Telnet Suppress Local Echo     45  Exp                    *
TOPT-STARTTLS Telnet Start TLS            46  Exp                    *
TOPT-KERMIT   Telnet KERMIT               47  Exp                    *
TOPT-SEND-URL Send-URL                    48  Exp                    *
TOPT-EXTOP Extended-Options-List         255  Std   Rec    861 32
```

[Note: an asterisk at the end of a line indicates a change from the
previous edition of this document.]

6.7. Experimental Protocols

All Experimental protocols have the Limited Use status.

```
Protocol    Name                                           RFC
========    ===================================            =====
TCP-WIN     Increasing TCP's Initial Window                2414*
PIM-SM      Protocol Independent Multicast-Sparse Mode     2362*
-------     Domain Names and Company Name Retrieva         2345
RTP-MPEG    RTP Payload Format for Bundled MPEG            2343
-------     Intra-LIS IP Multicast/Routers over ATM using PIM  2337
-------     Safe Response Header Field                     2310
LDAP-NIS    Approach Using LDAP as a Network Information Service  2307
HTTP-RVSA   HTTP Remote Variant Selection Algorithm        2296
TCN-HTTP    Transparent Content Negotiation in HTTP        2295
-------     Core Based Trees (CBT) Multicast Routing Architecture  2201
-------     Core Based Trees (CBT version 2) Multicast Routing  2189
-------     Trivial Convention using HTTP in URN Resolution  2169
-------     Resolution of URIs using DNS                   2168
MAP-MAIL    X.400 Mapping and Mail-11                      2162
MIME-ODA    A MIME Body Part for ODA                       2161
OSPF-DIG    OSPF with Digital Signature                    2154
GKMP-ARCH   Group Key Management Protocol (GKMP) Architecture  2094
GKMP-SPEC   Group Key Management Protocol (GKMP) Specification  2093
IP-SCSI     Encapsulating IP with the SCSI                 2143
X.500-NAME  Managing the X.500 Root Naming Context         2120
TFTP-MULTI  TFTP Multicast Option                          2090
IP-Echo     IP Echo Host Service                           2075
METER-MIB   Traffic Flow Measurement Meter MIB             2064
TFM-ARCH    Traffic Flow Measurement Architecture          2063
DNS-SRV     Location of Services in the DNS                2052
URAS        Uniform Resource Agents                        2016
GPS-AR      GPS-Based Addressing and Routing               2009
ETFTP       Enhanced Trivial File Transfer Protocol        1986
BGP-RR      BGP Route Reflection                           1966
BGP-ASC     Autonomous System Confederations for BGP       1965
SMKD        Scalable Multicast Key Distribution            1949
HTML-TBL    HTML Tables                                    1942
SNMPV2SM    User-based Security Model for SNMPv2           1910
SNMPV2AI    SNMPv2 Administrative Infrastructure           1909
SNMPV2CB    Introduction to Community-based SNMPv2         1901
-------     IPv6 Testing Address Allocation                1897
DNS-LOC     Location Information in the DNS                1876
SGML-MT     SGML Media Types                               1874
CONT-MT     Access Type Content-ID                         1873
UNARP       ARP Extension - UNARP                          1868
-------     Form-based File Upload in HTML                 1867
-------     BGP/IDRP Route Server Alternative              1863
```

```
-------    IP Authentication using Keyed SHA              1852
ESP3DES    ESP Triple DES Transform                       1851
-------    SMTP 521 Reply Code                            1846
-------    SMTP Serv. Ext. for Checkpoint/Restart         1845
-------    SMTP Serv. Ext. Large and Binary MIME Msgs.    1830
ST2        Stream Protocol Version 2                      1819
-------    Content-Disposition Header                     1806
-------    Schema Publishing in X.500 Directory           1804
-------    X.400-MHS use X.500 to support X.400-MHS Routing 1801
-------    Class A Subnet Experiment                      1797
TCP/IPXMIB TCP/IPX Connection Mib Specification           1792
-------    TCP And UDP Over IPX Networks With Fixed Path MTU 1791
ICMP-DM    ICMP Domain Name Messages                      1788
CLNP-MULT  Host Group Extensions for CLNP Multicasting    1768
OSPF-OVFL  OSPF Database Overflow                         1765
RWP        Remote Write ProtocolL - Version 1.0           1756
NARP       NBMA Address Resolution Protocol               1735
DNS-ENCODE DNS Encoding of Geographical Location          1712
TCP-POS    An Extension to TCP: Partial Order Service     1693
T/TCP      TCP Extensions for Transactions                1644
MIME-UNI   Using Unicode with MIME                        1641
FOOBAR     FTP Operation Over Big Address Records         1639
X500-CHART Charting Networks in the X.500 Directory       1609
X500-DIR   Representing IP Information in the X.500 Directory 1608
SNMP-DPI   SNMP Distributed Protocol Interface            1592
CLNP-TUBA  Use of ISO CLNP in TUBA Environments           1561
REM-PRINT  TPC.INT Subdomain Remote Printing - Technical  1528
EHF-MAIL   Encoding Header Field for Internet Messages    1505
RAP        Internet Route Access Protocol                 1476
TP/IX      TP/IX: The Next Internet                       1475
X400       Routing Coordination for X.400 Services        1465
DNS        Storing Arbitrary Attributes in DNS            1464
IRCP       Internet Relay Chat Protocol                   1459
TOS-LS     Link Security TOS                              1455
SIFT/UFT   Sender-Initiated/Unsolicited File Transfer     1440
DIR-ARP    Directed ARP                                   1433
TEL-SPX    Telnet Authentication: SPX                     1412
TEL-KER    Telnet Authentication: Kerberos V4             1411
TRACE-IP   Traceroute Using an IP Option                  1393
DNS-IP     Experiment in DNS Based IP Routing             1383
RMCP       Remote Mail Checking Protocol                  1339
TCP-HIPER  TCP Extensions for High Performance            1323
MSP2       Message Send Protocol 2                        1312
DSLCP      Dynamically Switched Link Control              1307
--------   X.500 and Domains                              1279
IN-ENCAP   Internet Encapsulation Protocol                1241
CLNS-MIB   CLNS-MIB                                        1238
CFDP       Coherent File Distribution Protocol            1235
```

```
IP-AX.25    IP Encapsulation of AX.25 Frames                1226
ALERTS      Managing Asynchronously Generated Alerts        1224
MPP         Message Posting Protocol                        1204
SNMP-BULK   Bulk Table Retrieval with the SNMP              1187
DNS-RR      New DNS RR Definitions                          1183
IMAP2       Interactive Mail Access Protocol                1176
NTP-OSI     NTP over OSI Remote Operations                  1165
DMF-MAIL    Digest Message Format for Mail                  1153
RDP         Reliable Data Protocol                      908,1151
TCP-ACO     TCP Alternate Checksum Option                   1146
IP-DVMRP    IP Distance Vector Multicast Routing            1075
VMTP        Versatile Message Transaction Protocol          1045
COOKIE-JAR  Authentication Scheme                           1004
NETBLT      Bulk Data Transfer Protocol                      998
IRTP        Internet Reliable Transaction Protocol           938
LDP         Loader Debugger Protocol                         909
RLP         Resource Location Protocol                       887
NVP-II      Network Voice Protocol                       ISI-memo
PVP         Packet Video Protocol                        ISI-memo
```

[Note: an asterisk at the end of a line indicates a change from the
previous edition of this document.]

6.8. Informational Protocols

Information protocols have no status.

```
Protocol    Name                                             RFC
========    ==================================               =====
--------    ST2+ over ATM Protocol Spec - UNI 3.1 Version    2383*
--------    Mapping Airline Reservation, Ticketing, Messaging 2351
KOI8-U      Ukrainian Character Set KOI8-U                   2319
TEXT-CSS    The text/css Media Type                          2318
PKCS-7      PKCS #7: Cryptographic Message Syntax Version 1.5 2315
PKCS-10     PKCS #10: Certification Request Syntax Version 1.5 2314
PKCS-1      PKCS #1: RSA Encryption Version 1.5              2313
SMIME-CERT  S/MIME Version 2 Certificate Handling            2312
SMIME-MSG   S/MIME Version 2 Message Specification           2311
TIFF        Tag Image File Format F Profile for Facsimile    2302
GSMP        Ipsilon's General Switch Management Protocol     2297
HSRP        Cisco Hot Standby Router Protocol (HSRP)         2281
RC2-ENCRP   A Description of the RC2(r) Encryption Algorithm 2268
SNQP        Simple Nomenclator Query Protocol                2259
--------    Japanese Character Encoding for Internet Messages 2237
KEYX-DNS    Key Exchange Delegation Record for the DNS       2230
DSP         A Dictionary Server Protocol                     2229
NFS-URL     NFS URL Scheme                                   2224
APP-MARC    The Application/MARC Content-type                2220
ODETTE-FTP  ODETTE File Transfer Protocol                    2204
ESRO        AT&T/Neda's Efficient Short Remote Operations Protocol 2188
ICP         Internet Cache Protocol Version 2                2186
IPV4-MAPOS  IPv4 over MAPOS Version 1                        2176
MAPOS-SONET Multiple Access Protocol over SONET/SDH Version 1 2171
RWHOIS      Referral Whois Protocol                          2167
PPP-EXT     PPP Vendor Extensions                            2153
UTF-7       UTF-7                                            2152
CAST-128    CAST-128 Encryption Algorithm                    2144
RADIUS-ACC  RADIUS Accounting                                2139
DLSCAP      Data Link Switching Client Access Protocol       2114
PNG         Portable Network Graphics Version 1.0            2083
RC5         RC5, RC5-CBC, RC5-CBC-Pad, and RC5-CTS Algorithms 2040
SNTP        Simple Network Time Protocol v4 for IPv4, IPv6 and OSI 2030
PGP-MEF     PGP Message Exchange Formats                     1991
PPP-DEFL    PPP Deflate Protocol                             1979
PPP-PRED    PPP Predictor Compression Protocol               1978
PPP-BSD     PPP BSD Compression Protocol                     1977
PPP-DCE     PPP for Data Compression in DCE                  1976
PPP-MAG     PPP Magnalink Variable Resource Compression      1975
PPP-STAC    PPP Stac LZS Compression Protocol                1974
GZIP        GZIP File Format Specification Version 4.3        1952
DEFLATE     DEFLATE Compressed Data Format Specification V. 1.3 1951
```

```
ZLIB        ZLIB Compressed Data Format Specification V. 3.3   1950
HTTP-1.0    Hypertext Transfer Protocol -- HTTP/1.0            1945
--------    text/enriched MIME Content-type                    1896
--------    Application/CALS-1840 Content-type                 1895
--------    PPP IPCP Extensions for Name Server Addresses      1877
SNPP        Simple Network Paging Protocol - Version 2         1861
--------    ISO Transport Class 2 Non-use Explicit Flow Control 1859
            over TCP RFC1006 extension
--------    IP in IP Tunneling                                 1853
--------    PPP Network Control Protocol for LAN Extension     1841
TESS        The Exponential Security System                    1824
NFSV3       NFS Version 3 Protocol Specification               1813
--------    A Format for Bibliographic Records                 1807
-------     Data Link Switching: Switch-to-Switch Protocol     1795
BGP-4       Experience with the BGP-4 Protocol                 1773
SDMD        IPv4 Option for Sender Directed MD Delivery        1770
SNOOP       Snoop Version 2 Packet Capture File Format         1761
BINHEX      MIME Content Type for BinHex Encoded Files         1741
DNS-NSAP    DNS NSAP Resource Records                          1706
RADIO-PAGE TPC.INT Subdomain: Radio Paging -- Technical Procedures 1703
GRE-IPv4    Generic Routing Encapsulation over IPv4            1702
GRE         Generic Routing Encapsulatio                       1701
ADSNA-IP    Advanced SNA/IP: A Simple SNA Transport Protocol   1538
TACACS      Terminal Access Control Protocol                   1492
MD4         MD4 Message Digest Algorithm                       1320
SUN-NFS     Network File System Protocol                       1094
SUN-RPC     Remote Procedure Call Protocol Version 2           1057
GOPHER      The Internet Gopher Protocol                       1436
LISTSERV    Listserv Distribute Protocol                       1429
-------     Replication Requirements                           1275
PCMAIL      Pcmail Transport Protocol                          1056
MTP         Multicast Transport Protocol                       1301
BSD Login   BSD Login                                          1282
DIXIE       DIXIE Protocol Specification                       1249
IP-X.121    IP to X.121 Address Mapping for DDN                1236
OSI-HYPER   OSI and LLC1 on HYPERchannel                       1223
HAP2        Host Access Protocol                               1221
SUBNETASGN On the Assignment of Subnet Numbers                 1219
SNMP-TRAPS Defining Traps for use with SNMP                    1215
DAS         Directory Assistance Service                       1202
LPDP        Line Printer Daemon Protocol                       1179
```

[Note: an asterisk at the end of a line indicates a change from the
previous edition of this document.]

6.9. Historic Protocols

All Historic protocols have Not Recommended status.

```
Protocol   Name                                      RFC  STD
========   ===================================       ===== ===
IPV6-UNI   IPv6 Provider-Based Unicast Address  Elective 2073     *
IPV6-Addr  IPv6 Addressing Architecture         Elective 1884     *
L2F        Cisco Layer Two Forwarding Protocol           2341
IPSO       DoD Security Options for IP          Elective 1108
SNMPv2     Manager-to-Manager MIB               Elective 1451
SNMPv2     Party MIB for SNMPv2                 Elective 1447
SNMPv2     Security Protocols for SNMPv2        Elective 1446
SNMPv2     Administrative Model for SNMPv2      Elective 1445
RIP        Routing Information Protocol          Ele    1058   34
--------   Mapping full 822 to Restricted 822           1137
BGP3       Border Gateway Protocol 3 (BGP-3)        1267,1268
--------   Gateway Requirements                  Req    1009    4
EGP        Exterior Gateway Protocol             Rec     904   18
SNMP-MUX   SNMP MUX Protocol and MIB                     1227
OIM-MIB-II OSI Internet Management: MIB-II                1214
IMAP3      Interactive Mail Access Protocol Version 3    1203
SUN-RPC    Remote Procedure Call Protocol Version 1      1050
802.4-MIP  IEEE 802.4 Token Bus MIB                      1230
CMOT       Common Management Information Services        1189
--------   Mail Privacy: Procedures                      1113
--------   Mail Privacy: Key Management                  1114
--------   Mail Privacy: Algorithms                      1115
NFILE      A File Access Protocol                        1037
HOSTNAME   HOSTNAME Protocol                              953
SFTP       Simple File Transfer Protocol                  913
SUPDUP     SUPDUP Protocol                                734
BGP        Border Gateway Protocol                  1163,1164
MIB-I      MIB-I                                         1156
SGMP       Simple Gateway Monitoring Protocol            1028
HEMS       High Level Entity Management Protocol         1021
STATSRV    Statistics Server                              996
POP2       Post Office Protocol, Version 2                937
RATP       Reliable Asynchronous Transfer Protocol        916
HFEP       Host - Front End Protocol                      929
THINWIRE   Thinwire Protocol                              914
HMP        Host Monitoring Protocol                       869
GGP        Gateway Gateway Protocol                       823
RTELNET    Remote Telnet Service                          818
CLOCK      DCNET Time Server Protocol                     778
MPM        Internet Message Protocol                      759
NETRJS     Remote Job Service                             740
NETED      Network Standard Text Editor                   569
```

```
RJE        Remote Job Entry                                407
XNET       Cross Net Debugger                           IEN-158
NAMESERVER Host Name Server Protocol                    IEN-116
MUX        Multiplexing Protocol                         IEN-90
GRAPHICS   Graphics Protocol                          NIC-24308
```

[Note: an asterisk at the end of a line indicates a change from the
previous edition of this document.]

6.10. Obsolete Protocols

   Some of the protocols listed in this memo are described in RFCs that
   are obsoleted by newer RFCs. "Obsolete" or "obsoleted" is not an
   official state or status of protocols. This subsection is for
   information only.

   While it may seem to be obviously wrong to have an obsoleted RFC in
   the list of standards, there may be cases when an older standard is
   in the process of being replaced. This process may take a year or
   two.

   Many obsoleted protocols are of little interest and are dropped from
   this memo altogether. Some obsoleted protocols have received enough
   recognition that it seems appropriate to list them under their
   current status and with the following reference to their current
   replacement.

```
RFC            RFC   Status    Title                                   *
====           ====  ========  ================================= =
1305 obsoletes 1119  Stan/Rec  Network Time Protocol version 2
```

   Thanks to Lynn Wheeler for compiling the information in this
   subsection.

   [Note: an asterisk at the end of a line indicates a change from the
   previous edition of this document.]

7. Contacts

7.1. IAB, IETF, and IRTF Contacts

    7.1.1. Internet Architecture Board (IAB) Contact

    Please send your comments about this list of protocols and especially
    about the Draft Standard Protocols to the Internet Architecture Board
    care of Abel Winerib, IAB Executive Director.

        Contacts:

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    The protocol standards are managed by the Internet Assigned Numbers
    Authority.

    Please refer to the document "Assigned Numbers" (RFC-1700) for
    further information about the status of protocol documents. There
    are two documents that summarize the requirements for host and
    gateways in the Internet, "Host Requirements" (RFC-1122 and RFC-1123)
    and "Requirements for IP Version 4 Routers" (RFC-1812).

       How to obtain the most recent edition of this "Internet Official
       Protocol Standards" memo:

       The file "in-notes/std/std1.txt" may be copied via FTP from the
       FTP.ISI.EDU computer using the FTP username "anonymous" and FTP
       password "guest".

7.3.   Request for Comments Editor Contact

       Contact:

          Jon Postel
          RFC Editor
          USC/Information Sciences Institute
          4676 Admiralty Way
          Marina del Rey, CA 90292-6695

          1-310-822-1511

          RFC-Editor@ISI.EDU

   Documents may be submitted via electronic mail to the RFC Editor for
   consideration for publication as RFC. If you are not familiar with
   the format or style requirements please request the "Instructions for
   RFC Authors". In general, the style of any recent RFC may be used as
   a guide.

7.4.   The Network Information Center and
       Requests for Comments Distribution Contact

   RFCs can be obtained via FTP from FTP.ISI.EDU, with the pathname in-
   notes/rfcnnnn.txt (where "nnnn" refers to the number of the RFC).
   Login with FTP username "anonymous" and password "name@host.domain".

   RFCs can also be obtained via electronic mail from ISI.EDU by using
   the RFC-INFO service. Address the request to "rfc-info@isi.edu" with
   a message body of:

             Retrieve: RFC
                Doc-ID: RFCnnnn

   (Where "nnnn" refers to the number of the RFC (always use 4 digits -
   the DOC-ID of RFC 822 is "RFC0822")). The RFC-INFO@ISI.EDU server
   provides other ways of selecting RFCs based on keywords and such; for
   more information send a message to "rfc-info@isi.edu" with the
   message body "help: help".

   contact: RFC-Manager@ISI.EDU

7.5. Sources for Requests for Comments

   Details on many sources of RFCs via FTP or EMAIL may be obtained by
   sending an EMAIL message to "rfc-info@ISI.EDU" with the message body
   "help: ways_to_get_rfcs". For example:

           To: rfc-info@ISI.EDU
           Subject: getting rfcs

           help: ways_to_get_rfcs

8. Security Considerations

   Security issues are not addressed in this memo.

9. Authors' Addresses

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