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## Internet Official Protocol Standards

### Status of this Memo

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### Abstract

This memo contains a snapshot of the state of standardization of protocols used in the Internet as of April 17, 2001. It lists only official protocol standards RFCs; it is not a complete index to the RFC series. The latest version of this memo is designated STD 1.

### Table of Contents

1. Overview . . . . .	2
2. Contacts . . . . .	2
2.1. Internet-Related Organizations . . . . .	2
2.2. Request for Comments Editor (RFC Editor) Web Pages . . . . .	2
2.3. Retrieval using FTP . . . . .	3
2.4. Search and Retrieval Using Email . . . . .	4
3. Current Technical Specifications . . . . .	5
3.1. Standard Protocols Ordered by STD . . . . .	5
3.2. Standard Protocols Ordered by RFC . . . . .	8
3.3. Draft Standard Protocols . . . . .	10
3.4. Proposed Standard Protocols . . . . .	13
3.5. Experimental Protocols . . . . .	30
3.6. Historic Protocols . . . . .	35
4. Security Considerations . . . . .	37
5. Editors' Addresses . . . . .	37
6. Full Copyright Statement . . . . .	38

## 1. Overview

This memo contains a snapshot of the state of standardization of protocols used in the Internet, as determined by the Internet Engineering Task Force (IETF). It is an April 17, 2001 snapshot of the current official protocol standards list, which is updated daily and is available from the RFC Editor Web site.

The RFC Editor publishes Request for Comments (RFC) documents that are the output of the IETF process or are submitted individually via electronic mail. Further information about the RFC series is contained in section 2.1, RFC 2026 and at <http://www.rfc-editor.org>.

This memo is published by the RFC Editor for the IESG and IAB in accordance with Section 2.1 of "The Internet Standards Process -- Revision 3", RFC 2026, which specifies the rules and procedures by which all Internet standards are set. Sections 3.1 - 3.6 of this memo contain the lists of protocols in each stage of standardization - Standard, Draft Standard, Proposed Standard, Experimental and Historic. Protocols that are new to this document or have been moved from one protocol level to another, or that differ from the previous edition of this document are marked with an asterisk. Informational RFCs are not included. This memo lists the current standards track, Experimental, and Historic protocols; it is not a complete index to RFCs.

## 2. Resources

This section contains important contact information, for reference.

### 2.1. Internet-Related Organizations

Internet Architecture Board (IAB) Contact: [www.iab.org](http://www.iab.org)

Internet Engineering Task Force (IETF) Contact: [www.ietf.org](http://www.ietf.org)

Internet Research Task Force (IRTF) Contact: [www.irtf.org](http://www.irtf.org)

Internet Assigned Numbers Authority (IANA) Contact: [www.iana.org](http://www.iana.org)

### 2.2. Request for Comments Editor (RFC Editor) Web Pages

The RFC Editor maintains the official repository of all RFCs and indexes to them. The RFC Editor web site is:

<http://www.rfc-editor.org>.

At this URL, a user can:

- (a) Obtain the current "Internet Official Protocol Standards" list.  
See:

<http://www.rfc-editor.org/rfcxx00.html>

This hyper-linked listing is updated daily.

- (b) Retrieve the latest version of this STD 1 memo. See:

<http://www.rfc-editor.org/go.html>, and select STD and "1".

- (c) Retrieve text of any RFC. See:

<http://www.rfc-editor.org/go.html>

- (d) Search for RFCs by category. See:

<http://www.rfc-editor.org/category.html>

- (e) Search the RFC index for document number, author, title, and/or keywords, and retrieve the text of any matching documents. See:

<http://www.rfc-editor.org/rfcsearch.html>

RFC information can also be retrieved using FTP or email.

### 2.3 Retrieval using FTP

RFC-related files may be copied via FTP from the FTP.RFC-EDITOR.ORG computer using the FTP username "anonymous" and password "name@host.domain". An FTP user can:

- (a) Retrieve the latest version of this STD 1 memo.

File: "in-notes/std/std1.txt"

- (b) Retrieve text of any RFC.

File: "in-notes/rfcnnnn.txt" will retrieve the ASCII version. Some RFCs also have secondary Postscript and/or PDF versions, available from File: "in-notes/rfcnnnn.ps" and/or "in-notes/rfcnnnn.pdf", respectively.

Here "nnnn" is a 1-4 digit RFC number, with no leading zeros.

## 2.4 Search and Retrieval Using Email

To use the RFC Editor's email-based RFC-INFO service, send a request to:

RFC-INFO@RFC-EDITOR.ORG

In the message body, include your information request. For example, the following message bodies may be used.

(a) To retrieve the latest version of this STD 1 memo:

```
Retrieve: STD
Doc-ID: STD0001
```

(b) To retrieve ASCII text of any RFC:

```
Retrieve: RFC
Doc-ID: RFCnnnn
```

Here "nnnn" must be filled with leading zeros to 4 digits.

(c) The RFC-INFO@RFC-EDITOR.ORG server provides other capabilities, e.g., search and retrieval based on author, title, and/or keyword. For more information, send the following message body to the server:

```
help: help
```

The server will email back the results.

## 3. Current Technical Specifications

## 3.1. Standard Protocols Ordered by STD

Mnemonic	Title	RFC#	STD#
-----	Internet Official Protocol Standards	2800	1*
-----	Assigned Numbers	1700	2
-----	Requirements for Internet Hosts - Communication Layers	1122	3
-----	Requirements for Internet Hosts - Application and Support	1123	3
-----	[Reserved for Router Requirements. See RFC 1812]		4*
IP	Internet Protocol	791	5
ICMP	Internet Control Message Protocol	792	5
-----	Broadcasting Internet Datagrams	919	5
-----	Broadcasting Internet datagrams in the presence of subnets	922	5
-----	Internet Standard Subnetting Procedure	950	5
IGMP	Host extensions for IP multicasting	1112	5
UDP	User Datagram Protocol	768	6
TCP	Transmission Control Protocol	793	7
TELNET	Telnet Protocol Specification	854	8
TELNET	Telnet Option Specifications	855	8
FTP	File Transfer Protocol	959	9
SMTP	[Reserved for Simple Mail Transfer Protocol (SMTP). See RFC 2821.]		10*
SMTP-SIZE	SMTP Service Extension for Message Size Declaration	1870	10
MAIL	[Reserved for Internet Message Format. See RFC 2822.]		11*
NTP	[Reserved for Network Time Protocol (NTP). See RFC 1305.]		12*
DOMAIN	Domain names - concepts and facilities	1034	13
DOMAIN	Domain names - implementation and specification	1035	13
DNS-MX	[Was Mail Routing and the Domain System (RFC974). Now Historic.]		14*
SNMP	Simple Network Management Protocol (SNMP)	1157	15
SMI	Structure and identification of management information for TCP/IP-based internets	1155	16
Concise-MI	Concise MIB definitions	1212	16
MIB-II	Management Information Base for Network Management of TCP/IP-based internets:MIB-II	1213	17
EGP	[Was Exterior Gateway Protocol (RFC904). Now Historic.]		18*
NETBIOS	Protocol standard for a NetBIOS service on a TCP/UDP transport: Concepts and methods	1001	19
NETBIOS	Protocol standard for a NetBIOS service on a TCP/UDP transport: Detailed specifications	1002	19

ECHO	Echo Protocol	862	20
DISCARD	Discard Protocol	863	21
CHARGEN	Character Generator Protocol	864	22
QUOTE	Quote of the Day Protocol	865	23
USERS	Active users	866	24
DAYTIME	Daytime Protocol	867	25
TIME	Time Protocol	868	26
TOPT-BIN	Telnet Binary Transmission	856	27
TOPT-ECHO	Telnet Echo Option	857	28
TOPT-SUPP	Telnet Suppress Go Ahead Option	858	29
TOPT-STAT	Telnet Status Option	859	30
TOPT-TIM	Telnet Timing Mark Option	860	31
TOPT-EXTOP	Telnet Extended Options: List Option	861	32
TFTP	The TFTP Protocol (Revision 2)	1350	33
RIP1	[Was Routing Information Protocol (RIP). Replaced by STD 56.]		34*
TP-TCP	ISO transport services on top of the TCP: Version 3	1006	35
IP-FDDI	Transmission of IP and ARP over FDDI Networks	1390	36
ARP	Ethernet Address Resolution Protocol: Or converting network protocol addresses to 48.bit Ethernet address for transmission on Ethernet hardware	826	37
RARP	Reverse Address Resolution Protocol	903	38
-----	[Was BBN Report 1822 (IMP/Host Interface). Now Historic.]		39*
IP-WB	Host Access Protocol specification	907	40*
IP-E	Standard for the transmission of IP datagrams over Ethernet networks	894	41
IP-EE	Standard for the transmission of IP datagrams over experimental Ethernet networks	895	42
IP-IEEE	Standard for the transmission of IP datagrams over IEEE 802 networks	1042	43
IP-DC	DCN local-network protocols	891	44
IP-HC	Internet Protocol on Network System's HYPERchannel: Protocol specification	1044	45
IP-ARC	Transmitting IP traffic over ARCNET networks	1201	46
IP-SLIP	Nonstandard for transmission of IP datagrams over serial lines: SLIP	1055	47
IP-NETBIOS	Standard for the transmission of IP datagrams over NetBIOS networks	1088	48
IP-IPX	Standard for the transmission of 802.2 packets over IPX networks	1132	49
ETHER-MIB	Definitions of Managed Objects for the Ethernet- like Interface Types	1643	50
PPP	The Point-to-Point Protocol (PPP)	1661	51
PPP-HDLC	PPP in HDLC-like Framing	1662	51
IP-SMDS	Transmission of IP datagrams over the SMDS Service	1209	52
POP3	Post Office Protocol - Version 3	1939	53

OSPF2	OSPF Version 2	2328	54
IP-FR	Multiprotocol Interconnect over Frame Relay	2427	55
RIP2	RIP Version 2	2453	56
RIP2-APP	RIP Version 2 Protocol Applicability Statement	1722	57
SMIPv2	Structure of Management Information Version 2 (SMIPv2)	2578	58
CONV-MIB	Textual Conventions for SMIPv2	2579	58
CONF-MIB	Conformance Statements for SMIPv2	2580	58
RMON-MIB	Remote Network Monitoring Management Information Base	2819	59
SMTP-Pipe	SMTP Service Extension for Command Pipelining	2920	60*
ONE-PASS	A One-Time Password System	2289	61*

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

## 3.2. Standard Protocols Ordered by RFC

Mnemonic	Title	STD#	RFC#
SMTP-Pipe	SMTP Service Extension for Command Pipelining	60*	2920*
RMON-MIB	Remote Network Monitoring Management Information Base	59	2819
IAB	Internet Official Protocol Standards	1*	2800*
CONF-MIB	Conformance Statements for SMIV2	58	2580
CONV-MIB	Textual Conventions for SMIV2	58	2579
SMIV2	Structure of Management Information Version 2 (SMIV2)	58	2578
RIP2	RIP Version 2	56	2453
IP-FR	Multiprotocol Interconnect over Frame Relay	55	2427
OSPF2	OSPF Version 2	54	2328
ONE-PASS	A One-Time Password System	61*	2289*
POP3	Post Office Protocol - Version 3	53	1939
SMTP-SIZE	SMTP Service Extension for Message Size Declaration	10	1870
RIP2-APP	RIP Version 2 Protocol Applicability Statement	57	1722
-----	Assigned Numbers	2	1700
PPP-HDLC	PPP in HDLC-like Framing	51	1662
PPP	The Point-to-Point Protocol (PPP)	51	1661
ETHER-MIB	Definitions of Managed Objects for the Ethernet-like Interface Types	50	1643
IP-FDDI	Transmission of IP and ARP over FDDI Networks	36	1390
TFTP	The TFTP Protocol (Revision 2)	33	1350
MIB-II	Management Information Base for Network Management of TCP/IP-based internets:MIB-II	17	1213
Concise-MI	Concise MIB definitions	16	1212
IP-SMDS	Transmission of IP datagrams over the SMDS Service	52	1209
IP-ARC	Transmitting IP traffic over ARCNET networks	46	1201
SNMP	Simple Network Management Protocol (SNMP)	15	1157
SMI	Structure and identification of management information for TCP/IP-based internets	16	1155
IP-IPX	Standard for the transmission of 802.2 packets over IPX networks	49	1132
-----	Requirements for Internet Hosts - Application and Support	3	1123
-----	Requirements for Internet Hosts - Communication Layers	3	1122
IGMP	Host extensions for IP multicasting	5	1112
IP-NETBIOS	Standard for the transmission of IP datagrams over NetBIOS networks	48	1088
IP-SLIP	Nonstandard for transmission of IP datagrams over serial lines: SLIP	47	1055
IP-HC	Internet Protocol on Network System's HYPERchannel: Protocol specification	45	1044



IP-IEEE	Standard for the transmission of IP datagrams over IEEE 802 networks	43	1042
DOMAIN	Domain names - implementation and specification	13	1035
DOMAIN	Domain names - concepts and facilities	13	1034
TP-TCP	ISO transport services on top of the TCP: Version 3	35	1006
NETBIOS	Protocol standard for a NetBIOS service on a TCP/UDP transport: Detailed specifications	19	1002
NETBIOS	Protocol standard for a NetBIOS service on a TCP/UDP transport: Concepts and methods	19	1001
FTP	File Transfer Protocol	9	959
-----	Internet Standard Subnetting Procedure	5	950
-----	Broadcasting Internet datagrams in the presence of subnets	5	922
-----	Broadcasting Internet Datagrams	5	919
IP-WB	Host Access Protocol specification	40*	907*
RARP	Reverse Address Resolution Protocol	38	903
IP-EE	Standard for the transmission of IP datagrams over experimental Ethernet networks	42	895
IP-E	Standard for the transmission of IP datagrams over Ethernet networks	41	894
IP-DC	DCN local-network protocols	44	891
TIME	Time Protocol	26	868
DAYTIME	Daytime Protocol	25	867
USERS	Active users	24	866
QUOTE	Quote of the Day Protocol	23	865
CHARGEN	Character Generator Protocol	22	864
DISCARD	Discard Protocol	21	863
ECHO	Echo Protocol	20	862
TOPT-EXTOP	Telnet Extended Options: List Option	32	861
TOPT-TIM	Telnet Timing Mark Option	31	860
TOPT-STAT	Telnet Status Option	30	859
TOPT-SUPP	Telnet Suppress Go Ahead Option	29	858
TOPT-ECHO	Telnet Echo Option	28	857
TOPT-BIN	Telnet Binary Transmission	27	856
TELNET	Telnet Option Specifications	8	855
TELNET	Telnet Protocol Specification	8	854
ARP	Ethernet Address Resolution Protocol: Or converting network protocol addresses to 48.bit Ethernet address for transmission on Ethernet hardware	37	826
TCP	Transmission Control Protocol	7	793
ICMP	Internet Control Message Protocol	5	792
IP	Internet Protocol	5	791
UDP	User Datagram Protocol	6	768

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

## 3.3. Draft Standard Protocols

Mnemonic	Title	RFC#
RADIUS	Remote Authentication Dial In User Service (RADIUS)	2865
INTERGRMIB	The Interfaces Group MIB	2863
-----	Host Resources MIB	2790
-----	HTTP Authentication: Basic and Digest Access Authentication	2617
HTTP	Hypertext Transfer Protocol -- HTTP/1.1	2616
VACM-SNMP	View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)	2575
USM-SNMPV3	User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)	2574
SNMP-APP	SNMP Applications	2573
MPD-SNMP	Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)	2572
ARCH-SNMP	An Architecture for Describing SNMP Management Frameworks	2571
ICMPv6	Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification	2463
IPV6-AUTO	IPv6 Stateless Address Autoconfiguration	2462
IPV6-ND	Neighbor Discovery for IP Version 6 (IPv6)	2461
IPV6	Internet Protocol, Version 6 (IPv6) Specification	2460
URI-GEN	Uniform Resource Identifiers (URI): Generic Syntax	2396
IARP	Inverse Address Resolution Protocol	2390
TN3270E	TN3270 Enhancements	2355
TFTP-Opt	TFTP Timeout Interval and Transfer Size Options	2349
TFTP-Blk	TFTP Blocksize Option	2348
TFTP-Ext	TFTP Option Extension	2347
UTF-8	UTF-8, a transformation format of ISO 10646	2279
DHCP-BOOTP	DHCP Options and BOOTP Vendor Extensions	2132
DHCP	Dynamic Host Configuration Protocol	2131
FRAME-MIB	Management Information Base for Frame Relay DTEs Using SMIv2	2115
IP-HIPPI	IP over HIPPI	2067
MIME-CONF	Multipurpose Internet Mail Extensions (MIME) Part Five: Conformance Criteria and Examples	2049
MIME-MSG	MIME (Multipurpose Internet Mail Extensions) Part Three: Message Header Extensions for Non-ASCII Text	2047
MIME-MEDIA	Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types	2046
MIME	Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies	2045
PPP-CHAP	PPP Challenge Handshake Authentication Protocol (CHAP)	1994
PPP-MP	The PPP Multilink Protocol (MP)	1990

PPP-LINK	PPP Link Quality Monitoring	1989
SNMPv2-MIB	Management Information Base for Version 2 of the Simple Network Management Protocol (SNMPv2)	1907
TRANS-MIB	Transport Mappings for Version 2 of the Simple Network Management Protocol (SNMPv2)	1906
OPS-MIB	Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2)	1905
CON-MD5	The Content-MD5 Header Field	1864
OSPF-MIB	OSPF Version 2 Management Information Base	1850
XDR	XDR: External Data Representation Standard	1832
-----	The String Representation of Standard Attribute Syntaxes	1778
-----	Lightweight Directory Access Protocol	1777
BGP-4-APP	Application of the Border Gateway Protocol in the Internet	1772
BGP-4	A Border Gateway Protocol 4 (BGP-4)	1771
PPP-DNCP	The PPP DECnet Phase IV Control Protocol (DNCP)	1762
802.5-MIB	IEEE 802.5 MIB using SMIV2	1748
RIP2-MIB	RIP Version 2 MIB Extension	1724
SIP-MIB	Definitions of Managed Objects for SMDS Interfaces using SMIV2	1694
-----	Definitions of Managed Objects for Parallel- printer-like Hardware Devices using SMIV2	1660
-----	Definitions of Managed Objects for RS-232- like Hardware Devices using SMIV2	1659
-----	Definitions of Managed Objects for Character Stream Devices using SMIV2	1658
BGP-4-MIB	Definitions of Managed Objects for the Fourth Version of the Border Gateway Protocol (BGP- 4) using SMIV2	1657
-----	SMTP Service Extension for 8bit-MIMEtransport	1652
OSI-NSAP	Guidelines for OSI NSAP Allocation in the Internet	1629
ISO-TS-ECH	An Echo Function for CLNP (ISO 8473)	1575
DECNET-MIB	DECnet Phase IV MIB Extensions	1559
-----	Clarifications and Extensions for the Bootstrap Protocol	1542
DHCP-BOOTP	Interoperation Between DHCP and BOOTP	1534
BRIDGE-MIB	Definitions of Managed Objects for Bridges	1493
IP-X.25	Multiprotocol Interconnect on X.25 and ISDN in the Packet Mode	1356
NTPV3	Network Time Protocol (Version 3) Specification, Implementation	1305
FINGER	The Finger User Information Protocol	1288
IP-MTU	Path MTU discovery	1191
-----	Proposed Standard for the Transmission of IP Datagrams over FDDI Networks	1188*

TOPT-LINE	Telnet Linemode Option	1184
NICNAME	NICNAME/WHOIS	954
BOOTP	Bootstrap Protocol	951

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

## 3.4. Proposed Standard Protocols

Mnemonic	Title	RFC#
-----	Mobile IP Vendor/Organization-Specific Extensions	3115*
-----	DNS Security Extension Clarification on Zone Status	3090*
COPS-PR	COPS Usage for Policy Provisioning (COPS-PR)	3084*
-----	Mapping the BEEP Core onto TCP	3081*
BEEP	The Blocks Extensible Exchange Protocol Core	3080*
-----	A Link-Layer Tunneling Mechanism for Unidirectional Links	3077*
-----	XML-Signature Syntax and Processing	3075*
-----	DHC Load Balancing Algorithm	3074*
L2TP-FR	Layer Two Tunneling Protocol (L2TP) over Frame Relay	3070*
BGP-ASC	Autonomous System Confederations for BGP	3065*
-----	LDAP Password Modify Extended Operation	3062*
CIM	Policy Core Information Model -- Version 1 Specification	3060*
SLPv2	Attribute List Extension for the Service Location Protocol	3059*
-----	ISDN Q.921-User Adaptation Layer	3057*
-----	Connection of IPv6 Domains via IPv4 Clouds	3056*
-----	Management Information Base for the PINT Services Architecture	3055*
-----	TN3270E Service Location and Session Balancing	3049*
-----	RTP Payload Format for ITU-T Recommendation G.722.1	3047*
-----	DHCP Relay Agent Information Option	3046*
-----	Enhancing TCP's Loss Recovery Using Limited Transmit	3042*
-----	Privacy Extensions for Stateless Address Autoconfiguration in IPv6	3041*
-----	Internet X.509 Public Key Infrastructure Qualified Certificates Profile	3039*
-----	VCID Notification over ATM link for LDP	3038*
-----	LDP Specification	3036*
-----	MPLS using LDP and ATM VC Switching	3035*
-----	Use of Label Switching on Frame Relay Networks Specification	3034*
-----	The Assignment of the Information Field and Protocol Identifier in the Q.2941 Generic Identifier and Q.2957 User-to-user Signaling for the Internet Protocol	3033*
-----	MPLS Label Stack Encoding	3032*
MPLS	Multiprotocol Label Switching Architecture	3031*
-----	SMTP Service Extensions for Transmission of Large and Binary MIME Messages	3030*
-----	Sieve: A Mail Filtering Language	3028*
-----	Reverse Tunneling for Mobile IP, revised	3024*
-----	XML Media Types	3023*

-----	Using 31-Bit Prefixes on IPv4 Point-to-Point Links	3021*
-----	Definitions of Managed Objects for Monitoring and Controlling the UNI/NNI Multilink Frame Relay Function	3020*
-----	IP Version 6 Management Information Base for The Multicast Listener Discovery Protocol	3019*
-----	XML DTD for Roaming Access Phone Book	3017*
-----	RTP Payload Format for MPEG-4 Audio/Visual Streams	3016*
MEGACO	Megaco Protocol Version 1.0	3015*
-----	Notification Log MIB	3014*
-----	Mobile IPv4 Challenge/Response Extensions	3012*
-----	The IPv4 Subnet Selection Option for DHCP	3011*
NFSV4	NFS version 4 Protocol	3010*
-----	Registration of parityfec MIME types	3009*
DNSSEC	Domain Name System Security (DNSSEC) Signing Authority	3008*
-----	Secure Domain Name System (DNS) Dynamic Update	3007*
-----	Integrated Services in the Presence of Compressible Flows	3006*
-----	The User Class Option for DHCP	3004*
-----	The audio/mpeg Media Type	3003*
-----	Specification of the Null Service Type	2997*
-----	Format of the RSVP DCLASS Object	2996*
-----	Computing TCP's Retransmission Timer	2988*
-----	Registration of Charset and Languages Media Features Tags	2987*
-----	Use of the CAST-128 Encryption Algorithm in CMS	2984*
-----	Distributed Management Expression MIB	2982*
-----	Event MIB	2981*
-----	The SIP INFO Method	2976*
-----	IMAP4 ID extension	2971*
-----	HTTP State Management Mechanism	2965*
-----	Stream Control Transmission Protocol	2960*
-----	Real-Time Transport Protocol Management Information Base	2959*
-----	Definitions of Managed Objects for Monitoring and Controlling the Frame Relay/ATM PVC Service Interworking Function	2955*
FR-MIB	Definitions of Managed Objects for Frame Relay Service	2954*
-----	Telnet Encryption: CAST-128 64 bit Cipher Feedback	2950*
-----	Telnet Encryption: CAST-128 64 bit Output Feedback	2949*
-----	Telnet Encryption: DES3 64 bit Output Feedback	2948*
-----	Telnet Encryption: DES3 64 bit Cipher Feedback	2947*
-----	Telnet Data Encryption Option	2946*
-----	The SRP Authentication and Key Exchange System	2945*
-----	Telnet Authentication: SRP	2944*
-----	TELNET Authentication Using DSA	2943*
-----	Telnet Authentication: Kerberos Version 5	2942*

TOPT-AUTH	Telnet Authentication Option	2941*
-----	Definitions of Managed Objects for Common Open Policy Service (COPS) Protocol Clients	2940*
-----	Identifying Composite Media Features	2938*
-----	The Name Service Search Option for DHCP	2937*
IOTP-HTTP	Internet Open Trading Protocol (IOTP) HTTP Supplement	2935*
-----	Internet Group Management Protocol MIB	2933*
-----	IPv4 Multicast Routing MIB	2932*
-----	DNS Request and Transaction Signatures ( SIG(0)s )	2931*
TKEY-RR	Secret Key Establishment for DNS (TKEY RR)	2930*
-----	Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations	2925*
-----	Route Refresh Capability for BGP-4	2918*
-----	E.164 number and DNS	2916*
NAPTR	The Naming Authority Pointer (NAPTR) DNS Resource Record	2915*
-----	MIME Content Types in Media Feature Expressions	2913*
-----	Indicating Media Features for MIME Content	2912*
IPP-M-S	Internet Printing Protocol/1.1: Model and Semantics	2911*
IPP-E-T	Internet Printing Protocol/1.1: Encoding and Transport	2910*
-----	MADCAP Multicast Scope Nesting State Option	2907*
RMON-MIB	Remote Network Monitoring MIB Protocol Identifier Reference	2895*
-----	Router Renumbering for IPv6	2894
TRANS-IPV6	Transition Mechanisms for IPv6 Hosts and Routers	2893
-----	LDAP Control Extension for Server Side Sorting of Search Results	2891
-----	Key and Sequence Number Extensions to GRE	2890
SACK	An Extension to the Selective Acknowledgement (SACK) Option for TCP	2883
-----	Content Feature Schema for Internet Fax (V2)	2879
PPP-BCP	PPP Bridging Control Protocol (BCP)	2878
-----	Diffie-Hellman Proof-of-Possession Algorithms	2875
-----	DNS Extensions to Support IPv6 Address Aggregation and Renumbering	2874
-----	TCP Processing of the IPv4 Precedence Field	2873
-----	Application and Sub Application Identity Policy Element for Use with	2872
-----	The Inverted Stack Table Extension to the Interfaces Group MIB	2864
-----	RTP Payload Format for Real-Time Pointers	2862
MEXT-BGP4	Multiprotocol Extensions for BGP-4	2858
-----	The Use of HMAC-RIPEMD-160-96 within ESP and AH	2857
SNMP	Textual Conventions for Additional High Capacity Data Types	2856
-----	DHCP for IEEE 1394	2855
-----	Generic Security Service API Version 2 : Java Bindings	2853
-----	Deliver By SMTP Service Extension	2852

-----	Textual Conventions for Internet Network Addresses	2851
LDIF	The LDAP Data Interchange Format (LDIF) - Technical Specification	2849
-----	The PINT Service Protocol: Extensions to SIP and SDP for IP Access to Telephone Call Services	2848
LIPKEY	LIPKEY - A Low Infrastructure Public Key Mechanism Using SPKM	2847
-----	GSTN Address Element Extensions in E-mail Services	2846
TSIG	Secret Key Transaction Authentication for DNS (TSIG)	2845
-----	Capabilities Advertisement with BGP-4	2842
-----	Definitions of Managed Objects for the Fabric Element in Fibre Channel Standard	2837
-----	Per Hop Behavior Identification Codes	2836
GSN	IP and ARP over HIPPI-6400 (GSN)	2835
-----	ARP and IP Broadcast over HIPPI-800	2834
-----	RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals	2833
-----	Using Digest Authentication as a SASL Mechanism	2831
LDAP	Lightweight Directory Access Protocol (v3): Extension for Transport Layer Security	2830
-----	Authentication Methods for LDAP	2829
-----	Integrated Service Mappings on IEEE 802 Networks	2815
-----	SBM (Subnet Bandwidth Manager): A Protocol for RSVP-based Admission Control over IEEE 802-style networks	2814
-----	URLs for Telephone Calls	2806
-----	Certificate Management Messages over CMS	2797
-----	BGP Route Reflection - An Alternative to Full Mesh IBGP	2796
-----	Mobile IP Network Access Identifier Extension for IPv4	2794
-----	RTP Payload for Text Conversation	2793
-----	Mail Monitoring MIB	2789
-----	Network Services Monitoring MIB	2788
-----	Definitions of Managed Objects for the Virtual Router Redundancy Protocol	2787
GRE	Generic Routing Encapsulation (GRE)	2784
DNS-SRV	A DNS RR for specifying the location of services (DNS SRV)	2782
MZAP	Multicast-Scope Zone Announcement Protocol (MZAP)	2776
RPSL	Routing Policy System Replication	2769
NAT-PT	Network Address Translation - Protocol Translation (NAT-PT)	2766
SIIT	Stateless IP/ICMP Translation Algorithm (SIIT)	2765
-----	Identity Representation for RSVP	2752
RSVP	Signaled Preemption Priority Policy Element	2751
-----	RSVP Extensions for Policy Control	2750
COPS-RSV	COPS usage for RSVP	2749
COPS	The COPS (Common Open Policy Service) Protocol	2748



-----	RSVP Cryptographic Authentication	2747
-----	RSVP Operation Over IP Tunnels	2746
-----	RSVP Diagnostic Messages	2745
-----	Generic Security Service API Version 2 : C-bindings	2744
-----	Generic Security Service Application Program Interface Version 2, Update 1	2743
-----	Definitions of Managed Objects for Extensible SNMP Agents	2742
SNMP	Agent Extensibility (AgentX) Protocol Version 1	2741
-----	OSPF for IPv6	2740
-----	Calendar Attributes for vCard and LDAP	2739
-----	Corrections to "A Syntax for Describing Media Feature Sets"	2738
-----	Entity MIB (Version 2)	2737
-----	NHRP Support for Virtual Private Networks	2735
-----	IPv4 over IEEE 1394	2734
-----	An RTP Payload Format for Generic Forward Error Correction	2733
-----	Format for Literal IPv6 Addresses in URL's	2732
MADCAP	Multicast Address Dynamic Client Allocation Protocol (MADCAP)	2730
-----	The Transmission of IP Over the Vertical Blanking Interval of a Television Signal	2728
-----	PGP Authentication for RIPE Database Updates	2726
-----	Routing Policy System Security	2725
-----	Traffic Flow Measurement: Meter MIB	2720
TLS	Addition of Kerberos Cipher Suites to Transport Layer Security (TLS)	2712
-----	IPv6 Router Alert Option	2711
MLD-IPv6	Multicast Listener Discovery (MLD) for IPv6	2710
-----	Integrated Services Mappings for Low Speed Networks	2688
-----	PPP in a Real-time Oriented HDLC-like Framing	2687
-----	The Multi-Class Extension to Multi-Link PPP	2686
VPNI	Virtual Private Networks Identifier	2685
-----	Multiprotocol Encapsulation over ATM Adaptation Layer 5	2684
-----	A Round-trip Delay Metric for IPPM	2681
-----	A One-way Packet Loss Metric for IPPM	2680
-----	A One-way Delay Metric for IPPM	2679
IPPM-MET	IPPM Metrics for Measuring Connectivity	2678
NHRP-MIB	Definitions of Managed Objects for the NBMA Next Hop Resolution Protocol (NHRP)	2677
-----	IPv6 Jumbograms	2675
-----	Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering and Virtual LAN Extensions	2674
DNS	Binary Labels in the Domain Name System	2673
-----	Non-Terminal DNS Name Redirection	2672

EDNS0	Extension Mechanisms for DNS (EDNS0)	2671
-----	Radio Frequency (RF) Interface Management Information	2670
	Base for MCNS/DOCSIS compliant RF interfaces	
-----	DOCSIS Cable Device MIB Cable Device Management	2669
	Information Base for DOCSIS compliant Cable	
	Modems and Cable Modem Termination Systems	
MAU-MIB	Definitions of Managed Objects for IEEE 802.3 Medium	2668
	Attachment Units (MAUs)	
-----	IP Tunnel MIB	2667
-----	Definitions of Managed Objects for the Ethernet-	2665
	like Interface Types	
-----	Definitions of Managed Objects for the ADSL Lines	2662
L2TP	Layer Two Tunneling Protocol "L2TP"	2661
-----	RTP Payload Format for PureVoice(tm) Audio	2658
-----	CIP Transport Protocols	2653
-----	MIME Object Definitions for the Common Indexing	2652
	Protocol (CIP)	
CIP	The Architecture of the Common Indexing Protocol (CIP)	2651
-----	The Text/Plain Format Parameter	2646
ODMR-SMT	ON-DEMAND MAIL RELAY (ODMR) SMTP with Dynamic IP	2645
	Addresses	
-----	Internationalization of the File Transfer Protocol	2640
-----	Enhanced Security Services for S/MIME	2634
-----	S/MIME Version 3 Message Specification	2633
-----	S/MIME Version 3 Certificate Handling	2632
-----	Diffie-Hellman Key Agreement Method	2631
-----	Cryptographic Message Syntax	2630
-----	IP and ARP over Fibre Channel	2625
-----	NFS Version 2 and Version 3 Security Issues and	2623
	the NFS Protocol's Use of RPCSEC_GSS and Kerberos	
	V5	
RPSL	Routing Policy Specification Language (RPSL)	2622
-----	RADIUS Authentication Server MIB	2619
-----	RADIUS Authentication Client MIB	2618
-----	PPP over SONET/SDH	2615
-----	Remote Network Monitoring MIB Extensions for Switched	2613
	Networks Version 1.0	
-----	DHCP Options for Service Location Protocol	2610
-----	Service Templates and Service: Schemes	2609
SLP	Service Location Protocol, Version 2	2608
-----	Directory Server Monitoring MIB	2605
-----	ILMI-Based Server Discovery for NHRP	2603
-----	ILMI-Based Server Discovery for MARS	2602
-----	ILMI-Based Server Discovery for ATMARP	2601
-----	An Expedited Forwarding PHB	2598
-----	Assured Forwarding PHB Group	2597
-----	Use of Language Codes in LDAP	2596
-----	Using TLS with IMAP, POP3 and ACAP	2595

-----	Definitions of Managed Objects for WWW Services	2594
-----	Definitions of Managed Objects for the Delegation of Management Script	2592
-----	Definitions of Managed Objects for Scheduling Management Operations	2591
-----	Transmission of IPv6 Packets over Frame Relay Networks Specification	2590*
LDAPv3	Lightweight Directory Access Protocol (v3): Extensions for Dynamic Directory Services	2589
-----	Internet X.509 Public Key Infrastructure LDAPv2 Schema	2587
-----	Internet X.509 Public Key Infrastructure Operational Protocols: FTP and HTTP	2585
-----	Definitions of Managed Objects for APPN/HPR in IP Networks	2584
TCP-CC	TCP Congestion Control	2581
SNMP	Coexistence between Version 1, Version 2, and Version 3 of the Internet-standard Network Management Framework	2576
APP-MIB	Application Management MIB	2564
-----	DHCP Option to Disable Stateless Auto-Configuration in IPv4 Clients	2563
TN3270E-R	Definitions of Protocol and Managed Objects for TN3270E Response Time Collection Using SMIV2 (TN3270E-RT-MIB)	2562
-----	Base Definitions of Managed Objects for TN3270E Using SMIV2	2561
PKIX	X.509 Internet Public Key Infrastructure Online Certificate Status Protocol - OCSP	2560
-----	Internet X.509 Public Key Infrastructure Operational Protocols - LDAPv2	2559
-----	Definitions of Managed Objects for the SONET/SDH Interface Type	2558
MHTML	MIME Encapsulation of Aggregate Documents, such as HTML (MHTML)	2557
-----	SMTP Service Extension for Authentication	2554
-----	Use of BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing	2545
SIP	SIP: Session Initiation Protocol	2543
DHK-DNS	Storage of Diffie-Hellman Keys in the Domain Name System (DNS)	2539
SC-DNS	Storing Certificates in the Domain Name System (DNS)	2538
-----	RSA/MD5 KEYS and SIGs in the Domain Name System (DNS)	2537
-----	DSA KEYS and SIGs in the Domain Name System (DNS)	2536
DNS-SECEXT	Domain Name System Security Extensions	2535
-----	Media Features for Display, Print, and Fax	2534
-----	A Syntax for Describing Media Feature Sets	2533
-----	Extended Facsimile Using Internet Mail	2532

-----	Indicating Supported Media Features Using Extensions to DSN and MDN	2530
-----	Transmission of IPv6 over IPv4 Domains without Explicit Tunnels	2529
-----	Reserved IPv6 Subnet Anycast Addresses	2526
WEBDAV	HTTP Extensions for Distributed Authoring -- WEBDAV	2518
ATM-MIBMAN	Definitions of Managed Objects for ATM Management	2515
ATM-TC-OID	Definitions of Textual Conventions and OBJECT-IDENTITIES for ATM Management	2514
-----	Managed Objects for Controlling the Collection and Storage of Accounting Information for Connection-Oriented Networks	2513
-----	Accounting Information for ATM Networks	2512
X.509-CRMF	Internet X.509 Certificate Request Message Format	2511
PKICMP	Internet X.509 Public Key Infrastructure Certificate Management Protocols	2510
IPCOM-PPP	IP Header Compression over PPP	2509
-----	Compressing IP/UDP/RTP Headers for Low-Speed Serial Links	2508
-----	IP Header Compression	2507
-----	Transmission of IPv6 Packets over ARCnet Networks	2497
DS3-E3-MIB	Definitions of Managed Object for the DS3/E3 Interface Type	2496
-----	Definitions of Managed Objects for the DS1, E1, DS2 and E2 Interface Types	2495
-----	Definitions of Managed Objects for the DS0 and DS0 Bundle Interface Type	2494
-----	Textual Conventions for MIB Modules Using Performance History Based on 15 Minute Intervals	2493
IPv6ATMNET	IPv6 over ATM Networks	2492
IPv6-NBMA	IPv6 over Non-Broadcast Multiple Access (NBMA) networks	2491
SMTP-TLS	SMTP Service Extension for Secure SMTP over TLS	2487
NAI	The Network Access Identifier	2486
-----	DHCP Option for The Open Group's User Authentication Protocol	2485
-----	PPP LCP Internationalization Configuration Option	2484
-----	Gateways and MIME Security Multiparts	2480
-----	The Simple and Protected GSS-API Negotiation Mechanism Message Submission	2478
-----	Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers	2476
-----	Generic Packet Tunneling in IPv6 Specification	2474
IPv6-PPP	IP Version 6 over PPP	2472
-----	Transmission of IPv6 Packets over Token Ring Networks	2470
-----	Transmission of IPv6 Packets over FDDI Networks	2467
ICMPv6-MIB	Management Information Base for IP Version 6: ICMPv6 Group	2466

-----	Management Information Base for IP Version 6: Textual Conventions and General Group	2465
-----	Transmission of IPv6 Packets over Ethernet Networks	2464
-----	Internet X.509 Public Key Infrastructure Certificate and CRL Profile	2459
EBN-MIB	Definitions of Managed Objects for Extended Border Node	2457
-----	Definitions of Managed Objects for APPN TRAPS	2456
APPN-MIB	Definitions of Managed Objects for APPN	2455
-----	IP Version 6 Management Information Base for the User Datagram Protocol	2454
-----	IP Version 6 Management Information Base for the Transmission Control Protocol	2452
-----	The ESP CBC-Mode Cipher Algorithms	2451
POP3-EXT	POP3 Extension Mechanism	2449
IMIP	iCalendar Message-Based Interoperability Protocol (iMIP)	2447
ITIP	iCalendar Transport-Independent Interoperability Protocol (iTIP) Scheduling Events, BusyTime, To-dos and Journal Entries	2446
ICALNDAR	Internet Calendaring and Scheduling Core Object Specification (iCalendar)	2445
OTP-SASL	The One-Time-Password SASL Mechanism	2444
-----	OpenPGP Message Format	2440
-----	BGP Route Flap Damping	2439
-----	RTP Payload Format for JPEG-compressed Video	2435
-----	RTP Payload Format for BT.656 Video Encoding	2431
-----	RTP Payload Format for the 1998 Version of ITU-T Rec. H.263 Video (H.263+)	2429
-----	FTP Extensions for IPv6 and NATs	2428
MIME-VCARD	vCard MIME Directory Profile	2426
TXT-DIR	A MIME Content-Type for Directory Information	2425
CONT-DUR	Content Duration MIME Header Definition	2424
MIME-VPIM	VPIM Voice Message MIME Sub-type Registration	2423
MIME-ADPCM	Toll Quality Voice - 32 kbit/s ADPCM MIME Sub-type Registration	2422
MIME-VP2	Voice Profile for Internet Mail - version 2	2421
3DESE	The PPP Triple-DES Encryption Protocol (3DESE)	2420
DESE-bis	The PPP DES Encryption Protocol, Version 2 (DESE-bis)	2419
-----	Definitions of Managed Objects for Multicast over UNI 3.0/3.1 based ATM Networks	2417
-----	The NULL Encryption Algorithm and Its Use With IPsec	2410
IKE	The Internet Key Exchange (IKE)	2409
ISAKMP	Internet Security Association and Key Management Protocol (ISAKMP)	2408
ISAKMPSEC	The Internet IP Security Domain of Interpretation for ISAKMP	2407
ESP	IP Encapsulating Security Payload (ESP)	2406

ESPDES-CBC	The ESP DES-CBC Cipher Algorithm With Explicit IV	2405
-----	The Use of HMAC-SHA-1-96 within ESP and AH	2404
-----	The Use of HMAC-MD5-96 within ESP and AH	2403
IP-AUTH	IP Authentication Header	2402
IPSEC	Security Architecture for the Internet Protocol	2401
DATA-URL	The "data" URL scheme	2397
IPCOMP	IP Payload Compression Protocol (IPComp)	2393
CIDMID-URL	Content-ID and Message-ID Uniform Resource Locators	2392
-----	Feature negotiation mechanism for the File Transfer Protocol	2389
-----	Returning Values from Forms: multipart/form-data	2388
MIME-RELAT	The MIME Multipart/Related Content-type	2387
-----	Protection of BGP Sessions via the TCP MD5 Signature Option	2385
POP-URL	POP URL Scheme	2384
-----	Interoperation of Controlled-Load Service and Guaranteed Service with ATM	2381
-----	RSVP over ATM Implementation Requirements	2380
-----	An IPv6 Aggregatable Global Unicast Address Format	2374
-----	IP Version 6 Addressing Architecture	2373
TIPV3	Transaction Internet Protocol Version 3.0	2371
OSPF-LSA	The OSPF Opaque LSA Option	2370
-----	The Use of URLs as Meta-Syntax for Core Mail List Commands and their Transport through Message Header Fields	2369
URLMAILTO	The mailto URL scheme	2368
PPP-AAL	PPP Over AAL5	2364
PPP-FUNI	PPP Over FUNI	2363
IMAP4UIDPL	IMAP4 UIDPLUS extension	2359
IMAP4NAME	IMAP4 Namespace	2342
VRRP	Virtual Router Redundancy Protocol	2338
NHRP-SCSP	A Distributed NHRP Service Using SCSP	2335
SCSP	Server Cache Synchronization Protocol (SCSP)	2334
-----	NHRP Protocol Applicability Statement	2333
NHRP	NBMA Next Hop Resolution Protocol (NHRP)	2332
UNI-SIG	ATM Signalling Support for IP over ATM - UNI Signalling 4.0 Update	2331
SDP	SDP: Session Description Protocol	2327
RTSP	Real Time Streaming Protocol (RTSP)	2326
IPOA-MIB	Definitions of Managed Objects for Classical IP and ARP Over ATM Using SMIPv2 (IPOA-MIB)	2320
DNS-NCACHE	Negative Caching of DNS Queries (DNS NCACHE)	2308
SMFAX-IM	A Simple Mode of Facsimile Using Internet Mail	2305
MINFAX-IM	Minimal FAX address format in Internet Mail	2304
MIN-PSTN	Minimal PSTN address format in Internet Mail	2303
TIFF	Tag Image File Format (TIFF) - image/tiff MIME Sub-type Registration	2302
FFIF	File Format for Internet Fax	2301

EMF-MDN	An Extensible Message Format for Message Disposition Notifications	2298
OR-ADD	Representing the O/R Address hierarchy in the X.500 Directory Information Tree	2294
SUBTABLE	Representing Tables and Subtrees in the X.500 Directory	2293
-----	Mobile-IPv4 Configuration Option for PPP IPCP	2290
SLM-APP	Definitions of System-Level Managed Objects for Applications	2287
PPP-EAP	PPP Extensible Authentication Protocol (EAP)	2284
-----	Definitions of Managed Objects for IEEE 802.12 Repeater Devices	2266
-----	A Summary of the X.500(96) User Schema for use with LDAPv3	2256
LDAP-URL	The LDAP URL Format	2255
STR-LDAP	The String Representation of LDAP Search Filters	2254
LDAP3-UTF8	Lightweight Directory Access Protocol (v3): UTF-8 String Representation of Distinguished Names	2253
LDAP3-ATD	Lightweight Directory Access Protocol (v3): Attribute Syntax Definitions	2252
LDAPV3	Lightweight Directory Access Protocol (v3)	2251
RTP-MPEG	RTP Payload Format for MPEG1/MPEG2 Video	2250
-----	Using Domains in LDAP/X.500 Distinguished Names	2247
-----	The TLS Protocol Version 1.0	2246
SASL-ANON	Anonymous SASL Mechanism	2245
ACAP	ACAP -- Application Configuration Access Protocol	2244
OTP-ER	OTP Extended Responses	2243
NETWAREIP	NetWare/IP Domain Name and Information	2242
DHCP-NDS	DHCP Options for Novell Directory Services	2241
HPR-MIB	Definitions of Managed Objects for HPR using SMIV2	2238
IGMP	Internet Group Management Protocol, Version 2	2236
ABNF	Augmented BNF for Syntax Specifications: ABNF	2234
DLUR-MIB	Definitions of Managed Objects for DLUR using SMIV2	2232
MIME-EXT	MIME Parameter Value and Encoded Word Extensions: Character Sets, Languages, and Continuations	2231
FTPSECEXT	FTP Security Extensions	2228
-----	Simple Hit-Metering and Usage-Limiting for HTTP	2227
-----	IP Broadcast over ATM Networks	2226
IP-ATM	Classical IP and ARP over ATM	2225
SASL	Simple Authentication and Security Layer (SASL)	2222
IMAP4LOGIN	IMAP4 Login Referrals	2221
-----	A Common Schema for the Internet White Pages Service	2218
-----	General Characterization Parameters for Integrated Service Network Elements	2215
-----	Integrated Services Management Information Base Guaranteed Service Extensions using SMIV2	2214
-----	Integrated Services Management Information Base using SMIV2	2213
GQOS	Specification of Guaranteed Quality of Service	2212

-----	Specification of the Controlled-Load Network Element Service	2211
RSVP-IS	The Use of RSVP with IETF Integrated Services	2210
RSVP-IPSEC	RSVP Extensions for IPSEC Data Flows	2207
RSVP-MIB	RSVP Management Information Base using SMIV2	2206
RSVP	Resource ReSerVation Protocol (RSVP) -- Version 1 Functional Specification	2205
RPCSEC-GSS	RPCSEC_GSS Protocol Specification	2203
RTP-RAD	RTP Payload for Redundant Audio Data	2198
IMAPPOPAU	IMAP/POP AUTHorize Extension for Simple Challenge/Response	2195
IMAP4MAIL	IMAP4 Mailbox Referrals	2193
IMAP-URL	IMAP URL Scheme	2192
-----	RTP Payload Format for H.263 Video Streams	2190
-----	Communicating Presentation Information in Internet Messages: The Content-Disposition Header Field	2183
DNS-CLAR	Clarifications to the DNS Specification	2181
IMAP4-IDLE	IMAP4 IDLE command	2177
SLP	Service Location Protocol	2165
-----	Use of an X.500/LDAP directory to support MIXER address mapping	2164
DNS-MCGAM	Using the Internet DNS to Distribute MIXER Conformant Global Address Mapping (MCGAM)	2163
-----	Carrying PostScript in X.400 and MIME	2160
-----	A MIME Body Part for FAX	2159
-----	X.400 Image Body Parts	2158
-----	Mapping between X.400 and RFC-822/MIME Message Bodies	2157
MIXER	MIXER (Mime Internet X.400 Enhanced Relay): Mapping between X.400 and RFC 822/MIME	2156
MAIL-SERV	Mailbox Names for Common Services, Roles and Functions	2142
URN-SYNTAX	URN Syntax	2141
DNS-UPDATE	Dynamic Updates in the Domain Name System (DNS UPDATE)	2136
DC-MIB	Dial Control Management Information Base using SMIV2	2128
ISDN-MIB	ISDN Management Information Base using SMIV2	2127
ITOT	ISO Transport Service on top of TCP (ITOT)	2126
BAP-BACP	The PPP Bandwidth Allocation Protocol (BAP) / The PPP Bandwidth Allocation Control Protocol (BACP)	2125
VEMMI-URL	VEMMI URL Specification	2122
ROUT-ALERT	IP Router Alert Option	2113
802.3-MIB	Definitions of Managed Objects for IEEE 802.3 Repeater Devices using SMIV2	2108
PPP-NBFCP	The PPP NetBIOS Frames Control Protocol (NBFCP)	2097
TABLE-MIB	IP Forwarding Table MIB	2096
RIP-TRIG	Triggered Extensions to RIP to Support Demand Circuits	2091
IMAP4-LIT	IMAP4 non-synchronizing literals	2088
IMAP4-QUO	IMAP4 QUOTA extension	2087
IMAP4-ACL	IMAP4 ACL extension	2086
HMAC-MD5	HMAC-MD5 IP Authentication with Replay Prevention	2085



RIP2-MD5	RIP-2 MD5 Authentication	2082
RIPNG-IPV6	RIPng for IPv6	2080
URI-ATT	Definition of an X.500 Attribute Type and an Object Class to Hold Uniform Resource Identifiers (URIs)	2079
MIME-MODEL	The Model Primary Content Type for Multipurpose Internet Mail Extensions	2077
IMAPV4	Internet Message Access Protocol - Version 4rev1	2060
URLZ39.50	Uniform Resource Locators for Z39.50	2056
SNANAU-APP	Definitions of Managed Objects for APPC using SMIV2	2051*
PPP-SNACP	The PPP SNA Control Protocol (SNACP)	2043
SMTP-ENH	SMTP Service Extension for Returning Enhanced Error Codes	2034
RTP-H.261	RTP Payload Format for H.261 Video Streams	2032
RTP-CELLB	RTP Payload Format of Sun's CellB Video Encoding	2029
SPKM	The Simple Public-Key GSS-API Mechanism (SPKM)	2025
DLSW-MIB	Definitions of Managed Objects for Data Link Switching using SMIV2	2024
MULTI-UNI	Support for Multicast over UNI 3.0/3.1 based ATM Networks	2022
RMON-MIB	Remote Network Monitoring Management Information Base Version 2 using SMIV2	2021
802.12-MIB	IEEE 802.12 Interface MIB	2020
TCP-ACK	TCP Selective Acknowledgement Options	2018
URL-ACC	Definition of the URL MIME External-Body Access-Type	2017
MIME-PGP	MIME Security with Pretty Good Privacy (PGP)	2015
MIB-UDP	SNMPv2 Management Information Base for the User Datagram Protocol using SMIV2	2013
MIB-TCP	SNMPv2 Management Information Base for the Transmission Control Protocol using SMIV2	2012
MIB-IP	SNMPv2 Management Information Base for the Internet Protocol using SMIV2	2011
MOBILEIPMI	The Definitions of Managed Objects for IP Mobility Support using SMIV2	2006
-----	Applicability Statement for IP Mobility Support	2005
MINI-IP	Minimal Encapsulation within IP	2004
IPENCAPIP	IP Encapsulation within IP	2003
MOBILEIPSU	IP Mobility Support	2002
BGP-COMM	BGP Communities Attribute	1997
DNS-NOTIFY	A Mechanism for Prompt Notification of Zone Changes (DNS NOTIFY)	1996
DNS-IZT	Incremental Zone Transfer in DNS	1995
SMTP-ETRN	SMTP Service Extension for Remote Message Queue Starting	1985
SNA	Serial Number Arithmetic	1982
MTU-IPV6	Path MTU Discovery for IP version 6	1981
PPP-FRAME	PPP in Frame Relay	1973
PPP-ECP	The PPP Encryption Control Protocol (ECP)	1968
GSSAPI-KER	The Kerberos Version 5 GSS-API Mechanism	1964

PPP-CCP	The PPP Compression Control Protocol (CCP)	1962
GSSAPI-SOC	GSS-API Authentication Method for SOCKS Version 5	1961
AUTH-SOCKS	Username/Password Authentication for SOCKS V5	1929
SOCKSV5	SOCKS Protocol Version 5	1928
WHOIS++M	How to Interact with a Whois++ Mesh	1914
WHOIS++A	Architecture of the Whois++ Index Service	1913
DSN	An Extensible Message Format for Delivery Status Notifications	1894
EMS-CODE	Enhanced Mail System Status Codes	1893
MIME-RPT	The Multipart/Report Content Type for the Reporting of Mail System Administrative Messages	1892
SMTP-DSN	SMTP Service Extension for Delivery Status Notifications	1891
RTP-AV	RTP Profile for Audio and Video Conferences with Minimal Control	1890
RTP	RTP: A Transport Protocol for Real-Time Applications	1889
DNS-IPV6	DNS Extensions to support IP version 6	1886
MIME-Sec	MIME Object Security Services	1848
MIME-Encyp	Security Multiparts for MIME: Multipart/Signed and Multipart/Encrypted	1847
WHOIS++	Architecture of the WHOIS++ service	1835
ONC-RPC	Binding Protocols for ONC RPC Version 2	1833
RPC	RPC: Remote Procedure Call Protocol Specification Version 2	1831
-----	The ESP DES-CBC Transform	1829
-----	IP Authentication using Keyed MD5	1828
-----	Requirements for IP Version 4 Routers	1812
URL	Relative Uniform Resource Locators	1808
CLDAP	Connection-less Lightweight X.500 Directory Access Protocol	1798
OSPF-DC	Extending OSPF to Support Demand Circuits	1793
OSI-Dir	Using the OSI Directory to Achieve User Friendly Naming	1781
MIME-EDI	MIME Encapsulation of EDI Objects	1767
XNSCP	The PPP XNS IDP Control Protocol (XNSCP)	1764
BVCP	The PPP Banyan Vines Control Protocol (BVCP)	1763
Print-MIB	Printer MIB	1759
ATM	ATM Signaling Support for IP over ATM	1755
IPNG	The Recommendation for the IP Next Generation Protocol	1752
802.5-SSR	IEEE 802.5 Station Source Routing MIB using SMIV2	1749
SDLCSMIV2	Definitions of Managed Objects for SNA Data Link Control (SDLC) using SMIV2	1747
BGP4/IDRP	BGP4/IDRP for IP---OSPF Interaction	1745
AT-MIB	AppleTalk Management Information Base II	1742
MacMIME	MIME Encapsulation of Macintosh Files - MacMIME	1740
URL	Uniform Resource Locators (URL)	1738
POP3-AUTH	POP3 AUTHentication command	1734
IMAP4-AUTH	IMAP4 Authentication Mechanisms	1731

RDBMS-MIB	Relational Database Management System (RDBMS) Management Information Base (MIB) using SMIV2	1697
MODEM-MIB	Modem Management Information Base (MIB) using SMIV2	1696
TMUX	Transport Multiplexing Protocol (TMux)	1692
SNANAU-MIB	Definitions of Managed Objects for SNA NAUs using SMIV2	1666
PPP-TRANS	PPP Reliable Transmission	1663
-----	Postmaster Convention for X.400 Operations	1648
UPS-MIB	UPS Management Information Base	1628
PPP-ISDN	PPP over ISDN	1618
DNS-R-MIB	DNS Resolver MIB Extensions	1612
DNS-S-MIB	DNS Server MIB Extensions	1611
PPP-X25	PPP in X.25	1598
OSPF-NSSA	The OSPF NSSA Option	1587
OSPF-Multi	Multicast Extensions to OSPF	1584
RIP-DC	Extensions to RIP to Support Demand Circuits	1582
TOPT-ENVIR	Telnet Environment Option	1572
PPP-LCP	PPP LCP Extensions	1570*
CIPX	Compressing IPX Headers Over WAN Media (CIPX)	1553
IPXCP	The PPP Internetworking Packet Exchange Control Protocol (IPXCP)	1552
SRB-MIB	Definitions of Managed Objects for Source Routing Bridges	1525
CIDR-STRA	Classless Inter-Domain Routing (CIDR): an Address Assignment and Aggregation Strategy	1519
CIDR-ARCH	An Architecture for IP Address Allocation with CIDR	1518
CIDR	Applicability Statement for the Implementation of Classless Inter-Domain Routing (CIDR)	1517
-----	Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs)	1515
-----	Token Ring Extensions to the Remote Network Monitoring MIB	1513
FDDI-MIB	FDDI Management Information Base	1512
KERBEROS	The Kerberos Network Authentication Service (V5)	1510
-----	X.400 Use of Extended Character Sets	1502
HARPOON	Rules for downgrading messages from X.400/88 to X.400/84 when MIME content-types are present in the messages	1496
-----	Equivalences between 1988 X.400 and RFC-822 Message Bodies	1494
IDPR	Inter-Domain Policy Routing Protocol Specification: Version 1	1479
IDPR-ARCH	An Architecture for Inter-Domain Policy Routing	1478
PPP/Bridge	The Definitions of Managed Objects for the Bridge Network Control Protocol of the Point-to-Point Protocol	1474
PPP/IPMIB	The Definitions of Managed Objects for the IP Network Control Protocol of the Point-to-Point Protocol	1473

PPP/SECMIB	The Definitions of Managed Objects for the Security Protocols of the Point-to-Point Protocol	1472
PPP/LCPMIB	The Definitions of Managed Objects for the Link Control Protocol of the Point-to-Point Protocol	1471
IP-TR-MC	IP Multicast over Token-Ring Local Area Networks	1469
X25-MIB	SNMP MIB extension for Multiprotocol Interconnect over X.25	1461
SNMPv2	Introduction to version 2 of the Internet-standard Network Management Framework	1441
PEM-KEY	Privacy Enhancement for Internet Electronic Mail: Part IV	1424
PEM-ALG	Privacy Enhancement for Internet Electronic Mail: Part III	1423
PEM-CKM	Privacy Enhancement for Internet Electronic Mail: Part II	1422
PEM-ENC	Privacy Enhancement for Internet Electronic Mail: Part I	1421
SNMP-IPX	SNMP over IPX	1420
SNMP-AT	SNMP over AppleTalk	1419
SNMP-OSI	SNMP over OSI	1418
FTP	FTP-FTAM Gateway Specification	1415
IDENT-MIB	Identification MIB	1414
IDENT	Identification Protocol	1413
BGP-OSPF	BGP OSPF Interaction	1403
-----	Default Route Advertisement In BGP2 and BGP3 Version of The Border Gateway Protocol	1397
SNMP-X.25	SNMP MIB Extension for the X.25 Packet Layer	1382
SNMP-LAPB	SNMP MIB Extension for X.25 LAPB	1381
PPP-ATCP	The PPP AppleTalk Control Protocol (ATCP)	1378
PPP-OSINLC	The PPP OSI Network Layer Control Protocol (OSINLCP)	1377
TOPT-RFC	Telnet Remote Flow Control Option	1372
-----	Applicability Statement for OSPF	1370
PPP-IPCP	The PPP Internet Protocol Control Protocol (IPCP)	1332
-----	X.400 1988 to 1984 downgrading	1328
TCP-EXT	TCP Extensions for High Performance	1323
NETFAX	A File Format for the Exchange of Images in the Internet	1314
FDDI-MIB	FDDI Management Information Base	1285
-----	Encoding Network Addresses to Support Operation over Non-OSI Lower Layers	1277
-----	Replication and Distributed Operations extensions to provide an Internet Directory using X.500	1276
-----	The COSINE and Internet X.500 Schema	1274
BGP-MIB	Definitions of Managed Objects for the Border Gateway Protocol: Version 3	1269
ICMP-ROUT	ICMP Router Discovery Messages	1256
STD-MIBs	Reassignment of experimental MIBs to standard MIBs	1239
IPX-IP	Tunneling IPX traffic through IP networks	1234

IS-IS	Use of OSI IS-IS for routing in TCP/IP and dual environments	1195
IP-CMPRS	Compressing TCP/IP headers for low-speed serial links	1144
TOPT-XDL	Telnet X display location option	1096
TOPT-TERM	Telnet terminal-type option	1091
TOPT-TS	Telnet terminal speed option	1079
TOPT-NAWS	Telnet window size option	1073
TOPT-X.3	Telnet X.3 PAD option	1053
TOPT-DATA	Telnet Data Entry Terminal option: DODIIS implementation	1043*
TOPT-3270	Telnet 3270 regime option	1041
NNTP	Network News Transfer Protocol	977
TOPT-TLN	Telnet terminal location number option	946
TOPT-OM	Output marking Telnet option	933
TOPT-TACAC	TACACS user identification Telnet option	927
TOPT-EOR	Telnet end of record option	885
TOPT-SNDL	Telnet send-location option	779
TOPT-SUPO	Telnet SUPDUP-Output option	749
TOPT-SUP	Telnet SUPDUP option	736
TOPT-BYTE	Revised Telnet byte macro option	735
TOPT-LOGO	Telnet logout option	727
TOPT-REM	Remote Controlled Transmission and Echoing Telnet option	726
TOPT-EXT	Telnet extended ASCII option	698

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

## 3.5. Experimental Protocols

Mnemonic	Title	RFC#
-----	OpenLDAP Root Service An experimental LDAP referral service	3088*
-----	Notification and Subscription for SLP	3082*
-----	MPLS Loop Prevention Mechanism	3063*
-----	Internet X.509 Public Key Infrastructure Data Validation and Certification Server Protocols	3029*
-----	Unified Memory Space Protocol Specification	3018*
SAP	Session Announcement Protocol	2974*
-----	Protocol Independent Multicast MIB for IPv4	2934*
MASC	The Multicast Address-Set Claim (MASC) Protocol	2909*
-----	Generic AAA Architecture	2903*
-----	TCP Congestion Window Validation	2861
TSWTCM	A Time Sliding Window Three Colour Marker (TSWTCM)	2859
-----	OSPF over ATM and Proxy-PAR	2844*
PPP-SDL	PPP over Simple Data Link (SDL) using SONET/SDH with ATM-like framing	2823
-----	Diffie-Helman USM Key Management Information Base and Textual Convention	2786
-----	An HTTP Extension Framework	2774
-----	Encryption using KEA and SKIPJACK	2773
-----	GLOP Addressing in 233/8	2770
-----	Sampling of the Group Membership in RTP	2762
-----	Definitions of Managed Objects for Service Level Agreements Performance Monitoring	2758
HTCP	Hyper Text Caching Protocol (HTCP/0.0)	2756
-----	RTFM: New Attributes for Traffic Flow Measurement	2724
-----	PPP EAP TLS Authentication Protocol	2716
-----	SPKI Certificate Theory	2693
-----	SPKI Requirements	2692
-----	QoS Routing Mechanisms and OSPF Extensions	2676
-----	The Secure HyperText Transfer Protocol	2660
-----	Security Extensions For HTML	2659
-----	LDAPv2 Client vs. the Index Mesh	2657
-----	Registration Procedures for SOIF Template Types	2656
-----	CIP Index Object Format for SOIF Objects	2655
-----	A Tagged Index Object for use in the Common Indexing Protocol	2654
-----	An LDAP Control and Schema for Holding Operation Signatures	2649
-----	Script MIB Extensibility Protocol Version 1.0	2593
-----	The NewReno Modification to TCP's Fast Recovery Algorithm	2582
-----	Mapping between LPD and IPP Protocols	2569

IPP-RAT	Rationale for the Structure of the Model and Protocol for the Internet Printing Protocol	2568
IPP-DG	Design Goals for an Internet Printing Protocol	2567
DNS-INFO	Detached Domain Name System (DNS) Information	2540
PHOTURIS-E	Photuris: Extended Schemes and Attributes	2523
PHOTURIS-S	Photuris: Session-Key Management Protocol	2522
ICMP-SEC	ICMP Security Failures Messages	2521
NHRP-MNHCS	NHRP with Mobile NHCs	2520
-----	URI Resolution Services Necessary for URN Resolution	2483
ECN-IP	A Proposal to add Explicit Congestion Notification (ECN) to IP	2481
-----	IPv6 Testing Address Allocation	2471
MARS-SCSP	A Distributed MARS Service Using SCSP	2443
TCP-WIN	Increasing TCP's Initial Window	2414
PIM-SM	Protocol Independent Multicast-Sparse Mode (PIM- SM): Protocol Specification	2362
-----	Domain Names and Company Name Retrieval	2345
RTP-MPEG	RTP Payload Format for Bundled MPEG	2343
-----	Intra-LIS IP multicast among routers over ATM using Sparse Mode PIM	2337
-----	The Safe Response Header Field	2310
LDAP-NIS	An Approach for Using LDAP as a Network Information Service	2307
HTTP-RVSA	HTTP Remote Variant Selection Algorithm -- RVSA/1.0	2296
TCN-HTTP	Transparent Content Negotiation in HTTP	2295
TOPT-COMPO	Telnet Com Port Control Option	2217
-----	Core Based Trees (CBT) Multicast Routing Architecture	2201
-----	Core Based Trees (CBT version 2) Multicast Routing	2189
-----	A Trivial Convention for using HTTP in URN Resolution	2169
-----	Resolution of Uniform Resource Identifiers using the Domain Name System	2168
MAP-MAIL	MaXIM-11 - Mapping between X.400 / Internet mail and Mail-11 mail	2162
MIME-ODA	A MIME Body Part for ODA	2161
OSPF-DIG	OSPF with Digital Signatures	2154
IP-SCSI	Encapsulating IP with the Small Computer System Interface	2143
X.500-NAME	Managing the X.500 Root Naming Context	2120
GKMP-ARCH	Group Key Management Protocol (GKMP) Architecture	2094
GKMP-SPEC	Group Key Management Protocol (GKMP) Specification	2093
TFTP-MULTI	TFTP Multicast Option	2090
IP-Echo	IP Echo Host Service	2075
TOPT-CHARS	TELNET CHARSET Option	2066
URAS	Uniform Resource Agents (URAs)	2016
GPS-AR	GPS-Based Addressing and Routing	2009
ETFTP	Experiments with a Simple File Transfer Protocol for Radio Links using Enhanced Trivial File Transfer Protocol (ETFTP)	1986

BGP-RR	BGP Route Reflection An alternative to full mesh IBGP	1966
SMKD	Scalable Multicast Key Distribution	1949
SNMPV2SM	User-based Security Model for SNMPv2	1910
SNMPV2AI	An Administrative Infrastructure for SNMPv2	1909
SNMPV2CB	Introduction to Community-based SNMPv2	1901
-----	OSI NSAPs and IPv6	1888
DNS-LOC	A Means for Expressing Location Information in the Domain Name System	1876
SGML-MT	SGML Media Types	1874
CONT-MT	Message/External-Body Content-ID Access Type	1873
UNARP	ARP Extension - UNARP	1868
BGP-IDRP	A BGP/IDRP Route Server alternative to a full mesh routing	1863
ESP3DES	The ESP Triple DES Transform	1851
-----	SMTP 521 Reply Code	1846
-----	SMTP Service Extension for Checkpoint/Restart	1845
ST2	Internet Stream Protocol Version 2 (ST2) Protocol Specification - Version ST2+	1819
-----	Communicating Presentation Information in Internet Messages: The Content-Disposition Header	1806
-----	Schema Publishing in X.500 Directory	1804
-----	MHS use of the X.500 Directory to support 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 Protocol - Version 1.0	1756
NARP	NBMA Address Resolution Protocol (NARP)	1735
DNS-ENCODE	DNS Encoding of Geographical Location	1712
TCP-POS	An Extension to TCP : Partial Order Service	1693
T/TCP	T/TCP -- TCP Extensions for Transactions Functional Specification	1644
MIME-UNI	Using Unicode with MIME	1641
FOOBAR	FTP Operation Over Big Address Records (FOOBAR)	1639
X500-CHART	Charting Networks in the X.500 Directory	1609
X500-DIR	Representing IP Information in the X.500 Directory	1608
SNMP-DPI	Simple Network Management Protocol Distributed Protocol Interface Version 2.0	1592
CLNP-TUBA	Use of ISO CLNP in TUBA Environments	1561
REM-PRINT	Principles of Operation for the TPC.INT Subdomain: Remote Printing -- Technical Procedures	1528
DASS	DASS - Distributed Authentication Security Service	1507
EHF-MAIL	Encoding Header Field for Internet Messages	1505
RAP	RAP: Internet Route Access Protocol	1476
TP-IX	TP/IX: The Next Internet	1475



-----	Routing Coordination for X.400 MHS Services Within a Multi Protocol / Multi Network Environment Table Format V3 for Static Routing	1465
-----	Using the Domain Name System To Store Arbitrary String Attributes	1464
IRCP	Internet Relay Chat Protocol	1459
SIFT	SIFT/UFT: Sender-Initiated/Unsolicited File Transfer	1440
DIR-ARP	Directed ARP	1433
TEL-SPX	Telnet Authentication: SPX	1412
TEL-KER	Telnet Authentication: Kerberos Version 4	1411
TRACE-IP	Traceroute Using an IP Option	1393
DNS-IP	An Experiment in DNS Based IP Routing	1383
RMCP	Remote Mail Checking Protocol	1339
MSP2	Message Send Protocol 2	1312
DSLCP	Dynamically Switched Link Control Protocol	1307
-----	X.500 and Domains	1279
IN-ENCAP	Scheme for an internet encapsulation protocol: Version 1	1241
CLNS-MIB	CLNS MIB for use with Connectionless Network Protocol (ISO 8473) and End System to Intermediate System (ISO 9542)	1238
CFDP	Coherent File Distribution Protocol	1235
IP-AX.25	Internet protocol encapsulation of AX.25 frames	1226
ALERTS	Techniques for managing asynchronously generated alerts	1224
MPP	Message Posting Protocol (MPP)	1204
SNMP-BULK	Bulk Table Retrieval with the SNMP	1187
DNS-RR	New DNS RR Definitions	1183
IMAP2	Interactive Mail Access Protocol: Version 2	1176
NTP-OSI	Network Time Protocol (NTP) over the OSI Remote Operations Service	1165
-----	Message Send Protocol	1159
DMF-MAIL	Digest message format	1153
RDP	Version 2 of the Reliable Data Protocol (RDP)	1151
-----	Standard for the transmission of IP datagrams on avian carriers	1149
TCP-ACO	TCP alternate checksum options	1146
-----	The Q Method of Implementing TELNET Option Negotiation	1143
IP-DVMRP	Distance Vector Multicast Routing Protocol	1075
VMTP	VMTP: Versatile Message Transaction Protocol	1045
COOKIE-JAR	Distributed-protocol authentication scheme	1004
NETBLT	NETBLT: A bulk data transfer protocol	998

IRTP	Internet Reliable Transaction Protocol functional and interface specification	938
LDP	Loader Debugger Protocol	909
RDP	Reliable Data Protocol	908

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

## 3.6. Historic Protocols

Mnemonic	Title	RFC#
IP-MAC	IP Authentication using Keyed SHA1 with Interleaved Padding (IP-MAC)	2841*
L2F	Cisco Layer Two Forwarding (Protocol) "L2F"	2341
IPV6-UNI	An IPv6 Provider-Based Unicast Address Format	2073
HTML-INT	Internationalization of the Hypertext Markup Language	2070
-----	A Proposed Extension to HTML : Client-Side Image Maps	1980*
HTML-TBL	HTML Tables	1942
IPV6-Addr	IP Version 6 Addressing Architecture	1884
-----	Form-based File Upload in HTML	1867
HTML	Hypertext Markup Language - 2.0	1866
-----	Definitions of Managed Objects for the Ethernet-like Interface Types	1623*
-----	Manager-to-Manager Management Information Base	1451
-----	Party MIB for version 2 of the Simple Network Management Protocol (SNMPv2)	1447
-----	Security Protocols for version 2 of the Simple Network Management Protocol (SNMPv2)	1446
-----	Administrative Model for version 2 of the Simple Network Management Protocol (SNMPv2)	1445
TOPT-ENVIR	Telnet Environment Option	1408
SNMP-PARTY	Definitions of Managed Objects for Administration of SNMP Parties	1353*
SNMP-SEC	SNMP Security Protocols	1352*
SNMP-ADMIN	SNMP Administrative Model	1351*
-----	Application of the Border Gateway Protocol in the Internet	1268
BGP3	Border Gateway Protocol 3 (BGP-3)	1267
OSI-UDP	OSI connectionless transport services on top of UDP: Version 1	1240*
802.4-MIP	IEEE 802.4 Token Bus MIB	1230
SNMP-MUX	SNMP MUX protocol and MIB	1227
OIM-MIB-II	OSI internet management: Management Information Base	1214
IMAP3	Interactive Mail Access Protocol: Version 3	1203
CMOT	Common Management Information Services and Protocols for the Internet (CMOT and CMIP)	1189
-----	Application of the Border Gateway Protocol in the Internet	1164
BGP	Border Gateway Protocol (BGP)	1163
MIB-I	Management Information Base for network management of TCP/IP-based internets	1156
-----	Mapping between full RFC 822 and RFC 822 with restricted encoding	1137
-----	Privacy enhancement for Internet electronic mail: Part III - algorithms, modes, and identifiers	1115

-----	Privacy enhancement for Internet electronic mail: Part II - certificate-based key management	1114
-----	Privacy enhancement for Internet electronic mail: Part I - message encipherment and authentication procedures	1113
IPSO	U.S. Department of Defense Security Options for the Internet Protocol	1108
RIP	Routing Information Protocol	1058
-----	Standard for the transmission of IP datagrams and ARP packets over ARCNET networks	1051
SUN-RPC	RPC: Remote Procedure Call Protocol specification	1050
CONTENT	Content-type header field for Internet messages	1049
NFILE	NFILE - a file access protocol	1037
SGMP	Simple Gateway Monitoring Protocol	1028
HEMS	High-level Entity Management System (HEMS)	1021
-----	Requirements for Internet gateways	1009
STATSRV	Statistics server	996
HOSTNAME	Hostname Server	953
POP2	Post Office Protocol: Version 2	937
HFEP	Proposed Host-Front End Protocol	929
RATP	Reliable Asynchronous Transfer Protocol (RATP)	916
THINWIRE	Thinwire protocol for connecting personal computers to the Internet	914
SFTP	Simple File Transfer Protocol	913
EGP	Exterior Gateway Protocol formal specification	904
HMP	Host Monitoring Protocol	869
GGP	DARPA Internet gateway	823
RTELNET	Remote User Telnet service	818
CLOCK	DCNET Internet Clock Service	778
MPM	Internet Message Protocol	759
NETRJS	NETRJS Protocol	740
SUPDUP	SUPDUP Protocol	734
TOPT-OLD	Telnet output linefeed disposition	658
TOPT-OVTD	Telnet output vertical tab disposition option	657
TOPT-OVT	Telnet output vertical tabstops option	656
TOPT-OFD	Telnet output formfeed disposition option	655
TOPT-OHTD	Telnet output horizontal tab disposition option	654
TOPT-OHT	Telnet output horizontal tabstops option	653
TOPT-OCRD	Telnet output carriage-return disposition option	652
NETED	NETED: A Common Editor for the ARPA Network	569
RJE	Remote Job Entry Protocol	407

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

#### 4. Security Considerations

This memo does not affect the technical security of the Internet, but it does cite a number of important security specifications.

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