

Network Working Group

Request for Comments: 2600

Obsoletes: 2500, 2400, 2300, 2200, 2000, 1920,  
1880, 1800, 1780, 1720, 1610, 1600, 1540, 1500,  
1410, 1360, 1280, 1250, 1200, 1140, 1130, 1100,  
1083

STD: 1

Category: Standards Track

Internet Engineering Task Force

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Editors

March 2000

## 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 Engineering Task Force (IETF). This memo is an Internet Standard. Distribution of this memo is unlimited.

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### Overview

This memo is published by the RFC Editor 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. This memo is prepared by the RFC Editor for the IESG and IAB. Please see <http://www.rfc-editor.org> for later updates to this document.

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## 1. Contacts

This section contains important contact information, for reference.

## 1.1. IAB, IETF, and IRTF Contacts

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)

## 1.2. Internet Assigned Numbers Authority (IANA) Contact

See: [www.iana.org](http://www.iana.org)

## 1.3. Request for Comments Editor (RFC Editor) Contact

See: [www.rfc-editor.org](http://www.rfc-editor.org)

The RFC Editor publishes 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>.

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".

#### 1.4. 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

#### 1.5. 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
```

## 2. Current Technical Specifications

### 2.1. Standard Protocols Ordered by STD

Mnemonic	Title	RFC#	STD#
-----	Internet Official Protocol Standards	2600	1
-----	Assigned Numbers	1700	2
-----	Host Requirements - Applications	1123	3
-----	Host Requirements - Communications	1122	3
-----	Requirements for Internet gateways (Historic)	1009	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	Simple Mail Transfer Protocol	821	10
SMTP-EXT	SMTP Service Extensions	1869	10
SMTP-SIZE	SMTP Service Extension for Message Size Declaration	1870	10
MAIL	Standard for the format of ARPA Internet text messages	822	11
NTPV2	Network Time Protocol (version 2) specification and implementation	1119	12
DOMAIN	Domain names - concepts and facilities	1034	13
DOMAIN	Domain names - implementation and specification	1035	13
DNS-MX	Mail routing and the domain system	974	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	Exterior Gateway Protocol formal specification (Historic)	904	18
NETBIOS	Protocol standard for a NetBIOS service on a TCP/UDP transport	1001	19
NETBIOS	Protocol standard for a NetBIOS service on a TCP/UDP transport	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	861	32
TFTP	The TFTP Protocol (Revision 2)	1350	33
RIP	Routing Information Protocol (Historic)	1058	34
TP-TCP	ISO transport services on top of the TCP	1006	35
IP-FDDI	Transmission of IP and ARP over FDDI Networks	1390	36*
ARP	Ethernet Address Resolution Protocol	826	37*
RARP	Reverse Address Resolution Protocol	903	38*
BBN1822	Internet Protocol on ARPANET	BBN1822	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	1044	45*
IP-ARC	Transmitting IP traffic over ARCNET networks	1201	46*
IP-SLIP	Nonstandard for transmission of IP datagrams over serial lines	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

SMIv2	Structure of Management Information Version 2 (SMIv2)	2578	58
CONV-MIB	Textual Conventions for SMIv2	2579	58
CONF-MIB	Conformance Statements for SMIv2	2580	58

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

## 2.2. Standard Protocols Ordered by RFC

Mnemonic	Title	RFC#
CONF-MIB	Conformance Statements for SMiv2	2580
CONV-MIB	Textual Conventions for SMiv2	2579
SMiv2	Structure of Management Information Version 2 (SMiv2)	2578
-----	Internet Official Protocol Standards	2500
RIP2	RIP Version 2	2453
IP-FR	Multiprotocol Interconnect over Frame Relay	2427
OSPF2	OSPF Version 2	2328
POP3	Post Office Protocol - Version 3	1939
SMTP-SIZE	SMTP Service Extension for Message Size Declaration	1870
SMTP-EXT	SMTP Service Extensions	1869
RIP2-APP	RIP Version 2 Protocol Applicability Statement	1722
-----	Assigned Numbers	1700
PPP-HDLC	PPP in HDLC-like Framing	1662
PPP	The Point-to-Point Protocol (PPP)	1661
ETHER-MIB	Definitions of Managed Objects for the Ethernet-like Interface Types	1643
IP-FDDI	Transmission of IP and ARP over FDDI Networks	1390*
TFTP	The TFTP Protocol (Revision 2)	1350
MIB-II	Management Information Base for Network Management of TCP/IP-based internets:MIB-II	1213
Concise-MI	Concise MIB definitions	1212
IP-SMDS	Transmission of IP datagrams over the SMDS Service	1209
IP-ARC	Transmitting IP traffic over ARCNET networks	1201*
SNMP	Simple Network Management Protocol (SNMP)	1157
SMI	Structure and identification of management information for TCP/IP-based internets	1155*
IP-IPX	Standard for the transmission of 802.2 packets over IPX networks	1132*
-----	Host Requirements - Applications	1123
-----	Host Requirements - Communications	1122
NTPV2	Network Time Protocol (version 2) specification and implementation	1119*
IGMP	Host extensions for IP multicasting	1112
IP-NETBIOS	Standard for the transmission of IP datagrams over NetBIOS networks	1088*
RIP	Routing Information Protocol (Historic)	1058
IP-SLIP	Nonstandard for transmission of IP datagrams over serial lines	1055*
IP-HC	Internet Protocol on Network System's HYPERchannel	1044*
IP-IEEE	Standard for the transmission of IP datagrams over IEEE 802 networks	1042*
DOMAIN	Domain names - implementation and specification	1035
DOMAIN	Domain names - concepts and facilities	1034

-----	Requirements for Internet gateways (Historic)	1009
TP-TCP	ISO transport services on top of the TCP	1006
NETBIOS	Protocol standard for a NetBIOS service on a TCP/UDP transport	1002
NETBIOS	Protocol standard for a NetBIOS service on a TCP/UDP transport	1001
DNS-MX	Mail routing and the domain system	974
FTP	File Transfer Protocol	959
-----	Internet Standard Subnetting Procedure	950
-----	Broadcasting Internet datagrams in the presence of subnets	922
-----	Broadcasting Internet Datagrams	919
IP-WB	Host Access Protocol specification	907*
EGP	Exterior Gateway Protocol formal specification(Historic)	904
RARP	Reverse Address Resolution Protocol	903*
IP-EE	Standard for the transmission of IP datagrams over experimental Ethernet networks	895*
IP-E	Standard for the transmission of IP datagrams over Ethernet networks	894*
IP-DC	DCN local-network protocols	891*
TIME	Time Protocol	868
DAYTIME	Daytime Protocol	867
USERS	Active users	866
QUOTE	Quote of the Day Protocol	865
CHARGEN	Character Generator Protocol	864
DISCARD	Discard Protocol	863
ECHO	Echo Protocol	862
TOPT-EXTOP	Telnet Extended Options	861
TOPT-TIM	Telnet Timing Mark Option	860
TOPT-STAT	Telnet Status Option	859
TOPT-SUPP	Telnet Suppress Go Ahead Option	858
TOPT-ECHO	Telnet Echo Option	857
TOPT-BIN	Telnet Binary Transmission	856
TELNET	Telnet Option Specifications	855
TELNET	Telnet Protocol Specification	854
ARP	Ethernet Address Resolution Protocol	826*
MAIL	Standard for the format of ARPA Internet text messages	822
SMTP	Simple Mail Transfer Protocol	821
TCP	Transmission Control Protocol	793
ICMP	Internet Control Message Protocol	792
IP	Internet Protocol	791
UDP	User Datagram Protocol	768
BBN1822	Internet Protocol on ARPANET	BBN1822

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



## 2.3. Draft Standard Protocols

Mnemonic	Title	RFC#
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)	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
ONE-PASS	A One-Time Password System	2289
UTF-8	UTF-8, a transformation format of ISO 10646	2279*
SMTP-Pipe	SMTP Service Extension for Command Pipelining	2197
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 SMIPv2	2115
IP-HIPPI	IP over HIPPI	2067*
MIME-CONF	Multipurpose Internet Mail Extensions (MIME) Part File	2049
MIME-MSG	MIME (Multipurpose Internet Mail Extensions) Part Three	2047
MIME-MEDIA	Multipurpose Internet Mail Extensions (MIME) Part Two	2046
MIME	Multipurpose Internet Mail Extensions (MIME) Part One	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
COEX-MIB	Coexistence between Version 1 and Version 2 of the Internet-standard Network Management Framework	1908
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
RPC	XDR	1832*
STR-REP	A String Representation of Distinguished Names	1779
X.500syn	The String Representation of Standard Attribute Syntaxes	1778
X.500lite	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
RMON-MIB	Remote Network Monitoring Management Information Base	1757
802.5-MIB	IEEE 802.5 MIB using SMIPv2	1748
RIP2-MIB	RIP Version 2 MIB Extension	1724
-----	RIP Version 2 Protocol Applicability Statement	1722
SIP-MIB	Definitions of Managed Objects for SMDS Interfaces using SMIPv2	1694
-----	Definitions of Managed Objects for Parallel-printer-like Hardware Devices using SMIPv2	1660
-----	Definitions of Managed Objects for RS-232-like Hardware Devices using SMIPv2	1659
-----	Definitions of Managed Objects for Character Stream Devices using SMIPv2	1658
BGP-4-MIB	Definitions of Managed Objects for the Fourth Version of the Border Gateway Protocol (BGP-4) using SMIPv2	1657
SMTP-8BIT	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
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.]

## 2.4. Proposed Standard Protocols

Mnemonic	Title	RFC#
-----	Generic Routing Encapsulation (GRE)	2784*
-----	A DNS RR for specifying the location of services (DNS SRV)	2782*
-----	Multicast-Scope Zone Announcement Protocol (MZAP)	2776*
RPSL	Routing Policy System Replication	2769*
-----	Network Address Translation - Protocol Translation (NAT-PT)	2766*
-----	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 usage for RSVP	2749*
QOS	The COPS (Common Open Policy Service) Protocol	2748*
-----	RSVP Cryptographic Authentication	2747*
-----	RSVP Operation Over IP Tunnels	2746*
-----	RSVP Diagnostic Messages	2745*
GSS-API	Generic Security Service API Version 2	2744*
GSS-API	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*
-----	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	2720*
-----	Addition of Kerberos Cipher Suites to Transport Layer Security (TLS)	2712*
-----	IPv6 Router Alert Option	2711*
-----	Multicast Listener Discovery (MLD) for IPv6	2710*

-----	Integrated Services Mappings for Low Speed Networks	2688*
PPP	PPP in a Real-time Oriented HDLC-like Framing	2687*
PPP	The Multi-Class Extension to Multi-Link PPP	2686*
IP	Virtual Private Networks Identifier	2685*
-----	Multiprotocol Encapsulation over ATM Adaptation Layer5	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*
-----	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*
-----	Extension Mechanisms for DNS (EDNS0)	2671*
-----	Radio Frequency (RF) Interface Management Information Base for MCNS/DOCSIS compliant RF interfaces	2670*
-----	DOCSIS Cable Device MIB Cable Device Management Information Base for DOCSIS compliant Cable Modems and Cable Modem Termination Systems	2669*
-----	Definitions of Managed Objects for IEEE 802.3 Medium Attachment Units (MAUs)	2668*
-----	IP Tunnel MIB	2667*
-----	Definitions of Managed Objects for the Ethernet- like Interface Types	2665*
-----	Definitions of Managed Objects for the ADSL Lines	2662*
PPP	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 Protocol (CIP)	2652*
-----	The Architecture of the Common Indexing Protocol (CIP)	2651*
-----	The Text/Plain Format Parameter	2646*
-----	ON-DEMAND MAIL RELAY (ODMR) SMTP with Dynamic IP Addresses	2645*
INT-FTP	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 the NFS Protocol's Use of RPCSEC_GSS and Kerberos V5	2623*
-----	Routing Policy Specification Language (RPSL)	2622*

-----	RADIUS Authentication Server MIB	2619*
-----	RADIUS Authentication Client MIB	2618*
DAA	HTTP Authentication: Basic and Digest Access Authentication	2617*
HTTP-1.1	Hypertext Transfer Protocol -- HTTP/1.1	2616*
-----	PPP over SONET/SDH	2615*
-----	Remote Network Monitoring MIB Extensions for Switched Networks Version 1.0	2613*
DHCP-SLP	DHCP Options for Service Location Protocol	2610*
-----	Service Templates and Service	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	2590*
LDAPv3	Lightweight Directory Access Protocol (v3)	2589*
-----	Internet X.509 Public Key Infrastructure LDAPv2 Schema	2587*
-----	Internet X.509 Public Key Infrastructure Operational Protocols	2585
-----	Definitions of Managed Objects for APPN/HPR in IP Networks	2584
TCP-CC	TCP Congestion Control	2581
-----	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
-----	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	2558

	Interface Type	
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	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*
-----	Content Feature Schema for Internet Fax	2531*
-----	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)	2491

	networks	
-----	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	2478
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MIB-UDP	SNMPv2 Management Information Base for the User Datagram Protocol using SMIPv2	2013
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MOBILEIPMI	The Definitions of Managed Objects for IP Mobility Support using SMIPv2	2006
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IPENCAPIP	IP Encapsulation within IP	2003
MOBILEIPSU	IP Mobility Support	2002
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DNS-IZT	Incremental Zone Transfer in DNS	1995
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MTU-IPV6	Path MTU Discovery for IP version 6	1981
PPP-FRAME	PPP in Frame Relay	1973
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## 2.5. Experimental Protocols

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-----	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*
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-----	QoS Routing Mechanisms and OSPF Extensions	2676*
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-----	Security Extensions For HTML	2659*
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-----	Registration Procedures for SOIF Template Types	2656*
-----	CIP Index Object Format for SOIF Objects	2655*
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-----	An LDAP Control and Schema for Holding Operation Signatures	2649*
-----	Script MIB Extensibility Protocol Version 1.0	2593*
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PHOTURIS-S	Photuris	2522
ICMP-SEC	ICMP Security Failures Messages	2521
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IP-SCSI	Encapsulating IP with the Small Computer System Interface	2143
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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
METER-MIB	Traffic Flow Measurement	2064
TFM-ARCH	Traffic Flow Measurement	2063
DNS-SRV	A DNS RR for specifying the location of services (DNS SRV)	2052
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
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
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SGML-MT	SGML Media Types	1874
CONT-MT	Message/External-Body Content-ID Access Type	1873
UNARP	ARP Extension - UNARP	1868
-----	Form-based File Upload in HTML	1867
-----	A BGP/IDRP Route Server alternative to a full mesh routing	1863
-----	IP Authentication using Keyed SHA	1852
ESP3DES	The ESP Triple DES Transform	1851
-----	SMTP 521 Reply Code	1846
-----	SMTP Service Extension for Checkpoint/Restart Directory	1845
-----	Representing the O/R Address hierarchy in the X.500 Directory Information Tree	1836
-----	SMTP Service Extensions for Transmission of Large and Binary MIME Messages	1830
ST2	Internet Stream Protocol Version 2 (ST2) Protocol Specification - Version ST2+	1819
-----	Communicating Presentation Information in Internet Messages	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	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	1528
DASS	DASS - Distributed Authentication Security Service	1507*
EHF-MAIL	Encoding Header Field for Internet Messages	1505
RAP	RAP	1476
TP/IX	TP/IX	1475

X400	Routing Coordination for X.400 MHS Services Within a Multi Protocol / Multi Network Environment Table Format V3 for Static Routing	1465
DNS	Using the Domain Name System To Store Arbitrary String Attributes	1464
IRCP	Internet Relay Chat Protocol	1459
TOS-LS	Physical Link Security Type of Service	1455
SIFT/UFT	SIFT/UFT	1440
DIR-ARP	Directed ARP	1433
TOPT-AUTH	Telnet Authentication Option	1416
TEL-SPX	Telnet Authentication	1412
TEL-KER	Telnet Authentication	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	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	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
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	1045
COOKIE-JAR	Distributed-protocol authentication scheme	1004
NETBLT	NETBLT	998
IRTP	Internet Reliable Transaction Protocol functional and interface specification	938

LDP	Loader Debugger Protocol	909
RDP	Reliable Data Protocol	908
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.]

## 2.6. Historic Protocols

Mnemonic	Title	RFC#
L2F	Cisco Layer Two Forwarding (Protocol) "L2F"	2341
IPV6-UNI	An IPv6 Provider-Based Unicast Address Format	2073
-----	RIPv1 Applicability Statement for Historic Status	1923
IPV6-Addr	IP Version 6 Addressing Architecture	1884
SNMPv2	Manager-to-Manager Management Information Base	1451
SNMPv2	Party MIB for version 2 of the Simple Network Management Protocol (SNMPv2)	1447
SNMPv2	Security Protocols for version 2 of the Simple Network Management Protocol (SNMPv2)	1446
SNMPv2	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*
BGP3	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	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	1214
IMAP3	Interactive Mail Access Protocol	1203
CMOT	Common Management Information Services and Protocols for the Internet (CMOT and CMIP)	1189
BGP	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 <a href="#">RFC 822</a> and <a href="#">RFC 822</a> with restricted encoding	1137
-----	Privacy enhancement for Internet electronic mail	1115

-----	Privacy enhancement for Internet electronic mail	1114
-----	Privacy enhancement for Internet electronic mail	1113
IPSO	U.S. Department of Defense Security Options for the Internet Protocol	1108
RIP	Routing Information Protocol (STD34)	1058
SUN-RPC	RPC	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 (STD4)	1009
STATSRV	Statistics server	996
HOSTNAME	Hostname Server	953
POP2	Post Office Protocol	937
HFEP	Proposed Host-Front End Protocol	929
RATP	Reliable Asynchronous Transfer Protocol	916
THINWIRE	Thinwire protocol for connecting personal computers to the Internet	914
SFTP	Simple File Transfer Protocol	913
EGP	Exterior Gateway Protocol formal specification (STD18)	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	569
RJE	Remote Job Entry Protocol	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.]

### 3. 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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## Acknowledgement

Funding for the RFC Editor function is currently provided by the Internet Society.