

Obsoletes: RFCs [084](#), [100](#), [160](#), [170](#), [200](#), [598](#), [699](#), [800](#), [899](#), [999](#)

THE REQUEST FOR COMMENTS REFERENCE GUIDE

STATUS OF THIS MEMO

This RFC is a reference guide for the Internet community which summarizes of all the Request for Comments issued between April 1969 and March 1987. This guide also categorizes the RFCs by topic.

INTRODUCTION

This RFC Reference Guide is intended to provide a historical account by categorizing and summarizing of the Request for Comments numbers 1 through 999 issued between the years 1969-1987. These documents have been cross referenced to indicate which RFCs are current, obsolete, or revised. Distribution of this memo is unlimited.

THE ORIGINS OF RFCS - by Stephen D. Crocker

The DDN community now includes hundreds of nodes and thousands of users, but once it was all a gleam in Larry Roberts' eye. While much of the development proceeded according to a grand plan, the design of the protocols and the creation of the RFCs was largely accidental.

The procurement of the ARPANET was initiated in the summer of 1968 -- Remember Vietnam, flower children, etc? There had been prior experiments at various ARPA sites to link together computer systems, but this was the first version to explore packet-switching on a grand scale. ("ARPA" didn't become "DARPA" until 1972.) Unlike most of the ARPA/IPTO procurements of the day, this was a competitive procurement. The contract called for four IMPs to be delivered to UCLA, SRI, UCSB and The University of Utah. These sites were running a Sigma 7 with the SEX operating system, an SDS 940 with the Genie operating system, an IBM 360/75 with OS/MVT (or perhaps OS/MFT), and a DEC PDP-10 with the Tenex operating system. Options existed for additional nodes if the first experiments were successful. BBN won the procurement in December 1968, but that gets ahead of this story.

Part of the reason for selecting these four sites was these were existing ARPA computer science research contractors. The precise usage of the ARPANET was not spelled out in advance, and the research community could be counted on to take some initiative. To stimulate this process, a meeting was called during the summer with representatives from the selected sites, chaired by Elmer Shapiro

from SRI. If memory serves me correctly, Jeff Rulifson came from SRI, Ron Stoughton from UCSB, Steve Carr from Utah and I came from UCLA. (Apologies to anyone I've left out; records are inaccessible or lost at this point.) At this point we knew only that the network was coming, but the precise details weren't known.

That first meeting was seminal. We had lots of questions -- how IMPs and hosts would be connected, what hosts would say to each other, and what applications would be supported. No one had any answers, but the prospects seemed exciting. We found ourselves imagining all kinds of possibilities -- interactive graphics, cooperating processes, automatic data base query, electronic mail -- but no one knew where to begin. We weren't sure whether there was really room to think hard about these problems; surely someone from the east would be along by and by to bring the word. But we did come to one conclusion: We ought to meet again. Over the next several months, we managed to parlay that idea into a series of exchange meetings at each of our sites, thereby setting the most important precedent in protocol design.

The first few meetings were quite tenuous. We had no official charter. Most of us were graduate students and we expected that a professional crew would show up eventually to take over the problems we were dealing with. Without clear definition of what the host-IMP interface would look like, or even what functions the IMP would provide, we focused on exotic ideas. We envisioned the possibility of application specific protocols, with code downloaded to user sites, and we took a crack at designing a language to support this. The first version was known as DEL, for "Decode-Encode Language" and a later version was called NIL, for "Network Interchange Language." When the IMP contract was finally let and BBN provided some definite information on the host-IMP interface, all attention shifted to low-level matters and the ambitious ideas for automatic downloading of code evaporated. It was several years before ideas like remote procedure calls and typed objects reappeared.

In February of 1969 we met for the first time with BBN. I don't think any of us were prepared for that meeting. The BBN folks, led by Frank Heart, Bob Kahn, Severo Ornstein and Will Crowther, found themselves talking to a crew of graduate students they hadn't anticipated. And we found ourselves talking to people whose first concern was how to get bits to flow quickly and reliably but hadn't -- of course -- spent any time considering the thirty or forty layers of protocol above the link level. And while BBN didn't take over the protocol design process, we kept expecting that an official protocol design team would announce itself.

A month later, after a particularly delightful meeting in Utah, it became clear to us that we had better start writing down our

discussions. We had accumulated a few notes on the design of DEL and other matters, and we decided to put them together in a set of notes. I remember having great fear that we would offend whomever the official protocol designers were, and I spent a sleepless night composing humble words for our notes. The basic ground rules were that anyone could say anything and that nothing was official. And to emphasize the point, I labeled the notes "Request for Comments." I never dreamed these notes would be distributed through the very medium we were discussing in these notes. Talk about Sorcerer's Apprentice!

Over the spring and summer of 1969 we grappled with the detailed problems of protocol design. Although we had a vision of the vast potential for intercomputer communication, designing usable protocols was another matter. A custom hardware interface and custom intrusion into the operating system was going to be required for anything we designed, and we anticipated serious difficulty at each of the sites. We looked for existing abstractions to use. It would have been convenient if we could have made the network simply look like a tape drive to each host, but we knew that wouldn't do.

It was clear we needed to support remote login for interactive use -- later known as Telnet -- and we needed to move files from machine to machine. We also knew that we needed a more fundamental point of view for building a larger array of protocols. Unfortunately, operating systems of that era tended to view themselves as the center of the universe; symmetric cooperation did not fit into the concepts currently available within these operating systems. And time was pressing: The first IMP was due to be delivered to UCLA September 1, 1969, and the rest were scheduled at monthly intervals.

At UCLA we scrambled to build a host-IMP interface. SDS, the builder of the Sigma 7, wanted many months and many dollars to do the job. Mike Wingfield, another grad student at UCLA, stepped in and offered to get interface built in six weeks for a few thousand dollars. He had a gorgeous, fully instrumented interface working in five and one half weeks. I was in charge of the software, and we were naturally running a bit late. September 1 was Labor Day, so I knew I had a couple of extra days to debug the software. Moreover, I had heard BBN was having some timing troubles with the software, so I had some hope they'd miss the ship date. And I figured that first some Honeywell people would install the hardware -- IMPs were built out of Honeywell 516s in those days -- and then BBN people would come in a few days later to shake down the software. An easy couple of weeks of grace.

BBN fixed their timing trouble, air shipped the IMP, and it arrived on our loading dock on Saturday, August 30. They arrived with the IMP, wheeled it into our computer room, plugged it in and the

software restarted from where it had been when the plug was pulled in Cambridge. Still Saturday, August 30. Panic time at UCLA.

The second IMP was delivered to SRI at the beginning of October, and ARPA's interest was intense. Larry Roberts and Barry Wessler came by for a visit on November 21, and we actually managed to demonstrate a Telnet-like connection to SRI.

With the pressure to get something working and the general confusion as to how to achieve the high generality we all aspired to, we punted and defined the first set of protocols to include only Telnet and FTP functions. In particular, only asymmetric, user-server relationships were supported. In December 1969, we met with Larry Roberts in Utah, and suffered our first direct experience with "redirection". Larry made it abundantly clear that our first step was not big enough, and we went back to the drawing board. Over the next few months we designed a symmetric host-host protocol, and we defined an abstract implementation of the protocol known as the Network Control Program. ("NCP" later came to be used as the name for the protocol, but it originally meant the program within the operating system that managed connections. The protocol itself was known blandly only as the host-host protocol.) Along with the basic host-host protocol, we also envisioned a hierarchy of protocols, with Telnet, FTP and some splinter protocols as the first examples. If we had only consulted the ancient mystics, we would have seen immediately that seven layers were required.

The initial experiment had been declared an immediate success and the network continued to grow. More and more people started coming to meetings, and the Network Working Group began to take shape. Working Group meetings started to have 50 and 100 people in attendance instead of the half dozen we had had in 1968 and early 1969. We held one meeting in conjunction with the Spring Joint Computer Conference in Atlantic City in 1971. In October 1971 we all convened at MIT for a major protocol "fly-off". Representatives from each site were on hand, and everyone tried to log in to everyone else's site. With the exception of one site that was completely down, the matrix was almost completely filled in, and we had reached a major milestone in connectivity.

The rapid growth of the network and the working group also led to a large pile of RFCs. When the 100th RFC was in sight, Peggy Karp took on the task of indexing them. That seemed like a large task then, and we could have hardly anticipated seeing more than a 1000 RFCs several years later.

Where will it end? The network has exceeded all estimates of its growth. It has been transformed, extended, cloned, renamed and reimplemented. I doubt if there is a single computer still on the

network that was on it in 1971. But the RFCs march on. Maybe I'll write a few words for RFC 10,000.

REQUEST FOR COMMENTS BY CATEGORIES

The RFCs are categorized into several broad groups and within these groups are subdivided by topic. For example, the RFCs relating to file transfer are in 5 (Applications) c (File Transfer).

1. Administrative

1a. Assigned Numbers RFCs

997, 990, 960, 943, 923, 900, 870, 820, 790, 776, 770, 762, 758, 755, 750, 739, 717, 604, 503, 433, 349, 322, 317, 204, 179, 175, 167.

1b. Official Protocols RFCs

991, 961, 944, 924, 901, 880, 840, 694, 661, 617, 582, 580, 552.
774 - Internet Protocol Handbook Table of Contents

1c. Meeting Notes and Minutes

898 - Gateway Special Interest Group Meeting Notes
808, 805, 469 - Computer Mail Meeting Notes
910, 807 - Multimedia Mail Meeting Notes
585 - ARPANET Users Interest Working Group Meeting
549, 396, 282, 253 - Graphics Meeting Notes
371 - International Computer Communications Conference
327 - Data and File Transfer Workshop Notes
316 - Data Management Working Group Meeting Report
164, 131, 116, 108, 101, 082, 077, 066, 063, 037, 021 - Network Working Group Meeting

1d. Meeting Announcements and Group Overviews

828 - Data Communications: IFIP's International "Network" of Experts
631 - Call for Papers: International Meeting on Minicomputers and Data Communication
584 - Charter for ARPANET Users Interest Working Group
537 - Announcement of NGG Meeting
526 - Technical Meeting - Digital Image Processing Software Systems
504 - Workshop Announcement
483 - Cancellation of the Resource Notebook Framework Meeting
474, 314, 246, 232, 134 - Network Graphics Working Group

- 471 - Announcement of a (Tentative) Workshop on Multi-Site Executive Programs
- 461 - Telnet Meeting Announcement
- 457 - TIPUG
- 456 - Memorandum
- 454 - File Transfer Protocol Meeting Announcement
- 453 - Meeting Announcement to Discuss a Network Mail System
- 374 - IMP System Announcement
- 359 - The Status of the Release of the New IMP System (2600)
- 343, 331 - IMP System Change Notification
- 324 - RJE Protocol Meeting
- 323 - Formation of Network Measurement Group (NMG)
- 320 - Workshop on Hard Copy Line Graphics
- 309 - Data and File Transfer Workshop Announcement
- 299 - Information Management System
- 295 - Report of the Protocol Workshop
- 291, 188, 173 - Data Management Meetings
- 245, 234, 207, 188, 173, 140, 116, 099, 087, 085, 075, 043, 035
 - Network Working Group Meetings
- 222 - System Programmer's Workshop
- 212 - NWG Meeting on Network Usage
- 157 - Invitation to the Second Symposium on Problems in the Optimization of Data Communication Systems
- 149 - The Best Laid Plans...
- 147 - The Definition of a Socket
- 111 - Pressure from the Chairman
- 048 - A Possible Protocol Plateau
- 046 - ARPA Network Protocol Notes

1e. Distribution List

- 402, 363, 329, 303, 300, 211, 168, 155 - ARPA Network Mailing Lists
- 069 - Distribution List Change for MIT
- 052 - Updated Distribution List

1f. Policies

- 980 - Protocol Document Order Form
- 952, 810, 608 - Host Table Specification
- 945 - A DoD Statement on the NRC Report
- 902 - ARPA-Internet Protocol Policy
- 849 - Suggestions for Improved Host Table Distribution
- 678 - Document Formats
- 602 - The Stockings Were Hung by the Chimney With Care
- 115 - Some Network Information Center Policies on Handling Documents
- 053 - An Official Protocol Mechanism

1g. Request for Comments Administrative

- 999, 899, 800, 699 - Requests for Comments Summary
- 825 - Request for Comments on Requests for Comments
- 629 - Scenario for Using the Network Journal
- 628 - Status of RFC Numbers and a Note on Pre-assigned Journal Numbers
- 598, 200, 170, 160, 100, 084 - RFC Index

1h. Bibliographies

- 829 - Packet Satellite Technology Reference Sources
- 290 - Computer Network and Data Sharing: A Bibliography
- 243 - Network and Data Sharing Bibliography

1i. Other

- 637 - Change of Network Address for SU-DSL
- 634 - Change in Network Address for Haskins Lab
- 616 - Latest Network Maps
- 609 - Statement of Upcoming Move of NIC/NLS Service
- 590 - MULTICS Address Change
- 588 - London Node is Now Up
- 551 - NYU, ANL, and LBL Joining the Net
- 544 - Locating On-Line Documentation at SRI-ARC
- 543 - Network Journal Submission and Delivery
- 518 - ARPANET Accounts
- 511 - Enterprise Phone Service to NIC From ARPANET Sites
- 510 - Request for Network Mailbox Addresses
- 432 - Network Logical Map
- 423, 389 - UCLA Campus Computing Network Liaison Staff for APRA Network
- 421 - A Software Consulting Service for Network Users
- 419 - MIT-DMS on Vacation
- 416 - The ARC System will be Unavailable for Use During Thanksgiving Week
- 405 - Correction to [RFC 404](#)
- 404 - Host Address Changes Involving Rand and ISI
- 403 - Desirability of a Network 1108 Service
- 386 - Letter to TIP Users - 2
- 384 - Official Site IDENTIS for Organizations in the ARPA Networks
- 381 - Three Aids to Improved Network Operation
- 356 - ARPA Network Control Center
- 334 - Network Use on May 8
- 305 - Unknown Host Numbers
- 301 - BBN IMP No. 5 and NCC Schedule for March 4, 1972
- 276 - NIC Course
- 249 - Coordination of Equipment and Supplies Purchase

- 223 - Network Information Center Schedule for Network Users
- 185 - NIC Distribution of Manuals and Handbooks
- 154 - Exposition Style
- 136 - Host Accounting and Administrative Procedures
- 118 - Information Required for Each Service Available to the Network
- 095 - Distribution of NWG/RFC's Through the NIC
- 016 - MIT

2. ARPANET Host to Host Protocol

2a. Network Control Protocol

- 801 - NCP/TCP Transition Plan
- 773 - Comments on NCP/TCP Mail Service Transition Strategy
- 714 - A Host/Host Protocol for an ARPANET-type Network
- 689 - Tenex NCP Finite State Machine for Connections
- 663 - A Lost Message Detection and Recovery Protocol
- 636 - TIP/TENEX Reliability Improvements
- 635 - An Assessment of ARPANET Protocols
- 534, 516, 512 - Lost Message Detection
- 492, 467 - Proposed Change to Host-Host Protocol
Resynchronization of Connection Status
- 489 - Comment on Resynchronization of Connection Status
Proposal
- 425 - "But my NCP Costs \$500 a day..."
- 210 - Improvement of Flow Control
- 197 - Initial Connection Protocol - Revised
- 176 - Comments on Byte Size for Connections
- 165 - A Proffered Official Initial Connection Protocol
- 147 - The Definition of a Socket
- 142 - Time-out Mechanism in the Host-Host Protocol
- 132, 124, 107, 102 - Output of the Host-Host Protocol Glitch
Cleaning Committee
- 129 - A Request for Comments on Socket Name Structure
- 128 - Bytes
- 117 - Some Comments on the Official Protocol
- 072 - Proposed Moratorium on Changes to Network Protocol
- 068 - Comments on Memory Allocation Control Commands (CEASE,
ALL, GVB, RET) and RFNM
- 065 - Comments on Host-Host Protocol Document Number 1
- 060 - A Simplified NCP Protocol
- 059 - Flow Control-Fixed Versus Demand Allocation
- 058 - Logical Message Synchronization
- 057, 054 - An Official Protocol Proffering
- 056 - Third Level Protocol
- 055 - A Prototypical Implementation of the NCP
- 050, 049, 048, 047, 046, 045, 044, 040, 039, 038, 036, 033 -
New Host-Host Protocol

- 042 - Message Data Types
- 023 - Transmission of Multiple Control Messages
- 022 - Host-Host Control Message Formats
- 018 - Comments Re: Host-Host control link
- 015 - Network Subsystem for Time Sharing Hosts
- 011 - Implementation of the Host-Host Software Procedures in GORDO
- 009, 001 - Host Software
- 008 - ARPA Network Functional Specifications
- 005 - DEL
- 002 - Links

2b. Initial Connection Protocol

- 202 - Possible Deadlock in ICP
- 197 - Initial Connection Protocol - Revised
- 161 - A Solution to the Race Condition in the ICP
- 151, 148, 143, 127, 123 - A Proffered Official ICP
- 150 - The Use of IPC Facilities
- 145 - Initial Connection Protocol Control Commands
- 093 - Initial Connection Protocol
- 080 - Protocol and Data Formats
- 066 - 3rd Level Ideas and Other Noise

3. Internet Level

3a. Internet Protocol

- 815 - IP Datagram Reassembly Algorithms
- 791, 760 - Internet Protocol (IP)
- 781 - A Specification of the Internet Protocol IP Timestamp Option

3b. Internet Control Message Protocol

- 792, 777 - Internet Control Message Protocol (ICMP)

3c. Gateway Protocols

- 985 - Requirements for Internet Gateways
- 975 - Autonomous Confederations
- 970 - On Packet Switches With Infinite Storage
- 911 - EGP Gateway under Berkeley Unix
- 904, 890, 888, 827 - Exterior Gateway Protocol
- 875 - Gateways, Architectures, and Heffalumps
- 823 - Gateway Gateway Protocol

3d. Other

- 986 - Working Draft - Guidelines for the Use of Internet-IP Addressing in the ISO Connectionless-Mode Network
- 981 - An Experimental Multiple-Path Routing Algorithm
- 963 - Some Problems with the Specification of the Military Standard Internet Protocol
- 950 - Internet Standard Subnetting Procedure
- 947 - Multi-Network Broadcasting Within the Internet
- 940, 917, 925, 932, 936, 922 - Internet Subnets Protocol
- 925, 917, 826 - Multi-LAN Address Resolution Protocol
- 919, 922 - Broadcasting Internet Datagrams
- 891 - DCN Local-Network Protocols
- 871 - A Perspective on the ARPANET Reference Model
- 831 - Backup Access to the European Side of SATNET
- 817 - Modularity and Efficiency in Protocol Implementation
- 816 - Fault Isolation and Recovery
- 814 - Name, Addresses, Ports, and Routes
- 796 - Address Mapping
- 795 - Service Mappings
- 730 - Extensible Field Addressing

4. Host Level

4a. User Datagram Protocol

- 768 - User Datagram Protocol

4b. Transmission Control Protocol

- 983 - ISO Transport Services on Top of the TCP
- 964 - Some Problems with the Specification of the Military Standard Transmission Control Protocol
- 896 - Congestion Control in IP/TCP Internetworks
- 889 - Internet Delay Experiments
- 879 - The TCP Maximum Segment Size and Related Topics
- 872 - TCP-ON-A-LAN
- 817 - Modularity and Efficiency in Protocol Implementation
- 816 - Fault Isolation and Recovery
- 814 - Name, Addresses, Ports, and Routes
- 794 - Pre-Emption
- 793, 761, 675 - Transmission Control Protocol
- 721 - Out of Band Control Signals in a Host to Host Protocol
- 700 - A Protocol Experiment

4c. Transaction Protocols and Distributed Operating Systems

- 955 - Towards a Transport Service for Transaction Processing Applications

- 938 - Internet Reliable Transaction Protocol Functional and Interface Specification
- 908 - Reliable Data Protocol
- 722 - Thoughts on Interactions in Distributed Services
- 713 - MSDTP -- Message Services Data Transmission Protocol
- 712 - A Distributed Capability Computing System DCCS
- 708 - Elements of a Distributed Programming System
- 707 - A High-Level Framework for Network-Based Resource Sharing
- 684 - A Commentary on Procedure Calling as A Network Protocol
- 677 - The Maintenance of Duplicate Databases
- 674 - Procedure Call Documents--Version 2
- 672 - A Multi-Site Data Collection Facility
- 671 - A Note on Reconnection Protocol
- 645 - Network Standard Data Specification Syntax
- 615 - Proposed Network Standard Data Pathname Syntax
- 610 - Further Datalanguage Design Concepts
- 592 - Some Thoughts on System Design to Facilitate Resource Sharing
- 578 - Using MIT-MATHLAB MACSYMA From MIT-DMS Muddle - An Experiment in Automated Resource Sharing
- 515 - Specifications for Datalanguage, Version 0/9
- 500 - The Integration of Data Management Systems on a Computer Network
- 441 - Inter-Entity Communication - An Experiment
- 437 - Data Reconfiguration Service at UCSB
- 203 - Achieving Reliable Communication
- 076 - Connection-by-Name: User-Oriented Protocol
- 062 - A System for Interprocess Communication in a Resource Sharing Computer Network
- 061 - A Note on Interprocess Communication in a Resource Sharing Computer Network
- 051 - Proposal for a Network Interchange Language
- 031 - Binary Message Forms in Computer Networks
- 005 - DEL
- 001 - Host Software

4d. Other

- 998, 969 - NETBLT: A Bulk Data Transfer Protocol
- 988 - Host Extensions for IP Multicasting
- 979 - PSN End-to-End Functional Specification
- 966 - A Multicast Extension to the Internet Protocol
- 869 - Host Monitoring Protocol
- 741 - Specifications for the Network Voice Protocol NVP
- 643 - Cross Net Debugger
- 162 - NETBUGGER3

5. Application Level

5a. Telnet Protocol

854, 764 - Telnet Protocol Specification
818 - The Remote User Telnet Service
801 - NCP/TCP Transition Plan
782 - A Virtual Terminal Management Model
764 - Telnet Protocol Specification
728 - A Minor Pitfall in the Telnet Protocol
688 - Tentative Schedule for the New Telnet Implementation for the TIP
681 - Network Unix
600 - Interfacing an Illinois Plasma Terminal to the ARPANET
596 - Second Thoughts on Telnet Go-Ahead
595 - Some Thoughts in Defense of the Telnet Go-Ahead
593 - Telnet and FTP Implementation Schedule Change
576 - Proposal for Modifying Linking
570 - Experimental Input Mapping Between NVT ASCII and UCSB Online System
562 - Modifications to the Telnet Specification
559 - Comments on the New Telnet Protocol and Its Implementation
529 - A Note on Protocol Synch Sequences
513 - Comments on the New Telnet Specifications
495 - Telnet Protocol Specification
466 - Telnet Logger/Server for Host LL-67
461 - Telnet Meeting Announcement
452 - Telnet Command at Host LL
435 - Telnet Issues
426 - Reconnection Protocol
393 - Comments on Telnet Protocol Changes
377 - Using TSO Via ARPA Network Virtual Terminal
357 - An Echoing Strategy for Satellite Links
355, 346 - Satellite Considerations
340 - Proposed Telnet Changes
339 - MLTNET - A "Multi-Telnet" Subsystem for TENEX
328 - Suggested Telnet Protocol Changes
318 - Ad Hoc Telnet Protocol
216 - Telnet Access to UCSB's On-Line System
215 - NCP, ICP, and Telnet: The Terminal IMP Implementation
206 - A User Telnet Description of an Initial Implementation
205 - NETCRT - A Character Display Protocol
190 - DEC PDP-10 - IMLAC Communication System
158 - Proposed Telnet Protocol
139 - Discussion of Telnet Protocol
137 - Telnet Protocol - A Proposed Document
135, 110 - Conventions for Using an IBM 2741 Terminal as a User Console for Access to Network Server Hosts

- 103 - Implementation of Interrupt Keys
- 097 - A First Cut at a Proposed Telnet Protocol
- 091 - A Proposed User-User Protocol
- 015 - Network Subsystem for Time Sharing Hosts

5b. Telnet Options

- 946 - Telnet Terminal Location Number Option
- 933 - Output Marking Telnet Option
- 930 - Telnet Terminal Type Option
- 927 - TACACS User Identification Telnet Option
- 885 - Telnet End of Record Option
- 884 - Telnet Terminal Type Option
- 861 - Telnet Extended Options - List Option
- 860 - Telnet Timing Mark Option
- 859 - Telnet Status Option
- 858 - Telnet Suppress Go Ahead Option
- 857 - Telnet Echo Option
- 856 - Telnet Binary Transmission
- 855 - Telnet Option Specifications
- 854 - Telnet Protocol Specifications
- 779 - Telnet Send-Location Option
- 749 - Telnet SUPDUP-OUTPUT Option
- 748 - Telnet Randomly-Lose Option
- 736 - Telnet SUPDUP Option
- 735 - Revised Telnet Byte Macro Option
- 734 - SUPDUP Protocol
- 747 - Recent Extensions to the SUPDUP Protocol
- 746 - The SUPDUP Graphics Extension
- 732 - Telnet Data Entry Terminal Option
- 731 - Telnet Data Entry Terminal Option
- 729 - Telnet Byte Macro Option
- 727 - Telnet Logout Option
- 726 - Remote Controlled Transmission and Echoing Telnet Option
- 719 - Discussion on RCTE
- 718 - Comments on RCTE from the Tenex Implementation Experience
- 703, 702, 701 - Survey of New-Protocol Telnet Servers
- 698 - Telnet Extended ASCII Option
- 679 - February, 1975, Survey of New-Protocol Telnet Servers
- 669 - November 1974, Survey of New-Protocol Telnet Servers
- 659 - Announcing Additional Telnet Options
- 658 - Telnet Output Line Feed Disposition
- 657 - Telnet Output Vertical Tab Disposition Option
- 656 - Telnet Output Vertical Tab Stops Option
- 655 - Telnet Output Form Feed Disposition Option
- 654 - Telnet Output Horizontal Tab Disposition Option
- 653 - Telnet Output Horizontal Tab Stops Option
- 652 - Telnet Output Carriage Return Disposition Option
- 651 - Revised Telnet Status Option

- 587 - Announcing New Telnet Options
- 581 - Corrections to [RFC 560](#) - Remote Controlled Transmission and Echoing Telnet Option
- 563 - Comments on the RCTE Telnet Option
- 560 - Remote Controlled Transmission and Echoing Telnet Option

5c. File Transfer Protocol

- 987 - Mapping Between X.400 and [RFC 822](#)
- 959, 542, 354, 265, 172, 114 - The File Transfer Protocol
- 949 - FTP Unique-Named Store Command
- 913 - Simple File Transfer Protocol
- 906 - Bootstrap Loading Using TFTP
- 822 - Standard for the Format of ARPA Internet Text Messages
- 821, 788 - Simple Mail Transfer Protocol
- 783, 768, 764 - The TFTP Protocol Revision 2
- 775 - Directory Oriented FTP Commands
- 743 - FTP Extension: XRSQ/XRCP
- 737 - FTP Extension: XSEN
- 697 - CWD Command of FTP
- 691 - One More Try on the FTP
- 686 - Leaving Well Enough Alone
- 683 - FTPSRV -- Tenex Extension for Paged Files
- 678 - Document File Format Standards
- 662 - Performance Improvement in ARPANET File Transfers from Multics
- 640 - Revised FTP Reply Codes
- 630 - FTP Error Code Usage for More Reliable Mail Service
- 624 - Comments on the File Transfer Protocol
- 614 - Response to [RFC 607](#) - Comments on the FTP
- 607 - NIC-21255 Comments on the File Transfer Protocol
- 573 - Data and File Transfer - Some Measurement Results
- 571 - Tenex FTP Problem
- 535 - Comments on File Access Protocol
- 532 - The UCSD-CC Server-FTP Facility
- 520 - Memo to FTP Group (Proposal for File Access Protocol)
- 506 - An FTP Command Naming Problem
- 505 - Two Solutions to a File Transfer Access Problem
- 501 - Un-Muddling "Free File Transfer"
- 487 - Host-Dependent FTP Parameters
- 486 - Data Transfer Revisited
- 480 - Host-Dependent FTP Parameters
- 479 - Use of FTP by the NIC Journal
- 478 - FTP Server-Server Interaction - II
- 475 - FTP and the Network Mail System
- 468 - FTP Data Compression
- 463 - FTP Comments and Response to [RFC 430](#)
- 458 - Mail Retrieval via FTP

- 454 - File Transfer Protocol - Meeting Announcement and a New Proposed Document
- 448 - Print Files in FTP
- 438 - FTP Server-Server Interaction
- 430 - Comments on File Transfer Protocol
- 418 - Server File Transfer Under TSS/360 at NASA/Ames Research Center
- 414 - File Transfer Protocols (FTP): Status and Further Comments
- 412 - User FTP Documentation
- 385 - Comments on the File Transfer Protocol ([RFC 354](#))
- 310 - Another Look at Data and File Transfer Protocols
- 294 - The Use of "Set Data Type" Transaction in the File Transfer Protocol
- 281 - A Suggested Addition to File Transfer Protocol
- 269 - Some Experience with File Transfer
- 264, 171 - The Data Transfer Protocol
- 250 - Some Thoughts on File Transfer
- 242 - Data Descriptive Language for Shared Data
- 238 - Comments on DTP and FTP Protocols
- 163 - Data Transfer Protocols
- 141 - Comments on [RFC 114](#) (A File Transfer Protocol)
- 133 - File Transfer and Error Recovery

5d. Domain Name System

- 974 - Mail Routing and the Domain System
- 973 - Domain System Changes and Observations
- 953, 811, 810 - HOSTNAME Protocol
- 921, 897 - Domain Name System Implementation Schedule
- 920 - Domain Requirements
- 883 - Domain Names - Implementation and Specification
- 882 - Domain Names - Concepts and Facilities
- 881 - The Domain Names Plan and Schedule
- 830 - A Distributed System for Internet Name Service
- 819 - The Domain Naming Convention for Internet User Applications
- 799 - Internet Name Domains
- 756 - The NIC Name Server -- A Datagram-Based Information Utility
- 752 - A Universal Host Table

5e. Mail and Message Systems

- 994, 983 - PCMAIL: A Distributed Mail System
- 977 - Network News Transfer Protocol
- 976 - UUCP Mail Interchange Format Standard
- 974 - Mail Routing and the Domain System
- 934 - Proposed Standard for Message Encapsulation

- 915 - Network Mail Path Service
- 886 - Proposed Standard for Message Header Munging
- 850 - Standard for Interchange of USENET Messages
- 841 - Specification for Message Format for Computer Based
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REQUEST FOR COMMENTS LIST WITH ABSTRACTS

RFC	Author	Date	Title
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999	Westine	Mar 87	Requests For Comments Summary
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A summary of the Request for Comments Documents from [RFC 900](#)-999.

998	Lambert	Mar 87	NETBLT: A Bulk Data Transfer Protocol
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This document is a description of and a specification for the NETBLT protocol. It is a revision of the specification published in [RFC-969](#). NETBLT (NETwork BLock Transfer) is a transport level protocol intended for the rapid transfer of a large quantity of data between computers. It provides a transfer that is reliable and flow controlled, and is designed to provide maximum throughput over a wide variety of networks. Although NETBLT currently runs on top of the Internet Protocol (IP), it should be able to operate on top of any datagram protocol similar in function to IP.

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

997	Reynolds	Mar 87	Internet Numbers
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This memo is an official status report on the network numbers used in the Internet community. As of 1-Mar-87 the Network Information Center (NIC) at SRI International has assumed responsibility for assignment of Network Numbers and Autonomous System Numbers. This RFC documents the current assignments of these numbers at the time of this transfer of responsibility.

996	Mills	Feb 87	Statistics Server
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This RFC specifies a standard for the ARPA Internet community. Hosts and gateways on the DARPA Internet that choose to implement a remote statistics monitoring facility may use this protocol to send statistics data upon request to a monitoring center or debugging host.

995	ANSI	Apr 86	End System to Intermediate System Routing Exchange Protocol for use in conjunction with ISO 8473.
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This Protocol is one of a set of International Standards produced

to facilitate the interconnection of open systems. The set of standards covers the services and protocols required to achieve such interconnection.

This Protocol is positioned with respect to other related standards by the layers defined in the Reference Model for Open Systems Interconnection (ISO 7498) and by the structure defined in the Internal Organization of the Network Layer (DIS 8648). In particular, it is a protocol of the Network Layer. This Protocol permits End Systems and Intermediate Systems to exchange configuration and routing information to facilitate the operation of the routing and relaying functions of the Network Layer.

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|-----|------|--------|--|
| 994 | ANSI | Mar 86 | Final Text of DIS 8473, Protocol for
Providing the Connectionless Mode
Network Service |
|-----|------|--------|--|

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

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

- 993 Clark Dec 86 PCMAIL: A Distributed Mail System
for Personal Computers

This document is a discussion of the PCMAIL workstation-based distributed mail system. It is a revision of the design published in NIC [RFC 984](#). The revision is based on discussion and comments from a variety of sources, as well as further research into the design of interactive PCMAIL clients and the use of client code on machines other than IBM PCs. As this design may change, implementation of this document is not advised.

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|-----|--------|--------|---|
| 992 | Birman | Nov 86 | On Communication Support for
Fault-Tolerant Process Groups |
|-----|--------|--------|---|

This memo describes a collection of multicast communication primitives integrated with a mechanism for handling process failure and recovery. These primitives facilitate the implementation of fault-tolerant process groups, which can be used

to provide distributed services in an environment subject to non-malicious crash failures.

Here, we argue that the form of "best effort" reliability provided by host groups may not address the requirements of those researchers who are building fault tolerant software. Our basic premise is that reliable handling of failures, recoveries, and dynamic process migration are important aspects of programming in distributed environments, and that communication support that provides unpredictable behavior in the presence of such events places an unacceptable burden of complexity on higher level application software. This complexity does not arise when using the fault-tolerant process group alternative.

991 Reynolds Nov 86 Official ARPA-Internet Protocols

This RFC identifies the documents specifying the official protocols used in the Internet. Comments indicate any revisions or changes planned. This memo is an official status report on the numbers used in protocols in the ARPA-Internet community. This memo obsoletes RFCs 961, 944, 924, 901, 880, 840, 694, 661, 617, 582, 580, 552.

990 Reynolds Nov 86 Assigned Numbers

This Network Working Group Request for Comments documents the currently assigned values from several series of numbers used in network protocol implementations. This memo is an official status report on the numbers used in protocols in the ARPA-Internet community. This memo obsoletes RFCs 960, 943, 923, 900, 870, 820, 790, 776, 770, 762, 758, 755, 750, 739, 717, 604, 503, 433, 349, 322, 317, 204, 179, 175, 167.

989 Linn Feb 87 Privacy Enhancement for Internet
 Electronic Mail: Part I: Message
 Encipherment and Authentication
 Procedures

This RFC suggests a proposed protocol for the Internet community and requests discussion and suggestions for improvements. This RFC is the outgrowth of a series of IAB Privacy Task Force meetings and of internal working papers distributed for those meetings. This RFC defines message encipherment and authentication procedures, as the initial phase of an effort to provide privacy enhancement services for electronic mail transfer in the Internet. It is intended that the procedures defined here be compatible with a wide range of key management approaches, including both conventional (symmetric) and public-key (asymmetric) approaches for encryption of data encrypting keys.

Use of conventional cryptography for message text encryption and/or authentication is anticipated.

Privacy enhancement services (confidentiality, authentication, and message integrity assurance) are offered through the use of end-to-end cryptography between originator and recipient User Agent processes, with no special processing requirements imposed on the Message Transfer System at endpoints or at intermediate relay sites. This approach allows privacy enhancement facilities to be incorporated on a site-by-site or user-by-user basis without impact on other Internet entities. Interoperability among heterogeneous components and mail transport facilities is supported.

988 Deering Jul 86 Host Extensions for IP Multicasting

This memo specifies the extensions required of a host implementation of the Internet Protocol (IP) to support internetwork multicasting. This specification supersedes that given in [RFC 966](#), and constitutes a proposed protocol standard for IP multicasting in the ARPA-Internet. The reader is directed to [RFC 966](#) for a discussion of the motivation and rationale behind the multicasting extension specified here.

987	Kille	Jun 86	Mapping Between X.400 and RFC 822
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The X.400 series of protocols have been defined by CCITT to provide an Interpersonal Messaging Service (IPMS), making use of a store and forward Message Transfer Service. It is expected that this standard will be implemented very widely. This document describes a set of mappings which will enable interworking between systems operating the X.400 protocols and systems using [RFC 822](#) mail protocol or protocols derived from [RFC 822](#). This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

986	Callon	Jun 86	Working Draft -- Guidelines for the Use of Internet-IP addressing in the ISO Connectionless-Mode Network Protocol
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This RFC suggests a method to allow the existing IP addressing, including the IP protocol field, to be used for the ISO Connectionless Network Protocol (CLNP). This is a draft solution to one of the problems inherent in the use of "ISO-grams" in the DoD Internet. Related issues will be discussed in subsequent RFCs. This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

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|-----|-------|--------|------------------------------------|
| 985 | Mills | May 86 | Requirements for Internet Gateways |
|-----|-------|--------|------------------------------------|

This RFC summarizes the requirements for gateways to be used on networks supporting the DARPA Internet protocols. While it applies specifically to the National Science Foundation research programs, the requirements are stated in a general context and are believed applicable throughout the Internet community. The purpose of this document is to present guidance for vendors offering products that might be used or adapted for use in an Internet application. It enumerates the protocols required and gives references to RFCs and other documents describing the current specification. Suggestions and comments on this document are welcomed and can be sent to Dave Mills (Mills@D.ISI.EDU) or Dave Farber (Farber@HUEY.UDEL.EDU).

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|-----|-------|--------|---|
| 984 | Clark | May 86 | PCMAIL: A Distributed Mail System
for Personal Computers |
|-----|-------|--------|---|

This document is a preliminary discussion of the design of a personal-computer-based distributed mail system. Pcm ail is a distributed mail system that provides mail service to an arbitrary number of users, each of which owns one or more personal computers (PCs). The system is divided into two halves. The first consists of a single entity called the "repository". The repository is a storage center for incoming mail. Mail for a Pcm ail user can arrive externally from the Internet or internally from other repository users. The repository also maintains a stable copy of each user's mail state. The repository is therefore typically a computer with a large amount of disk storage. It is published for discussion and comment, and does not constitute a standard. As the proposal may change, implementation of this document is not advised.

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|-----|------|--------|--|
| 983 | Cass | Apr 86 | ISO Transport Services on Top of the TCP |
|-----|------|--------|--|

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

- 982 ANSI Apr 86 Guidelines for the Specification of
 the Structure of the Domain Specific
 Part (DSP) of the ISO Standard NSAP
 Address

This RFC is a draft working document of the ANSI "Guidelines for the Specification of the Structure of the Domain Specific Part (DSP) of the ISO Standard NSAP Address". It provides guidance to private address administration authorities on preferred formats and semantics for the Domain Specific Part (DSP) of an NSAP address. This RFC specifies the way in which the DSP may be constructed so as to facilitate efficient address assignment. This RFC is for informational purposes only and its distribution is unlimited and does not specify a standard of the ARPA-Internet.

- 981 Mills Mar 86 An Experimental Multiple-Path
 Routing Algorithm

This document introduces wiretap algorithms, a class of experimental, multiple routing algorithms that compute quasi-optimum routes for stations sharing a packet-radio broadcast channel. The primary route (a minimum-distance path), and additional paths ordered by distance, which serve as alternate routes should the primary route fail, are computed. This prototype is presented as an example of a class of routing algorithms and data-base management techniques that may find wider application in the Internet community. Discussions and suggestions for improvements are welcomed.

- 980 Jacobsen Mar 86 Protocol Document Order Information

This RFC indicates how to obtain various protocol documents used in the DARPA research community. Included is an overview of the new 1985 DDN Protocol Handbook and available sources for obtaining related documents (such as DOD, ISO, and CCITT).

- 979 Malis Mar 86 PSN End-to-End Functional
 Specification

This memo is an updated version of BBN Report 5775, "End-to-End Functional Specification". It describes important changes to the functionality of the interface between a host and the PSN (Packet Switch Node), and should be carefully reviewed by anyone involved in supporting a host on either the ARPANET or MILNET. The new End-to-End Protocol (EE) is being developed in order to correct a number of deficiencies in the old End-to-End Protocol, to improve its performance and overall throughput, and to better equip the Packet Switch Node (also known as the IMP) to support its current and anticipated host population.

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|-----|----------|--------|---|
| 978 | Reynolds | Feb 86 | Voice File Interchange Protocol
(VFIP) |
|-----|----------|--------|---|

The purpose of the Voice File Interchange Protocol (VFIP) is to permit the interchange of various types of speech files between different systems in the ARPA-Internet community. Suggestions for improvement are encouraged.

- ```
977 Kantor Feb 86 Network News Transfer Protocol
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NNTP specifies a protocol for the distribution, inquiry, retrieval, and posting of news articles using a reliable stream-based transmission of news among the ARPA-Internet community. NNTP is designed so that news articles are stored in a central database allowing a subscriber to select only those items he wishes to read. Indexing, cross-referencing, and expiration of aged messages are also provided. This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

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|-----|--------|--------|---------------------------------------|
| 976 | Horton | Feb 86 | UUCP Mail Interchange Format Standard |
|-----|--------|--------|---------------------------------------|

This document defines the standard format for the transmission of mail messages between computers in the UUCP Project. It does not however, address the format for storage of messages on one machine, nor the lower level transport mechanisms used to get the data from one machine to the next. It represents a standard for conformance by hosts in the UUCP zone.

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|-----|-------|--------|---------------------------|
| 975 | Mills | Feb 86 | Autonomous Confederations |
|-----|-------|--------|---------------------------|

This RFC proposes enhancements to the Exterior Gateway Protocol (EGP) to support a simple, multiple-level routing capability while preserving the robustness features of the current EGP model. The enhancements generalize the concept of core system to include multiple communities of autonomous systems, called autonomous confederations. Discussion and suggestions for improvement are requested.

- 974 Partridge Jan 86 Mail Routing and the Domain System

This RFC presents a description of how mail systems on the Internet are expected to route messages based on information from the domain system. This involves a discussion of how mailers interpret MX RRs, which are used for message routing.



- |     |             |        |                                        |
|-----|-------------|--------|----------------------------------------|
| 973 | Mockapetris | Jan 86 | Domain System Changes and Observations |
|-----|-------------|--------|----------------------------------------|

This RFC documents updates to Domain Name System specifications [RFC-882](#) and [RFC-883](#), suggests some operational guidelines, and discusses some experiences and problem areas in the present system.

- |     |        |        |                             |
|-----|--------|--------|-----------------------------|
| 972 | Wancho | Jan 86 | Password Generator Protocol |
|-----|--------|--------|-----------------------------|

This RFC specifies a standard for the ARPA-Internet community. The Password Generator Service (PWDGEN) provides a set of six randomly generated eight-character "words" with a reasonable level of pronounceability, using a multi-level algorithm. Hosts on the ARPA-Internet that choose to implement a password generator service are expected to adopt and implement this standard.

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|-----|---------|--------|-------------------------------------------|
| 971 | DeSchon | Dec 85 | A Survey of Data Representation Standards |
|-----|---------|--------|-------------------------------------------|

This RFC is a comparison of several data representation standards that are currently in use. The standards discussed are the CCITT X.409 recommendation, the NBS Computer Based Message System (CBMS) standard, DARPA Multimedia Mail system, the Courier remote procedure call protocol, and the SUN Remote Procedure Call package. No proposals in this document are intended as standards for the ARPA-Internet at this time. Rather, it is hoped that a general consensus will emerge as to the appropriate approach to a data representation standard, leading eventually to the adoption of an ARPA-Internet standard.

- |     |       |        |                                          |
|-----|-------|--------|------------------------------------------|
| 970 | Nagle | Dec 85 | On Packet Switches With Infinite Storage |
|-----|-------|--------|------------------------------------------|

The purpose of this RFC is to focus discussion on a particular problem in the ARPA-Internet and possible methods of solution. Most prior work on congestion in datagram systems focuses on buffer management. In this memo, the case of a packet switch with infinite storage is considered. Such a packet switch can never run out of buffers. It can, however, still become congested. The meaning of congestion in an infinite-storage system is explored. An unexpected result is found that shows a datagram network with infinite storage, first-in-first-out queuing, at least two packet switches, and a finite packet lifetime will, under overload, drop all packets. By attacking the problem of congestion for the infinite-storage case, new solutions applicable to switches with finite storage may be found. No proposed solutions this document are intended as standards for the ARPA-Internet at this time.

969      Clark            Dec 85      NETBLT: A Bulk Data Transfer  
                                                 Protocol

This RFC has been replaced by [RFC 998](#). This is a preliminary discussion of the Network Block Transfer (NETBLT) protocol. NETBLT is intended for the rapid transfer of a large quantity of data between computers. It provides a transfer that is reliable and flow controlled, and is structured to provide maximum throughput over a wide variety of networks. This description is published for discussion and comment, and does not constitute a standard. As the proposal may change, implementation of this document is not advised.

968      Cerf            Dec 85      'Twas the Night Before Start-up'

This memo discusses problems that arise and debugging techniques used in bringing a new network into operation.

967      Padlipsky        Dec 85      All Victims Together

This RFC proposes a new set of RFCs on how the networking code is integrated with various operating systems. It appears that this topic has not received enough exposure in the literature. Comments and suggestions are encouraged.

966      Deering          Dec 85      A Multicast Extension to the  
                                                 Internet Protocol

This RFC defines a model of service for Internet multicasting and proposes an extension to the Internet Protocol (IP) to support such a multicast service. Discussion and suggestions for improvements are requested.

965      Aguilar           Dec 85      A Format for a Graphical  
                                                 Communication Protocol

This RFC describes the requirements for a graphical format on which to base a graphical on-line communication protocol, and proposes an Interactive Graphical Communication Format using the GKSM session metafile. We hope this contribution will encourage the discussion of multimedia data exchange and the proposal of solutions.

964      Sidhu            Nov 85      Some Problems with the Specification  
                                                 of the Military Standard  
                                                 Transmission Control Protocol

The purpose of this RFC is to provide helpful information on the Military Standard Transmission Control Protocol (MIL-STD-1778) so

that one can obtain a reliable implementation of this protocol standard. This note points out three errors with this specification. This note also proposes solutions to these problems.

963      Sidhu              Nov 85              Some Problems with the Specification  
                                                                                 of the Military Standard Internet  
                                                                                 Protocol

The purpose of this RFC is to provide helpful information on the Military Standard Internet Protocol (MIL-STD-1777) so that one can obtain a reliable implementation of this protocol. This paper points out several problems in this specification. This note also proposes solutions to these problems.

962      Padlipsky          Nov 85              TCP-4 Prime

This memo is in response to Bob Braden's call for a transaction oriented protocol ([RFC-955](#)), and continues the discussion of a possible transaction oriented transport protocol. This memo does not propose a standard.

961      Reynolds          Dec 85              Official ARPA-Internet Protocols

This RFC has been replaced by [RFC 991](#).

960      Reynolds          Dec 85              Assigned Numbers

This RFC has been replaced by RFCs 997 and 990.

959      Postel              Oct 85              File Transfer Protocol (FTP)

This memo is the official specification of the File Transfer Protocol (FTP) for the DARPA-Internet community. The primary intent is to clarify and correct the documentation of the FTP specification, not to change the protocol. The following new optional commands are included in this edition of the specification: Change to Parent Directory (CDUP), Structure Mount (SMNT), Store Unique (STOU), Remove Directory (RMD), Make Directory (MKD), Print Directory (PWD), and System (SYST). Note that this specification is compatible with the previous edition.

958      Mills              Sep 85              Network Time Protocol (NTP)

This document describes the Network Time Protocol (NTP), a protocol for synchronizing a set of network clocks using a set of distributed clients and servers. NTP is built on the User Datagram Protocol (UDP), which provides a connectionless transport mechanism. It evolved from the Time Protocol and the ICMP

Timestamp message and is a suitable replacement for both. This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

|     |       |        |                                                 |
|-----|-------|--------|-------------------------------------------------|
| 957 | Mills | Sep 85 | Experiments in Network Clock<br>Synchronization |
|-----|-------|--------|-------------------------------------------------|

This RFC discusses some experiments in clock synchronization in the ARPA-Internet community, and requests discussion and suggestions for improvements. One of the services frequently neglected in computer network design is a high-quality, time-of-day clock capable of generating accurate timestamps with small errors compared to one-way network delays. Such a service would be useful for tracing the progress of complex transactions, synchronizing cached data bases, monitoring network performance and isolating problems. In this memo, one such clock service design will be described and its performance assessed. This design has been incorporated as an integral part of the network routing and control protocols of the Distributed Computer Network (DCnet) architecture.

|     |       |        |                                                |
|-----|-------|--------|------------------------------------------------|
| 956 | Mills | Sep 85 | Algorithms for Synchronizing Network<br>Clocks |
|-----|-------|--------|------------------------------------------------|

This RFC discussed clock synchronization algorithms for the ARPA-Internet community, and requests discussion and suggestions for improvements. The recent interest within the Internet community in determining accurate time from a set of mutually suspicious network clocks has been prompted by several occasions in which errors were found in usually reliable, accurate clock servers after thunderstorms which disrupted their power supply. To these sources of error should be added those due to malfunctioning hardware, defective software and operator mistakes, as well as random errors in the mechanism used to set and synchronize clocks. This report suggests a stochastic model and algorithms for computing a good estimator from time-offset samples measured between clocks connected via network links. Included in this report are descriptions of certain experiments which give an indication of the effectiveness of the algorithms.

|     |        |        |                                                                        |
|-----|--------|--------|------------------------------------------------------------------------|
| 955 | Braden | Sep 85 | Towards a Transport Service for<br>Transaction Processing Applications |
|-----|--------|--------|------------------------------------------------------------------------|

The DoD Internet Protocol Suite includes two alternative transport service protocols, TCP and UDP, which provide virtual circuit and datagram service, respectively. These two protocols represent points in the space of possible transport service attributes which are quite "far apart". We want to examine an important class of applications, those which perform what is often called

"transaction processing". We will see that the communication needs for these applications fall into the gap "between" TCP and UDP -- neither protocol is very appropriate.

954      Harrenstien   Oct 85      NICNAME/WHOIS

This RFC is the official specification of the NICNAME/WHOIS protocol. This memo describes the protocol and the service. This is an update of [RFC 812](#). Obsoletes [RFC 812](#).

953      Harrenstien   Oct 85      Hostname Server

This RFC is the official specification of the Hostname Server Protocol. This edition of the specification includes minor revisions to [RFC 811](#) which brings it up to date. Obsoletes [RFC 811](#).

952      Harrenstien   Oct 85      DoD Internet Host Table  
Specification

This RFC is the official specification of the format of the Internet Host Table. This edition of the specification includes minor revisions to [RFC 810](#) which brings it up to date. Obsoletes RFCs 810, 608.

951      Croft           Sep 85      Bootstrap Protocol (BOOTP)

This RFC describes an IP/UDP bootstrap protocol (BOOTP) which allows a diskless client machine to discover its own IP address, the address of a server host, and the name of a file to be loaded into memory and executed. The bootstrap operation can be thought of as consisting of TWO PHASES. This RFC describes the first phase, which could be labeled 'address determination and bootfile selection'. After this address and filename information is obtained, control passes to the second phase of the bootstrap where a file transfer occurs. The file transfer will typically use the TFTP protocol, since it is intended that both phases reside in PROM on the client. However BOOTP could also work with other protocols such as SFTP or FTP. This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

950      Mogul           Aug 85      Internet Standard Subnetting  
Procedure

This memo discusses the utility of "subnets" of Internet networks, which are logically visible sub-sections of a single Internet network. For administrative or technical reasons, many organizations have chosen to divide one Internet network into

several subnets, instead of acquiring a set of Internet network numbers. This memo specifies procedures for the use of subnets. These procedures are for hosts (e.g., workstations). The procedures used in and between subnet gateways are not fully described. Important motivation and background information for a subnetting standard is provided in [RFC-940](#). This RFC specifies a protocol for the ARPA-Internet community. If subnetting is implemented it is strongly recommended that these procedures be followed.

949      Padlipsky      Jul 85      FTP Unique-Named Store Command

There are various contexts in which it would be desirable to have an FTP command that had the effect of the present STOR but rather than requiring the sender to specify a file name instead caused the resultant file to have a unique name relative to the current directory.

This RFC proposes an extension to the File Transfer Protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

948      Winston      Jun 85      Two Methods for the Transmission of  
IP Datagrams Over IEEE 802.3  
Networks

This memo describes two methods of encapsulating Internet Protocol (IP) datagrams on an IEEE 802.3 network.

947      Lebowitz      Jun 85      Multi-Network Broadcasting Within  
the Internet

This RFC describes the extension of a network's broadcast domain to include more than one physical network through the use of a broadcast packet repeater.

946      Nedved      May 85      Telnet Terminal Location Number  
Option

Many systems provide a mechanism for finding out where a user is logged in from usually including information about telephone extension and office occupants names. The information is useful for physically locating people and/or calling them on the phone. In 1982 CMU designed and implemented a terminal location database and modified existing network software to handle a 64-bit number called the Terminal Location Number (or TTYLOC). It now seems appropriate to incorporate this mechanism into the TCP-based network protocol family. The mechanism is not viewed as a replacement for the Terminal Location Telnet Option

(SEND-LOCATION) but as a shorthand mechanism for communicating terminal location information between hosts in a localized community. This RFC proposes a new option for Telnet for the ARPA-Internet community, and requests discussion and suggestions for improvements.

945        Postel            May 85            A DoD Statement on the NRC Report

In May 1983, the National Research Council (NRC) was asked jointly by the DoD and NBS to study the issues and recommend a course of action. The final report of the NRC committee was published in February 1985 (see [RFC-942](#)). The enclosed letter is from Donald C. Latham (ASDC3I) to DCA transmitting the NRC report and requesting specific actions relative to the recommendations of the report.

This RFC reproduces a letter from the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASDC3I) to the Director of the Defense Communications Agency (DCA). This letter is distributed for information only.

944        Reynolds        Apr 85            Official ARPA-Internet Protocols

This RFC has been replaced by [RFC 991](#).

943        Reynolds        Apr 85            Assigned Numbers

This RFC has been replaced by RFCs 997 and 990.

942        NRC                Feb 85            Transport Protocols for Department  
                                                                 of Defense Data Networks

This RFC reproduces the National Research Council report resulting from a study of the DoD Internet Protocol (IP) and Transmission Control Protocol (TCP) in comparison with the ISO Internet Protocol (ISO-IP) and Transport Protocol level 4 (TP-4).

941        ISO                Apr 85            Addendum to the Network Service  
                                                                 Definition Covering Network Layer  
                                                                 Addressing

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

This document is distributed as an RFC for information only. It does not specify a standard for the ARPA-Internet.

|     |      |        |                                                      |
|-----|------|--------|------------------------------------------------------|
| 940 | GADS | Apr 85 | Toward an Internet Standard Scheme<br>for Subnetting |
|-----|------|--------|------------------------------------------------------|

Several sites now contain a complex of local links connected to the Internet via a gateway. The details of the internal connectivity are of little interest to the rest of the Internet. One way of organizing these local complexes of links is to use the same strategy as the Internet uses to organize networks, that is, to declare each link to be an entity (like a network) and to interconnect the links with devices that perform routing functions (like gateways). This general scheme is called subnetting, the individual links are called subnets, and the connecting devices are called subgateways (or bridges, or gateways). This RFC discusses standardizing the protocol used in subnetted environments in the ARPA-Internet. Distribution of this memo is unlimited. The author of this RFC is the Gateway Algorithms and Data Structures (GADS) Task Force, chaired by David L. Mills.

|     |     |        |                                                                                                          |
|-----|-----|--------|----------------------------------------------------------------------------------------------------------|
| 939 | NRC | Feb 85 | Executive Summary of the NRC Report<br>on Transport Protocols for<br>Department of Defense Data Networks |
|-----|-----|--------|----------------------------------------------------------------------------------------------------------|

This RFC reproduces the material from the "front pages" of the National Research Council report resulting from a study of the DOD Internet Protocol (IP) and Transmission Control Protocol (TCP) in comparison with the ISO Internet Protocol (ISO-IP) and Transport Protocol level 4 (TP-4). The point of this RFC is to make the text of the Executive Summary widely available in a timely way. The order of presentation has been altered, and the pagination changed.

|     |        |        |                                                                                     |
|-----|--------|--------|-------------------------------------------------------------------------------------|
| 938 | Miller | Feb 85 | Internet Reliable Transaction<br>Protocol Functional and Interface<br>Specification |
|-----|--------|--------|-------------------------------------------------------------------------------------|

This RFC is being distributed to members of the DARPA research community in order to solicit their reactions to the proposals contained in it. While the issues discussed may not be directly relevant to the research problems of the DARPA community, they may be interesting to a number of researchers and implementors. This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.



937      Reynolds      Feb 85      Post Office Protocol - Version 2

This RFC suggests a simple method for workstations to dynamically access mail from a mailbox server. This RFC specifies a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvement. This memo is a revision of [RFC 918](#).

936      Karels      Feb 85      Another Internet Subnet Addressing Scheme

There have been several proposals for schemes to allow the use of a single Internet network number to refer to a collection of physical networks under common administration which are reachable from the rest of the Internet by a common route. Such schemes allow a simplified view of an otherwise complicated topology from hosts and gateways outside of this collection. They allow the complexity of the number and type of these networks, and routing to them, to be localized. Additions and changes in configuration thus cause no detectable change, and no interruption of service, due to slow propagation of routing and other information outside of the local environment. These schemes also simplify the administration of the network, as changes do not require allocation of new network numbers for each new cable installed. This proposal discusses an alternative scheme, one that has been in use at the University of California, Berkeley since April 1984. This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

935      Robinson      Jan 85      Reliable Link Layer Protocols

This RFC discusses protocols proposed recently in RFCs 914 and 916, and suggests a proposed protocol that could meet the same needs addressed in those memos. The stated need is reliable communication between two programs over a full-duplex, point-to-point communication link, and in particular the RFCs address the need for such communication over an asynchronous link at relatively low speeds. The suggested protocol uses the methods of existing national and international data link layer standards. This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

934      Rose      Jan 85      Proposed Standard for Message Encapsulation

This memo concerns itself with message forwarding. Forwarding can be thought of as encapsulating one or more messages inside

another. Although this is useful for transfer of past correspondence to new recipients, without a decapsulation process (which this memo terms "bursting"), the forwarded messages are of little use to the recipients because they can not be distributed, forwarded, replied-to, or otherwise processed as separate individual messages. In order to burst a message it is necessary to know how the component messages were encapsulated in the draft. At present there is no unambiguous standard for interest group digests. This RFC proposes a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

933        Silverman        Jan 85        Output Marking Telnet Option

This proposed option would allow a Server-Telnet to send a banner to a User-Telnet so that this banner would be displayed on the workstation screen independently of the application software running in the Server-Telnet.

932        Clark            Jan 85        A Subnetwork Addressing Scheme

This RFC proposes an alternative addressing scheme for subnets which, in most cases, requires no modification to host software whatsoever. The drawbacks of this scheme are that the total number of subnets in any one network are limited, and that modification is required to all gateways.

931        StJohns        Jan 85        Authentication Server

This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements. This is the second draft of this proposal (superseding [RFC 912](#)) and incorporates a more formal description of the syntax for the request and response dialog, as well as a change to specify the type of user identification returned.

930        Solomon        Jan 85        Telnet Terminal Type Option

This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet that exchange terminal type information within the Telnet protocol are expected to adopt and implement this standard. Distribution of this memo is unlimited. This standard supersedes [RFC 884](#). The only change is to specify that the TERMINAL-TYPE IS sub-negotiation should be sent only in response to the TERMINAL-TYPE SEND sub-negotiation.

929      Lilienkamp      Dec 84      Proposed Host-Front End Protocol

The Host-Front End Protocol introduced in [RFC 928](#) is described in detail in this memo. The first order of business is to declare that THIS IS A PROPOSAL, NOT A FINAL STANDARD, and the second order of business is to request that any readers of these documents who are able to do test implementations (a) do so and (b) coordinate their efforts with the author. This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

|     |           |        |                                               |
|-----|-----------|--------|-----------------------------------------------|
| 928 | Padlipsky | Dec 84 | Introduction to Proposed DOD<br>Standard H-FP |
|-----|-----------|--------|-----------------------------------------------|

The broad outline of the Host-Front End Protocol introduced here and described in [RFC 929](#) is the result of the deliberations of a number of experienced H-FP designers, who sat as a committee of the DoD Protocol Standards Technical Panel. It is the intent of the designers that the protocol be subjected to multiple test implementations and probable iteration before being agreed upon as any sort of "standard". Therefore, the first order of business is to declare that THIS IS A PROPOSAL, NOT A FINAL STANDARD, and the second order of business is to request that any readers of these documents who are able to do test implementations (a) do so and (b) coordinate their efforts with the author. This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

|     |          |        |                                             |
|-----|----------|--------|---------------------------------------------|
| 927 | Anderson | Dec 84 | TACACS User Identification Telnet<br>Option |
|-----|----------|--------|---------------------------------------------|

The following is the description of a Telnet option designed to facilitate double login avoidance. It is intended primarily for TAC connections to target hosts on behalf of TAC users, but it can be used between any two consenting hosts. For example, all hosts at one site (e.g., BBN) can use this option to avoid double login when TELNETing to one another.

This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

926           ISO                 Dec 84           Protocol for Providing the  
Connectionless-Mode Network Services

This note is the draft ISO protocol roughly similar to the DoD Internet Protocol. This document has been prepared by retyping the text of ISO DIS 8473 of May 1984, which is currently undergoing voting within ISO as a Draft International Standard

(DIS). This document is distributed as an RFC for information only. It does not specify a standard for the ARPA-Internet.

|     |        |        |                              |
|-----|--------|--------|------------------------------|
| 925 | Postel | Oct 84 | Multi-LAN Address Resolution |
|-----|--------|--------|------------------------------|

The problem of treating a set of local area networks (LANs) as one Internet network has generated some interest and concern. It is inappropriate to give each LAN within a site a distinct ARPA-Internet network number. It is desirable to hide the details of the interconnections between the LANs within a site from people, gateways, and hosts outside the site. The question arises on how to best do this, and even how to do it at all. In [RFC 917](#), Jeffery Mogul makes a case for the use of "explicit subnets" in a multi-LAN environment. The explicit subnet scheme is a call to recursively apply the mechanisms the ARPA-Internet uses to manage networks to the problem of managing LANs within one network. In this note I urge another approach: the use of "transparent subnets" supported by a multi-LAN extension of the Address Resolution Protocol. This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

924 Reynolds Oct 84 Official ARPA-Internet Protocols

This RFC has been replaced by [RFC 991](#).

|     |          |        |                  |
|-----|----------|--------|------------------|
| 923 | Reynolds | Oct 84 | Assigned Numbers |
|-----|----------|--------|------------------|

This RFC has been replaced by RFCs 997 and 990.

|     |       |        |                                                               |
|-----|-------|--------|---------------------------------------------------------------|
| 922 | Mogul | Oct 84 | Broadcasting Internet Datagrams in<br>the Presence of Subnets |
|-----|-------|--------|---------------------------------------------------------------|

We propose simple rules for broadcasting Internet datagrams on local networks that support broadcast, for addressing broadcasts, and for how gateways should handle them.

This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

921 Postel Oct 84 Domain Name System Implementation  
Schedule - Revised

This memo is a policy statement on the implementation of the Domain Style Naming System in the ARPA-Internet. This memo is an update of [RFC 881](#), and [RFC 897](#). This is an official policy statement of the IAB and the DARPA. The intent of this memo is to detail the schedule for the implementation for the Domain Style

Naming System. The explanation of how this system works is to be found in the references.

920 Postel Oct 84 Domain Requirements

This memo states the requirements on establishing a Domain, and introduces the limited set of top level domains. This memo is a policy statement on the requirements of establishing a new domain in the ARPA-Internet and the DARPA research community. This is an official policy statement of the IAB and the DARPA.

919 Mogul Oct 84 Broadcasting Internet Datagrams

This RFC proposes simple rules for broadcasting Internet datagrams on local networks that support broadcast, for addressing broadcasts, and for how gateways should handle them. This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

918 Reynolds Oct 84 Post Office Protocol (POP)

Updated by [RFC 937](#).

917 Mogul Oct 84 Internet Subnets

This memo discusses subnets and proposes procedures for the use of subnets, including approaches to solving the problems that arise, particularly that of routing. A subnet of an Internet network is a logically visible sub-section of a single Internet network. For administrative or technical reasons, many organizations have chosen to divide one Internet network into several subnets, instead of acquiring a set of Internet network numbers. This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

916 Finn Oct 84 Reliable Asynchronous Transfer Protocol (RATP)

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

This RFC suggests a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvements.

915      Elvy              Dec 84          Network Mail Path Service

The network mail path service fills the current need of people to determine mailbox addresses for hosts that are not part of the ARPA-Internet but can be reached by one or more relay hosts that have Unix to Unix Copy (UUCP) mail, CSNET mail, MAILNET mail, BITNET mail, etc. Anyone can use the service if they have TCP/TELENET to one of the hosts with a mail path server. This RFC proposes a new service for the ARPA-Internet community and requests discussion and suggestions for improvements.

914      Farber            Sep 84          A Thinwire Protocol

This document focuses discussion on the particular problems in the ARPA-Internet of low speed network interconnection with personal computers, and possible methods of solution. None of the proposed solutions in this document are intended as standards for the ARPA-Internet. Rather, it is hoped that a general consensus will emerge as to the appropriate solution to the problems, leading eventually to the adoption of standards.

913      Lottor              Sep 84          Simple File Transfer Protocol

This memo describes a proposed Simple File Transfer Protocol (SFTP). It fills the need of people wanting a protocol that is more useful than TFTP but easier to implement (and less powerful) than FTP. SFTP supports user access control, file transfers, directory listing, directory changing, file renaming, and deleting. Discussion of this proposal is encouraged, and suggestions for improvements may be sent to the author.

912      StJohns            Sep 84          Authentication Service

This memo describes a proposed authentication protocol for verifying the identity of a user of a TCP connection. Given a TCP port number pair, it returns a character string which identifies the owner of that connection on the server's system. Suggested uses include automatic identification and verification of a user during an FTP session, additional verification of a TAC dial up user, and access verification for a generalized network file server.

911      Kirton             Aug 84          EGP Gateway under Berkeley Unix 4.2

This memo describes an implementation of the Exterior Gateway Protocol (EGP) (in that sense it is a status report). The memo also discusses some possible extensions and some design issues (in that sense it is an invitation for further discussion).

910      Forsdick      Aug 84      Multimedia Mail Meeting Notes

This memo is a report on a meeting about the experimental multimedia mail system (and in a sense a status report on that experiment). The meeting was held at Bolt Beranek and Newman on 23-24 July 1984 to discuss recent progress by groups who are building multimedia mail systems and to discuss a variety of issues related to the further development of multimedia systems. Representatives were present from BBN, ISI, SRI and Linkabit. Distribution of this memo is unlimited.

909      Welles      Jul 84      Loader Debugger Protocol

The Loader Debugger Protocol (LDP) is an application layer protocol for loading, dumping, and debugging target machines from hosts in a network environment. This RFC specifies a proposed protocol for the ARPA-Internet and DARPA research community, and requests discussion and suggestions for improvements.

908      Velten      Jul 84      Reliable Data Protocol

The Reliable Data Protocol (RDP) is designed to provide a reliable data transport service for packet-based applications. This RFC specifies a proposed protocol for the ARPA-Internet and DARPA research community, and requests discussion and suggestions for improvements.

907      Storch      Jul 84      Host Access Protocol Specification

This document specifies the Host Access Protocol (HAP). Although HAP was originally designed as the network-access level protocol for the DARPA/DCA sponsored Wideband Packet Satellite Network, it is intended that it evolve into a standard interface SATNET and TACNET (aka MATNET) as well as the Wideband Network. HAP is an experimental protocol, and will undergo further revision as new capabilities are added and/or different satellite networks are supported. Implementations of HAP should be performed in coordination with satellite network development and operations personnel.

906      Finlayson      Jun 84      Bootstrap Loading Using TFTP

It is often convenient to be able to bootstrap a computer system from a communications network. This RFC proposes the use of the IP/TFTP protocol for bootstrap loading in this case.

|     |     |        |                                                       |
|-----|-----|--------|-------------------------------------------------------|
| 905 | ISO | Apr 84 | ISO Transport Protocol Specification<br>(ISO DP 8073) |
|-----|-----|--------|-------------------------------------------------------|

This is the current specification of the ISO Transport Protocol. This document is the text of ISO/TC97/SC16/N1576 as corrected by ISO/TC97/SC16/N1695. This is the specification currently being voted on in ISO as a Draft International Standard (DIS). This document is distributed as an RFC for your information only, it does not specify a standard for the ARPA-Internet or DARPA research community. Our thanks to Alex McKenzie of BBN for making this online version available. Please note the size of this document, the file contains 258,729 characters.

904 Mills Apr 84 Exterior Gateway Protocol Formal  
Specification

This is the specification of the Exterior Gateway Protocol (EGP). This memo updates portions of [RFC 888](#) and [RFC 827](#). This RFC specifies an official protocol of the DARPA community for use between gateways of different autonomous systems in the ARPA-Internet.

|     |           |        |                                       |
|-----|-----------|--------|---------------------------------------|
| 903 | Finlayson | Jun 84 | A Reverse Address Resolution Protocol |
|-----|-----------|--------|---------------------------------------|

This RFC suggests a method for workstations to dynamically find their protocol address (e.g., their Internet Address), when they know only their hardware address (e.g., their attached physical network address). This RFC specifies a proposed protocol for the ARPA-Internet community, and requests discussion and suggestions for improvement.

902      Postel      Jul 84      ARPA-Internet Protocol Policy

The purpose of this memo is to explain how protocol standards are adopted for the ARPA-Internet and the DARPA research community. There are three important aspects to be discussed: the process, the authority, and the complex relationship between the DARPA community and the DDN community. This memo is a policy statement on how protocols become official standards for the ARPA-Internet and the DARPA research community. This is an official policy statement of the ICCB and the DARPA.

901 Reynolds Jun 84 Official ARPA-Internet Protocols

This RFC has been replaced by [RFC 991](#).



900 Reynolds Jun 84 Assigned Numbers

This RFC has been replaced by RFCs 997 and 990.

899 Postel Apr 84 Requests For Comments Summary

A summary of the Request for Comments documents from [RFC 800-898](#).

898 Hinden Apr 84 Gateway Special Interest Group Meeting Notes

This memo is a report on the Gateway Special Interest Group Meeting that was held at ISI on 28 and 29 February 1984. Robert Hinden of BBNCC chaired, and Jon Postel of ISI hosted the meeting. Approximately 35 gateway designers and implementors attended. These notes are based on the recollections of Jon Postel and Mike Muuss. Under each topic area are Jon Postel's brief notes, and additional details from Mike Muuss. This memo is a report on the meeting. No conclusions, decisions, or policy statements are documented in this note.

897 Postel Feb 84 Domain Name System Implementation Schedule

This memo is a policy statement on the implementation of the Domain Style Naming System in the ARPA-Internet. This memo is a partial update of [RFC 881](#). The intent of this memo is to detail the schedule for the implementation of the Domain Style Naming System. The names of hosts will be changed to Domain style names. Hosts will begin to use Domain style names on 14-Mar-84, and the use of old style names will be completely phased out before 2-May-84. This applies to both the ARPA research hosts and the DDN operational hosts. This is an official policy statement of the ICCB and the DARPA.

896 Nagle Jan 84 Congestion Control in IP/TCP Internetworks

This memo discusses some aspects of congestion control in IP/TCP Internetworks. It is intended to stimulate thought and further discussion of this topic. While some specific suggestions are made for improved congestion control implementation, this memo does not specify any standards.

895 Postel Apr 84 A Standard for the Transmission of IP Datagrams over Experimental Ethernet Networks

This RFC specifies a standard method of encapsulating Internet

Protocol (IP) datagrams on an Experimental Ethernet. This RFC specifies a standard protocol for the ARPA-Internet community.

- 894      Hornig            Apr 84            A Standard for the Transmission of  
                                                                 IP Datagrams over Ethernet Networks

This RFC specifies a standard method of encapsulating Internet Protocol (IP) datagrams on an Ethernet. This RFC specifies a standard protocol for the ARPA-Internet community.

- 893      Leffler           Apr 84            Trailer Encapsulations

This RFC discusses the motivation for use of "trailer encapsulations" on local-area networks and describes the implementation of such an encapsulation on various media. This document is for information only. This is NOT an official protocol for the ARPA-Internet community.

- 892      ISO                Dec 83            ISO Transport Protocol Specification

This is a draft version of the transport protocol being standardized by the ISO. This version also appeared in the ACM SIGCOMM Computer Communication Review (V.12, N.3-4) July-October 1982. This version is now out of date.

- 891      Mills             Dec 83            DCN Local-Network Protocols

This RFC provides a description of the DCN protocols for maintaining connectivity, routing, and clock information in a local network. These procedures may be of interest to the designers and implementers of other local networks.

- 890      Postel             Feb 84            Exterior Gateway Protocol  
                                                                 Implementation Schedule

This memo is a policy statement on the implementation of the Exterior Gateway Protocol (EGP) in the ARPA-Internet. This is an official policy statement of ICCB and DARPA. After 1-Aug-84 there shall be no dumb gateways in the Internet. Every gateway must be a member of some autonomous system. Some gateway of each autonomous system must exchange routing information with some gateway of the core autonomous system using the Exterior Gateway Protocol.

- 889      Mills             Dec 83            Internet Delay Experiments

This memo reports on some measurements of round-trip times in the Internet and suggests some possible improvements to the TCP

retransmission timeout calculation. This memo is both a status report on the ARPA-Internet and advice to TCP implementers.

888      Seamonson      Jan 84      "Stub" Exterior Gateway Protocol

This RFC describes the Exterior Gateway Protocol (EGP) used to connect Stub Gateways to an Autonomous System of core Gateways. This document specifies the working protocol, and defines an ARPA official protocol. All implementers of Gateways should carefully review this document.

887      Accetta      Dec 83      Resource Location Protocol

This RFC specifies a draft standard for the ARPA-Internet community. It describes a resource location protocol for use in the ARPA-Internet. It is most useful on networks employing technologies which support some method of broadcast addressing, however it may also be used on other types of networks. For maximum benefit, all hosts which provide significant resources or services to other hosts on the ARPA-Internet should implement this protocol. Hosts failing to implement the Resource Location Protocol risk being ignored by other hosts which are attempting to locate resources on the ARPA-Internet.

886      Rose      Dec 83      Proposed Standard for Message Header Munging

This RFC specifies a draft standard for the ARPA-Internet community. It describes the rules to be used when transforming mail from the conventions of one message system to those of another message system. In particular, the treatment of header fields, and recipient addresses is specified.

885      Postel      Dec 83      Telnet End of Record Option

This RFC specifies a standard for the ARPA-Internet community. It specifies a method for marking the end of records in data transmitted on Telnet connections.

884      Solomon      Dec 83      Telnet Terminal Type Option

This RFC specifies a standard for the ARPA-Internet community. It specifies a method for exchanging terminal type information in the Telnet protocol.

- 883      Mockapetris    Nov 83      Domain Names - Implementation and Specification

This RFC discusses the implementation of domain name servers and resolvers, specifies the format of transactions, and discusses the use of domain names in the context of existing mail systems and other network software.

- 882      Mockapetris    Nov 83      Domain Names - Concepts and Facilities

This RFC introduces domain style names, their use for DDN/ARPA-Internet mail and host address support, and the protocol and servers used to implement domain name facilities.

- 881      Postel            Nov 83      The Domain Names Plan and Schedule

This RFC outlines a plan and schedule for the implementation of domain style names throughout the DDN/ARPA-Internet community. The introduction of domain style names will impact all hosts on the DDN/ARPA-Internet.

- 880      Reynolds          Oct 83      Official Protocols

This RFC has been replaced by [RFC 991](#).

- 879      Postel            Nov 83      The TCP Maximum Segment Size and Related Topics

This RFC discusses the TCP Maximum Segment Size Option and related topics. The purpose is to clarify some aspects of TCP and its interaction with IP. This memo is a clarification to the TCP specification, and contains information that may be considered as "advice to implementers".

- 878      Malis             Dec 83      The ARPANET 1822L Host Access Protocol

This RFC specifies the ARPANET 1822L Host Access Protocol, which is a successor to the existing 1822 Host Access Protocol. The 1822L procedure allows ARPANET hosts to use logical identifiers as well as 1822 physical interface identifiers to address each other.

- 877      Korb                Sep 83      A Standard for the Transmission of IP Datagrams Over Public Data Networks

This RFC specifies a standard adopted by CSNET, the VAN gateway,

and other organizations for the transmission of IP datagrams over the X.25-based public data networks.

876      Smallberg      Sep 83      Survey of SMTP Implementations

This RFC is a survey of implementation status. It does not specify an official protocol, but rather notes the status of implementation of aspects of a protocol. It is expected that the status of the hosts reported on will change. This information must be treated as a snapshot of the state of these implementations.

875      Padlipsky      Sep 82      Gateways, Architectures, and  
Heffalumps

This RFC is a discussion about the role of gateways in an internetwork, especially the problems of translating or mapping protocols between different protocol suites. The discussion notes possible functionality mis-matches, undesirable routing "singularity points", flow control issues, and high cost of translating gateways. Originally published as M82-51 by the MITRE Corporation, Bedford, Massachusetts.

874      Padlipsky      Sep 82      A Critique of X.25

This RFC is an analysis of X.25 pointing out some problems in the conceptual model, particularly the conflict between the interface aspects and the end-to-end aspects. The memo also touches on security, and implementation issues. Originally published as M82-50 by the MITRE Corporation, Bedford, Massachusetts.

873      Padlipsky      Sep 82      The Illusion of Vendor Support

This memo takes issue with the claim that international standards in computer protocols presently provide a basis for low cost vendor supported protocol implementations. Originally published as M82-49 by the MITRE Corporation, Bedford, Massachusetts.

872      Padlipsky      Sep 82      TCP-ON-A-LAN

This memo attacks the notion that TCP cannot be appropriate for use on a Local Area Network. Originally published as M82-48 by the MITRE Corporation, Bedford Massachusetts.

871      Padlipsky      Sep 82      A Perspective on the Arpanet  
Reference Model

This RFC is primarily intended as a perspective on the ARM and points out some of the differences between the ARM and the ISORM

which were expressed by members in NWG general meetings, NWG protocol design committee meetings, the ARPA-Internet Working Group, and private conversations over the intervening years. Originally published as M82-47 by the MITRE Corporation, Bedford, Massachusetts.

870      Reynolds      Oct 83      Assigned Numbers

This RFC has been replaced by RFCs 997 and 990.

869      Hinden      Dec 83      A Host Monitoring Protocol

This RFC specifies the Host Monitoring Protocol used to collect information from various types of hosts in the Internet. Designers of Internet communications software are encouraged to consider this protocol as a means of monitoring the behavior of their creations.

868      Postel      May 83      Time Protocol

This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet that choose to implement a Time Protocol are expected to adopt and implement this standard. This protocol provides a site-independent, machine readable date and time. The Time service sends back to the originating source the time in seconds since midnight on January first 1900.

867      Postel      May 83      Daytime Protocol

This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet that choose to implement a Daytime Protocol are expected to adopt and implement this standard. The Daytime service simply sends the current date and time as a character string without regard to the input.

866      Postel      May 83      Active Users

This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet that choose to implement an Active Users Protocol are expected to adopt and implement this standard. The Active Users service simply sends a list of the currently active users on the host without regard to the input.

865      Postel      May 83      Quote of the Day Protocol

This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet that choose to implement a Quote of the Day Protocol are expected to adopt and implement this standard.

The Quote of the Day service simply sends a short message without regard to the input.

864      Postel            May 83            Character Generator Protocol

This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet that choose to implement a Character Generator Protocol are expected to adopt and implement this standard. The Character Generator service simply sends data without regard to the input.

863      Postel            May 83            Discard Protocol

This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet that choose to implement a Discard Protocol are expected to adopt and implement this standard. The Discard service simply throws away any data it receives.

862      Postel            May 83            Echo Protocol

This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet that choose to implement a Echo Protocol are expected to adopt and implement this standard. The Echo service simply sends back to the originating source any data it receives.

861      Postel            May 83            Telnet Extended Options - List  
Option

This Telnet Option provides a mechanism for extending the set of possible options. This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet are expected to adopt and implement this standard. Obsoletes NIC 16239.

860      Postel            May 83            Telnet Timing Mark Option

This Telnet Option provides a way to check the roundtrip path between two Telnet modules. This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet are expected to adopt and implement this standard. Obsoletes NIC 16238.

859      Postel            May 83            Telnet Status Option

This Telnet Option provides a way to determine the other Telnet module's view of the status of options. This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet are expected to adopt and implement this standard. Obsoletes [RFC 651](#) (NIC 31154).

858      Postel            May 83            Telnet Suppress Go Ahead Option

This Telnet Option disables the exchange of go-ahead signals between the Telnet modules. This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet are expected to adopt and implement this standard. Obsoletes NIC 15392.

857      Postel            May 83            Telnet Echo Option

This Telnet Option enables remote echoing by the other Telnet module. This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet are expected to adopt and implement this standard. Obsoletes NIC 15390.

856      Postel            May 83            Telnet Binary Transmission

This Telnet Option enables a binary data mode between the Telnet modules. This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet are expected to adopt and implement this standard. Obsoletes NIC 15389.

855      Postel            May 83            Telnet Option Specifications

This memo specifies the general form for Telnet options and the directions for their specification. This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet are expected to adopt and implement this standard. Obsoletes [RFC 651](#), NIC 18640.

854      Postel            May 83            Telnet Protocol Specifications

This is the specification of the Telnet protocol used for remote terminal access in the ARPA-Internet. The purpose of the Telnet Protocol is to provide a fairly general, bi-directional, eight-bit byte oriented communications facility. Its primary goal is to allow a standard method of interfacing terminal devices and terminal-oriented processes to each other. It is envisioned that the protocol may also be used for terminal-terminal communication ("linking") and process-process communication (distributed computation). This RFC specifies a standard for the ARPA-Internet community. Hosts on the ARPA-Internet are expected to adopt and implement this standard. Obsoletes NIC 18639.

853      Never Issued.



852        Malis            Apr 83            The ARPANET Short Blocking Feature

This RFC specifies the ARPANET Short Blocking Feature, which will allow ARPANET hosts to optionally shorten the IMP's host blocking timer. This Feature is a replacement of the ARPANET non-blocking host interface, which was never implemented, and will be available to hosts using either the 1822 or 1822L Host Access Protocol. This RFC is also being presented as a solicitation of comments on the Short Blocking Feature, especially from host network software implementers and maintainers.

|     |       |        |                                           |
|-----|-------|--------|-------------------------------------------|
| 851 | Malis | Apr 83 | The ARPANET 1822L Host Access<br>Protocol |
|-----|-------|--------|-------------------------------------------|

This RFC specifies the ARPANET 1822L Host Access Protocol, which is a successor to the existing 1822 Host Access Protocol. 1822L allows ARPANET hosts to use logical names as well as 1822's physical port locations to address each other. This RFC is also being presented as a solicitation of comments on 1822L, especially from host network software implementers and maintainers. Obsoletes [RFC 802](#).

|     |        |        |                                                |
|-----|--------|--------|------------------------------------------------|
| 850 | Horton | Jun 83 | Standard for Interchange of USENET<br>Messages |
|-----|--------|--------|------------------------------------------------|

This memo is distributed as an RFC only to make this information easily accessible to researchers in the ARPA-Internet community. It does not specify an Internet standard. This RFC defines the standard format for interchange of Network News articles among USENET sites. It describes the format for articles themselves, and gives partial standards for transmission of news. The news transmission is not entirely standardized in order to give a good deal of flexibility to the individual hosts to choose transmission hardware and software, whether to batch news and so on.

|     |         |        |                                                     |
|-----|---------|--------|-----------------------------------------------------|
| 849 | Crispin | May 83 | Suggestions for Improved Host Table<br>Distribution |
|-----|---------|--------|-----------------------------------------------------|

This RFC actually is a request for comments. The issue dealt with is that of a naming registry update procedure, both as exists currently and what could exist in the future. None of the proposed solutions are intended as standards at this time; rather it is hoped that a general consensus will emerge as the appropriate solution, leaving eventually to the adoption of standards.

- 848      Smallberg      Mar 83      Who provides the "Little" TCP  
Services?

This RFC lists those hosts which provide any of these "little" TCP services: The list of hosts were taken from the NIC hostname table of 24-Feb-83. The tests were run on February 23 and 24, and March 3 and 5 from ISI-VAXA.ARPA.

- 847      Westine      Feb 83      Summary of Smallberg Surveys

This is a summary of the surveys of Telnet, FTP and Mail (SMTP) servers conducted by David Smallberg in December 1982, January and February 1983 as reported in [RFC 832](#)-843, 845-846. This memo extracts the number of hosts that accepted the connection to their server for each of Telnet, FTP, and SMTP, and compares it to the total host in the ARPA-Internet (not counting TACs or ECHOS).

- 846      Smallberg      Feb 83      Who Talks TCP? -- Survey of 22  
February 1983

This RFC is a survey of hosts to identify the implementation status of Telnet, FTP, and Mail on TCP. The list of hosts was taken from the NIC hostname table of 18-Feb-83. The tests were run on 22-Feb-83 from ISI-VAXA.ARPA.

- 845      Smallberg      Feb 83      Who Talks TCP? -- Survey of 15  
February 1983

This RFC is a survey of hosts to identify the implementation status of Telnet, FTP, and Mail on TCP. The list of hosts was taken from the NIC hostname table of 3-Feb-83. The tests were run on 15-Feb-83 from ISI-VAXA.ARPA.

- 844      Clements      Feb 83      Who Talks ICMP, too? Survey of 18  
February 1983

This survey determines how many hosts are able to respond to Telnet connections from a user at a class C site. This requires, in addition to IP and TCP, participation in gateway routing via ICMP and handling of Class C addresses. The list of hosts was taken from [RFC 843](#), extracting only those hosts which are listed there as accepting Telnet connection. The tests were run on 18-Feb-83.

- 843      Smallberg      Feb 83      Who Talks TCP? -- Survey of 8  
February 1983

This RFC is a survey of hosts to identify the implementation status of Telnet, FTP, and Mail on TCP. The list of hosts was

taken from the NIC hostname table of 3-Feb-83. The tests were run on 8-Feb-83 and on 9-Feb-83 from ISI-VAXA.ARPA.

842      Smallberg      Feb 83      Who Talks TCP? -- Survey of 1  
February 1983

This RFC is a survey of hosts to identify the implementation status of Telnet, FTP, and Mail on TCP. The list of hosts was taken from the NIC hostname table of 28-Jan-83. The tests were run on 1-Feb-83 and on 2-Feb-83 ISI-VAXA.ARPA.

841      FIPS PUB 98      Jan 83      Specification for Message Format for  
Computer Based Message Systems

This RFC is FIPS 98. The purpose of distributing this document as an RFC is to make it easily accessible to the ARPA research community. This RFC does not specify a standard for the ARPA-Internet. Obsoletes [RFC 806](#).

840      Postel      Apr 83      Official Protocols

This RFC has been replaced by [RFC 991](#).

839      Smallberg      Jan 83      Who Talks TCP?

This RFC is a survey of hosts to identify the implementation status of Telnet, FTP, and Mail on TCP. The list of hosts was taken from the NIC hostname table of 31-Dec-82. The tests were run on 25-Jan-83.

838      Smallberg      Jan 83      Who Talks TCP?

This RFC is a survey of hosts to identify the implementation status of Telnet, FTP, and Mail on TCP. The list of hosts was taken from the NIC hostname table of 31-Dec-82. The tests were run on 18-Jan-83.

837      Smallberg      Jan 83      Who Talks TCP?

This RFC is a survey of hosts to identify the implementation status of Telnet, FTP, and Mail on TCP. The list of hosts was taken from the NIC hostname table of 31-Dec-82. The tests were run on 11-Jan-83.

836      Smallberg      Jan 83      Who Talks TCP?

This RFC is a survey of hosts to identify the implementation status of Telnet, FTP, and Mail on TCP. The list of hosts was

taken from the NIC hostname table of 20-Dec-82. The tests were run on 4-Jan-83 through 5-Jan-83.

835 Smallberg Dec 82 Who Talks TCP?

This RFC is a survey of hosts to identify the implementation status of Telnet, FTP, and Mail on TCP. The list of hosts was taken from the NIC hostname table of 2-Dec-82. The tests were run on 28-Dec-82 through 5-Jan-83.

834 Smallberg Dec 82 Who Talks TCP?

This RFC is a survey of hosts to identify the implementation status of Telnet, FTP, and Mail on TCP. The list of hosts was taken from the NIC hostname table of 2-Dec-82. The tests were run on 22-Dec-82.

833 Smallberg Dec 82 Who Talks TCP?

This RFC is a survey of hosts to identify the implementation status of Telnet, FTP, and Mail on TCP. The list of hosts was taken from the NIC hostname table of 2-Dec-82. The tests were run on 14-Dec-82.

832 Smallberg Dec 82 Who Talks TCP?

This RFC is a survey of hosts to identify the implementation status of Telnet, FTP, and Mail on TCP. The list of hosts was taken from the NIC hostname table of 2-Dec-82. The tests were run on 7-Dec-82.

|     |        |        |                                                 |
|-----|--------|--------|-------------------------------------------------|
| 831 | Braden | Dec 82 | Backup Access to the European Side<br>of SATNET |
|-----|--------|--------|-------------------------------------------------|

The purpose of this RFC is to focus discussion on a particular Internet problem: a backup path for software maintenance of the European sector of the Internet, for use when SATNET is partitioned. We propose a mechanism, based upon the Source Routing option of IP, to reach European Internet sites via the VAN Gateway and UCL. This proposal is not intended as a standard at this time.

|     |             |        |                                                   |
|-----|-------------|--------|---------------------------------------------------|
| 830 | Zaw-Sing Su | Oct 82 | A Distributed System for Internet<br>Name Service |
|-----|-------------|--------|---------------------------------------------------|

This RFC proposes a distributed name service for ARPA-Internet. Its purpose is to focus discussion on the subject. It is hoped that a general consensus will emerge leading eventually to the adoption of standards.

- 829      Cerf              Oct 82      Packet Satellite Technology  
Reference Sources

This RFC describes briefly the packet satellite technology developed by the Defense Advanced Research Projects Agency and several other participating organizations in the U.K. and Norway and provides a bibliography of relevant papers for researchers interested in experimental and operational experience with this dynamic satellite-sharing technique.

- 828      Owen              Aug 82      Data Communications: IFIP's  
International "Network" of Experts

This RFC is distributed to inform the ARPA-Internet community of the activities of the IFIP technical committee on Data Communications, and to encourage participation in those activities.

- 827      Rosen              Oct 82      Exterior Gateway Protocol (EGP)

This RFC is proposed to establish a standard for Gateway to Gateway procedures that allow the Gateways to be mutually suspicious. This document is a DRAFT for that standard. Your comments are strongly encouraged.

- 826      Plummer            Nov 82      An Ethernet Address Resolution  
Protocol

The purpose of this RFC is to present a method of Converting Protocol Addresses (e.g., IP addresses) to Local Network Addresses (e.g., Ethernet addresses). This is an issue of general concern in the ARPA-Internet Community at this time. The method proposed here is presented for your consideration and comment. This is not the specification of an ARPA-Internet Standard.

- 825      Postel              Nov 82      Request for Comments on Requests for  
Comments

This RFC is intended to clarify the status of RFCs and to provide some guidance for the authors of RFCs in the future. It is in a sense a specification for RFCs.

- 824      MacGregor          Aug 82      The Cronus Virtual Local Network

The purpose of this note is to describe the CRONUS Virtual Local Network, especially the addressing related features. These features include a method for mapping between Internet Addresses and Local Network addresses. This is a topic of current concern in the ARPA-Internet community. This note is intended to

stimulate discussion. This is not a specification of an ARPA-Internet Standard.

823        Hinden            Sep 82            The DARPA Internet Gateway

This RFC is a status report on the Internet Gateway developed by BBN. It describes the Internet Gateway as of September 1982. This memo presents detailed descriptions of message formats and gateway procedures, however, this is not an implementation specification, and such details are subject to change.

822        Crocker           Aug 82            Standard for the Format of ARPA  
Internet Text Messages

This document revises the specifications in RFC 733, in order to serve the needs of the larger and more complex ARPA-Internet. Some of RFC 733's features failed to gain adequate acceptance. In order to simplify the standard and the software that follows it, these features have been removed. A different addressing scheme is used, to handle the case of internetwork mail; and the concept of re-transmission has been introduced. Obsoletes RFC 733, NIC 41952.

821        Postel            Aug 82            Simple Mail Transfer Protocol

The objective of Simple Mail Transfer Protocol (SMTP) is to transfer mail reliably and efficiently. SMTP is independent of the particular transmission subsystem and requires only a reliable ordered data stream channel. Obsoletes RFCs 788, 780, 772.

820        Postel            Jan 82            Assigned Numbers

This RFC is is replaced by RFCs 997 and 990.

819        Zaw-Sing Su    Aug 82            The Domain Naming Convention for  
Internet User Applications

This RFC is an attempt to clarify the generalization of the Domain Naming Convention, the Internet Naming Convention, and to explore the implications of its adoption for ARPA-Internet name service and user applications.

818        Postel            Nov 82            The Remote User Telnet Service

This RFC is the specification of an application protocol. Any host that implements this application level service must follow this protocol.

817      Clark            Jul 82            Modularity and Efficiency in  
                                                 Protocol Implementation

This RFC will discuss some of the commonly encountered reasons why protocol implementations seem to run slowly.

816      Clark            Jul 82            Fault Isolation and Recovery

This RFC describes the portion of fault isolation and recovery which is the responsibility of the host.

815      Clark            Jul 82            IP Datagram Reassembly Algorithms

This RFC describes an alternate approach of dealing with reassembly which reduces the bookkeeping problem to a minimum, and requires only one buffer for storage equal in size to the final datagram being reassembled, which can reassemble a datagram from any number of fragments arriving in any order with any possible pattern of overlap and duplication, and which is appropriate for almost any sort of operating system.

814      Clark            Jul 82            Name, Addresses, Ports, and Routes

This RFC gives suggestions and guidance for the design of the tables and algorithms necessary to keep track of these various sorts of identifiers inside a host implementation of TCP/IP.

813      Clark            Jul 82            Window and Acknowledgement Strategy  
                                                 in TCP

This RFC describes implementation strategies to deal with two mechanisms in TCP, the window and the acknowledgement. It also presents a particular set of algorithms which have received testing in the field, and which appear to work properly with each other. With more experience, these algorithms may become part of the formal specification, until such time their use is recommended.

812      Harrenstien    Mar 82            NICNAME/WHOIS

This RFC gives a description of what the NICNAME/WHOIS Server is and how to access it. This server together with the corresponding Identification Data Base provides online directory look-up equivalent to the ARPANET Directory.

811 Harrenstien Mar 82 Hostnames Server

This RFC gives a description of what the Hostnames Server is and how to access it. The function of this particular server is to deliver machine-readable name/address information describing networks, gateways, hosts, and eventually domains, within the Internet environment.

810 Feinler Mar 82 DoD Internet Host Table Specification

This RFC specifies a new host table format applicable to both ARPANET and Internet needs. In addition to host name to host address translation and selected protocol information, we have also included network and gateway name to address correspondence, and host operating system information. This RFC obsoletes the host table described in [RFC 608](#).

809 Chang Feb 82 UCL Facsimile System

This RFC describes the features of the computerised facsimile system developed in the Department of Computer Science at UCL. First its functions are considered and the related experimental work are reported. Then the disciplines for system design are discussed. Finally, the implementation of the system are described, while detailed description are given as appendices.

808 Postel Mar 82 Summary of Computer Mail Services Meeting Held at BBN on 10 January 1979

This RFC is a very belated attempt to document a meeting that was held three years earlier to discuss the state of computer mail in the ARPA community and to reach some conclusions to guide the further development of computer mail systems such that a coherent total mail service would continue to be provided.

807 Postel Feb 82 Multimedia Mail Meeting Notes

This RFC consists of notes from a meeting held at USC/Information Sciences Institute on the 12th of January to discuss common interests in multimedia computer mail issues and to agree on some specific initial experiments.

806 NBS Sep 81 Specification for Message Format for Computer Based Message Systems

This RFC deals with Computer Based Message systems which provides a basis for interaction between different CBMS by defining the



format of messages passed between them. This RFC is replaced by [RFC 841](#).

805      Postel              Feb 82              Computer Mail Meeting Notes

This RFC consists of notes from a meeting that was held at USC/Information Sciences Institute on 11 January 1982, to discuss addressing issues in computer mail. The major conclusion reached at the meeting is to extend the "username@hostname" mailbox format to "username@host.domain", where the domain itself can be further structured.

804      CCITT              Jan 82              CCITT Draft Recommendation T.4

This is the CCITT standard for group 3 facsimile encoding. This is useful for data compression of bit map data.

803      Agarwal              Nov 81              Dacom 450/500 Facsimile Data  
Transcoding

The first part of this RFC describes in detail the Dacom 450 data compression algorithms and is an update and correction to an earlier memorandum. The second part of this RFC describes briefly the Dacom 500 data compression algorithm as used by the INTELPOST electronic-mail network under development by the US Postal Service and several foreign administrators.

802      Malis              Nov 81              The ARPANET 1822L Host Access  
Protocol

This document proposed two major changes to the current ARPANET host access protocol. The first change will allow hosts to use logical addressing (i.e., host addresses that are independent of their physical location on the ARPANET) to communicate with each other, and the second will allow a host to shorten the amount of time that it may be blocked by its IMP after it presents a message to the network (currently, the IMP can block further input from a host for up to 15 seconds). See RFCs 852 and 851.

801      Postel              Nov 81              NCP/TCP Transition Plan

This RFC discusses the conversion of hosts from NCP to TCP. And making available the principle services: Telnet, File Transfer, and Mail. These protocols allow all hosts in the ARPA community to share a common interprocess communication environment.

800 Postel Nov 82 Requests for Comments Summary

This RFC is a slightly annotated list of the 100 RFCs from [RFC 700](#) through [RFC 799](#). This is a status report on these RFCs.

799 Mills Sep 81 Internet Name Domains

This document suggests that, as the Internet grows, the space of host names cannot remain a flat space of globally unique names, therefore a hierarchy of name domains must be introduced; see also [RFC 822](#).

798 Katz Sep 81 Decoding Facsimile Data From the Rapicom 450

A description of the encoding/decoding procedure for Rapicom 450 facsimile machine.

797 Katz Sep 81 Format for Bitmap Files

The description of a simple file format for bitmap data.

796 Postel Sep 81 Address Mappings

A description of the way the addresses of a few actual networks are mapped into internet addresses.

795 Postel Sep 81 Service Mappings

A description of how the internet type of service is mapped into the actual service parameters of a few particular networks, and vice versa.

794 Cerf Sep 81 Pre-Emption

Discusses how pre-emption of TCP connection can be implemented. Replaces IEN 125.

793 Postel Sep 81 Transmission Control Protocol

The specification of TCP. Replaces RFCs 761 and 675.

792 Postel Sep 81 Internet Control Message Protocol

The specification of ICMP. Replaces RFCs 777 and 760.

791 Postel Sep 81 Internet Protocol

An updated specification of IP. Replaces RFC 760.

790 Postel Sep 81 Assigned Numbers

The RFC is replaced by RFCs 997 and 990.

789 Rosen Jul 81 Vulnerabilities of Network Control  
Protocols: An Example

A description of an outage in ARPANET service and the process of determining the cause; also, subtleties of designing network protocols.

788 Postel Nov 81 Simple Mail Transfer Protocol

An old version; see RFC 821.

787 Chapin Jul 81 Connectionless Data Transmission  
Survey/Tutorial

A discussion of datagram service. Intended for submission to international standards bodies.

786 Sluizer Jul 81 Mail Transfer Protocol: ISI TOPS-20  
MTP-NIMAIL Interface

The description of the way mail is passed between the MTP and the NIMAIL programs in ISI TOPS-20. Outdated.

785 Sluizer Jul 81 Mail Transfer Protocol: ISI TOPS-20  
File Definitions

The description of the file format for passing mail to the MTP program from user mail programs in ISI TOPS-20. Outdated.

784 Sluizer Jul 81 Mail Transfer Protocol: ISI TOPS-20  
Implementation

The description of the program structure for the MTP implementation in the ISI TOPS-20. Outdated.

783 Sollins Jun 81 The TFTP Protocol Revision 2

The specification of TFTP. Replaces RFCs 768, 764 and IEN 133.

782      Nabelsky      undated      A Virtual Terminal Management Model

A description of the elements of a virtual terminal and the management of communications between them.

781      Su              May 81      A Specification of the Internet Protocol IP Timestamp Option

The description of IP Timestamp option, now included in the IP specification ([RFC 791](#)).

780      Sluizer      May 81      Mail Transfer Protocol

An outdated Mail protocol; see [RFC 821](#).

779      Killian      Apr 81      Telnet Send-Location Option

Definition of this Telnet option.

778      Mills      Apr 81      DCNet Internet Clock Service

Specifies a format and procedure for the exchange of messages to maintain synchronized clocks.

777      Postel      Apr 81      Internet Control Message Protocol

An old version; see [RFC 792](#).

776      Postel      Jan 81      Assigned Numbers

This RFC has been replaced by RFCs 997 and 990.

775      Mankins      Dec 80      Directory Oriented FTP Commands

The definition of additional FTP Commands related to directory management.

774      Postel      Oct 80      Internet Protocol Handbook Table of Contents

An out-of-date table of contents for an Internet Protocol Handbook.

773      Cerf      Oct 80      Comments on NCP/TCP Mail Service Transition Strategy

A discussion of issues in the transition from NCP to TCP, particularly as related to MAIL Service.

772      Sluizer          Sep 80          Mail Transfer Protocol

An old version of a Mail Protocol; see [RFC 821](#).

771      Cerf            Sep 80          Mail Transition Plan

A plan for supporting mail service in the transition from NCP to TCP; see also [RFC 801](#).

770      Postel          Sep 80          Assigned Numbers

This RFC has been replaced by RFCs 997 and 990.

769      Postel          Sep 80          Rapicom 450 Facsimile File Format

The definition of the exchange format of the encoded facsimile data of the Rapicom 450; see also [RFC 798](#).

768      Postel          Aug 80          User Datagram Protocol

The specification of the UDP.

767      Postel          Aug 80          A Structured Format for Transmission  
of Multi-Media Documents

The definition of the format for the document of a multimedia message.

766      Postel          Jul 80          Internet Protocol Handbook

An out-of-date table of contents for the Internet Protocol Handbook.

765      Postel          Jun 80          File Transfer Protocol Specification

The specification of FTP.

764      Postel          Jun 80          Telnet Protocol Specification

The specification of Telnet.

763      Abrams          May 80          Role Mailboxes

A call for mailboxes with role names, such as "Management".

762 Postel Jan 80 Assigned Numbers

This RFC has been replaced by RFCs 997 and 990.

761 Postel Jan 80 DOD Standard Transmission Protocol

An old version; see [RFC 793](#).

760 Postel Jan 80 DOD Standard Internet Protocol

An old version; see [RFC 791](#).

759 Postel Aug 80 Internet Message Protocol

The definition of the protocol and format for the exchange of multimedia mail. Replaces [RFC 753](#).

758 Postel Aug 79 Assigned Numbers

This RFC has been replaced by RFCs 997 and 990.

757 Deutsch Sep 79 A Suggested Solution to the Naming, Addressing, and Delivery Problem for ARPANET Message Systems

Discusses several proposals for handing the name to address to route processing for computer mail. Favors a solution based on unique-ids and a data base, see also RFCs 759, 821 and 822.

756 Pickens Jul 79 The NIC Name server--A Datagram-Based Information Utility

Describes a Host Name to Address look up service.

755 Postel May 79 Assigned Numbers

This RFC has been replaced by RFCs 997 and 990.

754 Postel Apr 79 Out-of-Net Host Addresses for Mail

A discussion of options for addressing computer mail beyond the ARPANET.

753 Postel Mar 79 Internet Message Protocol

An old version; see [RFC 759](#).

752      Crispin      Jan 79      A Universal Host Table

Describes the host table used at MIT and Stanford. This has several extensions and generalizations from the NIC standard and the table used by most Tenex and TOPS20 hosts.

751      Lebling      Dec 78      Survey of FTP Mail and MLFL

A survey of hosts' responses to probes of their FTP servers to see if servers (a) accept mail for unknown users and (b) support the MAIL and MLFL commands.

750      Postel      Sep 78      Assigned Numbers

This RFC has been replaced by RFCs 997 and 990.

749      Greenberg      Sep 78      Telnet SUPDUP-OUTPUT Option

Updates [RFC 736](#); see also RFCs 734, 746, and 747.

748      Crispin      Apr 78      Telnet Randomly-Lose Option

Defines this Telnet option (note the date of this memo).

747      Crispin      Mar 78      Recent Extensions to the SUPDUP  
Protocol

An update to the SUPDUP protocol ([RFC 734](#)); see also RFCs 749, 746 and 736.

746      Stallman      Mar 78      The SUPDUP Graphics Extension

An extension of SUPDUP for Graphics; see also RFCs 734, 736, 747 and 749.

745      Beeler      Mar 78      JANUS Interface Specifications

The specification of a symmetrical 1822 style interface.

744      Sattley      Jan 78      MARS - A Message Archiving and  
Retrieval Service

The description of a database service for computer mail messages, which operates via computer mail.

543 Harrenstien Dec 77 FTP Extension: XRSQ/XRCP

An extension to FTP mail to allow more efficient transmission of computer mail. Now incorporated into SMTP; see [RFC788](#).

742 Harrenstien Dec 77 NAME/FINGER Protocol

Defines the Name or Finger Protocol which allows one to get "who is on" or "where is user x" information from another host.

741 Cohen Nov 77 Specifications for the Network Voice Protocol NVP

Defines the protocol used in the ARPANET packet speech experiments. Replaced by NVP-II and ST for Internet packet speech experiments. ST is documented in ISN 119; NVP-II is documented in an ISI Internal memo.

740 Braden Nov 77 NETRJS Protocol

Defines the protocol used for Remote Job Entry on the UCLA CCN IBM system; replaces RFCs 599 and 189.

739 Postel Nov 77 Assigned Numbers

This RFC has been replaced by RFCs 997 and 990.

738 Harrenstien Oct 77 Time Server

Defines the Time Server Protocol; see IEN 142 for the TCP and VDP versions.

737 Harrenstien Oct 77 FTP Extension: XSEN

An extension to the Mail procedures. This function is incorporated in the SMTP; see also [RFC 821](#).

736 Crispin Oct 77 Telnet SUPDUP Option

Defines the procedure for negotiating to use the SUPDUP, protocol as a Telnet option; see also RFCs 734, 746, 747 and 749.

735 Crocker Nov 77 Revised Telnet Byte Macro Option

Defines a Telnet option for assigning codes to stand for strings in Telnet connections. Replaces [RFC 729](#). Obsoletes NIC 40306.



- 734      Crispin      Oct 77      SUPDUP Protocol
- Description of a terminal control protocol used at Stanford and MIT; see also RFCs 736, 746-749.
- 733      Crocker      Nov 77      Standard for the Format of ARPA  
Network Text Messages
- Specification of the format for the headers of computer mail. An old version; see [RFC 822](#).
- 732      Day      Sep 77      Telnet Data Entry Terminal Option
- The specification of a Telnet Option for the control of a data entry display terminal. Replaces [RFC 731](#).
- 731      Day      Jun 77      Telnet Data Entry Terminal Option
- An old version; see [RFC 732](#).
- 730      Postel      May 77      Extensible Field Addressing
- Discusses some ideas on addressing that come up in the context of changing from 8-bit to 24-bit network addresses.
- 729      Crocker      May 77      Telnet Byte Macro Option
- An old version; see [RFC 735](#).
- 728      Day      Apr 77      A Minor Pitfall in the Telnet  
Protocol
- This RFC warns of the possibility of an unexpected occurrence in Telnet resulting from the interaction between option subnegotiations and the Telnet SYNCH operation.
- 727      Crispin      Apr 77      Telnet Logout Option
- Defines a Telnet option for causing a logout.
- 726      Postel      Mar 77      Remote Controlled Transmission and  
Echoing Telnet Option
- Defines a Telnet option for controlling the transmission and echoing of data to smooth the response to use in high transmission delay environments; see also RFCs 719 and 718.

725      Day                      Mar 77              An RJE Protocol for a Resource  
                                                                                 Sharing Network

Describes a possible Remote Job Entry protocol.

724      Crocker                  May 77              Proposed Official Standard for the  
                                                                                 Format of ARPA Network Messages

An old version; see [RFC 822](#).

723      Never Issued.

722      Haverty                  Sep 76              Thoughts on Interactions in  
                                                                                 Distributed Services

A discussion on the design of interactive distributed services and the kinds of primitive operations that are needed.

721      Garlick                  Sep 76              Out of Band Control Signals in a  
                                                                                 Host to Host Protocol

A discussion of the control signals in transport protocols (e.g., NCP's Interrupt or TCP's Urgent).

720      Crocker                  Aug 76              Address Specification Syntax for  
                                                                                 Network Mail

A discussion of computer mail addresses, with comments on real names vs. mailboxes, and mailing lists; see also [RFC 819](#).

719      Postel                      Jul 76              Discussion on RCTE

A short discussion of RCTE implementation issues; see also RFCs 726 and 718.

718      Postel                      Jun 76              Comments on RCTE from the Tenex  
                                                                                 Implementation Experience

A short note on the Tenex implementation of RCTE; see also RFCs 726 and 719.

717      Postel                      Jul 76              Assigned Network Numbers

This RFC has been replaced by [RFC 997](#) and 990.

716      Levin              May 76              Interim Revision to [Appendix F](#) of  
BBN 1822

A short note updating the specification of the Very Distant Host  
1822 interface.

715      Never Issued.

714      McKenzie          Apr 76              A Host/Host Protocol for an  
ARPANET-type Network

A specification of a NCP-like protocol for an ARPA-like network.  
Interesting to compare to the NCP specification to see what the  
author would do differently.

713      Haverty             Apr 76              MSDTP -- Message Services Data  
Transmission Protocol

The specification of a set of Data Primitives for building  
interactive services.

712      Donnelley          Feb 76              A Distributed Capability Computing  
System DCCS

A description of a Distributed Capability based computing system.

711      Never Issued.

710      Never Issued.

709      Never Issued.

708      White               Jan 76              Elements of a Distributed  
Programming System

A description of a distributed programming system; see also [RFC  
707](#).

707      White               Dec 75              A High-Level Framework for  
Network-Based Resource Sharing

A description of a programming environment for network-based  
programs; see also [RFC 708](#).

706      Postel               Nov 75              On the Junk Mail Problem

A short note pointing out that the ARPANET maybe subject to a  
"denial of service" attack by a misbehaving host.

705      Bryan            Nov 75          Front-End Protocol

This RFC describes a protocol used between a PDP-11 (the ARPANET front end) and a B6700 to support network communication.

704      Santos           Sep 75          IMP/Host and Host/IMP Protocol Change

Describes the changes to the 1822 interface to eliminate the restriction of 63 IMPs.

703      Dodds            Jul 75          Survey of New-Protocol Telnet Servers

A poll of Telnet servers to check implementation status and Telnet options. Updates RFCs 702, 701, 679 and 669.

702      Dodds            Sep 74          Survey of New-Protocol Telnet Servers

An earlier poll of Telnet server implementation status; see also RFC's 703, 701, 679, and 669.

701      Dodds            Aug 74          Survey of New-Protocol Telnet Servers

An earlier poll of Telnet server implementation status; see also RFCs 703, 702, 679 and 669.

700      Mader            Aug 74          A Protocol Experiment

Describes a protocol based loosely on a very early version of TCP, used to send data to a printer server.

699      Postel            Nov 82          Requests for Comments Summary Notes: 600-699

A summary of the Request for Comments documents from RFC 600-699.

698      Tovar            Jul 75          Telnet Extended ASCII Option

Describes an option to allow transmission of a special kind of extended ASCII used at the Stanford AI and MIT AI Labs.

697      Lieb            Jul 75          CWD Command of FTP

Discusses FTP login access to "files only" directories.

|     |      |        |                                                           |
|-----|------|--------|-----------------------------------------------------------|
| 696 | Cerf | Jul 75 | Comments on the IMP/HOST and<br>HOST/IMP Protocol Changes |
|-----|------|--------|-----------------------------------------------------------|

Observations on current international standards recommendations from IFIP working group 6.1; see also RFCs 692, 690 687.

|     |             |        |                                       |
|-----|-------------|--------|---------------------------------------|
| 695 | Krilanovich | Jul 75 | Official Change in Host-Host Protocol |
|-----|-------------|--------|---------------------------------------|

Corrects an ambiguity concerning the ERR command; changes NIC 8246 and NIC 7104.

694 Postel Jun 75 Protocol Information

This RFC has been replaced by [RFC 991](#).

693        Never Issued.

|     |       |        |                                          |
|-----|-------|--------|------------------------------------------|
| 692 | Wolfe | Jun 75 | Comments on IMP/Host Protocol<br>Changes |
|-----|-------|--------|------------------------------------------|

A proposed solution to the problem of combined length of IMP and Host leaders; see also RFCs 696, 690 and 687.

|     |        |        |                         |
|-----|--------|--------|-------------------------|
| 691 | Harvey | May 75 | One More Try on the FTP |
|-----|--------|--------|-------------------------|

A slight revision of [RFC 686](#), regarding the subject of print files; see also RFCs 640, 630, 542, 454, 448, 414, 385 and 354.

690 Postel Jun 75 Comments on the Proposed Host/IMP  
Protocol Changes

Comments on suggestions in [RFC 687](#); see also RFCs 692 and 696.

|     |          |        |                                                |
|-----|----------|--------|------------------------------------------------|
| 689 | Clements | May 75 | Tenex NCP Finite State Machine for Connections |
|-----|----------|--------|------------------------------------------------|

Describes the internal states of an NCP connection in the Tenex implementation.

|     |        |        |                                                                     |
|-----|--------|--------|---------------------------------------------------------------------|
| 688 | Walden | Jun 75 | Tentative Schedule for the New<br>Telnet Implementation for the TIP |
|-----|--------|--------|---------------------------------------------------------------------|

|     |        |        |                                           |
|-----|--------|--------|-------------------------------------------|
| 687 | Walden | Jun 75 | IMP/Host and Host/IMP Protocol<br>Changes |
|-----|--------|--------|-------------------------------------------|

This RFC discusses addressing hosts on more than 63 IMPs, and other backwards compatible expansions; see also RFCs 690 and 692.

- 686 Harvey May 75 Leaving Well Enough Alone
- Discusses the difference between early and later versions of FTP; see also RFCs 691, 640, 630, 542, 454, 448, 414, 385 and 354.
- 685 Beeler Apr 75 Response Time in Cross-network Debugging
- This memo discusses the contribution of ARPANET communication to response time.
- 684 Schantz Apr 75 A Commentary on Procedure Calling as a Network Protocol
- Describes issues in designing distributed computing systems. Shortcomings of [RFC 674](#); see also RFCs 542 and 354.
- 683 Clements Apr 75 FTPSRV -- Tenex Extension for Paged Files
- Defines an extension to FTP for page-mode transfers between Tenex systems; also discusses file transfer reliability.
- 682 Never Issued.
- 681 Holmgren May 75 Network Unix
- Capabilities as an ARPANET Mini-Host: standard I/O, Telnet, NCP, Hardware/Software requirements, reliability, availability.
- 680 Myer Apr 75 Message Transmission Protocol
- Extends message field definition beyond [RFC 561](#) attempts to establish syntactic and semantic standards for ARPANET; see also RFCs 733 and 822.
- 679 Dodds Feb 75 February, 1975, Survey of New-Protocol Telnet Servers
- An earlier poll of Telnet server implementation status. Updates RFCs 701, 702 and 669; see also [RFC 703](#).
- 678 Postel Dec 74 Standard File Formats
- For transmission of documents across different environments.

- 677 Johnson Jan 75 The Maintenance of Duplicate Databases
- 676 Never Issued.
- 675 Cerf Dec 74 Specification of Internet Transmission Control Program (TCP)
- The first detailed specification of TCP; see [RFC 793](#).
- 674 Postel Dec 74 Procedure Call Documents--Version 2
- A host level protocol used in the NSW--a slightly constrained version of ARPANET Host-to-Host protocol, affecting allocation, RFNM wait, and retransmission; see also [RFC 684](#).
- 673 Never Issued.
- 672 Schantz Dec 74 A Multi-Site Data Collection Facility
- Applicability of TIP/Tenex protocols beyond TIP accounting.
- 671 Schantz Dec 74 A Note on Reconnection Protocol
- Experience with implementation in RSEXEC context.
- 670 Never Issued.
- 669 Dodds Dec 74 November 1974, Survey of New-Protocol Telnet Servers
- An earlier poll of Telnet server implementation status. Updates [RFC 702](#); see also RFCs 703 and 679.
- 668 Never Issued.
- 667 Chipman Dec 74 BBN Host Ports
- Approved scheme to connect host ports to the network.
- 666 Padlipsky Nov 74 Specification of the Unified User-Level Protocol
- Discusses and proposes a common command language.
- 665 Never Issued.
- 664 Never Issued.

- 663 Kanodia Nov 74 A Lost Message Detection and Recovery Protocol
- Proposed extension of host-host protocol; see also RFCs 534, 516, 512, 492 and 467.
- 662 Kanodia Nov 74 Performance Improvement in ARPANET File Transfers from Multics
- Experimenting with host output buffers to improve throughput.
- 661 Postel Nov 74 Protocol Information
- This RFC has been replaced by [RFC 991](#).
- 660 Walden Oct 74 Some Changes to the IMP and the IMP/Host Interface
- Decoupling of message number sequences of hosts; host-host access control; message number window; messages outside normal mechanism; see also BBN 1822.
- 659 Postel Oct 74 Announcing Additional Telnet Options
- Options defined in RFCs 651-658.
- 658 Crocker Oct 74 Telnet Output Line Feed Disposition
- Defines a Telnet option for specific control of Line Feed.
- 657 Crocker Oct 74 Telnet Output Vertical Tab Disposition Option
- Defines a Telnet option for specific control of Vertical Tab.
- 656 Crocker Oct 74 Telnet Output Vertical Tab Stops Option
- Defines a Telnet option for setting the stops for Vertical Tab.
- 655 Crocker Oct 74 Telnet Output Form Feed Disposition Option
- Defines a Telnet option for specific control of Form Feed.



654 Crocker Oct 74 Telnet Output Horizontal Tab  
Disposition Option

Defines a Telnet option for specific control of Horizontal Tab.

653 Crocker Oct 74 Telnet Output Horizontal Tab Stops  
Option

Defines a Telnet option for setting the stops for Horizontal Tab.

652 Crocker Oct 74 Telnet Output Carriage Return  
Disposition Option

Defines a Telnet option for specific control of Carriage Return.

651 Crocker Oct 74 Revised Telnet Status Option

Revises the Telnet Option for communicating the status of all  
Telnet options over the network.

650 Never Issued.

649 Never Issued.

648 Never Issued.

647 Padlipsky Nov 74 A Proposed Protocol for Connecting  
Host Computers to ARPA-Like Networks  
via Front End Processors

Approaches to Front-End protocol processing using available  
hardware and software.

646 Never Issued.

645 Crocker Jun 74 Network Standard Data Specification  
Syntax

Providing a mechanism for specifying all attributes of a  
collection of bits; see also [RFC 615](#).

644 Thomas Jul 74 On The Problem of Signature  
Authentication for Network Mail

Proposes that the mail sender be an authorized system process and  
that the mail sender and mail receiver processes exchange a  
password. The sender process takes responsibility for  
authentication of the signature on the mail.

- 643 Mader Jul 74 Network Debugging Protocol  
To be used in an implementation of a PDP-11 network bootstrap device and a cross-network debugger.
- 642 Burchfiel Jul 74 Ready Line Philosophy and Implementation
- 641 Never Issued.
- 640 Postel Jun 74 Revised FTP Reply Codes  
Updates [RFC 542](#).
- 639 Never Issued.
- 638 McKenzie Apr 74 IMP/TIP Preventive Maintenance Schedule  
Corrects [RFC 633](#).
- 637 McKenzie Apr 74 Change of Network Address for SU-DSL  
A host at Stanford changes its address from 2/2 to 2/3.
- 636 Burchfiel Jun 74 TIP/TENEX Reliability Improvements  
Obtaining/maintaining connections; recovery from lost connections; connection-state changes.
- 635 Cerf Apr 74 An Assessment of ARPANET Protocols  
Theoretical and practical motivation for redesign. Multipacket messages; host retransmission; duplicate detection; sequencing; acknowledgement.
- 634 McKenzie Apr 74 Change in Network Address for Haskins Lab.  
A host a Haskins Lab changes its address from 5/3 to 9/3.
- 633 McKenzie Mar 74 IMP/TIP Preventive Maintenance Schedule  
An old version; see [RFC 638](#).

- 632      Opderbeck      May 74      Throughput Degradations for Single Packet Messages

A study of packet throughput.

- 631      Danthine      Apr 74      Call for Papers: International Meeting on Minicomputers and Data Communication

A meeting on data communications held January 1975 in Liege, Belgium.

- 630      Sussman      Apr 74      FTP Error Code Usage for More Reliable Mail Service

Describes FTP reply-code usage in TENEX mail processing.

- 629      North      Mar 74      Scenario for Using the Network Journal

An example of how to access information in the NIC's Journal database.

- 628      Keeney      Mar 74      Status of RFC Numbers and a Note on Pre-assigned Journal Numbers

A method for getting the next RFC number to use on a new memo.

- 627      Feinler      Mar 74      ASCII Text File of Hostnames

See also RFCs 606, 608, 623 and 625.

- 626      Kleinrock      Mar 74      On a possible Lockup Condition in IMP Subnet due to Message Sequencing

A potential problem in the IMP processing of messages. A detailed description of how this condition can arise.

- 625      Feinler      Mar 74      On Line Hostnames Service

See also RFCs 606, 608, 623 and 627.

- 624      Krilanovich      Feb 74      Comments on the File Transfer Protocol

Design changes and slight modifications. Replaces RFC 607; see also RFCs 614, 542 and 640.

623 Krilanovich Feb 74 Comments on On-Line Host Name Service

See also RFCs 627, 625, 608 and 606.

622 McKenzie Mar 74 Scheduling IMP/TIP Down Time

Modification of previous policy.

621 Kudlick Mar 74 NIC User Directories at SRI-ARC

Changes in user accounts at the NIC.

620 Ferguson Mar 74 Request for Monitor Host Table Updates

Changes in the hosts Office-1 and SRI-ARC.

619 Naylor Mar 74 Mean Round-Trip Times in the ARPANET

Actual measurements of round-trip times.

618 Taft Feb 74 A Few Observations on NCP Statistics

Distribution of NCP and IMP message types by actual measurement.

617 Taft Feb 74 A Note on Socket Number Assignment

Danger of imposing more fixed socket number requirements; see also RFCs 542, 503 and 451.

616 Walden Feb 74 Latest Network Maps

Geographic and Topologic maps of the ARPANET of January 1974.

615 Crocker Mar 74 Proposed Network Standard Data Pathname Syntax

A suggestion for a network wide standard for naming data (such as files).

614 Pogran Jan 74 Response to RFC 607 (NIC-21255), "Comments on the FTP"

See also RFCs 624, 542 and 640.

- 613 McKenzie Jan 74 Network Connectivity: A Response to  
[RFC 603](#)
- Remarks about connectivity and robustness of networks.
- 612 McKenzie Jan 74 Traffic Statistics
- A report on Host traffic statistics for the month of December 1973. Updates [RFC 601](#).
- 611 Walden Feb 74 Two Changes to the IMP/Host Protocol
- Expansion of Host-Going-Down and addition of Dead-Host-Status Message.
- 610 Winter Dec 73 Further Datalanguage Design Concepts
- Preliminary results of the language design; a model for data language semantics; future considerations.
- 609 Ferguson Jan 74 Statement of Upcoming Move of  
NIC/NLS Service
- See also RFCs 621 and 620.
- 608 Feinler Jan 73 Host Names On-Line
- Response to [RFC 606](#); see also RFCs 627, 625 and 623.
- 607 Krilanovich Jan 73 NIC-21255 Comments on the File  
Transfer Protocol
- An old version; see [RFC 624](#); see also RFCs 614, 542 and 640.
- 606 Deutsch Dec 73 Host Names On-Line
- Resolving differences in hostname-address mappings; see also RFCs 627, 625, 623 and 608.
- 605 Never Issued.
- 604 Postel Dec 73 Assigned Link Numbers
- Modifies official host-host protocol. Replaced by RFCs 997 and 990.

- 603      Burchfiel      Dec 73      Response to [RFC 597](#): Host Status  
Questions about the ARPANET topology described in [RFC 597](#).
- 602      Metcalfe      Dec 73      "The Stockings Were Hung by the  
Chimney With Care"  
Susceptibility of ARPANET to security violations.
- 601      McKenzie      Dec 73      Traffic Statistics  
A report on Host traffic statistics for the month of November 1973. Updates [RFC 586](#).
- 600      Berggreen      Nov 73      Interfacing an Illinois Plasma  
Terminal to the ARPANET  
Discusses plans to map Plato terminal codes to network ASCII for accessing the Plato system via the network using Telnet.
- 599      Braden      Dec 73      Update on NETRJS  
A status report and update on UCLA-CCN's remote job entry service.
- 598      NICSTA      Dec 73      RFC Index - December 5, 1973  
Lists RFCs 1-593.
- 597      Neigus      Dec 73      Host Status  
This RFC provides the most current network maps, geographic and logical, plus a list of hosts connected to the ARPANET.
- 596      Taft      Dec 73      Second Thoughts on Telnet Go-Ahead  
Cited objections to the requirement that hosts implement the Telnet Go-Ahead (GA) command, as specified in the Telnet Protocol Specification.
- 595      Hathaway      Dec 73      Some Thoughts in Defense of the  
Telnet Go-Ahead  
This RFC is in reply to [RFC 596](#).
- 594      Burchfiel      Dec 73      Speedup of Host-IMP Interface  
A discussion on how to make the full performance capabilities of the subnet available for interprocess communication.

- 593 McKenzie Nov 73 Telnet and FTP Implementation  
Schedule Change
- 592 Watson Nov 73 Some Thoughts on System Design to  
Facilitate Resource Sharing
- Proposes a system interconnection approach which would help in  
moving toward more resource sharing on the ARPANET.
- 591 Walden Nov 73 Addition to the Very Distant Host  
Specification
- A sentence correction notation that should be inserted in [Appendix  
F](#) of BBN Report 1822.
- 590 Padlipsky Nov 73 MULTICS Address Change
- Announcement of a plan to change the address of MIT Multics.
- 589 Braden Nov 73 CCN NETRJS Server Messages to Remote  
User
- Describes the system to user messages at UCLA-CCN's remote job  
entry service.
- 588 Stokes Oct 73 London Node is now up
- Notice that an ARPANET node is operational at University College,  
London.
- 587 Postel Nov 73 Announcing New Telnet Options
- Announcement of Negotiate About Output Line Width (NAOL), and  
Negotiate About Output Page Size (NAOP).
- 586 McKenzie Nov 73 Traffic Statistics
- A report on the Host traffic statistics for the month of  
October 1973. Updates [RFC 579](#).
- 585 Crocker Nov 73 ARPANET Users Interest Working Group  
Meeting
- Meeting notes of the first Users Interest Working Group.

584      Iseli              Nov 73              Charter for ARPANET Users Interest Working Group

Describes the background, membership, and scope of the newly formed Users Interest Working Group.

583      Never Issued.

582      Clements          Nov 73              Comments on [RFC 580](#) - Machine Readable Protocols

Cites objections to the phrase "preferably NLS files".

581      Crocker            Nov 73              Corrections to [RFC 560](#) - Remote Controlled Transmission and Echoing Telnet Option

This RFC contains corrections to [RFC 560](#), which described the Remote Controlled Transmission and Echoing Telnet Option.

580      Postel              Oct 73              Note to Protocol Designers and Implementers

An announcement that future proposed protocols shall be submitted in the form of on-line documents, preferably in NLS files, to the Network Information Center.

579      McKenzie            Oct 73              Traffic Statistics

A report on the Host traffic statistics for the month of September 1973. Updates [RFC 566](#).

578      Bhushan              Oct 73              Using MIT-MATHLAB MACSYMA From MIT-DMS Muddle - An Experiment in Automated Resource Sharing

This paper describes an experiment in non-trivial automated resource sharing between dissimilar systems. The goal of this experiment was to interface the Muddle system at MIT-DMS to the MACSYMA system at MIT-Mathlab.

577      Crocker            Oct 73              Mail Priority

A paper that suggests interpretations for urgency values, based on arguments presented in [RFC 555](#). References [RFC 539](#).



576 Victor Sep 73 Proposal for Modifying Linking

This RFC presents a plan to modify the link jsys in Tenex to work in a better way in terms of the user interface.

575 Never Issued.

574 Krilanovich Sep 73 Announcement of a Mail Facility at UCSB

An announcement of a server program which supports that subset of the File Transfer Protocol necessary for mail delivery.

573 Bhushan Sep 73 Data and File Transfer - Some Measurement Results

A report on the results of the performance of MIT-DM's FTP-user and FTP-server programs.

572 Never Issued.

571 Braden Nov 73 Tenex FTP Problem

A report on a problem in the current Tenex implementation which is likely to cause incorrect results when transferring files to a non-Tenex site.

570 Pickens Oct 73 Experimental Input Mapping Between NVT ASCII and UCSB Online System

This RFC updates [RFC 216](#). This document describes the proposed solutions from the requests to improve the human interface to the UCSB On-Line System.

569 Padlipsky Oct 73 NETED: A Common Editor for the ARPA Network

Defines a simple line style text editor and suggests that it be made available on every host in the network.

568 McQuillan Sep 73 Response to [RFC 567](#) - Cross-Country Network Bandwidth

This RFC serves as a brief correction to several fundamental errors in [RFC 567](#).

- 567      Deutsch      Sep 73      Cross-Country Network Bandwidth  
Computation of cross-country network bandwidth.
- 566      McKenzie      Sep 73      Traffic Statistics  
A report on the Host traffic statistics for the month of August 1973. Updates [RFC 556](#).
- 565      Cantor      Aug 73      Storing Network Survey Data at the Datacomputer  
A project summary report describing the programs developed and implemented that have been operating successfully with the datacomputer since July 10.
- 564      Never Issued.
- 563      Davidson      Aug 73      Comments on the RCTE Telnet Option  
A critique based on inferences drawn from the sample Tenex interaction in [RFC 560](#).
- 562      McKenzie      Aug 73      Modifications to the Telnet Specification  
Presenting two documents that update [RFC 495](#), plus summarizing the changes.
- 561      Bhushan      Sep 73      Standardizing Network Mail Headers  
A proposed document for the explicit specification of such header information as author, title, and date within the current FTP mail protocol.
- 560      Crocker      Aug 73      Remote Controlled Transmission and Echoing Telnet Option  
Defines a Telnet option for detailed control of echoing to promote interactive use on long delay paths.
- 559      Bhushan      Aug 73      Comments on the New Telnet Protocol and Its Implementation  
This RFC describes the experience that MIT-DM had with the implementation of the new Telnet protocol (both server and user).
- 558      Never Issued.

557      Wessler      Aug 73      Revelations in Network Host  
Measurements

A report to the RFC community on the current network host  
measurements.

556      McKenzie      Aug 73      Traffic Statistics

A report on the Host traffic statistics for the month of  
July 1973. Updates [RFC 538](#).

555      White      Jul 73      Response to Critiques of the  
Proposed Mail Protocol

Response to the proposal for a Mail Protocol ([RFC 524](#)).

554      Never Issued.

553      Thomas      Jul 73      Draft Design for a Text/Graphics  
Protocol

This document was proposed as a synthesis of existing ideas rather  
than an attempt to put forth new ones. It draws upon the concerns  
about the lack of text-handling capabilities of the protoocl  
suggested in [RFC 493](#).

552      Owen      Jul 73      Single Access to Standard Protocols

Queries and statements regarding a socket number assignment for a  
single access protocol before the proposed mail protocol becomes  
official.

551      Feinroth      Aug 73      NYU, ANL, and LBL Joining the Net

Announcement of the intent of several Atomic Energy Commission  
installations to enter the network.

550      Deutsch      Aug 73      NIC NCP Experiment

Statistics on total incoming messages, incoming host-host control  
opcodes, and size of outgoing messages.

549      Michener      Jul 73      Minutes of Network Graphics Group  
Meeting

Description of a meeting on graphics held in July 1973.

|     |        |        |                                           |
|-----|--------|--------|-------------------------------------------|
| 548 | Walden | Aug 73 | Hosts Using the IMP Going Down<br>Message |
|-----|--------|--------|-------------------------------------------|

Discusses the user and intention of the ARPANET IMP's "going down" message.

|     |        |        |                                               |
|-----|--------|--------|-----------------------------------------------|
| 547 | Walden | Aug 73 | Change to the Very Distant Host Specification |
|-----|--------|--------|-----------------------------------------------|

A document on a new version of figure F-4 for BBN Report 1822.

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546 Thomas Aug 73 Tenex Load Averages for July 1973
```

Report on the load on two of the key service computers on the ARPANET.

545            Pickens            Jul 73            Of What Quality be the UCSB Resource  
Evaluators?

This memo is in response to [RFC 531](#).

|     |       |        |                                              |
|-----|-------|--------|----------------------------------------------|
| 544 | Meyer | Jul 73 | Locating On-Line Documentation at<br>SRI-ARC |
|-----|-------|--------|----------------------------------------------|

Updated memo on how to access on-line documentation at the NIC.

|     |       |        |                                         |
|-----|-------|--------|-----------------------------------------|
| 543 | Meyer | Jul 73 | Network Journal Submission and Delivery |
|-----|-------|--------|-----------------------------------------|

Announcement that the first implementation of a Network Journal Submission and Delivery system is now experimentally up.

542 Neigus Jul 73 File Transfer Protocol

This RFC states that there are considerable changes from the last "official" version of FTP, but the gross structure still remains the same. References RFCs 354, 454, and 495.

541        Never Issued.

540        Never Issued.

|     |         |        |                                                                      |
|-----|---------|--------|----------------------------------------------------------------------|
| 539 | Crocker | Jul 73 | Thoughts on the Mail Protocol<br>Proposed in <a href="#">RFC 524</a> |
|-----|---------|--------|----------------------------------------------------------------------|

This memo is in response to [RFC 524](#). In general, the authors of this RFC feel that the protocol is extremely rich. They also feel that there are some minor and some major problems.

538 McKenzie Jul 73 Traffic Statistics

A report on the Host traffic statistics for the month of June 1973. Updates [RFC 522](#).

537 Bunch Jun 73 Announcement of NGG Meeting

Arrangement details for a graphics meeting held July 1973. See [RFC 549](#).

536 Never Issued.

535 Thomas Jul 73 Comments on File Access Protocol

This memo is in response to [RFC 420](#).

534 Walden Jul 73 Lost Message Detection

This RFC presents three suggestions for detecting the loss of messages by the communications subsystem.

533 Walden Jul 73 Message-ID Numbers

Notice that the ARPANET link field of 8-bits has been expanded to 12-bits and renamed the message-id field.

532 Merryman Jul 73 The UCSD-CC Server-FTP Facility

A description of the FTP service at UCSD.

531 Padlipsky Jun 73 Feast or Famine? - A Response to Two Recent RFC's About Network Information

This memo is in response to RFCs 514 and 519.

530 Bhushan Jun 73 A Report on the SURVEY Project

The purpose of this paper is 1) to report on the status of the SURVEY project and current data, 2) to inform the ARPANET community of the services offered related to this project, 3) to report on future plans, and 4) to ask for suggestions and improvements.

529 McKenzie Jun 73 A Note on Protocol Synch Sequences

A response to [RFC 513](#).

- 528      McQuillan      Jun 73      Software Checksumming in the IMP and Network Reliability

A description of some of the modifications that have recently been made to the IMP and TIP programs.

- 527      Merryman      Jun 73      ARPAWOCKY

A parody by D. L. Covill of the ARPANET based on the Jabberwocky of Lewis Carroll

- 526      Pratt      Jun 73      Technical Meeting - Digital Image Processing Software Systems

Announcement of a technical meeting on digital image processing software systems.

- 525      Parrish      Jun 73      MIT-Mathlab Meets UCSB-OLS

A description of problem solving using both the MIT-PlACSYM system and the UCSB-OLS system.

- 524      White      Jun 73      A Proposed Mail Protocol

A proposed specification for handling mail in the ARPA network.

- 523      Bhushan      Jun 73      SURVEY is in Operation Again

The purpose of this RFC is to alert the network community that the survey program at MIT-DMCG computer system is in operation.

- 522      McKenzie      Jun 73      Traffic Statistics

A report on the Host traffic statistics for the month of May 1973. Updates [RFC 509](#).

- 521      McKenzie      May 73      Restricted Use of IMP DDT

Proposal of restricted use of IMP DDT due to opinions from representatives of several sites feeling that uncontrolled use of IMP DDT made access control mechanisms too vulnerable to interception or tampering.

- 520      Day      Jun 73      Memo to FTP Group (Proposal for File Access Protocol)

This document discusses the File Access Protocol as an extension to FTP.

519      Pickens          Jun 73          Resource Evaluation

UCSB announces a new test group based upon [RFC 369](#), which attempts to take a detailed look at specific network resources and develop initial site dependent and function dependent MINIMAN's.

518      Feinler          Jun 73          ARPANET Accounts

A memo on information regarding opening an account at a given site on the ARPANET.

517      Never Issued.

516      Postel          May 73          Lost Message Detection

This RFC is replaced by [RFC 534](#).

515      Winter          Jun 73          Specifications for Datalanguage,  
Version 0/9

This specification for Datalanguage is extremely primitive. Version 0/9 is currently running at CCA and offers an opportunity for experience with the Datacomputer and with fundamental Datalanguage concepts.

514      Kantrowitz      Jun 73          Network Make-Work

Updates [RFC 459](#).

513      Hathaway      May 73          Comments on the New Telnet  
Specifications

Discussion of the Telnet Protocol.

512      Hathaway      May 73          Lost Message Detection

This RFC is replaced by [RFC 534](#).

511      North          May 73          Enterprise Phone Service to NIC From  
ARPANET Sites

Discussion of cost and alternatives for special telephone numbers for the NIC.

510      White          May 73          Request for Network Mailbox  
Addresses

Announcement of Network Journal delivery by the NIC and a request for updated/additional network mailbox addresses.

509 McKenzie May 73 Traffic Statistics

A report on the Host traffic statistics for the month of April 1973. Updates [RFC 497](#).

508 Pfeifer May 73 Real-Time Data Transmission on the ARPANET

Discussion on the pros and cons of support of real-time processes on the ARPA Network.

507 Never Issued.

506 Padlipsky Jun 73 An FTP Command Naming Problem

This RFC discusses a problem when using the File Transfer Protocol: the choice of names for two crucial commands is faulty.

505 Padlipsky Jun 73 Two Solutions to a File Transfer Access Problem

This memo is in response to RFCs 487 and 501.

504 Thomas May 73 Workshop Announcement

Detailed plans for a workshop on Automated Resource Sharing to be held May 1973.

503 Neigus Apr 73 Socket Number List

This RFC has been replaced by RFCs 997 and 990.

502 Never Issued.

501 Pogran May 73 Un-Muddling "Free File Transfer"

This memo is in response to [RFC 487](#).

500 Shoshani Apr 73 The Integration of Data Management Systems on a Computer Network

In this paper, discussion is focused on an approach to integrating data management systems on a computer network for the purpose of data sharing.



- 499      Reussow      Apr 73      Harvard's Network RJE  
A description of the remote job entry service at Harvard.
- 498      Braden      Apr 73      On Mail Service to CCN  
A description of the electronic mail service at UCLA-CCN.
- 497      McKenize      Apr 73      Traffic Statistics  
A report on the Host traffic statistics for the month of March 1973. Updates [RFC 482](#).
- 496      Auerbach      Apr 73      A TNLS Quick Reference Card is Available  
Announcement of a new TNLS Quick Reference Card.
- 495      McKenize      May 73      Telnet Protocol Specification  
Results of an open meeting discussing Telnet, with two attached documents which report the results of that meeting.
- 494      Walden      Apr 73      Availability of MIX and MIXAL in the Network  
A list of hosts that support programming in MIX and MIXAL.
- 993      Michener      Apr 73      Graphics Protocol  
Discusses the opinions and decisions reached at the second meeting of the Network Graphics Group.
- 492      Meyer      Apr 73      Response to [RFC 467](#)  
This document briefly describes the problems and proposed solutions, offers comments and alternative suggestions in response to [RFC 467](#).
- 491      Padlipsky      Apr 73      What is "Free"?  
This memo discusses the assertion that network mail should be free; i.e., no login or USER command should be required.
- 490      Pickens      Mar 73      Surrogate RJS for UCLA-CCN  
A description of how UCLA's RJS can be accessed from UCSB's standard remote job entry service.

489 Postel Mar 73 Comment on Resynchronization of  
Connection Status Proposal

Comments on ideas proposed in [RFC 467](#).

488 Auerbach Mar 73 NLS Classes at Network Sites

This RFC solicits comments from the Network community on the desirability of doing on-site classes.

487 Bressler Mar 73 Host-Dependent FTP Parameters

This memo is in response to [RFC 430](#).

486 Bressler Apr 73 Data Transfer Revisited

A proposal to base RJE and FTP on a common data transfer protocol.

485 Pickens Mar 73 MIX and MIXAL at UCSB

A response to Walden's MIX query ([RFC 473](#)).

484 Never Issued.

483 Kudlick Mar 73 Cancellation of the Resource  
Notebook Framework Meeting

482 McKenzie Mar 73 Traffic Statistics

A report on the Host traffic statistics for the month of February 1973. Updates [RFC 455](#).

481 Never Issued.

480 White Mar 73 Host-Dependent FTP Parameters

This memo is in response to [RFC 430](#).

479 White Mar 73 Use of FTP by the NIC Journal

This RFC states how the NIC outlined its requirements for implementing FTP Journal delivery and submission.

478 Bressler Mar 73 FTP Server-Server Interaction - II

Discusses server-server interaction where, in a typical situation, a user conversing with two servers is interested in retrieving a file from one site and sending it to another.

477 Krilanovich May 73 Remote Job Service at UCSB

This RFC is the follow-on document to [RFC 436](#). This document restates the essence of the official RJE Protocol and documents in detail UCSB's implementation of it. Obsoletes [RFC 436](#).

476 McKenzie Mar 73 IMP/TIP Memory Retrofit Schedules  
(Revision 2)

Describes plans and schedule for upgrading IMPs and TIPs.

475 Bhushan Mar 73 FTP and the Network Mail System

This paper describes the author's understanding of the results of the Network Mail System meeting and the implications for FTP.

474 Bunch Mar 73 Announcement of Forthcoming Meeting  
of the Network Graphics Working  
Group and Call for RFC's.

Plans for a graphics meeting to be held in May 1973.

473 Walden Feb 73 MIX and MIXAL?

472 Bunch Mar 73 Illinois' Reply to Maxwell's Request  
for Graphics Information

This RFC represents the author's response to NIC document 14925.

471 Thomas Mar 73 Announcement of a (Tentative)  
Workshop on Multi-Site Executive  
Programs

A suggestion for a workshop and a query for interest.

470 Thomas Mar 73 Change in Socket for TIP News  
Facility

469 Kudlick Mar 73 Network Mail Meeting Summary

A description of a meeting on mail held February 1973.

468 Braden Mar 73 FTP Data Compression

This RFC describes the definition of the "HASP" or compressed mode.

- 467      Burchfiel      Feb 73      Proposed Change to Host-Host  
Protocol Resynchronization of  
Connection Status

To achieve resynchronization of allocation, this RFC proposes the addition of two commands to the host-host protocol.

- 466      Winett      Feb 73      Telnet Logger/Server for Host LL-67

This RFC contains writeup documents on the Telnet Logger/Server for the CP/CMS system on the Lincoln Laboratory 360/67.

- 465      Never Issued.

- 464      Kudlick      Feb 73      Resource Notebook Framework

This document presents a framework for coordinating all the surveys and data gathering efforts concerned with "resource notebook" type of information.

- 463      Bhushan      Feb 73      FTP Comments and Response to [RFC 430](#)

This RFC represents the author's response to [RFC 430](#) and other similar views.

- 462      Iseli      Feb 73      Responding to User Needs

A proposal to have network documentation maintained at the source, that is, by each site, and available as a distributed database.

- 461      McKenzie      Feb 73      Telnet Meeting Announcement

Plans for a meeting on Telnet to be held March 1973.

- 460      Kline      Feb 73      NCP Survey

This RFC is a first in a series which will request information on implementation of host-to-host protocol.

- 459      Kantrowitz      Feb 73      Network Questionnaires

Suggests that there is too much or too many different people trying to gather data from all the other sites.

- 458      Bressler      Feb 73      Mail Retrieval via FTP

Proposal of two new FTP commands called ReadMailFile and ReadMail.

457      Walden            Feb 73            TIPUG

How to get updates to the TIP Users Guide.

456      NIC                Feb 73            Memorandum

Change in the meeting time for the Network Mail meeting discussed in [RFC 453](#).

455      McKenzie          Feb 73            Traffic Statistics

Report on the Host traffic statistics for the month of January 1973. Updates [RFC 443](#).

454      McKenzie          Feb 73            File Transfer Protocol (Meeting Announcement and a New Proposed Document

The specification of the File Transfer Protocol and the announcement of a meeting (March 1973) to discuss it.

453      Kudlick            Feb 73            Meeting Announcement to Discuss a Network Mail System

Plans for a meeting on electronic mail held February 1973. See [RFC 469](#).

452      Winett              Feb 73            Telnet Command at Host LL

This RFC documents the use of the Telnet command at Host LL for uses under the CP/CMS time-sharing system.

451      Padlipsky          Feb 73            Tentative Proposal for a Unified User Level Protocol

A suggestion for the idea of a network standard command language for interactive systems.

450      Padlipsky          Feb 73            Multics Sampling Timeout Change

Announcement of better service for experimental users of MIT Multics.

449      Walden              Jan 73            The Current Flow-Control Scheme for IMPSYS

Updates [RFC 442](#).

448 Braden Feb 73 Print Files in FTP

This document reviews the problem of print files.

447 McKenzie Jan 73 IMP/TIP Memory Retrofit Schedule

Updates [RFC 434](#).

446 Deutsch Jan 73 Proposal to Consider a Network  
Program Resource Notebook

445 McKenzie Jan 73 IMP/TIP Preventive Maintenance  
Schedule

444 Never Issued.

443 McKenzie Jan 73 Traffic Statistics

Report on the Host traffic statistics for the month of December  
1972. Updates [RFC 422](#).

442 Cerf Jan 73 The Current Flow-Control Scheme for  
IMPSYS

This RFC discusses the current flow-control scheme for IMPSYS.

441 Bressler Jan 73 Inter-Entity Communication - An  
Experiment

A status report concerning an experiment based on the desire of  
users, at their consoles, to converse with one another, and to  
receive some debugging assistance.

440 Walden Jan 73 Scheduled Network Software  
Maintenance

Explains plans and schedule for IMP software maintenance, expands  
the normal time slot.

439 Cerf Jan 73 PARRY Encounters the Doctor

A lighthearted documentation on a session that actually happened  
on September 18, 1972.

438 Thomas Jan 73 FTP Server-Server Interaction

This document suggests a simple extension to FTP which would allow  
a FTP user process at one site to arrange for FTP server processes  
at other sites to act cooperatively on its behalf.

- 437      Faeh              Jun 73          Data Reconfiguration Service at UCSB  
Announcement of the availability of the Data Reconfiguration Service (DRS) at UCSB.
- 436      Krilanovich      Jan 73          Announcement of RJS at UCSB  
Announcement of the availability of RJS at UCSB.
- 435      Cosell             Jan 73          Telnet Issues  
This RFC discusses a number of Telnet related issues, with the central issue of discussion being echoing.
- 434      McKenzie          Jan 73          IMP/TIP Memory Retrofit Schedule  
Explains plans and schedule for IMP and TIP upgrades.
- 433      Postel             Dec 72          Socket Number List  
Establishment of assigned socket numbers to be used for public functions. This RFC has been replaced by [RFC 997](#) and 990.
- 432      Neigus             Dec 72          Network Logical Map  
Attachment of the network logical map as of December 30, 1972.
- 431      Krilanovich      Dec 72          Update on SMFS Login and Logout  
This document obsoletes [RFC 399](#), which introduced the Login and Logout commands for UCSB's SMFS, but was incomplete. [RFC 399](#) is restated more fully in this RFC.
- 430      Braden             Feb 73          Comments on File Transfer Protocol  
Discusses several issues in FTP.
- 429      Postel             Dec 72          Character Generator Process  
A proposal that there be a standard process implemented on whatever hosts desire which generates character data with out any regard to input.
- 428      Never Issued.
- 427      Never Issued.

426      Thomas          Jan 73          Reconnection Protocol

This document describes several situations in which the ability to reconnect is useful, presents a mechanism to achieve reconnections, sketches how the mechanism could be added to Host-Host or Telnet protocol, and recommends a place for the mechanism in the protocol hierarchy.

425      Bressler          Dec 72          "But my NCP costs \$500 a day..."

Discussion on the cost of network software and network use.

424      Never Issued.

423      Noble              Dec 72          UCLA Campus Computing Network  
Liaison Staff for ARPA Network

A list of ARPA network contacts at CCN. Updates [RFC 389](#).

422      McKenzie          Dec 72          Traffic Statistics

Report on the Host traffic statistics for the month of November 1972. Updates [RFC 413](#).

421      McKenzie          Nov 72          A Software Consulting Service for  
Network Users

An announcement of a BBN software consulting service that has been established for ARPA network users.

420      Murray            Jan 73          CCA ICCC Weather Demo

Announcement that the weather demo for the ICCC show is now generally available.

419      Vezza              Dec 72          MIT-DMS on Vacation

The MIT Dynamic Modeling System will be down for 2-4 weeks.

418      Hathaway          Nov 72          Server File Transfer Under TSS/360  
at NASA/Ames Research Center

This RFC is a description of the initial implementation of Server File Transfer at NASA-Ames Research Center.



417 Postel Nov 72 LINK Usage Violation

The protocol police issue a citation.

416 Norton Nov 72 The ARC System will be Unavailable  
for Use During Thanksgiving Week

The SRI-ARC machine will be down for 9-10 days.

415 Murray Nov 72 TENEX Bandwidth

Considerations of the performances of each host. References  
[RFC 392](#).

414 Bhushan Nov 72 File Transfer Protocols (FTP) Status  
and Further Comments

A status report on working server and user FTPs.

413 McKenzie Nov 72 Traffic Statistics

Three sets of network traffic statistic reports. Updates [RFC 400](#).

412 Hicks Nov 72 User FTP Documentation

A "help" file for the Utah-10 implementation of the User FTP  
process.

411 Padlipsky Nov 72 New Multics Network Software  
Features

Discussion on two recently-installed features of the Multics  
Network software.

410 McQuillan Nov 72 Removal of the 30-Second Delay When  
Hosts Come Up

A proposal to eliminate the 30-second delay altogether.

409 White Dec 72 TENEX Interface to UCSB's  
Simple-Minded File System

This document is intended to provide users with the information  
necessary to use SMFS from a terminal; the reader is assumed  
familiar with Tenex.

408 Owen Oct 72 NETBANK

A proposed idea for a protocol (or service) that is offered as an aid to network use for new users.

407 Bressler Oct 72 Remote Job Entry Protocol

The release of the official Remote Job Entry Protocol, per the ARPA office.

406 McQuillan Oct 72 Scheduled IMP Software Releases

Explains the plans and schedule for IMP software maintenance.

405 McKenzie Oct 72 Correction to [RFC 404](#)

Typographical error notation. Obsoletes [RFC 404](#).

404 McKenzie Oct 72 Host Address Changes Involving Rand and ISI

The new address of ISI is IMP 22. The new address of RAND is IMP 7.

d

403 Hicks Jan 73 Desirability of a Network 1108 Service

402 NIC Oct 72 ARPA Network Mailing Lists

Obsoletes [RFC 363](#).

401 Hansen Oct 72 Conversion of NGP-0 Coordinates to Device Specific Coordinates

A means is described to convert NGP coordinates to interger coordinates in the range zero to M, where M is the maximum address of the device screen on a machine using 2's complement arithmetic.

400 McKenzie Oct 72 Traffic Statistics

A report on the Host traffic statistics for the month of September 1972. Updates [RFC 391](#).

399 Krilanovich Sep 72 SMFS Login and Logout

398 Pickens Sep 72 UCSB Online Graphics

Announcement that users with Tektronix or IMLAC terminals, or with systems that support the proposed Level 0 graphics protocol can access UCSB graphics.

397 Never Issued.

396 Bunch Nov 72 Network Graphics Working Group Meeting - Second Iteration

395 McQuillan Oct 72 Switch Settings on IMPs and TIPS

Discussion on a description of the switches on the front panel of IMPs and TIPS that are important to the correct operation of the network software.

394 McQuillan Sep 72 Two Proposed Changes to the IMP-HOST Protocol

Updates [RFC 381](#). This note describes two changes to the IMP-Host communication protocol described in BBN Report 1822.

393 Winett Oct 72 Comments on Telnet Protocol Changes

Comments and objections to two of the three recent suggestions for changing the Telnet protocol as described in [RFC 328](#).

392 Hicks Sep 72 Measurement of Host Costs for Transmitting Network Data

Discussion of Utah's development of a program to use the Remote Job Service System (RJS) at UCLA-CCN in conjunction with Utah's "batch" users.

391 McKenzie Sep 72 Traffic Statistics

A report on the Host traffic statistics for the month of August 1972. Updates [RFC 378](#).

390 Braden May 72 TSO Scenario Batch Compilation and Foreground Execution

An example session with TSO on UCLA-CCN.

389 Noble Aug 72 UCLA Campus Computing Network  
Liaison Staff for ARPA Network

A list for ARPA Network contacts at UCLA/CCN.

388 Cerf Aug 72 NCP Statistics

Updates [RFC 323](#). Announcement that UCLA/NMC is prepared to gather NCP statistics on a daily basis.

387 Kelley Aug 72 Some Experiences in Implementing  
Network Graphics Protocol Level 0

386 Cosell Aug 72 Letter to TIP Users - 2

A second point of information letter to TIP users. Updates [RFC 365](#).

385 Bhushan Aug 72 Comments on the File Transfer  
Protocol ([RFC 354](#))

The comments in this document include errata, further discussion, emphasis points, and additions to the protocol. Updates [RFC 354](#).

384 North Aug 72 Official Site IDENTs for  
Organizations in the ARPA Network

Includes two lists, a list in alpha order and a list by Site address. Obsoletes [RFC 289](#).

383 Never Issued.

382 McDaniel Aug 72 Mathematical Software on the ARPA  
Network

Comments on the efforts to develop high quality libraries of mathematical and statistical subroutines.

381 McQuillan Jul 72 Three Aids to Improved Network  
Operation

Discusses helpful aids to improved network operation: schedules of software maintenance, IMP-to-Host communication, and network news service.

380 Never Issued.

379 Braden Aug 72 Using TSO at CCN

Announcement that IBM's Time Sharing Option (TSO) is up on a regularly scheduled basis at UCLA/CCN.

378 McKenzie Aug 72 Traffic Statistics

Traffic statistics for the month of July 1972.

377 Braden Aug 72 Using TSO Via ARPA Network Virtual Terminal

Announcement of IBM's Time Sharing Option (TSO) availability at UCLA/CCN on Socket 1, using the standard Telnet protocol.

376 Westheimer Aug 72 Network Host Status

Report on the status of Network Hosts from July 31 to August 4. Updates [RFC 370](#).

375 Never Issued.

374 McKenzie Jul 72 IMP System Announcement

Updates RFCs 331,343,359.

373 McCarthy Jul 72 Arbitrary Character Sets

Suggests how to get arbitrary characters sets stored in computers and to be able to display them on any CRT screen, edit them using any keyboard, and print them on any printer.

372 Watson Jul 72 Notes on a Conversation with Bob Kahn on the ICCC

Discussion on some aspects of the ICCC meeting demonstration.

371 Kahn Jul 72 Demonstration at International Computer Communications Conference

Observation and notes on the ICCC meeting demonstration.

370 Westheimer Jul 72 Network Host Status

Report on the status of Network Hosts from July 17 to July 28. Updates [RFC 367](#).

- 369      Pickens      Jul 72      Evaluation of ARPANET Services  
(January through March, 1972)

This paper provides descriptions, surveys, critiques of ARPANET services, and suggestions for improvement.

- 368      Braden      Jul 72      Comments on "Proposed Remote Job  
Entry Protocol"

Suggestions on honing the final standard of the RJE protocol (references [RFC 360](#)).

- 367      Westheimer      Jul 72      Network Host Status

Report on the status of Network Hosts from July 1 to July 16. Updates [RFC 366](#).

- 366      Westheimer      Jul 72      Network Host Status

Report on the status of Network Hosts from June 19 to June 30. Updates [RFC 362](#).

- 365      Walden      Jul 72      A Letter to All TIP Users

Descriptions of new commands that have recently been added to the "TIP Users Guide".

- 364      Abrams      Jul 72      Serving Remote Users on the ARPANET

This paper asserts that a problem exists in serving remote users and offers a set of suggestions for its amelioration.

- 363      NIC      Aug 72      ARPA Network Mailing Lists

Obsoletes [RFC 329](#).

- 362      Westheimer      Jun 72      Network Host Status

Report on the status of Network Hosts from June 5 to June 16. Updates [RFC 353](#).

- 361      Bressler      Jul 72      In Response to RFCs 347 and 348

Deamon Processes on Host 106.

360      Holland          Jun 72          Proposed Remote Job Entry Protocol

This protocol specifies the Network standard procedures for remote job entry as a mechanism whereby a user at one location causes a batch-processing job to be run at some other location.

359      Walden          Jun 72          The Status of the Release of the New  
IMP System (2600)

Obsoletes [RFC 343](#).

358      Never Issued.

357      Davidson        Jun 72          An Echoing Strategy for Satellite  
Links

This document describes a strategy which will eliminate the delay associated with simple echoing and allow the transmission delay to be hidden in the cost of computation only. This scheme is proposed as an optional addition to existing User Telnets; its use requires the explicit support of a cooperating server process.

356      Alter          Jun 72          ARPA Network Control Center

Announcement of the NCC's new operation schedule.

355      Davidson        Jun 72          Response to [RFC 346](#)

354      Bhushan        Jul 72          The File Transfer Protocol

This RFC obsoletes RFCs 264,265. The File Transfer Protocol (FTP) is a protocol for file transfer between HOSTs on the ARPANET. The primary function of FTP is to transfer files efficiently and reliably among hosts and to allow the convenient use of remote file storage capabilities.

353      Westheimer      Jun 72          Network Host Status

Status report of most Network Hosts from May 22 to June 2.  
Updates [RFC 344](#).

352      Crocker          Jun 72          TIP Site Information Form (Graphics)

An information form to provide additional information for TIP users of the NET.

- 351 Crocker Jun 72 (Graphics) Information Form for the  
ARPANET Graphics Resources Notebook

A questionnaire about the state of graphics resources at various sites.

- 350 Stoughton May 72 User Accounts for UCSB On-Line  
System

Announcement of new login parameters for the UCSB On-Line System.

- 349 Postel May 72 Proposed Standard Socket Numbers

A proposal to officially standardize socket number assignments.

- 348 Postel May 72 Discard Process

A RFC discussing debugging and measurement puposes for those hosts which are willing to implement a "Discard" process. Old version; see [RFC 863](#).

- 347 Postel May 72 Echo Process

A RFC discussing debugging and measurement puposes for those hosts which are willing to implement an "Echo" process. Old version; see [RFC 862](#).

- 346 Postel May 72 Satellite Considerations

Discussion on using space satellite transmission links in the ARPANET.

- 345 Kelly May 72 Interest in Mixed Integer  
Programming (MPSX on 360/91 at CCN)

Request for interested persons in the MPSX to contact author.

- 344 Westheimer May 72 Network Host Status

Updates [RFC 342](#).

- 343 McKenzie May 72 IMP System Change Notification

Obsoletes [RFC 331](#). Release of IMPSYS 2600 was unsuccessful.



342 Westheimer May 72 Network Host Status

Updates [RFC 332](#).

341 Never Issued.

340 O'Sullivan May 72 Proposed Telnet Changes

A proposed change to the Telnet protocol calling for one standard protocol and dropping the idea of minimum implementation.

339 Thomas May 72 MLTNET - A "Multi-Telnet" Subsystem for TENEX

This RFC describes MLTNET as a Telnet-like facility for Tenex which enables a user to control a number of jobs, running on different ARPANET hosts. MLTNET is currently a subsystem on the BBN-Tenex host.

338 Braden May 72 EBCDIC/ASCII Mapping for Network RJE

This RFC proposes: to make all users of NETRJS aware of the changed ASCII mapping; to call this problem to the attention of the Network RJE Protocol committee; and to knowledge and support Joel Winett's pioneering work in this area.

337 Never Issued.

336 Cotton May 72 Level 0 Graphic Input Protocol

A description of the graphics input protocol as discussed at a Network Graphics Working Group meeting.

335 Bryan May 72 New Interface-IMP/360

Announcement of a new interface and requests to hear of any difficulties network users encounter while operating with UCSB.

334 McKenzie May 72 Network Use on May 8

333 Bressler May 72 A Proposed Experiment with a Message Switching Protocol

This document attempts to sketch how one would organize the lowest level host-host protocol in the ARPANET around Message Switching Protocols (MSPs) and how this organization would affect the implementation of the host software.

- 332 Westheimer Apr 72 Network Host Status  
Updates [RFC 330](#).
- 331 McQuillan Apr 72 IMP System Change Notification  
Announcement of the release of IMPSYS 2600.
- 330 Westheimer Apr 72 Network Host Status  
Updates [RFC 326](#).
- 329 NIC May 72 ARPA Network Mailing Lists
- 328 Postel Apr 72 Suggested Telnet Protocol Changes  
This RFC proposes changes to the Telnet protocol.
- 327 Bhushan Apr 72 Data and File Transfer Workshop Notes
- 326 Westheimer Apr 72 Network Host Status  
Updates [RFC 319](#).
- 325 Hicks Apr 72 Network Remote Job Entry Program - NETRJS  
Report on the NETRJS running at the University of Utah.
- 324 Postel Apr 72 RJE Protocol Meeting  
Announcement of a RJE Protocol meeting at UCLA.
- 323 Cerf Mar 72 Formation of Network Measurement Group (NMG)  
Describes some network measurement results, some plans for further measurement and the formation of an interest group.
- 322 Cerf Mar 72 Well Known Socket Numbers  
Announcement of intent to catalog all sockets which are supposed to be well-known.

- 321 Karp Mar 72 CBI Networking Activity at MITRE  
Response to RFC 313 - comments on Computer Based Instruction.
- 320 Reddy Mar 72 Workshop on Hard Copy Line Graphics  
Announcement of a one day workshop on the XCRI BL system at CMU.
- 319 Westheimer Mar 72 Network Host Status  
Updates RFC 315.
- 318 Postel Apr 72 Ad Hoc Telnet Protocol  
Obsoletes RFC 158. This Telnet specification was effective for several years.
- 317 Postel Mar 72 Official Host-Host Protocol  
Modification: Assigned Link Numbers  
Lists current Link number assignments. This RFC has been replaced by RFCs 997 and 990.
- 316 McKay Feb 72 ARPA Network Data Management Working Group Meeting Report
- 315 Westheimer Mar 72 Network Host Status  
Updates RFC 306.
- 314 Cotton Mar 72 Next Network Graphics Working Group Meeting  
Describes plans for a graphics meeting to be held in April 1972.
- 313 O'Sullivan Mar 72 Computer Based Instruction  
This paper has two purposes: to solicit comments from the NWG and others on how selected classes of resources of a General Purpose Network might be applied to the field of Computer Based Instructions; and initiate a dialog between interested parties on the problem of Computer Base Instruction.
- 312 McKenzie Mar 72 Proposed Change in IMP-to-Host Protocol  
This RFC proposes a redefinition of the IMP-to-Host error message types and the creation of additional IMP-to-Host error message types. These changes should assist the Hosts in determining

appropriate recovery action without causing any serious reprogramming problems.

311      Bryan            Feb 72            New Console Attachments to the UCSB Host

Describes types of terminals used at UCSB.

310      Bhushan          Apr 72            Another Look at Data and File Transfer Protocols

This paper suggests some specific changes in DTP and FTP that should make them more useful and/or simplify implementation.

309      Bhushan          Mar 72            Data and File Transfer Workshop Announcement

Describes plans for a meeting on FTP to be held April 1972.

308      Seriff            Mar 72            ARPANET Host Availability Data

A SURVEY program is up and working to aid in gathering information on the availability of various Hosts on the ARPANET.

307      Harslem            Feb 72            Using Network Remote Job Entry

Announcement of a program on a PDP-10 allowing access to the Remote Job Service (RJS) at UCLA.

306      Westheimer        Feb 72            Network Host Status

Updates [RFC 298](#).

305      Alter              Jan 72            Unknown Host Numbers

Discusses testing of IMPs and notes that this may cause some hosts to receive messages from unregistered addresses.

304      McKay              Feb 72            A Data Management System Proposal for the ARPA Network

A proposal to provide a framework that will allow the ARPA community to recognize and develop the necessary tools in a unified manner enabling the network to manage its resources to the best advantage of the user.

- 303      NIC              Feb 72      ARPA Network Mailing List  
Obsoletes [RFC 300](#).
- 302      Bryan             Feb 72      Exercising the ARPANET  
Describes a class project to tryout hosts on the ARPANET.
- 301      Alter             Feb 72      BBN IMP (No. 5) and NCC Schedule for  
March 4, 1972  
BBN host will be down for a day for moving equipment.
- 300      NIC              Jan 72      ARPA Network Mailing Lists  
Obsoletes [RFC 211](#).
- 299      Hopkin            Feb 72      Information Management System  
Announcement of intent to build an Information Management and  
Statistical System for the ILLIAC IV.
- 298      Westheimer        Feb 72      Network Host Status  
Updates [RFC 293](#).
- 297      Walden             Jan 72      TIP Message Buffers  
Discussion regarding the size of the TIP's message buffers.
- 296      Liddle             Jan 72      DS-1 Display System  
This RFC describes a proposed modular graphic/alphanumeric display  
system containing a 512 by 512 line, 60 line per inch plasma  
display/memory panel and a minprocessor. It is intended to  
combine the advantages of display memory and local processing  
power in three general modes.
- 295      Postel            Oct 71      Report of the Protocol Workshop  
A report on the decisions reached at the protocol workshop held in  
conjunction with the NWG meeting of 10 October 1971.
- 294      Bhushan            Jan 72      The Use of "Set Data Type"  
Transaction in File Transfer  
Protocol  
Updates [RFC 265](#).

293 Westheimer Jan 72 Network Host Status

Updates [RFC 288](#).

292 Michener Jan 72 Graphics Protocol - Level 0 only

A description of part of the proposed Network Standard Graphics Protocol for transmitting graphics data within the ARPA network. The particular aspects covered are related to the form and content of graphics information sent from a source of graphical information to a display package for output to a graphics console.

291 McKay Jan 72 Data Management Meeting Announcement

A meeting about datamanagement will be held February 1972.

290 Mullery Jan 72 Computer Network and Data Sharing: A Bibliography

Updates [RFC 243](#).

289 Watson Dec 71 What We Hope is an Official List of Host Names

An accepted list of official formal host names and nicknames.

288 Westheimer Jan 72 Network Host Status

Updates [RFC 287](#).

287 Westheimer Dec 71 Network Host Status

Reports on tests of host availability for 6 Dec to 18 Dec 1971.

286 Forman Dec 71 Network Library Information System

This RFC solicites interested parties in the ARPA community to form a working group whose interests include developing a new system that would enable computer query of Library holdings. Georgetown University is currently designing a Learning Resource Center which could be the prototype of the proposed working group.

285 Huff Dec 71 Network Graphics

This paper is aimed at bringing together the present state of graphics on the NET for the newcomer and attempting to add a little more documentation to the current ground covered in graphics research by ARPA.

284          Never Issued.

|     |        |        |                                                  |
|-----|--------|--------|--------------------------------------------------|
| 283 | Braden | Dec 71 | NETRJT - Remote Job Service Protocol<br>for TIPS |
|-----|--------|--------|--------------------------------------------------|

Discusses how it may be feasible in the future to use TIPS for remote job entry in one or more of three ways: attach local card readers, line printer, and card punches directly to TIP ports, connect a remote batch terminal to a full-duplex TIP port via a communication line, and/or use the tape drive, and do card-to-tape and/or tape-to-print on another computer.

282      Padlipsky      Dec 71      Graphics Meeting Report

Describes a graphics meeting held November 1972.

281 McKenzie Dec 71 A Suggested Addition to File  
Transfer Protocol

Suggests an improved restart procedure in FTP.

|     |        |        |                           |
|-----|--------|--------|---------------------------|
| 280 | Watson | Nov 71 | A Draft Set of Host Names |
|-----|--------|--------|---------------------------|

A proposed list of names for hosts.

279      Never Issued.

278 Bhushan Nov 71 Revision of the Mail Box Protocol

This paper obsoletes [RFC 221](#). The changes to [RFC 221](#) are presented in this document. The protocol is also restated for additional review.

277      Never Issued.

276      Watson      Nov 71      NIC Course

A course announcement from the NIC on the use of its Online System (NLS).

275      Never Issued.

|     |        |        |                                                 |
|-----|--------|--------|-------------------------------------------------|
| 274 | Forman | Nov 71 | Establishing a Local Guide for<br>Network Usage |
|-----|--------|--------|-------------------------------------------------|

Discussion on the best solutions to the general problem of interfacing Hosts to IMPs.

- 273      Watson            Oct 71            More on Standard Host Names
- Discussion on the best way to set up naming schemes for standard Host names.
- 272      Never Issued.
- 271      Cosell            Jan 72            IMP System Change Notification
- Announcement of a new version of the IMP System, Version 2514.
- 270      McKenzie          Jan 72            Correction to BBN Report No. 1822
- Updates pages 25 and 26 of BBN report 1822.
- 269      Brodie            Dec 71            Some Experience with File Transfer
- Updates RFCs 122,238,172.
- 268      Postel            Nov 71            Graphic Facilities Information
- Request for graphics information.
- 267      Westheimer        Nov 71            Network Host Status
- Reports on tests of host availability for 8 Nov to 19 Nov 1971.
- 266      Westheimer        Nov 71            Network Host Status
- Reports on tests of host availability for 25 Oct to 5 Nov 1971.
- 265      Bhushan            Nov 71            The File Transfer Protocol
- This paper is a revision of [RFC 172](#). The changes to [RFC 172](#) are presented in this document. The protocol is also restated for additional review.
- 264      Bhushan            Nov 71            The Data Transfer Protocol
- This paper is a revision of [RFC 171](#). The changes to [RFC 171](#) are presented in this document. The protocol is also restated for additional review.
- 263      McKenzie          Dec 71            "Very Distant" Host Interface
- Discussion on the best solutions to the general problem of interfacing Hosts to IMPs.
- 262      Never Issued.



261      Never Issued.

260      Never Issued.

259      Never Issued.

258      Never Issued.

257      Never Issued.

256      Cosell            Nov 71            IMPSYS Change Notification

Announcement of a new version of the IMP system, Version 2513.

255      Westheimer      Oct 71            Site Status

Updates [RFC 252](#).

254      Bhushan            Oct 71            Scenarios for Using ARPANET  
Computers

This document is provided to facilitate the use of ARPANET host computer systems via the ARPANET. The objective of these scenarios is to aid a user in sampling host computers on the ARPANET, thereby stimulating his interest in using the ARPANET.

253      Moorer            Oct 71            Second Network Graphics Meeting  
Details

Plans for a graphics meeting to be held November 1971. See [RFC 282](#).

252      Westheimer      Oct 71            Site Status

Updates [RFC 240](#).

251      Stern              Oct 71            Weather Data

Announcement of the USAF Environmental Technical Application Center (ETAC) services in providing weather data for the ARPA Network.

250      Brodie              Oct 71            Some Thoughts on File Transfer

Further clarification and proposed revision on several aspects of the proposed Data Transfer Protocol and the File Transfer Protocol.

- Reynolds & Postel [Page 122]

238 Braden Sep 71 Comments on DTP and FTP Protocols

This RFC updates RFCs 171,172.

237 Watson Sep 71 The NIC's View of Standard Host Names

The NIC strongly favors standardization of host names. In this RFC, the NIC proposes that any standard naming scheme should take into account certain considerations.

236 Postel Sep 71 Standard Host Names

An update of [RFC 229](#), with some modifications included.

235 Westheimer Sep 71 Site Status

Starting with this RFC, BBN will report on the status of most Network Hosts.

234 Vezza Oct 71 Network Working Group Meeting Schedule

Plans for a Network Working Group meeting in October 1971.

233 Bhushan Sep 71 Standardization of Host Call Letters

A currently recommended list of call letters.

232 Vezza Sep 71 Announcement of the next Network Graphics Meeting

Schedule conflict and postponement of the graphics meeting.

231 Heafner Sep 71 Service Center Standards for Remote Usage - A User's View

A statement of views on service center standards. An input to the service center panel discussion of the October Network meeting.

230 Pyke Sep 71 Toward Reliable Operation of Minicomputer-based Terminals on a TIP

Points out inadequate error detection and initiation of corrective measures in the present protocol for communication between a TIP and attached terminals. References [RFC 203](#).

- 229 Postel Sep 71 Standard Host Names  
A suggestion of eight character names and a proposed list of names.
- 228 Walden Sep 71 Clarification  
A correction to [RFC 70](#).
- 227 Heafner Sep 71 Data Transfer Rates (RAND/UCLA)  
A memo on data rates typical of the RJS use at UCLA CCN.
- 226 Karp Sep 71 Standardization of Host Mnemonics  
A list of Host Mnemonics is provided.
- 225 Harslem Sep 71 RAND/UCSB Network Graphics Experiment  
Describes use from RAND of the UCSB-OLS system.
- 224 McKenzie Sep 71 Comments on Mailbox Protocol  
Comments on electronic mail and TIP's.
- 223 Melvin Sep 71 Network Information Center Schedule for Network Users  
Access schedule for remote users of the NIC.
- 222 Metcalfe Sep 71 System Programmer's Workshop  
Announcement of the next workshop.
- 221 Watson Aug 71 A Mail Box Protocol, Version-2  
Discussion of the initial reaction to [RFC 196](#).
- 220 Never Issued
- 219 Winter Sep 71 User's View of the Datacomputer  
A description of the Datacomputer.

- 218      Cosell          Sep 71          Changing the IMP Status Reporting
- A change in internal procedures in the ARPANET status reports from the IMPs to the NIC.
- 217      White            Sep 71          Specification Changes for OLS, RJE/RJOR, and SMFS
- Current listing of documents that have been revised.
- 216      White            Sep 71          Telnet Access to UCSB's On-Line System
- Discussion of the implementation of a teletype-compatible interface to UCSB's On-Line System.
- 215      McKenzie        Aug 71          NCP, ICP, and Telnet: The Terminal IMP Implementation
- Announcement of six Terminal IMPs being incorporated into the Network, with additional Terminal IMPs scheduled for delivery.
- 214      Harslem          Aug 71          Network Checkout
- Notification of the verification of certain sites.
- 213      Cosell            Aug 71          IMP System Change Notification
- Several changes in the IMP internal procedures.
- 212      Vezza            Aug 71          NWG Meeting on Network Usage
- A mailing list for RFC distribution.
- 211      NIC                Aug 71          ARPA Network Mailing List
- 210      Conrad            Aug 71          Improvement of Flow Control
- Discussion of the current "give back" - "return" scheme.
- 209      Cosell            Aug 71          Host/IMP Interface Documentation
- Discussion of a change to the IMP and the documentation (BBN report 1822).

208 McKenzie Aug 71 Address Tables

A table of hosts on or soon to be on the ARPANET.

207 Vezza Aug 71 A September Network Working Group Meeting

Next meeting announcement.

206 White Aug 71 A User Telnet Description of an Initial Implementation

This document describes a program whose function is to make an Online System terminal appear to any teletype-compatible, time-sharing system in the Network as if it were directly connected to that system.

205 Braden Aug 71 NETCRT - A Character Display Protocol

A significant revision of the character-display protocol (NETCRT), based on CCN's proposed NETCRT from the May NWG Meeting.

204 Postel Aug 71 Sockets in use

Announcement to collect information on the use of socket numbers for standard service programs.

203 Kalin Aug 71 Achieving Reliable Communication

This is a non-standard protocol, suitable for either second or third level use and is proposed with the intent of providing error resistant and highly reliable communication channels.

202 Wolfe Jul 71 Possible Deadlock in ICP

A notation of a possible deadlock that will occur if both sides open their send or both sides open their receive sockets first.

201 Never Issued.

200 NIC Aug 71 RFC List by Number

RFC's 1-200.

- 199 Williams Jul 71 Suggestions for a Network  
Data-Tablet Graphics Protocol

SDC's comments to the discussion of a protocol for network graphics within the ARPA Network community. Concern is focused on the development of the graphics protocol in two areas: non-interactive graphics and data-tablet graphics, as opposed to fully interactive graphics.

- 198 Heafner Jul 71 Site Certification - Lincoln Labs  
360/67

A report from RAND that Lincoln Labs protocol implementations are correct.

- 197 Shoshani Jul 71 Initial Connection Protocol -  
Revised

An attempt at a simple version of ICP, assuming one may add commands to Host-Host protocol.

- 196 Watson Jul 71 A Mail Box Protocol

The purpose of this protocol is to provide at each site a standard mechanism to receive sequential files for immediate or deferred printing or other uses.

- 195 Mealy Jul 71 Data Computers - Data Descriptions  
and Access Language

This document discusses some of the problems involved in the unified approach to Network data management, and to suggest possible avenues of approach toward their resolution.

- 194 Cerf Jul 71 The Data Reconfiguration Service -  
Compiler/Interpreter Implementation  
Notes

This document describes the new features of the language, the new syntax, the form interpreter, and the instruction set.

- 193 Harslem Jul 71 Network Checkout

A report from RAND on testing ten other hosts.

- 192      Watson            Jul 71            Some Factors Which a Network  
Graphics Protocol Must Consider

Discussion on what any network graphics protocol should come to grips with.

- 191      Irby                Jul 71            Graphics Implementation and  
Conceptualization at ARC

A brief description of the way in which graphics terminals are conceptualized and used at the Augmentation Research Center.

- 190      Deutsch            Jul 71            DEC PDP-10 - IMLAC Communication  
System

This document describes an operational system for communicating textual display information between a main-site computer and a remote display processor.

- 189      Braden            Jul 71            Interim NETRJS Specifications

A description of the operation and protocol of the remote job entry service to CCN's 360 Model 91. This interim protocol will be implemented as a production service before the end of July.

- 188      Karp                Jan 71            Data Management Meeting Announcement

Plans for a data management meeting to be held August 1971.

- 187      McKay               Jul 71            A Network/440 Protocol Concept

An information Request for Comments that is intended to convey some of the thinking and philosophy that went into IBM's network protocol and overall network design.

- 186      Michener           Jul 71            A Network Graphics Loader

The Network Graphics Loader described in this document proposes to permit remote users on the ARPA network to obtain graphics output from programs they write for the Evans and Sutherland Line Drawing System.

- 185      North               Jul 71            NIC Distribution of Manuals and  
Handbooks

The NIC request that sites send copies of manuals and handbooks to them.



- 184 Kelley Jul 71 Proposed Graphic Display Modes

The ARPA Network node at the University of Illinois' Center for Advanced Computation is different from other nodes. It is not just a simple attachment to the net. Establishment of the computer system specifically for use of the ILLIAC IV and the network is in process. This paper describes the operating systems, network interface and utility routines, and ILLIAC IV routines to be used over the network.

- 183 Winett Jul 71 The EBCDIC Codes and Their Mapping to ASCII

This document defines and describes the IBM Standard Extended BCD Interchange Code. This is done in order to uniquely map the ASCII codes into corresponding EBCDIC codes in a consistent manner throughout the ARPA Network.

- 182 North Jun 71 Compilation of List of Relevant Site Reports

A Network Information Center compilation list of all site-produced reports which are of interest to Network participants.

- 181 McConnell Jun 71 Modifications to [RFC 177](#)

This document is intended to modify the proposal for a device independent graphical display description discussed in [RFC 177](#). The main changes are in the definition of coordinate areas to avoid one problem encountered with the old definition and to provide more flexibility.

- 180 McKenzie Jun 71 File System Questionnaire

An attempt to gather information about local file and data conventions.

- 179 McKenzie Jun 71 Link Number Assignments

This RFC has been replaced by RFCs 997 and 990.

- 178 Cotton Jun 71 Network Graphic Attention Handling

The process of attention handling is briefly described, various graphic configurations are discussed, input devices are surveyed to identify the types of data which they produce, and an attention protocol is proposed.

- 177      McConnell      Jun 71      A Device Independent Graphical  
Display Description

As more nodes are connected to the ARPA network, the types of graphical display processors available to users is quite varied. To attempt to facilitate the transmission of graphical information over the network, a device independent description of a display is described.

- 176      Bhushan      Jun 71      Comments on Byte Size for  
Connections

This document points out three views on the use of byte size for network connections: 1) Byte size should not be used at all. 2) Byte size is solely for the convenience of NCP's. 3) Byte size choice is a user-level prerogative.

- 175      Harslem      Jun 71      Comments on "Socket Conventions  
Reconsidered"

Pro and con discussion regarding [RFC 167](#).

- 174      Postel      Jun 71      UCLA-Computer Science Graphics  
Overview

This document provides an overview of the hardware, software, and intentions of the UCLA Computer Science Department's Graphics project.

- 173      Karp      Jun 71      Network Data Management Committee  
Meeting Announcement

A report on the formation of a data management committee and on its first meeting.

- 172      Bhushan      Jun 71      The File Transfer Protocol

This protocol is a user-level protocol for file transfer between host computers (including terminal IMPs), on the ARPA computer network. The File Transfer Protocol (FTP) uses the data transfer protocol described in [RFC 171](#). This paper assumes knowledge of [RFC 171](#).

- 171      Bhushan      Jun 71      The Data Transfer Protocol

Definition of a low-level Data Transfer Protocol (DTP) to be used for transfer of data in file transfer, remote job entry, and other applications oriented protocols. A companion paper ([RFC 172](#)) describes file transfer protocol.

170      NIC                  Jun 71          RFC List by Number

A list of RFCs 1-170.

168      North               May 71          ARPA Network Mailing Lists

Distribution list for RFCs.

167      Bhushan              May 71          Socket Conventions Reconsidered

The recent NCP Protocol said nothing about how hosts should assign socket numbers to process ports, except that the low-order bit is to specify socket gender. This document discusses two recent proposals that call for additional network-wide conventions on the 32-bit socket number.

166      Anderson            May 71          Data Reconfiguration Service - An  
Implementation Specification

This DRS experiment involved a software mechanism to reformat Network data streams. The mechanism can be adapted to numerous Network application programs.

165      Postel               May 71          A Proffered Official Initial  
Connection Protocol

This document specifies the third level protocol used to connect a user process at one site with a server process at another site.

164      Heafner              May 71          Minutes of Network Working Group  
Meeting

A 38 page reference on the discussions held at the Network Working Group Meeting.

163      Cerf                  May 71          Data Transfer Protocols

An informal statement on Data Transfer Protocols, in relation to material discussed at the SJCC.

162      Kampe                May 71          NETBUGGER3

Discussion of NETBUGGER3 as a third level program for the debugging of second and third level programs, experimentation with and simulation of third level protocols.

161      Shoshani      May 71      A Solution to the Race Condition in  
the ICP

A proposed solution to a problem that arose out of [RFC 143](#).

160      NIC              May 71      RFC Brief List

Title or Partial Title RFC List (1-160)

159      Never Issued.

158      O'Sullivan      May 71      Proposed Telnet Protocol

Solicitation of comments, evaluation, and requests for  
modification of the proposed Telnet protocol.

157      Cerf              May 71      Invitation to the Second Symposium  
on Problems in the Optimization of  
Data Communication Systems

Announcement of an ACM/IEEE conference on data communication.

156      Bouknight      Apr 71      Status of the Illinois Site  
(Response to [RFC 116](#))

Discusses the status of the operational hardware at the Illinois  
site.

155      NIC              May 71      List to Receive RFCs

Mailing list of people who are receiving the initial distribution  
of RFCs.

154      Crocker          May 71      Exposition Style

A note on style in documentation.

153      Melvin            May 71      SRI ARC-NIC Status

Discusses the current computer and network status of the SRI  
ARC-NIC.

152      Wilber            May 71      SRI Artificial Intelligence Status  
Report

Status report on SRAI's connection to the ARPANET as a research  
center.

- 151 Shoshani May 71 Comments on a Proferred Official ICP  
(RFCs 123,127)

Specific and general remarks regarding the ICP.

- 150 Kalin May 71 The Use of IPC Facilities

A working paper discussing the exposition of the types of usage to which an IPC facility would be subjected. This document hopes to clarify the goals being pursued and should provide a benchmark for gauging various implementation strategies.

- 149 Crocker May 71 The Best Laid Plans...

Changes to the topics and attendees of the upcoming NWG meeting.

- 148 Bhushan May 71 Comments on [RFC 123](#)

Regarding the byte size requirements for the initial connection.

- 147 Winett May 71 The Definition of a Socket

Defining, specifying, and identifying sockets.

- 146 Karp May 71 Views on Issues Relevant to Data  
Sharing on Computer Networks

Concurrence with the views presented in [RFC 140](#).

- 145 Postel May 71 Initial Connection Protocol Control  
Commands

An interpretation of the exchange between NCP's which would be necessary to carry out the Initial Connection Protocol (ICP) of [RFC 123](#).

- 144 Shoshani Apr 71 Data Sharing on Computer Networks

An introductory paper for the upcoming NWG meeting in Atlantic City.

- 143 Naylor May 71 Regarding Proferred Official ICP

Comments on a race condition discovered in the ICP as proposed in [RFC 123](#).

- 142      Kline              May 71              Time-out Mechanism in the Host-Host Protocol

Discussion on potential situations that can occur when sending a message to a foreign site.

- 141      Harslem             Apr 71             Comments on [RFC 114](#) (A File Transfer Protocol)

Further discussion on the File Transfer Protocol.

- 140      Crocker             May 71             Agenda for the May NWG Meeting

A list of topics to be discussed at the upcoming meeting, plus a listing of relevant RFCs that should be reviewed prior to the meeting.

- 139      O'Sullivan          May 71             Discussion of Telnet Protocol

An extension of [RFC 137](#).

- 138      Anderson            Apr 71             Status Report on Proposed Data Reconfiguration Service

Provides a description of a proposed Network experiment and to solicit comments on any aspect of the experiment.

- 137      O'Sullivan          Apr 71             Telnet Protocol - A Proposed Document

Solicitation for review and comment before the Atlantic City NWG meetings.

- 136      Kahn                  Apr 71             Host Accounting and Administrative Procedures

Discussion of a plan to be formulated and accepted for the development of a Host accounting system in the ARPA Network.

- 135      Hathaway            Apr 71             Response to [RFC 110](#)

Comments and proposals of new conventions to replace the ones proposed in [RFC 110](#).

- 134      Vezza                Apr 71             Network Graphics Meeting

Announcement of the next Network Graphics Meeting at Project MAC in July 1971.

- 133      Sundberg      Apr 71      File Transfer and Error Recovery  
Sample interchanges and comments on file transfer and errors.
- 132      White      Apr 71      Typographical Error in [RFC 107](#)  
Points out an error in [RFC 107](#).
- 131      Harslem      Apr 71      Response to [RFC 116](#) (May NWG Meeting)  
  
A description of network plans at RAND, including the data reconfiguration service, and a comment on the role of the NWG.
- 130      Heafner      Apr 71      Response to [RFC 111](#) (Pressure from the Chairman)  
  
Discussion of RAND's role in testing other host implementations and schedule dependences.
- 129      Harslem      Apr 71      A Request for Comments on Socket Name Structure  
  
Comments on several suggested socket name structures.
- 128      Postel      Apr 71      Bytes  
  
Discussion of the Byte size parameter allowed by the 2nd level protocol.
- 127      Postel      Apr 71      Comments on [RFC 123](#)  
  
Continued interpretations of the exchange between NCP's which would be necessary to carry out the Initial Connection Protocol of [RFC 123](#).
- 126      McConnell      Apr 71      Ames Graphics Facilities at Ames Research Center  
  
Discusses the graphical facilities at Ames for the IBM 360/67 TSS.
- 125      McConnell      Apr 71      Response to [RFC 86](#), Proposal for Network Standard Format for a Graphics Data Stream  
  
Improves and updates [RFC 86](#).

- 124      Melvin            Apr 71            Typographical Error in [RFC 107](#)
- Points out an error in [RFC 107](#).
- 123      Crocker           Apr 71            A Proferred Official ICP
- Description of a family of ICPs (Initial Connection Protocol) suitable for establishing one pair of connections (one in each direction) between any user process and any server process, and proposes a particular subset of this family as the standard ICP for connecting user processes to loggers on systems which accept teletype-like devices.
- 122      White              Apr 71            Network Specifications for UCSB's Simple-Minded File System
- UCSB's Simple Minded File System (SMFS) which will provide file storage for network users. This document provides programmers with the information necessary to communicate with SMFS.
- 121      Krilanovich   Apr 71            Network On-Line Operators
- Descriptions of operators that have been implemented within UCSB's On-Line System and make the network (via NCP) accessible to On-Line system users.
- 120      Krilanovich   Apr 71            Network PL1 Subprograms
- Descriptions of subroutines that have been implemented at UCSB and make the network (via NCP) accessible to PL1 programs executing in the IBM 360/75.
- 119      Krilanovich   Apr 71            Network FORTRAN Subprograms
- Descriptions of a set of assembly-language subprograms, their functions and calling sequences.
- 118      Watson             Apr 71            Information Required for Each Service Available to the Network
- Cites two classes of information which each site needs to provide for every service or process it makes available over the ARPA network.
- 117      Wong                Apr 71            Some Comments on the Official Protocol
- Cites weaknesses in [RFC 107](#), and provides suggestions for correction and handling.



- 116 Crocker Apr 71 Structure of the May NWG Meeting  
Proposed meeting agenda centering around discussions of advertised topics, with published status reports and position papers.
- 115 Watson Apr 71 Some Network Information Center Policies on Handling Documents  
Discusses current document policies between the Network Information Center and sites on the network.
- 114 Bhushan Apr 71 A File Transfer Protocol  
Proposed file transfer mechanisms that have been developed for immediate implementation on hosts at MIT.
- 113 Harlsem Apr 71 Network Activity Report: UCSB and RAND  
Report on the network use and validity between UCSB's RJE and RJOR systems and RAND.
- 112 O'Sullivan Apr 71 User/Server Site Protocol Network HOST Questionnaire  
A summary of the responses to the referenced questionnaire.
- 111 Crocker Mar 71 Pressure from the Chairman  
Proposed scheduling for the implementation of NCPs and Telnets.
- 110 Winett Mar 71 Conventions for Using an IBM 2741 Terminal as a User Console for Access to Network Server Hosts  
Telnet implementation and the 2741.
- 109 Winett Mar 71 Level III Server Protocol for the Lincoln Laboratory 360/67 Host  
Telnet implementation and the 360/67.
- 108 Watson Mar 71 Attendance List at the Urbana NWG Meeting, 17-19 February 1971  
Lists attendees at the NWG meeting held February 1971.

- 107      Bressler      Mar 71      Output of the Host-Host Protocol  
Glitch Cleaning Committee
- The second meeting of the Host-Host Protocol Glitch Cleaning  
committee.
- 106      O'Sullivan      Mar 71      USER/SERVER Site Protocol Network  
Host Questionnaire
- An attempt to gather information for creating the Telnet Protocol.
- 105      White      Mar 71      Network Specification for Remote Job  
Entry and Remote Job Output  
Retrieval at UCSB
- Describes the remote job entry service at UCSB.
- 104      Postel      Feb 71      Link 191
- General agreement to reserve a link for use in measurements.  
Therefore, Link 191 will be assigned for measurement use.
- 103      Kalin      Feb 71      Implementation of Interrupt Keys
- This paper discusses the problems and solutions that are simple to  
implement in the current protocol specifications that contain  
serious logical errors in the interrupt functions.
- 102      Crocker      Feb 71      Output of the HOST/HOST Protocol  
Glitch Cleaning Committee
- Numerous topics were discussed.
- 101      Watson      Feb 71      Notes on the Network Working Group  
Meeting
- Transcript of the Network Working Group Meeting, February 1970.
- 100      Karp      Feb 71      Categorization and Guide to NWG/RFCs
- Categorizes, identifies, and summarizes RFCS 1-100.
- 099      Karp      Feb 71      Network Meeting
- Announcement of the next meeting of the Network Working Group for  
20 May 1970.

098      Meyer              Feb 71              Logger Protocol Proposal

This "network logger protocol" is intended to specify how the existing logger of a network host is to interface to the network so as to permit a login from a console attached to another host.

097      Melvin              Feb 71              A First Cut at a Proposed Telnet Protocol

This document was motivated by the need to set specifications for a protocol which would allow on-line access to the Network Information Center (NIC).

096      Watson              Feb 71              An Interactive Network Experiment to Study Modes of Access to the Network Information Center

Outlines the framework for a simple interactive experiment to study modes of access to the Network Information Center (NIC).

095      Crocker              Feb 71              Distribution of NWG/RFC's Through the NIC

Standards for establishing lines of communication of all of the sites with the Network Information Center, in regards to distribution of RFC's.

094      Harslem              Feb 71              Some Thoughts on Network Graphics

Discussion of the initial reaction to [RFC 86](#), whose purpose was to provide a basis for discussion and development of Network graphics.

093      McKenzie              Jan 71              Initial Connection Protocol

A review of the Initial Connection Protocol (ICP), first described in [RFC 66](#) and restated in [RFC 80](#).

092      Never Issued.

091      Mealy                  Dec 70              A Proposed User-User Protocol

Discussion of UCLA's Campus Computing Network of services and implementation priorities.

- 090 Braden Jan 71 CCN as a Network Service Center
- Discussion of UCLA's Campus Computing Network of services and implementation priorities.
- 089 Metcalfe Jan 71 Some Historic Moments in Networking
- Noteworthy achievements for the MIT-Project MAC Dynamic Modeling/Computer Graphics PDP-6/10 System, while awaiting the completion of an interim network control program.
- 088 Braden Jan 71 NETRJS - A Third Level Protocol for Remote Job Entry
- Description of NETRJS, which is the name for a message protocol and a set of control conventions which will allow users at remote Hosts to access the RJS remote batch subsystem of UCLA/CCN.
- 087 Vezza Jan 71 Topic for Discussion at the Next Network Working Group Meeting
- Suggests Network Working Group discussion on topics germane to network graphics.
- 086 Crocker Jan 71 Proposal for a Network Standard Format for a Data Stream to Control Graphics Display
- Proposes specifying the form of an output stream for the case that the output portion of the console (which is attached to a computer at the user's site) is a typical refresh display with point, vector, and character drawing capability.
- 085 Crocker Dec 70 Network Working Group Meeting
- Announcement of regularly scheduled Network Working Group Meetings every three months.
- 084 North Dec 70 List of NWG/RFCs 1-80
- Lists RFCs 1-80.
- 083 Anderson Dec 70 Language-Machine for Data Reconfiguration
- Describes a syntax-driven interpreter that operates on a grammar which is an ordered set of replacement rules for the Form Machine.

082      Meyer            Dec 70          Network Meeting Notes

A transcribed summary of the Fall 1970 network meeting notes.

081      Bouknight       Dec 70          Request for Reference Information

Request for documents in the subject areas of data communications and communications theory.

080      Harslem           Dec 70          Protocol and Data Formats

Proposes general solutions concerning Initial Connection Protocols, Pre-specified Data Formats, and Adaptable Mechanisms.

079      Meyer            Nov 70          Logger Protocol Error

078      Harslem           Nov 70          NCP Status Report: UCSB/Rand

Conducted an exercise between UCSB console to/from RAND console validation of the respective NCPs.

077      Postel            Nov 70          Network Meeting Report

Report on three Network Working Group meetings held during November 16, 17, and 18.

076      Bouknight       Oct 70          Connection-by-Name: User-Oriented Protocol

Suggests a user level interface to network protocol where all user protocol is handled symbolically with system procedures making the translation into host-to-host protocol. Proposes general solutions.

075      Crocker           Oct 70          Network Meeting

Announcement of the next scheduled meeting of the Network Working Group for 16 Nov 70.

074      White              Oct 70          Specifications for Network Use of the UCSB On-Line System

Announcement of UCSB's On-Line System (OLS) availability to ARPA Network users.

073 Crocker Sep 70 Response to RFC 67

General agreement with proposed policy.

072 Bressler Sep 70 Proposed Moratorium on Changes to Network Protocol

Cites critical changes that could occur in hardware/software development efforts and advanced debugging if changes in the Network Protocol aren't kept in check.

071 Schipper Sep 70 Reallocation in Case of Input Error

Discussion of how to resynchronize flow control using a proposed protocol for the CCN-Host at UCLA.

070 Crocker Oct 70 A Note on Padding

Discussion of padding on a message.

069 Bhushan Sep 70 Distribution List Change for MIT.

Announcement of name change.

068 Elie Aug 70 Comments on Memory Allocation Control Commands (CEASE, ALL, GVB, RET) and RFNM

Provides a scheme for buffer allocation.

067 Crowther Undated Proposed Change to Host/IMP Spec to Eliminate Marking

Proposed change to eliminate marking, per Walden's comments.

066 Crocker Aug 70 3rd Level Ideas and Other Noise

Meeting notes from 12 Aug 70 between Crocker and representatives from BBN and MIT regarding the third level protocol.

065 Walden Aug 70 Comments on Host-Host Protocol Document Number 1 (Crocker, 3 August 70)

Critique and suggestions for improvement of the Host-Host Protocol document.

- 064      Elie              Undated      Getting Rid of Marking
- Suggests simple modifications and solutions to the IMP-HOST interface which would be a better solution than marking.
- 063      Cerf              Jul 70      Belated Network Meeting Report
- Network meeting report of the Network Working Group from 8 May 70.
- 062      Walden              Aug 70      A System for Interprocess  
Communication in a Resource Sharing  
Computer Network
- Supersedes [RFC 61](#).
- 061      Walden              Jul 70      A Note on Interprocess Communication  
in a Resource Sharing Computer  
Network
- A draft request for comments of a resource sharing study that may be of general interest to network participants.
- 060      Kalin              Jul 70      A Simplified NCP Protocol
- Definition of a new NCP Protocol that is simple enough to be implemented on a very small computer, yet can be extended for efficient operation on large timesharing machines.
- 059      Meyer              Jun 70      Flow Control-Fixed Versus Demand  
Allocation
- Discussion of the advantages and disadvantages of the method of flow control as described in [RFC 54](#).
- 058      Skinner              Jun 70      Logical Message Synchronization
- A discussion on a question raised at the last network meeting regarding the question of logical and physical message distinctions.
- 057      Krale              Jun 70      Thoughts and Reflections on [RFC 54](#)
- 056      Belove              Jun 70      Third Level Protocol
- All explanations in this RFC are meant to describe functional characteristics rather than design.

055      Newkirk      Jun 70      A Prototypical Implementation of the NCP

A prototypical specification in a prose format of what the NCP could look like.

054      Crocker      Jun 70      An Official Protocol Proffering  
Submission of the Official Protocol for comments and suggestions.

053      Crocker      Jun 70      An Official Protocol Mechanism  
Group discussion on rules for establishing and modifying an official Host-Host protocol.

052      Postel      Jul 70      Updated Distribution List  
Mailing list for distributing the RFCs.

051      Elie      May 70      Proposal for a Network Interchange Language

A proposal to specify a high level programming language for computer networks, specifically the ARPA network.

050      Harslem      Apr 70      Comments on the Meyer Proposal  
General acceptance on [RFC 46](#), plus comments on the seven issues raised in [RFC 47](#).

049      Meyer      Apr 70      Conversations with Steve Crocker (UCLA)

Discussion of telephone conversations relating to the Network Protocol, specifically regarding Meyer's proposal in [RFC 46](#).

048      Postel      Apr 70      A Possible Protocol Plateau  
Reporting activities since the Network meeting of 17 March 1970.

047      Postel      Apr 70      BBN's Comments on [RFC 33](#)  
Comments from BBN regarding [RFC 33](#) (New HOST-HOST Protocol).

046      Meyer      Apr 70      ARPA Network Protocol Notes  
Comments and suggestions from the NWG at Project MAC, based upon the protocol outlined in RFCs 33,36.



- 045 Postel Apr 70 New Protocol is Coming  
Announcement of a new version of the Network Protocol.
- 044 Shoshani Apr 70 Comments on RFCs 33,36  
General discussion and suggestions for refinements to the  
HOST-HOST Protocol.
- 043 Nemeth Mar 70 Proposed Meeting  
An announcement of a meeting to discuss the Local Interaction  
Language system.
- 042 Ancona Mar 70 Message Data Types  
A proposal that the first eight bits of a normal message be  
reserved for a message data type.
- 041 Melvin Mar 70 IMP/IMP Teletype Communication  
Comments that transmitting IMP sites should use 24 hour time and  
include the time zone designation.
- 040 Harslem Mar 70 More Comments on the Forthcoming  
Protocol  
Further elaborations on the errors, queries, and Host status that  
were mentioned in [RFC 39](#).
- 039 Harslem Mar 70 Comments on Network Protocol  
([RFC 36](#))  
More suggestions to be considered as additions to [RFC 36](#) - Network  
Protocol.
- 038 Wolfe Mar 70 Comments on Network Protocol  
([RFC 36](#))  
Continued discussion on the proposed Network Protocol.
- 037 Crocker Mar 70 Network Meeting Epilogues, etc.  
Network Meeting notes from 17 March 1970.

036 Crocker Mar 70 Protocol Notes

A three part overview of the Network Protocol.

035 Crocker Mar 70 Network Meeting

Announcement of a network meeting: date, time, place, and proposed agenda.

034 English Feb 70 Some Brief Preliminary Notes on the ARC Clock

Describes the ARC Clock system.

033 Crocker Feb 70 New Host-Host Protocol

Revises RFC 11, and indicates numerous changes in the old protocol.

032 Cole Feb 70 Some Thoughts on SRI's Proposed Real Time Clock

References and comments on RFCs 28,29.

031 Bobrow Feb 68 Binary Message Forms in Computer Networks

Suggest alternative approaches and methods for describing messages.

030 Crocker Feb 70 Documentation Conventions

Revises the definition of style, content, form, and distribution of the Network Working Group's notes. Replaces RFCs 10,16,24,27.

029 Kahn Jan 70 Note in Response to Bill English's Request for Comments

Comments in response to English's question which was raised in RFC 28.

028 English Jan 70 Time Standards

Request for comments relative to Network time standards.

- 027      Crocker      Dec 69      Documentation Conventions
- Revises the definition of style, content, form, and distribution of the Network Working Group's notes. Replaces RFCs 10,16,24.
- 026      Never Issued.
- 025      Crocker      Oct 69      No High Link Numbers
- Suggests that no link number over 63 be used.
- 024      Crocker      Nov 69      Documentation Conventions
- Revises the definition of style, content, form, and distribution of the Network Working Group's notes. Replaces RFCs 10,16.
- 023      Gregg      Oct 69      Transmission of Multiple Control Messages
- Discusses how a network program at a site should be prepared to send or receive more than one control message in a single control communication.
- 022      Cerf      Oct 69      Host-Host Control Message Formats
- Reports on a new control message format which does not use the 7-bit ASCII character mode of transmission.
- 021      Cerf      Oct 69      Report on Network Meeting
- Attendance list and topics discussed.
- 020      Cerf      Oct 69      ASCII Format for Network Interchange
- Discusses the use of standard 7-bit ASCII embedded in an 8-bit byte whose high order bit is always 1.
- 019      Kreznar      Oct 69      Two Protocol Suggestions to Reduce Congestion at Swap-Bound Nodes
- Suggests alternatives in reducing congestion at swap-bound nodes.
- 018      Cerf      Sep 69      Comments Re: Host-Host control link
- Suggestions regarding the Host-Host control link.

- 017a Kahn Aug 69 Some Comments Re: HOST-IMP Protocol  
Comments in response to Kreznar's questions which were raised in [RFC 17](#).
- 017 Kreznar Aug 69 Some Questions Re: HOST-IMP Protocol  
Queries and opinions regarding the HOST-IMP Protocol.
- 016 Crocker Aug 69 M.I.T.  
Announcement that MIT is now to receive all Network Working Group memos.
- 015 Carr Sep 69 Network Subsystem for Time Sharing Hosts  
Proposes a subsystem called "Telnet", which would be a shell program around the network system primitives, allowing a teletype or similar terminal at a remote host to function as a teletype at the serving host.
- 014 Never Issued.
- 013 Cerf Aug 69 Referring to [RFC 11](#)  
Proposes a zero text length EOF (End-Of-File) message.
- 012 Wingfield Aug 69 IMP-HOST Interface Flow Diagrams  
Flow diagrams that indicate the logical sequence of hardware operations which occur within the IMP-HOST interface.
- 011 Deloche Aug 69 Implementation of the Host-Host Software Procedures in GORDO  
Discussion of Host-Host Procedures and GORDO as a time-sharing system that was implemented on a SDS Sigma 7.
- 010 Crocker Jul 69 Documentation Conventions  
Revises the definition of style, content, form, and distribution of the Network Working Group's notes. Replaces [RFC 3](#).
- 009 Deloche May 69 Host Software  
Discusses the Host-Host Protocol, Network Service Calls, and Data Structures.

- 008      Deloche      May 69      ARPA Network Functional Specifications
- Discusses transmission features, functional software specifications, and the Link establishment procedure.
- 007      Deloche      May 69      HOST-IMP Interface
- Discusses Host-IMP interface issues.
- 006      Crocker      Apr 69      Conversation with Bob Kahn
- Conversations regarding code conversion in the IMP's, IMP-HOST communication, and HOST software.
- 005      Rulifson      Jun 69      DEL
- Details the machine independent language DEL (Decode-Encode Language).
- 004      Shapiro      Mar 69      Network Timetable
- Discusses installation, configuration, network checkout, and test messages run between SRI and UCLA.
- 003      Crocker      Apr 69      Documentation Conventions
- Establishes a definition of style, content, form, and distribution of the Network Working Group's notes (Obsoleted by [RFC 10](#)).
- 002      Duvall      Apr 69      Links
- Discusses various types of Links, including Control, Primary, and Auxilliary Links.
- 001      Crocker      Apr 69      Host Software
- Discusses the Host software and initial experiments on the ARPA Network.