NIC 49000

<NETINFO>
TCP-IP-STATUS.TXT

# ARPANET DIRECTORY

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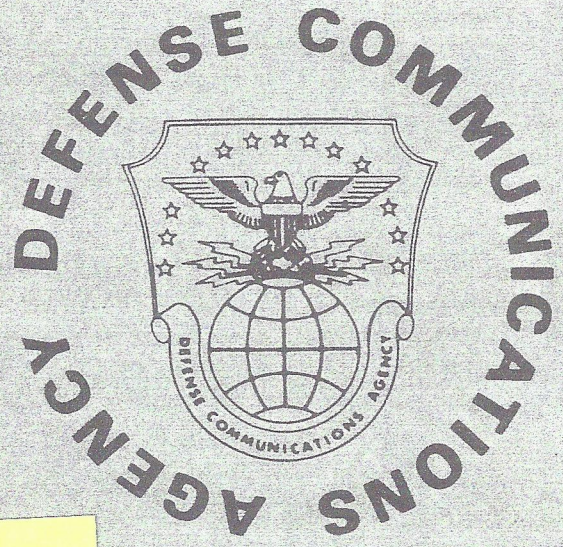


The directory is about 400 pages long and each page lists about 20 names. This means there were about 8,000 people on the net in 1982.

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# ARPANET DIRECTORY

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# ARPANET GENERAL INFORMATION

## USEFUL DEFINITIONS

### INTERFACE MESSAGE PROCESSOR (IMP)

A store and forward packet switch which can accomodate up to four host computers. The original IMPs and TIPs were Honeywell 316 and 516 machines. The 316 and 516 IMPs/TIPs are gradually being replaced by C/30 machines produced by Bolt Beranek and Newman, Inc. (BBN) for the Defense Communications Agency (DCA).

### TERMINAL INTERFACE PROCESSOR (TIP)

A store and forward packet switch which can accomodate up to three host computers and 63 terminals. Each terminal may be either asynchronous or externally clocked, and may operate at speeds up to 2400 baud on input and 19.2 kilobaud on output. Some types of intelligent terminals are also supported.

### TERMINAL ACCESS CONTROLLER (TAC)

A replacement for the TIP that is a standalone terminal controller attached to an IMP as a local or distant host. Several TACs may be attached to a single IMP thus providing an expanded capability for terminal access. The TAC is equiped with internet protocols, improved auto speed detect to higher baud rates, and increased character buffering for terminals. It can be combined with a private line interface (PLI) for secure terminal traffic and programmed for other functions.

### HOST

A customer-owned computer which is connected to a host port on an IMP or TIP. Hosts may be categorized as:

LOCAL HOST - A host located within 30 feet of an IMP or TIP.

DISTANT HOST - A host which is more than 30 feet, but less than 2,000 feet, from an IMP or TIP.

VERY DISTANT HOST - A host which is located over 2,000 feet from an IMP or TIP and requires modems on its access line.

### TERMINAL

A teletypewriter, CRT, or similar unit which is connected to a terminal port of a TIP.

### INTERSWITCH TRUNKS

A circuit between packet switches (e.g., IMPs and TIPs) which is used to pass packets through the network.

### ACCESS LINE

A circuit from a host computer or terminal to an IMP, TIP, or TAC. The circuit may be a local cable or a transmission facility requiring modems.

### ARPANET BACKBONE

The switching nodes, interfaces, communication lines interconnecting the nodes, and the Network Operations Center (NOC). The backbone is also known as the communications subnet.

### SPONSOR

A MILDEP, DoD Agency, or other U. S. Government Agency which is responsible for an ARPANET user(s) and reimburses DCA for the ARPANET backbone costs.

### NODE

The packet switch; an IMP or TIP.

## WHAT THE ARPANET IS

The ARPANET is an operational, resource sharing, host-to-host network linking a wide variety of computers at DoD facilities and non-DoD research centers in continental United States, Hawaii, Norway, and England.

The ARPANET orginated as a purely experimental network in late 1969 under a research and development program sponsored by DARPA to advance the state-of-the-art in computer networking. The network was designed to provide efficient communications between heterogeneous computers so that hardware, software, and data resources could be conveniently and economically shared by a wide community of users.

Today, the ARPANET provides support for a large number of DoD and non-DoD government projects with an operational network of many nodes and host computers.

Following the successful accomplishment of initial ARPANET design goals and the expansion of the network, it was considered appropriate to transfer the responsibility for operation of the ARPANET from DARPA to DCA. After July 1975, DCA became the operational manager of the ARPANET.

## BRIEF DESCRIPTION OF THE ARPANET

The ARPANET is an operational, computerized, packet switching DoD digital network which provides a capability for terminals or geographically separated computers, called hosts, to communicate with each other. The host computers often differ from one another in type, speed, word length, operating system, and other characteristics. Each terminal or host computer is connected into the network through a small local node computer called an IMP, TIP, or TAC. The complete network is formed by interconnecting the IMPs through wideband communication lines (normally 50,000 bits per second) supplied by common carriers.

Each node is programmed to receive and forward messages to neighboring nodes in the network. During a typical operation, a host passes a message to its node; the message is passed from node to node through the network until it finally arrives at the destination IMP, which in turn passes it along to the destination host. This process normally takes less than 250 milliseconds.

Hosts communicate with each other via regular messages. A regular message may vary in length from 96 to 8159 bits, the first 96 of which are control bits called the leader. The leader is also used for sending control messages between the host and its node. The remainder of the message is the data or text.

For each regular message, the host specifies a destination, consisting of node, host, and handling type. These three parameters uniquely specify a connection between source and destination hosts. The handling type gives the connection specific characteristics, such as priority or non-priority transmission. Additional leader space has been reserved for a fourth parameter, used for internetwork addressing. For each connection, messages are delivered to the destination in the same order that they were transmitted by the source.

For each regular message, the host also specifies a 12-bit identifier, the message-ID. The message-ID, together with the destination of the message, is used as the "name" of the message. The node uses this name to inform the host of the disposition of the message. Therefore, if the host refrains from re-using a particular message-ID value (to a given destination) until the node has responded about that message-ID, messages will remain uniquely identified and the host can retransmit them in the event of a failure within the network.

After receiving a regular message from a host connected to it, a node breaks the message into several packets (currently the maximum data bits per packet is 1008) and passes these through the network in the direction of the destination. Eventually, when all packets arrive at the destination, they are reassembled to form the original message which is passed to the destination host. The destination node returns a positive acknowledgment for receipt of the message to the source host. This acknowledgment is called a Ready for Next Message (RFNM) and identifies the message being acknowledged by name. In some relatively rare cases, however, the message may not be delivered due to a node failure; line disruption, etc., in such cases an Incomplete Transmission message will be returned to the source host instead of a RFNM. In this case the message which was incompletely transmitted is also identified by name.

If a response from the destination node (either RFNM or Incomplete Transmission) is not delivered to the originating host, this condition will be detected by the source node, which will automatically inquire of the destination node whether the original message was correctly received and repeat the inquiry until a response is received from the destination node. This inquiry mechanism is timeout-driven, and each timeout period may vary between 30 and 45 seconds in length.

When a message arrives at its destination node, the leader is modified to indicate the source host, but the message-ID field is passed through unchanged. Thus, in addition to providing message identification between a host and its local node, the message-ID can provide a means for hosts to identify messages between themselves.

Users of the ARPANET may access local or distant SERVER computers (hosts) over the network. They may also exchange messages, create realtime links between users, transfer files from one computer to another, and submit batch jobs to distant computers. For a more complete description of these processes, see the ARPANET Protocol Handbook available from the NIC.

## MANAGEMENT OF THE ARPANET

The Director, DCA controls system engineering and exercises operational direction over those operating elements of ARPANET which are part of the backbone. ARPANET user equipment and terminals are non-backbone. ARPANET users must be responsive to management instructions issued by the DCA regarding the ARPANET.

DCA will monitor the effectiveness of the ARPANET on a continuing basis, evaluate those matters which have major impact or will impact adversely on the network, and direct action to alleviate or prevent any problems.

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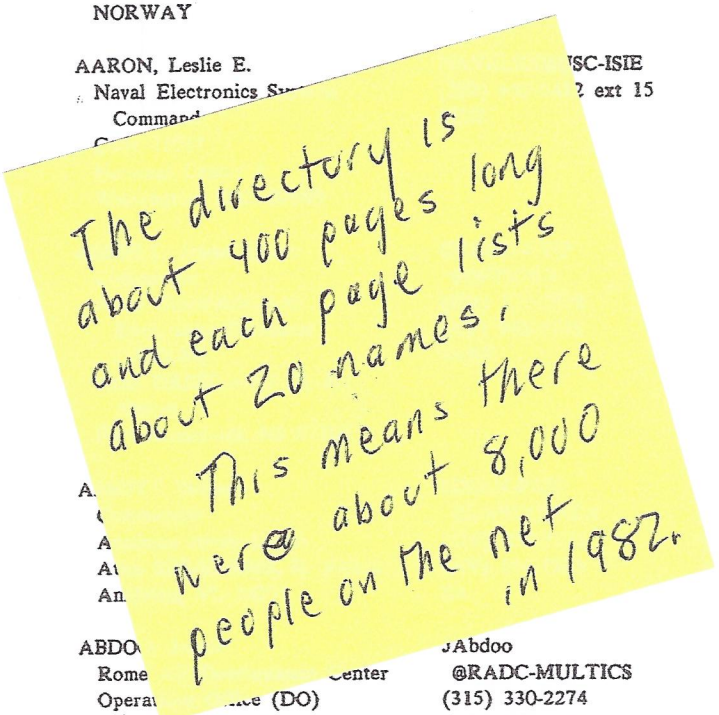


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## OLD HOST #/IMP # WITH NEW NETNUMBER ADDRESS ASSIGNMENTS

| OLD HOST | NEW ADDRESS | HOST NAME | STATUS |
|---|---|---|---|
| 0/1 | 10.0.0.1 | UCLA-ATS | SERVER, Limited |
| 1/1 | 10.1.0.1 | UCLA-CCN | SERVER |
| 2/1 | 10.2.0.1 | UCLA-SECURITY | SERVER, Limited |
| 0/2 | 10.0.0.2 | SRI-NSC11 | USER |
| 1/2 | 10.1.0.2 | SRI-KL | SERVER |
| 2/2 | 10.2.0.2 | SRI-CSL | SERVER, limited |
| 3/2 | 10.3.0.2 | SRI-TSC | USER |
| 0/3 | 10.0.0.3 | NOSC-CC | SERVER (VDH), Limited |
| 1/3 | 10.1.0.3 | NOSC-SPEL | SERVER, Limited |
| 2/3 | 10.2.0.3 | LOGICON | USER (VDH) |
| 3/3 | 10.3.0.3 | NPRDC | SERVER (VDH) |
| 2/4 | 10.2.0.4 | UTAH-TIP | TIP |
| 3/4 | 10.3.0.4 | UTAH-20 | SERVER |
| 0/5 | 10.0.0.5 | BBN-F | SERVER, Limited |
| 1/5 | 10.1.0.5 | BBNG | SERVER |
| 2/5 | 10.2.0.5 | BBN-PTIP | USER |
| 3/5 | 10.3.0.5 | BBNA | SERVER |
| 0/6 | 10.0.0.6 | MIT-MULTICS | SERVER |
| 1/6 | 10.1.0.6 | MIT-DMS | SERVER |
| 2/6 | 10.2.0.6 | MIT-AI | SERVER |
| 3/6 | 10.0.0.0 | MIT-ML | SERVER |
| 0/7 | 10.0.0.7 | RAND-AI | SERVER |
| 1/7 | 10.1.0.7 | CHI | SERVER (VDH), Limited |
| 2/7 | 10.2.0.7 | RAND-TIP | TIP |
| 3/7 | 10.3.0.7 | RAND-UNIX | SERVER |
| 0/8 | 10.0.0.8 | NRL | SERVER, Limited |
| 2/8 | 10.2.0.8 | NSWC-WO | SERVER (VDH), Limited |
| 6/8 | 10.6.0.8 | NRL-ARCTAN | USER |
| 7/8 | 10.7.0.8 | NRL-CSS | SERVER |
| 8/8 | 10.8.0.8 | NRL-TOPS10 | SERVER, Limited |
| 0/9 | 10.0.0.9 | HARV-10 | SERVER, Limited |
| 2/9 | 10.2.0.9 | YALE | SERVER |
| 0/10 | 10.0.0.10 | LL | SERVER, Limited |
| 2/10 | 10.2.0.10 | LL-XN | SERVER, Limited |
| 3/10 | 10.3.0.10 | LL-11 | SERVER, Limited |
| 0/11 | 10.0.0.11 | SU-AI | SERVER, Limited |
| 2/11 | 10.2.0.11 | SU-TIP | TIP |
| 3/11 | 10.3.0.11 | SU-SCORE | SERVER, Limited |
| 0/12 | 10.0.0.12 | DTI-VMS | SERVER |
| 1/12 | 10.1.0.12 | DTI | SERVER, Limited |
| 0/13 | 10.0.0.13 | GUNTER-UNIX | SERVER, Limited |
| 2/13 | 10.2.0.13 | GUNTER-TAC | TAC |