Pre DNS naming

Roy Arends | ccNSO-Techday | October 2015

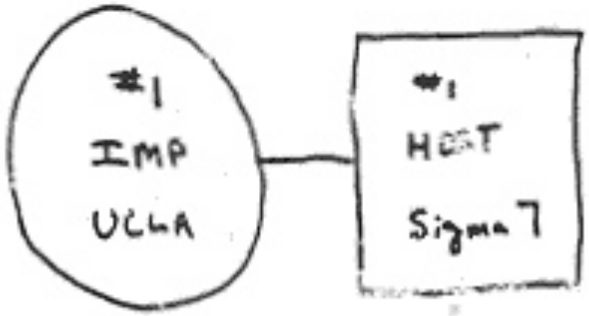
Who am I

- Principal Research Scientist
- Office of the CTO
- DNS, DNSSEC, Anti-Abuse, statistics

What is this about

- Finding the first hostname on the ‘early internet’
- Understanding how scaling issues lead to the DNS
- This was not an academic, scientific, in-depth research project.
- Digital Archeology at most.
- Does not take into consideration the early OSI, SNA or DECNET.

History of naming: 1969

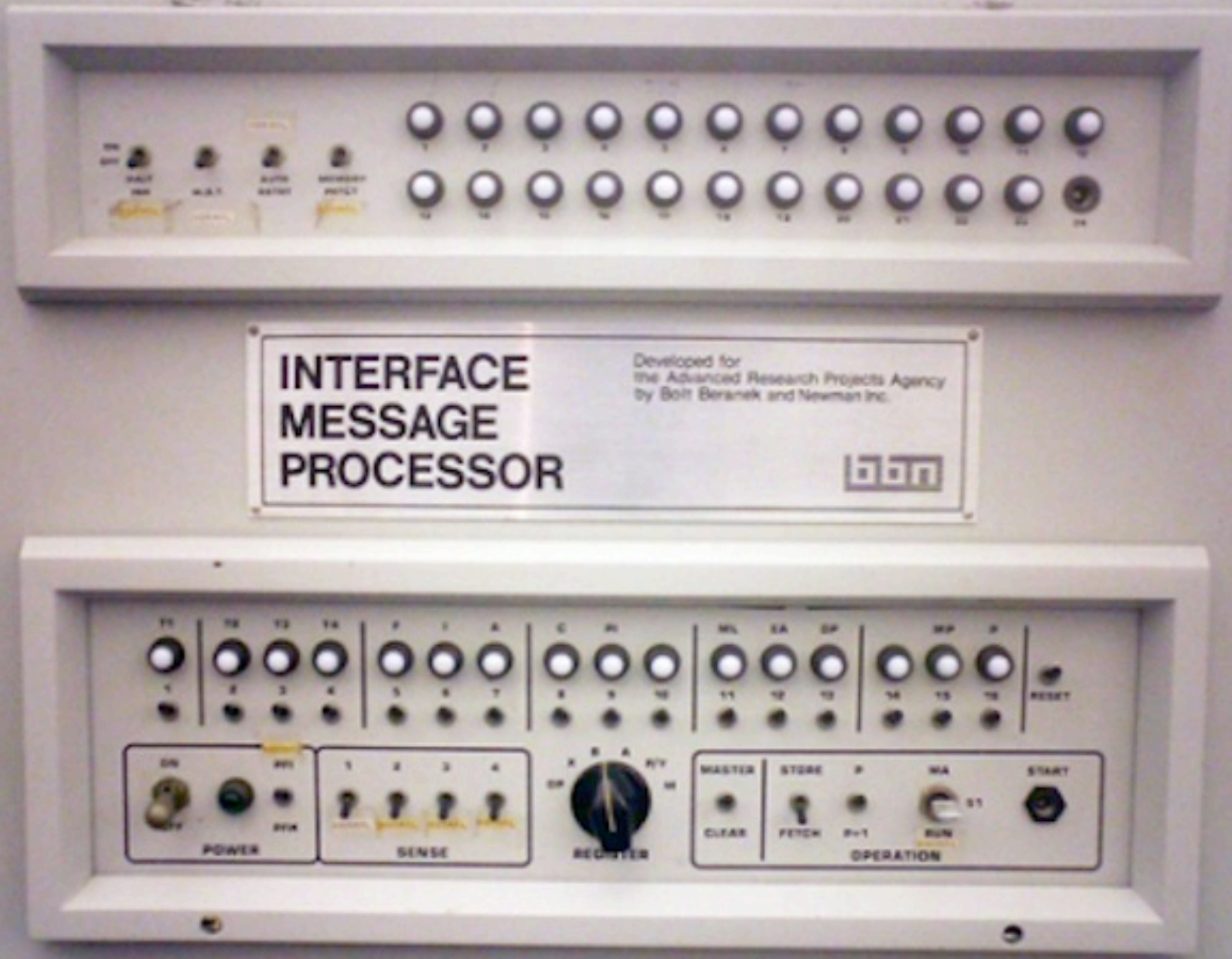


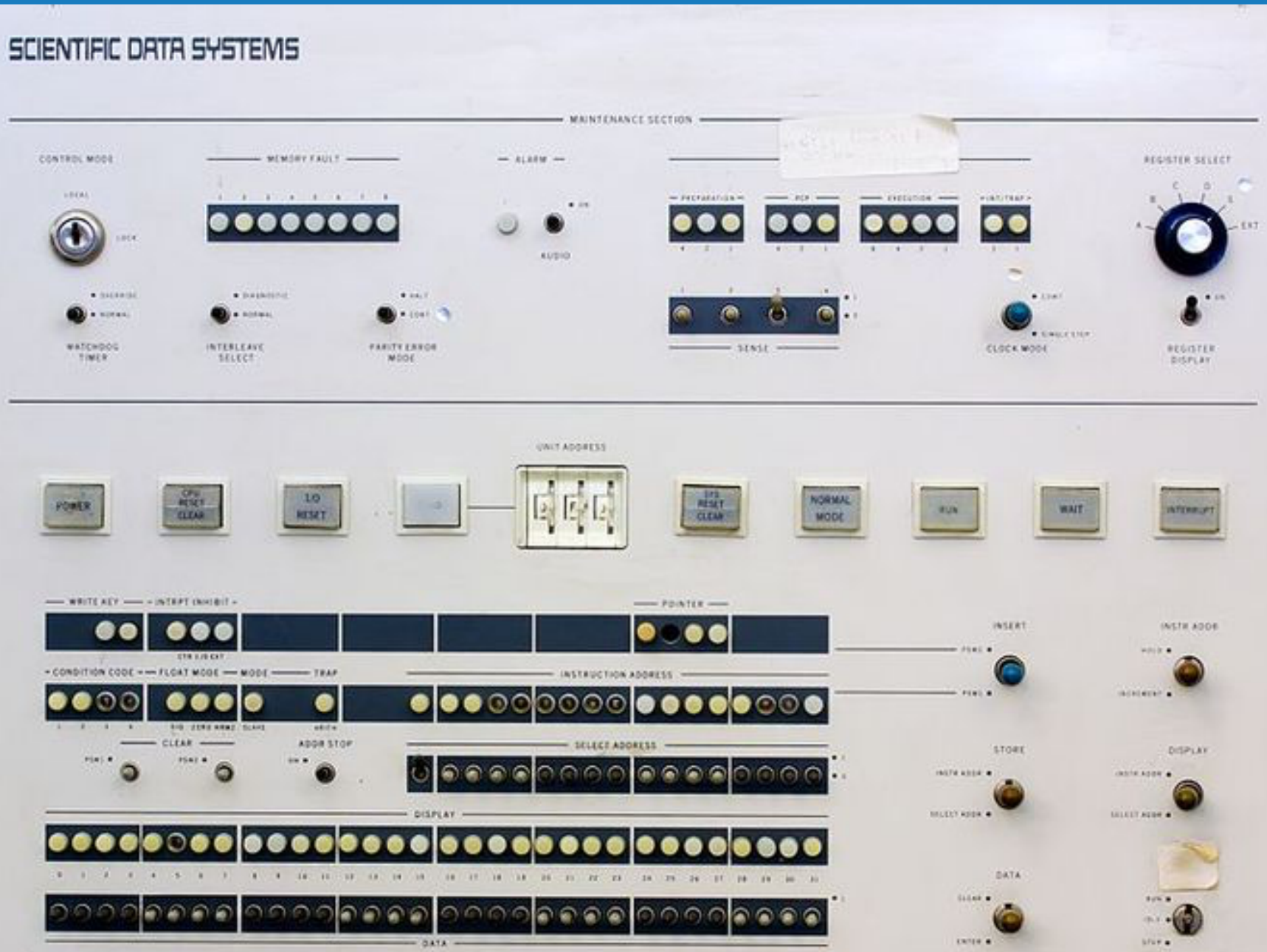
THE ARPA NETWORK

SEPT. 1969

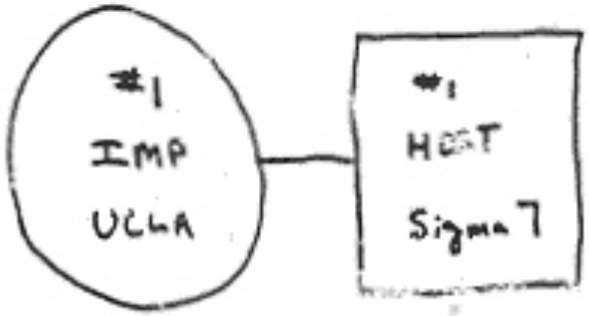
1 NODE

4


INTERFACE
MESSAGE
PROCESSOR
Developed for
the Advanced Research Projects Agency
by Bolt Beranek and Newman Inc.
POWER
SENSE
REGISTER
OPERATION
MASTER
CLEAR
STORE
FETCH
RUN
START
RESET


SCIENTIFIC DATA SYSTEMS
MAINTENANCE SECTION
CONTROL MODE
MEMORY FAULT
ALARM
AUDIO
REGISTER SELECT
WATCHDOG TIMER
INTERLEAVE SELECT
PARITY ERROR MODE
SENSE
CLOCK MODE
REGISTER DISPLAY
UNIT ADDRESS
POWER
CPU RESET CLEAR
I/O RESET
SYS RESET CLEAR
NORMAL MODE
RUN
WAIT
INTERRUPT
WRITE KEY
INTRPT (INHIBIT)
POINTER
CONDITION CODE
FLOAT MODE
MODE
TRAP
INSTRUCTION ADDRESS
CLEAR
ADDR STOP
SELECT ADDRESS
DISPLAY
DATA
INSERT
INSTR ADDR
STORE
DISPLAY
DATA

History of naming: 1969



THE ARPA NETWORK

SEPT. 1969

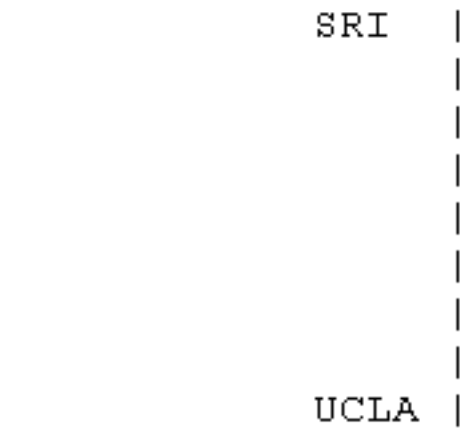
1 NODE

7

History of naming: 1969

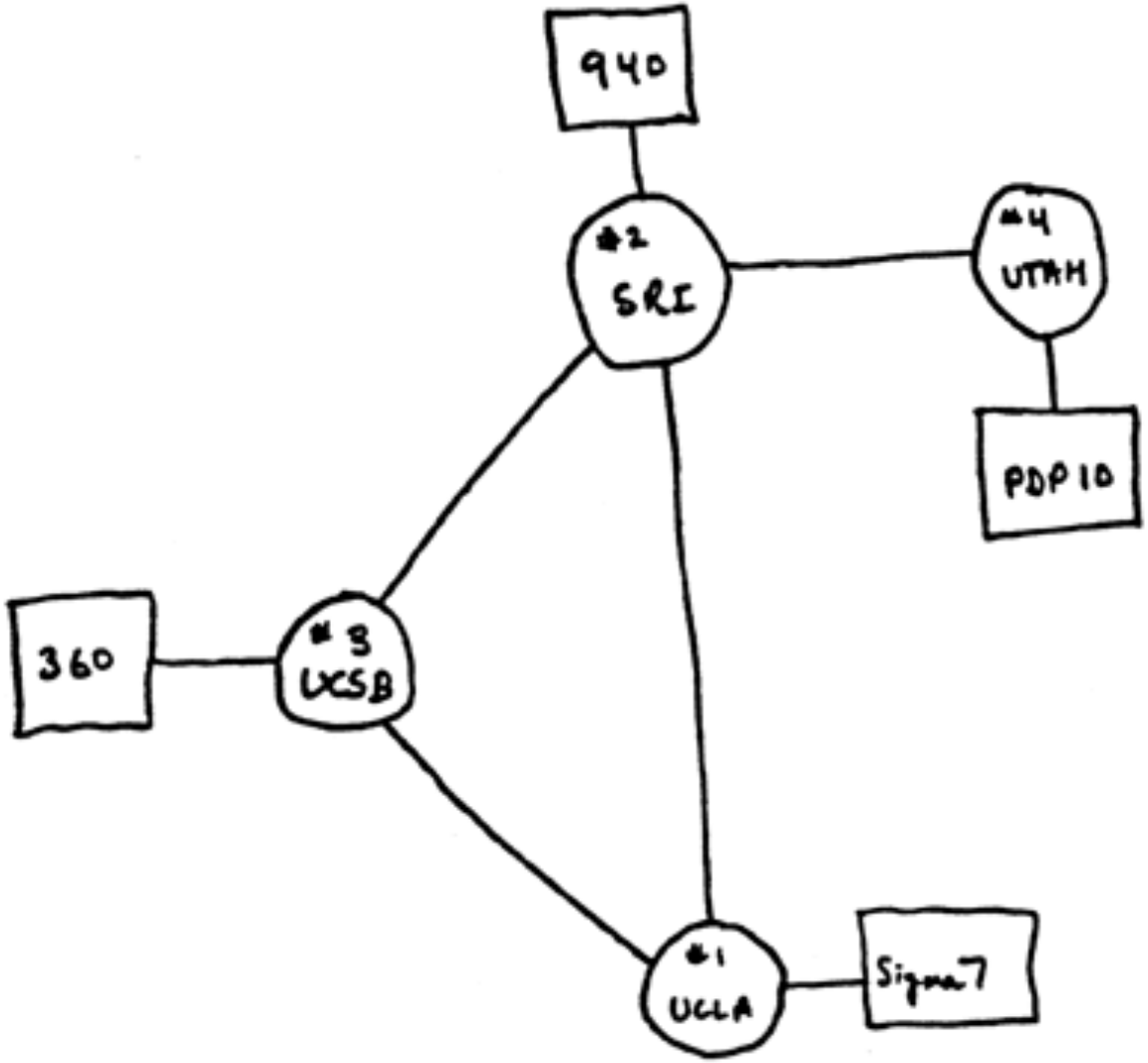
6 Test messages between UCLA-SRI 10/15/69

6a Network configuration

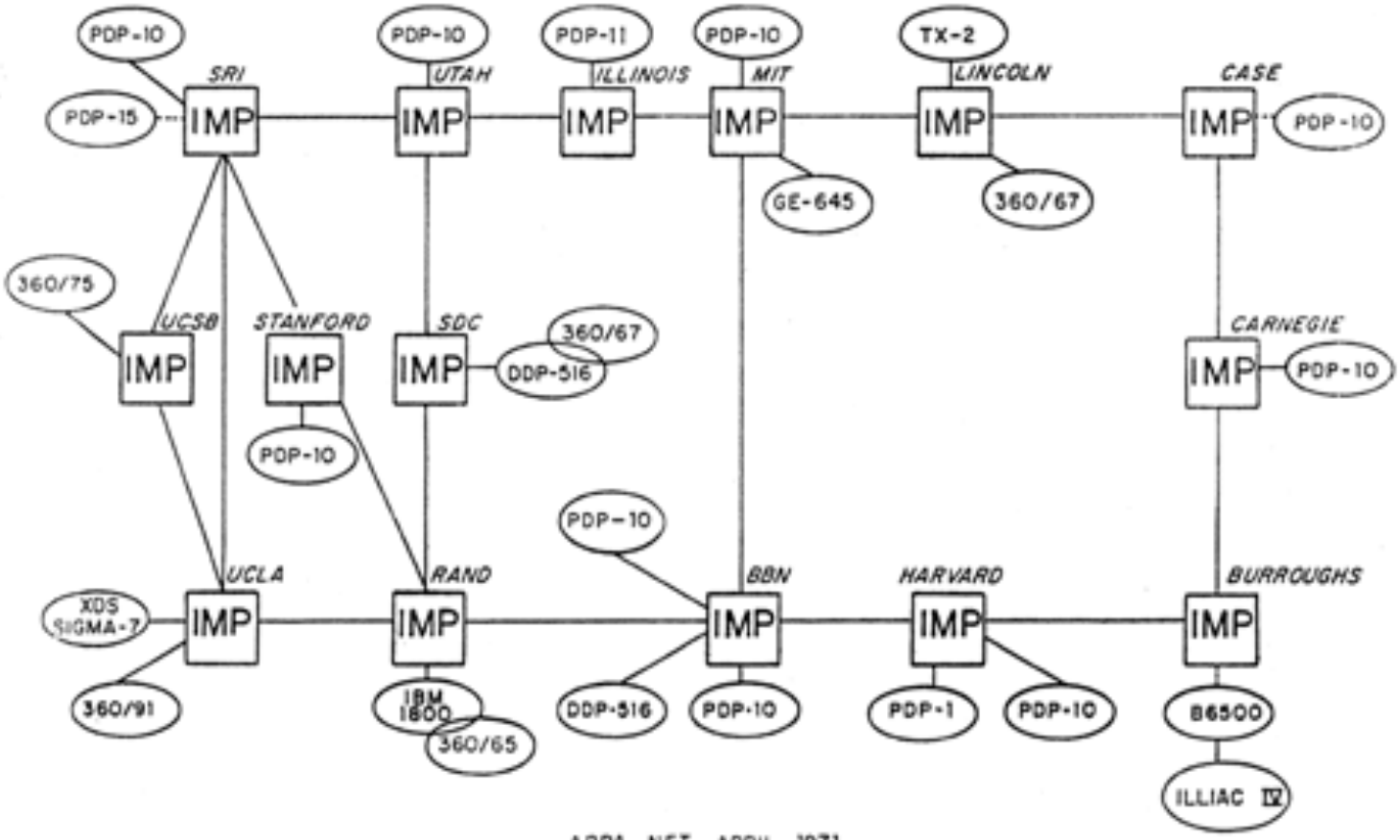


8

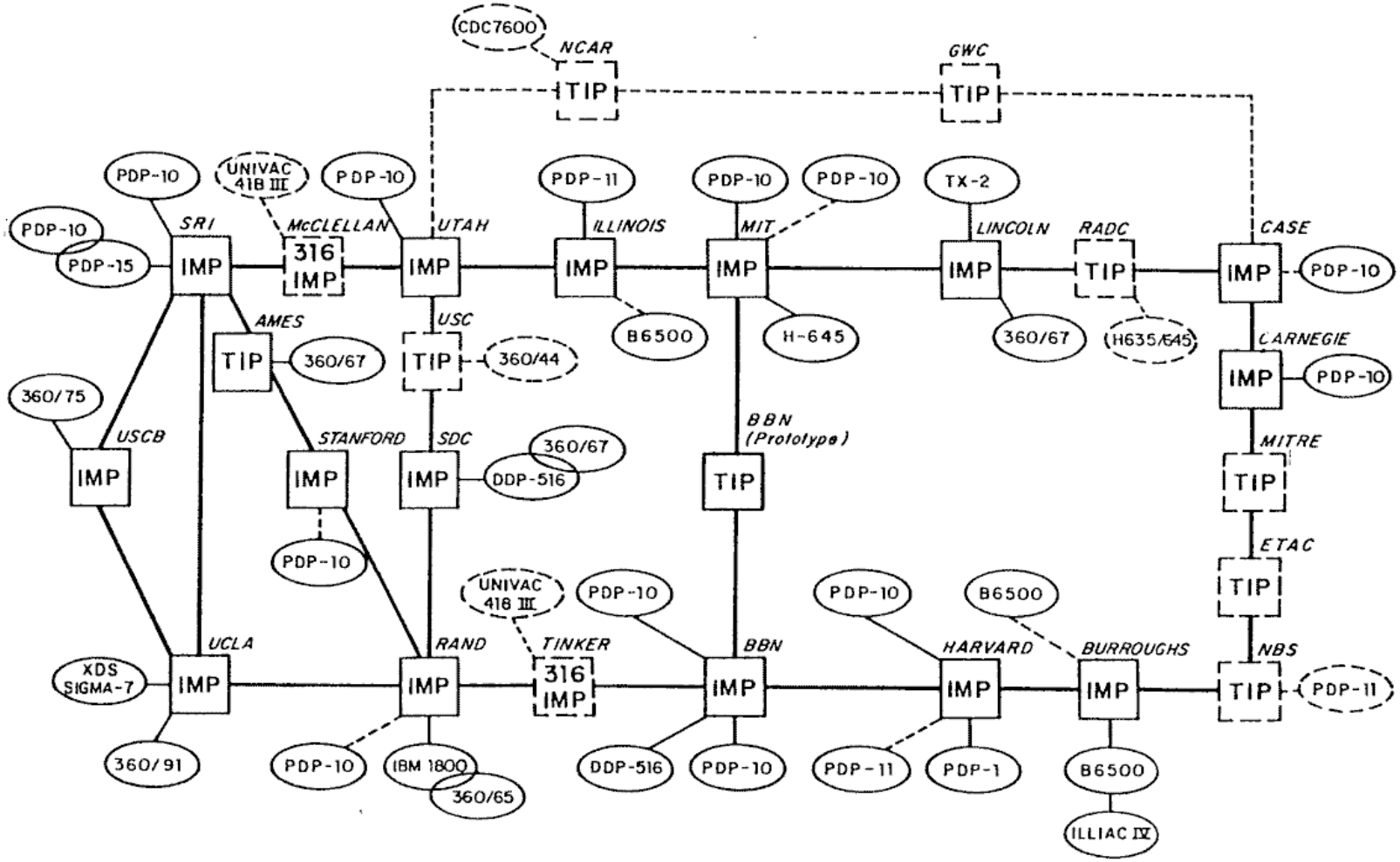
History of naming: 1969



History of Naming: 1971



History of Naming: 1971



ARPA NET, AUGUST 1971

History of Naming: 1971

Network Working Group
Request for Comments: 235
NIC: 7652
Obsoletes: None
Updates: None

E. Westheimer
BBN
September 27, 1971

SITE STATUS

Beginning with this RFC, BBN will report on the status of most Network Hosts approximately once every two weeks. The information for these reports will be gained from talking to people at each site, and from experimental "data". These data will be the results of daily attempts to log into each of the Hosts which might be accessible to a Network user; the attempts will have been made from the BBN prototype Terminal IMP at a random time each weekday.

History of Naming: 1971

NETWORK ADDRESS	SITE	COMPUTER	STATUS OR PREDICTION	CONTRACT
1	UCLA	SIGMA-7	Server	John Postel
65	UCLA	IBM-360	Remote Job Service now, Time-sharing in January	Steve Wolf
2	SRI(NIC)	PDP-10	October11	John Melvin
66	SRI(AI)	PDP-10	November	Len Chaiten
3	UCSB	IBM-360	Server	Jim White
4	UTAH	PDP-10	soon	Barry Wessler
5	BBN	DDP-516	NCC	Alex McKenzie
69	BBN	PDP-10	Server	Dan Murphy
6	MIT(Multics)	H-465	Soon	Mike Padlipsky
70	MIT(DM)	PDP-10	Server	Bob Bressler
7	RAND	IBM-360	User only	Eric Harslem
71	RAND	PDP-10	January	Eric Harslem
8	SDC	IBM-360	October 11	Bob Long
9	HARVARD	PDP-10	Soon	Bob Sundberg
73	HARVARD	PDP-1	User only	Bob Sundberg
10	LINCOLN	IBM-360	Soon	Joel Winnet
74	LINCOLN	TX2	Uncertain	Tom Barklow
11	STANFORD	PDP-10	November	Andy Moorer
12	ILLINOIS	PDP-11	User only	John Cravits

History of Naming: 1971

Network Working Group
Request for Comments: #229
NIC 7646
Categories: D.3
Related: #226
Obsoletes: None

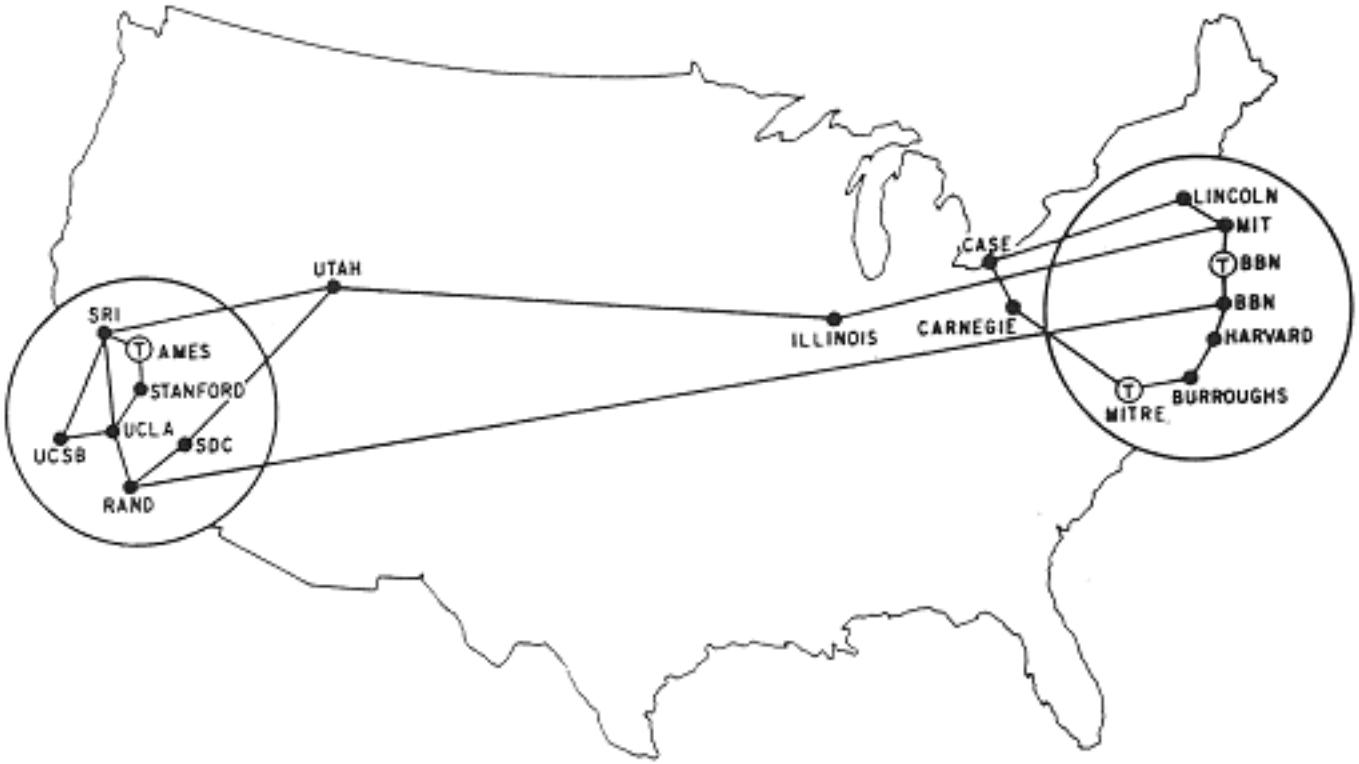
Jon Postel
UCLA-NMC
Computer Science
22 September 71

STANDARD HOST NAMES

I suggest 8 character names and the following list:

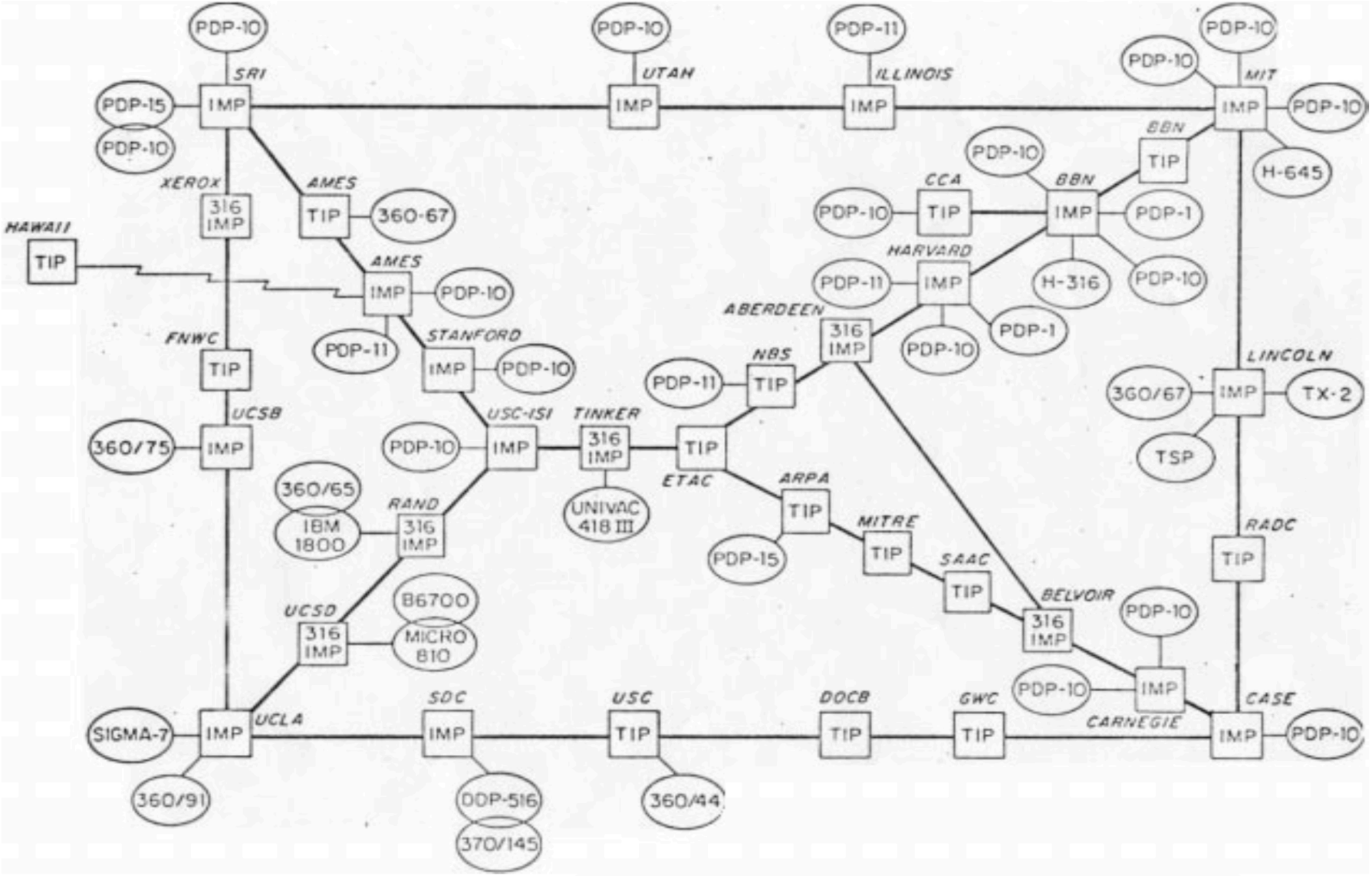
Site	Standard Name	Alternate Name
1	UCLA-NMC	SEX
65	UCLA-CCN	CCN
2	SRI-ARC	NIC
66	SRI-AI	
3	UCSB	
4	UTAH	
5	BBN-NCC	NCC
69	BBN-A	BBN

History of Naming: 1971

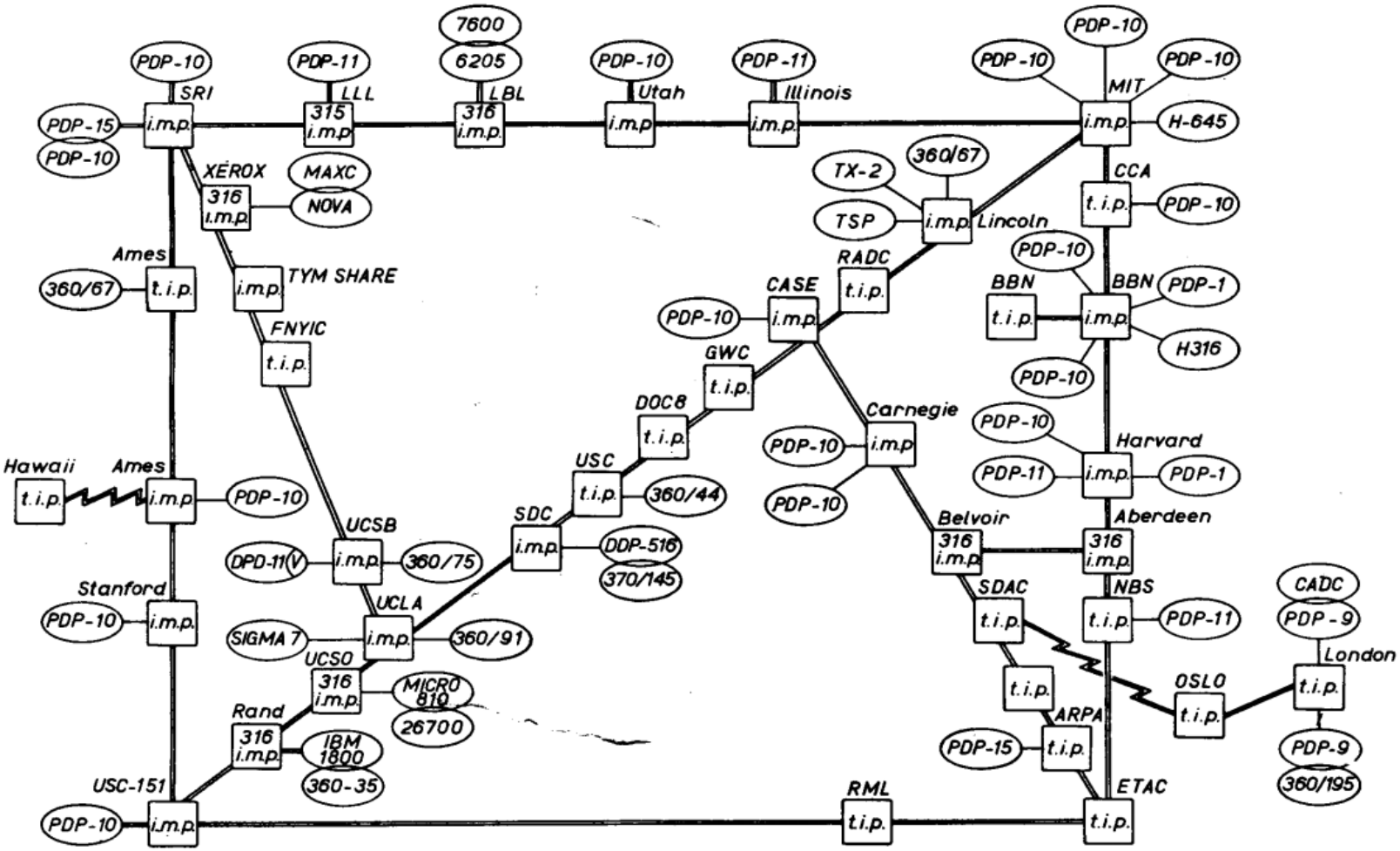


MAP 4 September 1971

History of Naming: 1972



History of naming: 1973



History of naming: 1973

Network Working Group
RFC # 601
NIC # 20905
Updates: RFC # 586

A. McKenzie
BBN-NET
14 December 1973

Traffic Statistics (November 1973)

Attached are the Host traffic statistics for the month of November 1973.

HOST THROUGHPUT SUMMARY
(PACKETS OUTPUT)

NOVEMBER 1973

		INTER-NODE	INTRA-NODE	TOTAL	AVG. DAILY INTERNODE	DAYS
UCLA	HOST 0	241273	30480	271753		
UCLA	HOST 1	1536918	56526	1593444		
UCLA	HOST 2	26253	4954	31207		
		1804444	91960	1896404	60148	30

History of naming: 1974

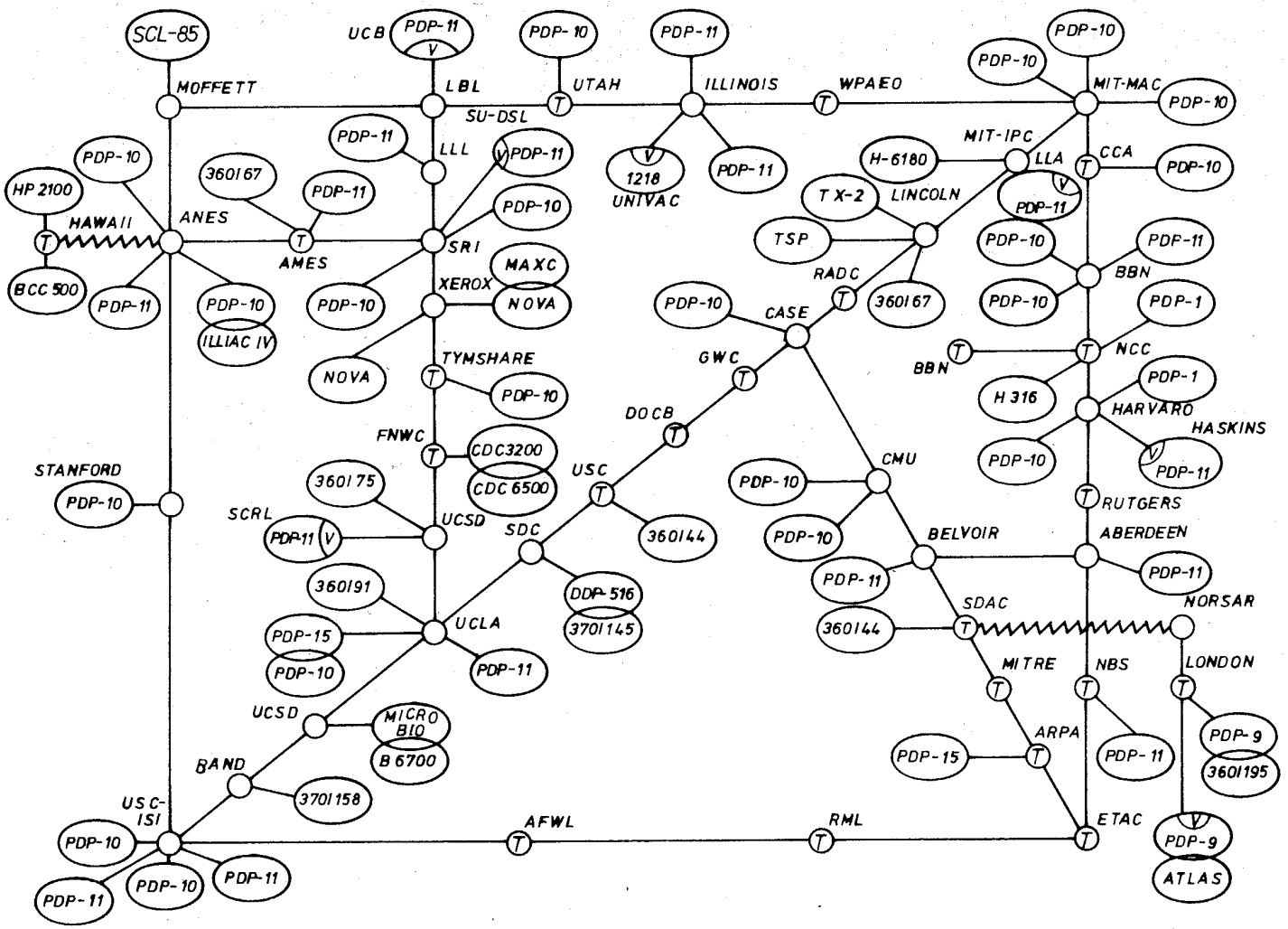


Abb. 4 ARPA NETwork, topologische Karte. Stand Juni 1974.

History of naming: 1973

- First scaling problems:
- 40 sites connected, 48 systems in total
- Each site maintained their own list of names
- … and sent them around

Netork Working Group
Request For Comments: 606

L. Peter Deutsch
PARC-MAXC
December 1973

Host Names On-line

Now that we finally have an official list of host names, it seems about time to put an end to the absurd situation where each site on the network must maintain a different, generally out-of-date, host list for the use of its own operating system or user programs.

Quick history of naming: 1973

- First Evolution of naming on the internet
- A centralized register of names
- Managed by SRI-NIC (Stanford Research Institute)
- Copies of the hosts file were made via FTP
  - Later through host name server, (port 101)
- SRI-NIC would receive IMP port info from BBN.
  - Contacts site for other info for the Host Table.
  - Makes sure names were unique.
  - Makes sure it met network guidelines.
  - Coordinated a list of Technical Liasons

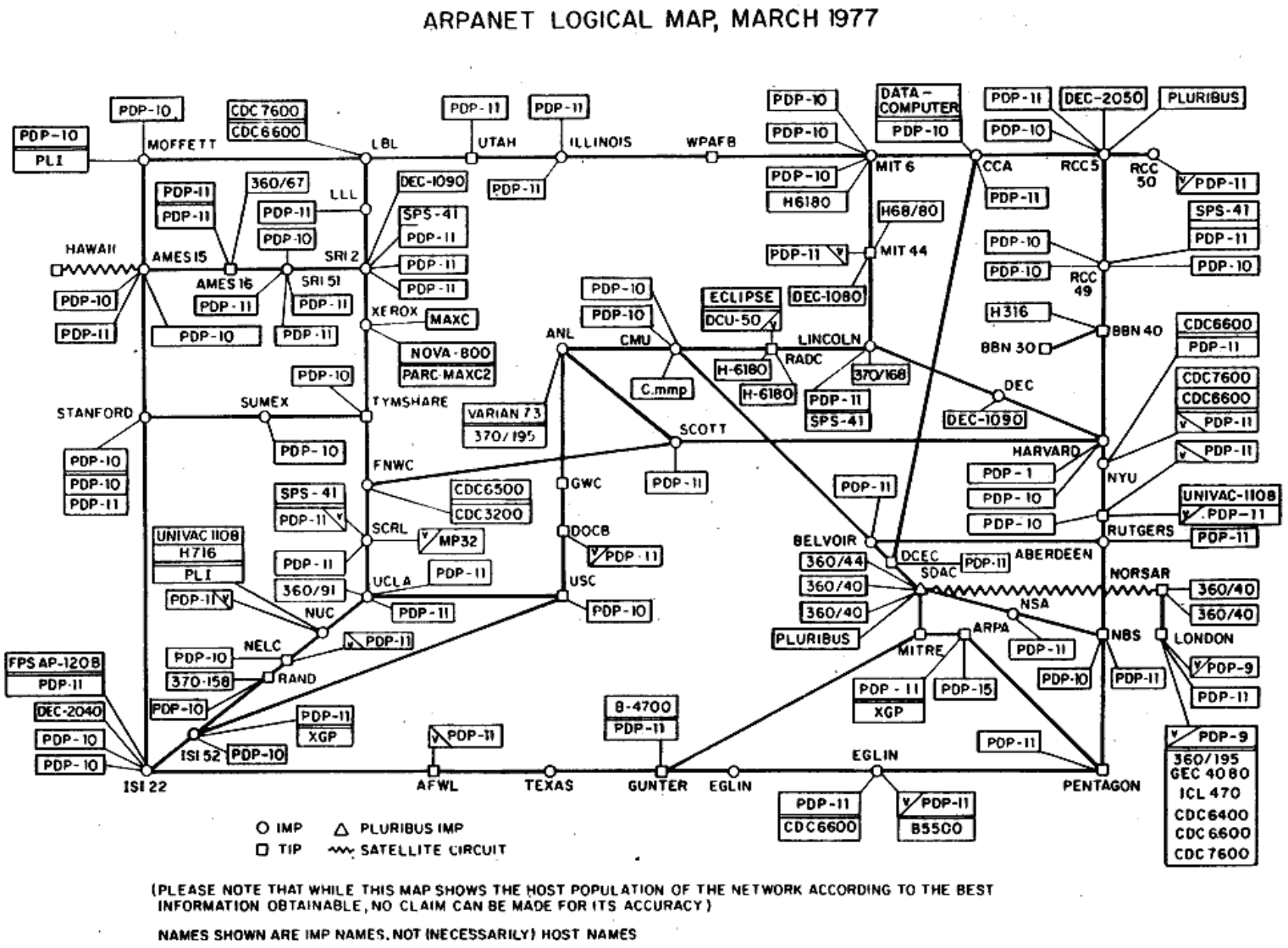
History of naming: 1974

HOST NAMES

HOSTNAME	HOST ADDR (Dec)	LIAISON	STATUS
AFWL-TIP	176	D Hyde (505)247-1711 x3803	TIP, Up 3-74
ALOHA-TIP	164	R Binder (808)948-7066	TIP
AMES-11	208	J Hart (415)965-5935	USER, up 12-73
AMES-67	16	W Hathaway (415)965-6033	SERVER
AMES-TIP	144	W Hathaway (415)965-6033	TIP
ANL	?	L Amiot (312)739-7711 x4309	SERVER, up 2-74
ARPA-DMS	28	S Crocker (202)694-5037	USER, Agency use only
ARPA-TIP	156	S Crocker (202)694-5037	TIP
BBN-11X	5	R Thomas (617)491-1850 x483	Peripheral processor for #69, up 12-73
BBN-1D	232	A McKenzie (617)491-1850 x441	USER

History of naming: (1966)

History of Naming: 1977

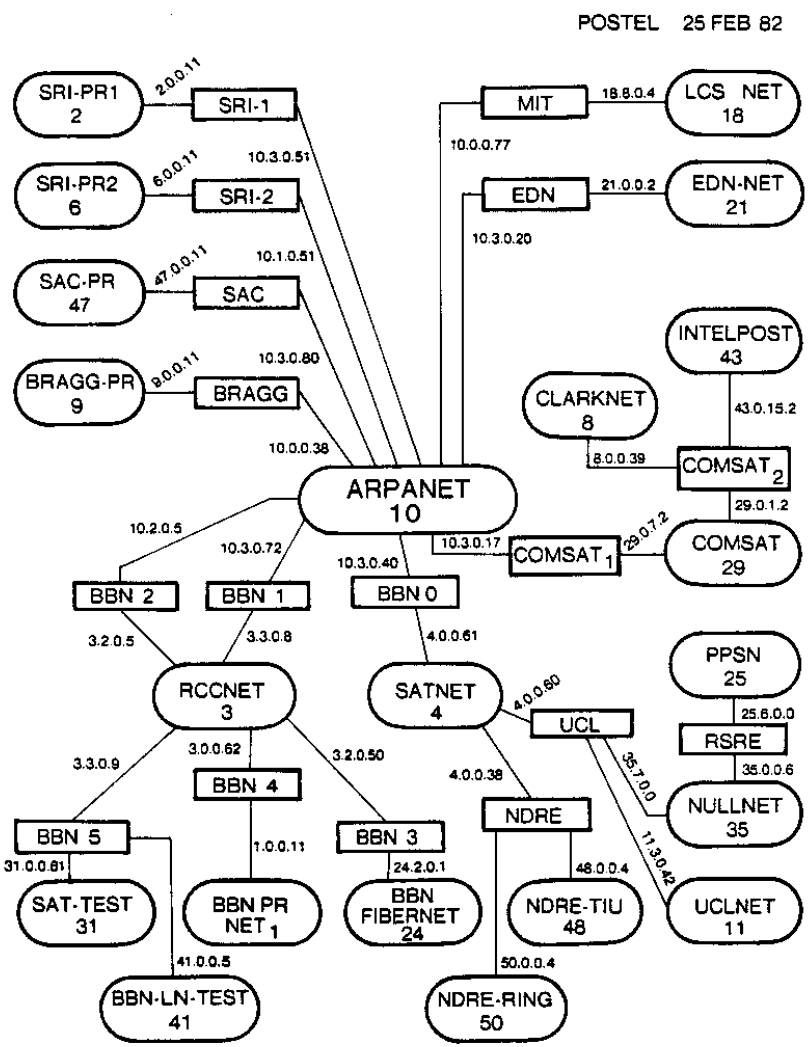


1	2	3	4	5	6	7	8	9	10	11
DEC69	4	2.00	1.33	2	---	--	---	----	----	----
JUN70	9	2.22	2.31	4	---	--	---	----	----	----
DEC70	13	2.46	2.76	6	---	--	---	----	----	----
SEP71	18	2.44	3.32	7	---	--	3.27%	2,892	3,121	6,013
MAR72	23	2.35	5.04	11	---	--	4.00%	11,633	21,073	32,706
AUG72	29	2.21	4.68	9	---	--	1.79%	682,502	287,953	970,455
SEP73	40	2.20	5.61	13	5.40	11	3.53%	2,893,130	742,746	3,635,876
JUN74	46	2.17	6.14	13	5.98	12	1.19%	3,125,955	1,513,777	4,639,732
JUL75	57	2.28	6.79	15	6.68	15	.67%	5,179,361	1,918,538	7,097,899
JUL76	58	2.45	5.26	11	5.13	10	.58%	6,627,968	1,961,726	8,589,694
JUL77	58	2.41	5.37	11	5.27	11	.94%	7,051,922	2,706,054	9,757,976

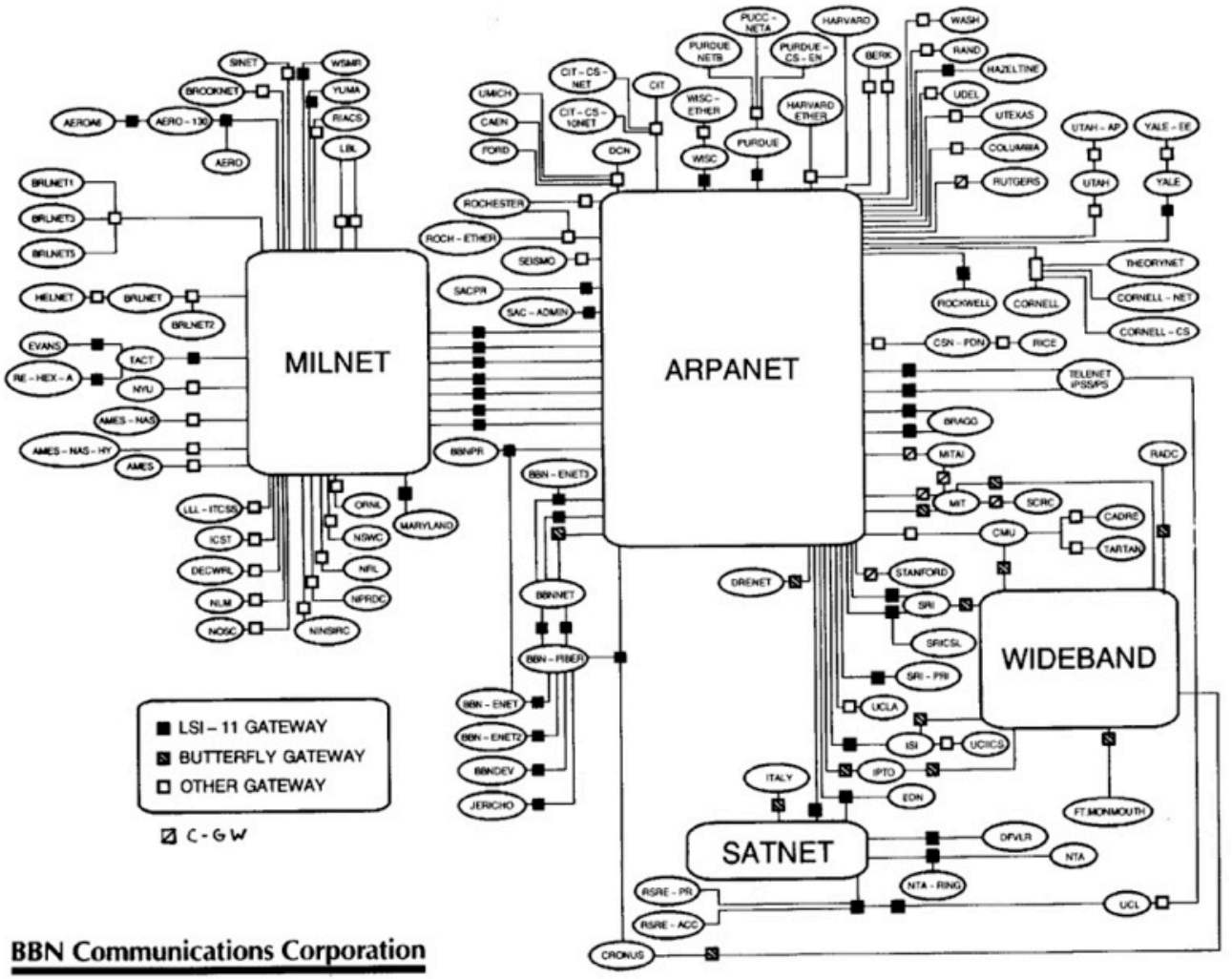
where the columns contain the following information:

Column 1: Date of Map
Column 2: Number of Nodes
Column 3: Average Connectivity
Column 4: Average Path Length
Column 5: Maximum Path Length
Column 6: Average Path Length, Minus HAWAII, NORSAR, LONDON
Column 7: Maximum Path Length, Minus HAWAII, NORSAR, LONDON
Column 8: Percentage of Node Unavailability
Column 9: Internode Throughput
Column 10: Intranode Throughput
Column 11: Sum of Internode and Intranode Throughput

History of naming: 1982



History of naming: 1985



History of naming: 1983

- More than 5500 Sites
- Centralized “flat” ASCII text file
- Hosts downloaded it from the NIC, first via FTP, and later via the NIC Name Server.
- The Hosts table itself was too large for small hosts to house in its entirety.
- Maintenance of a single Host Table had become cumbersome and inefficient, and did not serve the needs of the expanding internet.

Any Questions

roy.arends@icann.org