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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 we offer related to this project, 3) to report on our future plans, and 4) to ask for suggestions and improvements.

I. THE STATUS OF THE SURVEY PROGRAM

The SURVEY program is in operation again as many of you may have noticed. We are surveying at 20-minute intervals now (we were surveying at 15-minute intervals before). The SURVEY program attempts to do a complete ICP (initial connection protocol) to the LOGGER socket (socket 1) of each host listed in the survey table. We currently survey all the known "SERVER" Hosts on the ARPANET. It is easy for us to add and delete hosts from this table.

The previous version of the SURVEY program was aborting in the middle of ICP, but now we attempt to complete ICP (with a 5 second time-out for each of the connections after receiving the server socket number "S" on the ICP connection). This latter change was made as many HOSTs do not provide for either time-outs or queuing of the NCP commands (RFC's). Consequently, incomplete ICPs were tying up HOST connection resources. Please let me know if our 5-second time-out is too small and if you are encountering problems with SURVEY.

The survey program records date, time, status, and response time for each host (the response time is currently averaged, and date and time are only recorded for the first survey in a block of 96 surveys). We are in the process of modifying the SURVEY recording procedures to record all the data for each individual survey test in a standard ASCII format suitable for transmission to the DATACOMPUTER (CCA) where we are storing the SURVEY data. This database at the CCA-DATACOMPUTER is accessible via programs in our MUDDLE subsystem. A future memo will explain the use of the DATACOMPUTER database and facilities to access it.

The response time measurement is the time taken to establish the full-duplex TELNET connections. It is not the time taken to get the prompt message, or logging in. The latter measures of response time are more meaningful to the user but our measure for response time represents a lower bound for the "true" response

time. It should be noted that our response time measuring procedure has altered slightly (previously we were measuring the time taken to get the server socket number "S" on the ICP connection). It should also be noted that the response time measurement is valid only when the Host state is "logger available".

II. NETWORK STATUS SERVICE ON SOCKET 15

We offer a network status service on socket 15 (decimal) for communicating the results of the "last" or the most recent survey. To use this service, just ICP to HOST 70 socket 15. The SURGIV program will transmit data in the following format:

```
month,day,year,hours,minutes
host,status,response-time
host,status,response-time
.........
-1
```

An example of the data transmitted is given below:

```
@connection to host dmcg socket 15
completed.
06,05,1973,14,44
001,5,013
002,5,031
003,1,200
004,5,015
006,5,011
007,3,200
008,1,200
009,5,002
010,3,200
011,5,003
013,5,016
014,5,002
015,5,014
016,5,031
023,5,011
031,1,200
032,5,014
035,5,015
065,5,008
066,5,010
069,5,020
070,5,009
074,5,011
078,5,002
086,3,200
```

```
133,1,200
134,5,006
138,4,200
198,5,007
-1
    CONNECTIONS ABORTED
CLOSED BY FOREIGN HOST
```

The Host number is in decimal, the response time is in tenths of seconds, and the status code is as described below:

Code 5 - ICP to socket 1 successfully completed, logger available.
Code 4 - ICP timed-out (20 seconds), logger not responding.
Code 3 - ICP aborted by foreign Host, logger rejecting.
Code 2 - No reset response from foreign Host, (15 sec time-out) NCP not responding.
Code 1 - Foreign host DEAD status returned by IMP Host dead or disconnected.
Code 0 - Not surveyed or undetermined.

All transmission is in standard 8-bit network ASCII bytes. A response time of 200 (20 seconds) is sent for all other status except 5 (logger available). The entire survey data is for the time recorded on the first line (the survey usually takes only a couple of minutes), and should be good to within 20 minutes (10 minutes average).

The above service is designed more for use by programs but can also be used directly by human users. Other hosts on the ARPANET may periodically collect the survey information from us and store and display the information as they please. They can also display to their user's the latest host availability information without actually doing the survey themselves.

III. ACCESSING SURVEY DATA VIA THE "NETWRK" PROGRAM

To use the NETWRK program connect to (via ICP) socket 1 of host 70 (i.e., login), and login by typing "login <host no>initials CR" (e.g., login 70akb <CR>). After you are logged in and receive the ";" prompt, invoke NETWRK by typing "NETWRK <CR>" (<CR> = Carriage Return). You will get the message "Network commands available, and the "@" prompt from CALICO NETWRK. Now type any of the following commands and expect to receive type-out of the form shown below:

(comments are in parenthesis)

1. DISPLAYING THE RESULTS OF THE "LAST" SURVEY

```
@SURVey          (you type "surv <CR>")
SURVEY TAKEN AT 14:44:51 ON 06/05/73

---HOST--- ---#--- ----STATUS------
           OCT DEC
ucla-nmc     1 001 Logger available
sri-arc      2 002 Logger available
ucsb-mod75 003 003 Host disconnected
utah-10      4 004 Logger available
mit-multic 006 006 Logger available
rand-rcc     7 007 Logger not responding
sdc-adept   10 008 Host disconnected
harv-10     11 009 Logger available
ll-67       12 010 Logger not responding
su-ai       13 011 Logger available
case-10     15 013 Logger available
cmu-cc      16 014 Logger available
illiac      17 015 Logger available
ames-67     20 016 Logger available
usc-44      27 023 Logger available
cca         37 031 Host disconnected
parc-maxc   40 032 Logger available
ucsd-cc     43 035 Logger available
ucla-ccn   101 065 Logger available
sri-ai     102 066 Logger available
bbn-tenexa 105 069 Logger available
mit-dmcg   106 070 Logger available
ll-tx2     112 074 Logger available
cmu-10alt  116 078 Logger available
usc-isi    126 086 Logger not responding
bbn-tenexb 205 133 Host disconnected
mit-ai     206 134 Logger available
ll-tsp     212 138 Logger rejecting
mit-ml     306 198 Logger available
```

2. DISPLAYING THE CURRENT SUMMARY

```
@SUMmary.of.surveys     (you type SUM <CR>)

14 Surveys from 10:23:37 on 06/05/73 to 14:44:51 on 06/05/73
---HOST--- ---#--- -%-UP- -RESP-
           OCT DEC
ucla-nmc   001 001   093%   01.25
sri-arc    002 002   079%   02.37
ucsb-mod75 003 003   029%   00.67
utah-10    004 004   079%   01.43
mit-multic 006 006   100%   01.10
rand-rcc   007 007   000%   00.00
```

```
sdc-adept   010 008   000%    00.00
harv-10     011 009   100%    00.19
ll-67       012 010   007%    16.17
su-ai       013 011   100%    00.34
case-10     015 013   100%    01.53
cmu-cc      016 014   093%    00.22
illiac      017 015   071%    01.34
ames-67     020 016   079%    02.39
usc-44      027 023   057%    00.97
cca         037 031   029%    02.15
parc-maxc   040 032   100%    01.34
ucsd-cc     043 035   071%    01.57
ucla-ccn    101 085   093%    00.85
sri-ai      102 086   093%    00.99
bbn-tenexa  105 089   100%    01.92
mit-dmcg    106 070   100%    00.38 *
ll-tx2      112 074   079%    01.08
cmu-10alt   116 078   086%    00.24
usc-isi     126 086   043%    11.82
bbn-tenexb  205 133   000%    00.00
mit-ai      206 134   100%    00.63
ll-tsp      212 138   000%    00.00
mit-ml      306 198   100%    00.67
```

*MIT-DMCG was really up 100% as it completed 14 surveys at 20 minute intervals between 1023 and 1444.

3. DISPLAYING THE LONGTERM SUMMARY

@LONGterm.SUMmary.of.surveys (you type "long<SP>sum<SP>")

```
23232 Surveys from 19:48:24 on 04/27/72 to 10:03:32 on 06/05/73
---HOST---  ---#---  -%-UP-  -RESP-
            OCT DEC
ucla-nmc    001 001   075%    01.06
sri-arc     002 002   069%    01.70
ucsb-mod75  003 003   056%    00.69
utah-10     004 004   071%    02.02
bbn-ncc     005 005   000%    00.00
mit-multic  006 006   065%    04.52
rand-rcc    007 007   000%    00.30
sdc-adept   010 008   006%    01.67
harv-10     011 009   068%    00.17
ll-67       012 010   016%    04.99
su-ai       013 011   076%    00.41
case-10     015 013   039%    00.75
cmu-cc      016 014   075%    00.20
illiac      017 015   050%    02.95
```

ames-67	020	016	045%	01.51	
radc-645	022	018	000%	00.00	
nbs-ccst	023	019	000%	00.02	
usc-44	027	023	019%	00.36	
cca	037	031	030%	01.13	
parc-maxc	040	032	001%	01.34	
ucsd-cc	043	035	015%	02.14	(also add results of Host 129)
ucla-ccn	101	065	081%	00.32	
sri-ai	102	066	010%	00.94	
bbn-tenexa	105	069	073%	01.13	
mit-dmcg	106	070	096%	01.05	(real UP time is about 80%)
rand-csg	107	071	023%	01.82	(later changed to usc-isi)
ll-tx2	112	074	000%	00.91	
cmu-10alt	116	078	035%	00.20	
usc-isi	126	086	030%	01.00	(previously Rand-CSG)
????????	201	129	008%	02.01	(the old UCSD-CC Host)
bbn-tenexb	205	133	019%	01.56	
mit-ai	206	134	084%	00.82	
ll-tsp	212	138	000%	00.08	
mit-ml	300	198	073%	00.73	

4. DISPLAYING THE CURRENT HISTORY OF A HOST

@HISTory of NIC (you type "hist<SP>nic<CR>")
(You may use any acceptable host name or number)

14 Surveys taken beginning 10:23:37 on 06/05/73

Test #01 LOGGER available
Test #02 LOGGER available
Test #03 LOGGER available
Test #04 LOGGER available
Test #05 LOGGER not responding
Test #06 Host dead
Test #07 Host dead
Test #08 LOGGER available
Test #09 LOGGER available
Test #10 LOGGER available
Test #11 LOGGER available
Test #12 LOGGER available
Test #13 Not surveyed
Test #14 LOGGER available

Last survey at 14:44:51 on 06/05/73

5. DISPLAYING LONGTERM HISTORY OF A HOST

@LONGterm.HISTory of NIC (you type "long<SP>hist<SP>nic<CR>")
(You may use any other acceptable host name or number)

```
23232 Surveys taken beginning 19:48:24 on 04/27/72

    Undetermined 0 times (  0%)
    Host dead 5715 times ( 25%)
    NCP not responding 0 times (  0%)
    LOGGER rejecting 1546 times (  7%)
    LOGGER not responding 5 times (  0%)
    LOGGER available 15964 times ( 69%)
        Average response time =  1.70 seconds

Last survey at 10:03:32 on 06/05/73
```

6. DISPLAYING THE ACCEPTABLE HOST NAMES

```
@HOSTS          (to display the acceptable host names)

---#--- --------- HOSTS ---------
DEC OCT STANDARD NAME  NICK-NAMES
001 001  ucla-nmc      sex-ucla
002 002  sri-arc       nic
003 003  ucsb-mod75
004 004  utah-10
005 005  bbn-ncc
006 006  mit-multics   multics
007 007  rand-rcc
008 010  sdc-adept
009 011  harv-10       harvard
010 012  11-67
011 013  su-ai         sail
012 014  ill-ants
013 015  case-10
014 016  cmu-cc        cmu
015 017  illiac        i4
016 020  ames-67
017 021  mitre
018 022  radc-645
019 023  nbs-ccst
020 024  etac
021 025  tink-418
022 026  mccl-418
023 027  usc-44
024 030  gwc
025 031  noaa-7600
026 032  saac
027 033  amec
028 034  arpa
029 035  aberdeen
030 036  bbn-tip
031 037  cca
032 040  parc-maxc
```

033	041	fnwc		
034	042	lbl		
035	043	ucsd-cc		
065	101	ucla-ccn	ccn-ucla	
066	102	sri-ai		
069	105	bbn-tenexa	bbn	tenex
070	106	mit-dmcg	dmcg	its
071	107	rand-csg		
073	111	harv-1		
074	112	ll-tx2		
078	116	cmu-10alt		
079	117	ames		
086	126	usc-isi	isi	
096	140	parc-vts		
133	205	bbn-tenexb		
134	206	mit-ai	ai	
137	211	harv-11		
138	212	ll-tsp		
197	305	bbn-1d		
198	306	mit-ml	ml	

THE FOLLOWING HOSTS ARE TERMINAL IMPS:

144	220	ames-tip
145	221	mitre-tip
146	222	radc-tip
147	223	nbs-tip
148	224	etac-tip
151	227	usc-tip
152	230	gwc-tip
153	231	docb-tip
154	232	saac-tip
155	233	belvoir
156	234	arpa-tip
158	236	bbn-testip
159	237	cca-tip
163	243	aloha-tip

IV. FUTURE SERVICES

We will maintain a CURRENT database at the DATACOMPUTER (CCA) by transfering the survey information to the DATACOMPUTER as soon as possible, i.e., every 20 minutes whenever the DATACOMPUTER is in operation. So it should be possible for other network users to write their own query programs in DATALANGUAGE. We will provide one such querry facility in our MUDDLE subsystem. We do have an existing database of survey data at the DATACOMPUTER, and also programs exist in MUDDLE to access this database. As soon as the use and format of the data at the DATACOMPUTER database is

stabilized we will publish a memo on how to use the database and facilities to access it.

If it is considered desirable by network users and ARPA, we will provide specialized services to display survey data on specific sockets, and/or via commands in NETWRK and MUDDLE. An example of such specialized services is to display a week's or a month's Host availability profile.

V. REQUEST FOR COMMENTS AND SUGGESTIONS

As mentioned in NWG/RFC #523 (NIC #17048, "SURVEY is in Operation Again") if you desire a change in the list of sites we survey, please call me at 617-253-1428 or send mail to akb@mit-dmcg or at NIC (ident= akb). Please let mee know if survey is inconveniencing anyone, we will try our best to resolve any problems.

Your comments and suggestions are invited for improvements in the way we collect, store, retrieve, and display data. For example, should we measure the response time for actually getting some data on the TELNET connection, should we start surveying FTP socket 3 as well (perhaps less often), should we try to actually login (only occassionally at random) and collect statistics on system loading, time taken to login etc., and what services we should provide in addition to those mentioned above.