DVN 14-FEB-74 08:25 21901

HELP's Good Showing

When we were linked yesterday I think I neglected to mention HELP's good showing. There was a lot of talk in the Mon-Tues review of how hard NLS is to learn etc. and of the more general needs of the net and the MSI for "technology transfer". Charles demonstrated the HELP system. He was running on a terminal with souped-up allocation of CPU and by the grace of the data spirits hit no holes. It ran very well and the vsiitors were quite impressed. "If we hadn't had it we would have been in trouble." quoth Charles. People seemed grateful for the work you and Kirk and Harvey and I etc had done. 1

DVN 14-FEB-74 08:25 21901

HELP's Good Showing

(J21901) 14-FEB-74 08:25; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /JMB HGL(fyi) KIRK(fyi); Sub-Collections: SRI-ARC; Clerk: DVN;

PR 14-FEB-74 09:20 21902

Some Issues to be brought up at the forthcoming Tenex meeting

I would like to discuss these issues before the WDC meeting takes place.

PR 14-FEB-74 09:20 21902

Some Issues to be brought up at the forthcoming Tenex meeting

THE FORTHCOMING TENEX MEETING AT ARPA 1

From Analysis' point of view it is important that the following issues be brought up at the TENEX meeting in Washington. I would like to discuss them with those who are going to attend that meeting. 2

- the possibility to put superwatch in tenex and have it maintained by BB&n, 2a

- the account files do not give us the same statistics as superwatch and we suspect that there are some bugs in it, 2b

  See SRL who has checked both statistics. 2b1

- if the group allocation is put on tenex, then I would like to see the following additional control features inserted into it: 2c

  - a data collection for the group account system 2c1

  - an empty group for controlling the load average, 2c2

    off-quota users could be logged out whenever the moving load average becomes too high 2c2a

    but if load is too low then additional users could be allowed in as off-quota user on that slot's allocation 2c2b

  - a contingency mechanism that would suspend temporarily some users whenever the load becomes excessive. 2c3

    It is less annoying to be told that one gets suspended for N minutes rather than have to wait and hope for the best. 2c3a

  - a queueing mechanism for elog or NICLOG 2c4

    when the elog slots are busy a hold system seems desirable 2c4a

  - a reservation system for predetermined scheduling 2c5

PR 14-FEB-74 09:20 21902

Some Issues to be brought up at the forthcoming Tenex meeting

(J21902) 14-FEB-74 09:20; Title: Author(s): Paul Rech/PR;
Distribution: /JCN RWW MDK CHI DCE SRL WRF; Sub-Collections: SRI-ARC;
Clerk: PR;
Origin: <RECH>TENEX.NLS;2, 14-FEB-74 09:14 PR ;

PR 14-FEB-74 09:30 21903

Review of some Analysis Issues for the ARC/IPTO Meeting.

Just for the record.

REVIEW OF ANALYSIS ISSUES
(ARC/IPTO review meeting Feb 11, 1974)

1

THE ARC ANALYSIS FUNCTION 2

Background 2a

The evolutionary system development concept. 2a1

Augmented Knowledge Workshop (AKW) as an experimental information laboratory. 2a2

Scope and Objectives 2b

The ARC Analysis function has the following objectives: 2b1

1) To provide analytical support for all aspects of ARC's Operations and Development activities. 2b2

- timesharing operations, 2b2a
- NLS environment, 2b2b
- user feedback and behavioral aspects of user interface 2b2c
- experimental applications 2b2d
- NLS Utility. 2b2e
- the NIC 2b2f

2) Analysis of User Needs and Evaluation of Potential Application Areas. The following are a few examples: 2b3

- offices, 2b3a
- knowledge workshops 2b3b
- geographically distributed communities, 2b3c
- information networks, 2b3d
- planning activities. 2b3e
- information management 2b3f
- project management and control 2b3g

- management sciences . 2b3h

3) Evaluation of the Utility or Potential Utility of User Subsystems.A few examples are: 2b4

- the journal system (DSS). 2b4a

- the documentation production and control system (DPCS). 2b4b

- a personal information management systems. 2b4c

- a project management - 2b4d

- an SDI system system. 2b4e

- a message system 2b4f

4) Development of the methodology and tools for the experimental study of information handling processes. 2b5

In particular, design and development of a real time data collection system, a set of special purpose data reduction programs, and much better procedures for analyzing information handling processes. 2b5a

5) Active cooperation with other analysis staffs throughout the MST community. 2b6

Organizational Issues 2c

Analysis must be independent from Operations and Development if it is to play effectively its evolutionary role. 2c1

A minimal amount of activities is required to give the proper momentum to the Analysis function. 2c2

The Analysis team must be interdisciplinary. 2c3

Growth Problems 2d

Presently, only two professionals are involved full time in the ARC Analysis function. 2d1

So far, the primary objectives have been 2d2

- to conduct some urgently needed analyses and
- to build the foundations for future ARC analysis activities. 2d2a

Review of some Analysis Issues for the ARC/IPTO Meeting.

PR 14-FEB-74 09:30 21903

Review of some Analysis Issues for the ARC/IPTO Meeting.

(J21903) 14-FEB-74 09:30; Title: Author(s): Paul Rech/PR;
Distribution: /SRL DCE RWW; Sub-Collections: SRI-ARC; Clerk: PR;
Origin: <RECH>AGENDA.NLS;12, 14-FEB-74 09:25 PR ;

DVN 14-FEB-74 10:44 21904

Pleas Print the User Guide Again

We have foolishly lost the originals from which we printed the TNLS User Guide. Marcia needs new ones. I think it would be easiest for you to do since I can't come in at night this week. DDo you know the procddure for putting a name on a print file? If not it goes like this: When it askks whether to print or put in a name, put in an informative file nmae, e.g. <printer>ForMarcia.txt; Then copy that file name to LPT Let me know if you have problems...thanks.: 1

DVN 14-FEB-74 10:44 21904

Pleas Print the User Guide Again

(J21904) 14-FEB-74 10:44; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /JMB MLK(fyi); Sub-Collections: SRI-ARC; Clerk: DVN;

DHC 14-FEB-74 13:06 21946

Revision to Pathname proposal
cc: postel, cerf, crocker, dcrocker, neigus at BBN, white at NIC -
- - -

Several of you have sent some comments that pointed out serious weakness to my original suggestion. 1

1. NVP is taken by speeck people. And I'm not really proposing a "virtual" thing. 1a

2. The syntax doesn't provide for growth (new nets, etc.) 1b

3. Pathname string length and character set is not adequately defined. 1c

So the following looks better (?): 2

1. Network Standard Data Path 2a

2. BNF of syntax: 2b

<NSDPS> ::= <field. / <field> <NSDPS> 2b1

<field> ::= <key> <delim> <name> <delim> 2b2

<key> ::= Host / Peripheral / Directory / File / Type / Siteparm 2b3

<delim> ::= first char after <key>; may not be in the next <name> field. (i.e., standard delimeter use) 2b4

<name> ::= any chars acceptible to object site. 2b5

3. I'm not sure what to use as a terminator. We could simply say "any character not in <key> field" which doesn't allow <cr><lf>'s in the string. I don't think length needs to be specified in the syntax. That would be site-specific. 2c

Thoughts? Dave. 3

4

DHC 14-FEB-74 13:06 21946

Revision to Pathname proposal
cc: postel, cerf, crocker, dcrocker, neigus at BBN, white at NIC -
- - -

(J21946) 14-FEB-74 13:06; Title: Author(s): David H. Crocker/DHC ;
Distribution: /DHC ; Sub-Collections: NIC; Clerk: DHC;

AWH 14-FEB-74 13:30 21947

NETED votes and other comments.CNTRL= 5877

Group --

Following are my "votes" on Mike's item list, as well as some added comments. The numbers refer to the items in Mike's NIC#21815.

1. I very definitely thought the "*" prompt was for input mode too. I will gladly accept this not being the consensus, but it isn't too far fetched an idea? It seems Mike is assuming that "type ahead" is automatically allowed in input mode, which may not be the case. Also is a prompt really needed in "edit" mode, what with just about every command printing something? Perhaps if we remove the printing from "t" and "d" etc the prompting might be more valuable. At any rate, I will abstain from voting on this one as either interpretation is fine with me (I'll let the ones who thought it up decide).

2. Okay.

3. I'm not sure what problem the implied "h" is supposed to solve, but I do have one objection: it effectively eliminates the use of "neted" without a parameter except by total novices (as I surely don't want to sit through "h" output every time I choose to not specify a file name on the "neted" command itself). Maybe we could agree on something like the following as the message to print when "neted" is used without a file name:
Enter file name (or "h" for help).
This would of course disallow "h" as a file name, but ... At any rate my vote would be against the implied "h" -- "h" is now a standard re- quest and the user should be aware of it and he can enter it if he wishes (although entering it during prompting for a file name may be a problem, admittedly).

4. I realized when I made my comment that the offending phrase applied only to EOF -- even after an EOF message the pointer points "at" the last line and not "after" it. Like I said, should be able to do a "p" (or "r" or such) after an EOF and have it process the last line itself, which "pointing after the last line" would not imply. This also brings up another point (gotten from observing the UCSD implementation): what is the meaning of the sequence:
t
d
or the sequence:
t
r new line
Is the first line in the file being referenced? In my implementation, the pointer is left "above" the first line in the true sense, and any request to modify the phantom line <Top line> will result in an error message. This is not what I observed with the (old version) UCSD one. I will admit it seems natural to be able

to change the first line by saying "t" and "r" but ... At any rate, can we please clarify this? 6

5. I personally would like to see standard messages (EOF, input, edit) be identical on all implementations, because what appears to us to be an incredibly small difference can be confusing to real novices. And I would hardly call an EOF condition to be an "error" if encountered by an automaton since there is no other way to reference the last line (without going into input mode) or print an entire file etc. There aren't really that many messages to worry about, after all. 7

6. I do agree that things that may take a while should say something, but I surely didn't espouse printing "<Top line>" on that basis (did I?). I can't see why that operation would take any time at all. And there is the optional prompting, too. My vote: against printing on "t". And I do remember the "." of <Top line> being mentioned, but I thought it was decided against? 8

7. Must object strongly to implied things like "the stuff it knows is there" -- where in the spec does it say "the word "Input" and anything else following"? I don't really care about the text of these messages (as is witnessed by my implementation using exactly the wording in the spec) but I do feel we should be as consistent as possible. 9

8. Vote against "d" printing anything. I can't help but feel that this would be most confusing, as I might locate line 17, say delete, and have line 16 printed? Really scary, I would say. 10

9. You are right, we have stated that "save" is exactly "w/quit", but then we allow an argument on "w/quit" but not on "save". Either way is fine, however. 11

10. First I thought that "m" was to leave the pointer where it was? Second, I agree that printing something like "File wigit merged." is good (as is done for "w", right?) but printing a data line would seem rather confusing. I vote for some standard message and for leaving the pointer where it was (ie, at the line above the first merged line). 12

11. Agree with proposed solution and wording. 13

And one final item: I really feel quite strongly that we should try to make all implementations as nearly identical as possible. This not only includes messages etc but extensions as well, because we all know that users are in fact going to get used to extensions provided at the site they use most and are going to be confused/frustrated when they try to use another "identical" version which is in fact

different. I agree that there are some problems which require deviations (an aside: why can't the UCSD version do the "open" for the user automatically?) but I would like to urge strongly that there be no "voluntary" dif- ferences introduced. After all, we really don't want the novice and casual user to have to wade through pages of on-line documentation of deviations just to be able to create a simple file, do we? Perhaps sites can provide a "neted-like" editor for their locals which has the same base as "neted" but with extensions? Then people who use it only locally could get used to the extensions without becoming confused when using "neted" at other sites, but users who wish to use the pure (un- adulterated) "neted" can? Of course the two versions would have dif- ferent names etc. 14

And so goes another round of comments/ideas/votes/bullmerde. 15

Wayne. 16

AWH 14-FEB-74 13:30 21947

NETED votes and other comments.CNTRL= 5877

(J21947) 14-FEB-74 13:30; Title: Author(s): A. Wayne Hathaway/AWH ;
Distribution: /NETED ; Sub-Collections: NIC NETED; Clerk: AWH;

JAKE 14-FEB-74 15:30 21949

MTS suggestions

Here are two or three things that I think would be very useful to MTS users (presented in somewhat cavalier fashion - keep or toss): 1

1. It would be nice to have only one message file, preferably in NLS, so that it could easily be edited. (Other sites might want to be able to edit it with their own text edtors such as teco, etc. However, I am assuming the best possible world where everyone has nls available.) Currently, one can have as many as four files (I have three - JAKE, message.txt, sndmsgs.nls). The user should not have to run a program to have this happen - it should be automatic. It would also be really nice if the user could have some control over the automatic organization of his initial file (i.e., organized by date, first by date then by individual, by organization, or whatever). 1a

I would also like to have a link in the first line of an initial file journal citation rather than further down in the journal citation. That way when one has viewspec xb or first line only on he can link to the item in question easily without typing the link or opening up the branch. 1b

Another message-sending problem is the one of having to convert an nls file into a txt file before one can include a file in a sndmsg (via the control-b convention). Somehow this needs to happen automatically without the nonsense of 'output sequential' etc. 1c

2. I feel it is imperative to work out some sort of file switching protocol (or scheme) that permits one to transfer an nls file to another site, then be able to suck it back structurally intact. For instance, now I can send a resource notebook file to another site via the ;xnls convention and it arrives there looking just as it did here in nls. However, I cannot get the file back in any sequence that is recognizable without extensive editing. This is a problem with other sites also when they attempt to trasfer files back and forth, so the problem is a general one although more acute with NLS. In my head I see a scheme that causes each transferred file to go through a meta stage which is a network standard. From here it gets translated into the formatting 'language' of the receiving site. When it goes back to the home site it goes through a similar process in reverse. (This is very sketchy, but you get the idea.) 1d

3. I think the whole scheme of output processing directives should evolve into a graphics system that goes something like this. A special terminal (or better yet subsystem that would run on any crt screen) that can display all of the type faces and special effects now created by CCM would be developed that would allow a user to load a file and type a command such as 'Times Roman, 5 pt' or whatever. He would then bug the text to which he

would like this command to apply and the screen would display the text as it would look in this type face. When a page looks the way the user wants it to look, he can tell the system 'go' and a version of the file would be made containing all the right directives and ready for submission to DDSI or wherever. 1e

Such a system would also allow the user to specify directives that apply to a whole file such as 'continuous paging' 'all headings in xyz bold' or whatever; however, he should still have the option of viewing a sample page before he submits the file for printing. 1f

This would be a fairly complex system to design but the payoff would be tremendous both with respect to current ARPAnet users and with respect to technology tranfer. 1g

4. This is a fairly simple-minded suggestion that we could implement immediately that would have a lot of payoff for persons ediing in tnls. Allow the viewer to see invisibles as well as visables. This way he can easily find spaces, tabs, carriage returns, etc., without going through the gyrations of replacing these characters with some visible nonsense character such as a star. The star approach is less than adequate when you want to see carriage returns and tabs because the whole appearance of the file is changed. This is one of those things that DNLS users never think about that causes TNLS users to tear out their hair 1h

5. Create a 'who is' skills and biographical index to network people. This could have a skeleton entry of name, phone, host, group affiliations, host function (such as PI or Liaison), and network address for everyone having access to the arpanet. Each person could then be permitted to include a paragraph or two of his skills and biography so as to appear like a who's who entry upon access. This would need a search or find capability also. 1i

A skeleton could be built from the ident file and the rest could be added gradually. The use of the current ident file for this function is rather badly designed from a user's point of view and it makes the upkeep more difficult from an editor's point of view. 1j

6. Allow a user to organize his directory listing to suit himself with at least brief annotation. Likewise his archive file. I have so many files I forget what is in some of them or what I called them. I would like to be able to organize them in some other fashion than alphabetically. 1k

7. Develop an information retrieval scheme that allows indexing and permits inverted file maintenance. 1l

8. Develop a scheme that lets a user edit across files (for

instance , substitute text in more than one file, delete, etc.). Also allow a user to perform edits other than 'substitute' throughout a file. For instance, delete all statements (xyz), change statment (xyz) to (lmn) throughout the file, etc. 1m

9. Allow a user to have a viewspec 'Statement names only'. This lets him see the outline of his file without interfering text. 1n

JAKE 14-FEB-74 15:30 21949

MTS suggestions

(J21949) 14-FEB-74 15:30; Title: Author(s): Elizabeth J. (Jake) Feinler/JAKE; Distribution: /RWW; Sub-Collections: SRI-ARC; Clerk: JAKE; Origin: <FEINLER>RWW-MTS.NLS;4, 14-FEB-74 15:18 JAKE ;

Addendum

Another one I forgot: 1

There has been some discussion of being able to link by interhost links between SRI-ARC ad OFFICE-1. This could be a very powerful feature if it were designed as a general case linking mechanism between hosts. For instance, one site on the network wanted to keep its own 'schedule' file for the Resource Notebook. They had hoped that a user accessing the Resorce Notebook from Nic query would be able to choose the statement name (schedule) and then be automatically linked across the network to the 'schedule' file maintained at the distant host then jumped back to NIC query without having to personally implement the jumps. This could be extremely powerful in building and maintaining data bases, and could further the cause of distributed networking by a couple of giant steps. 1a

Addendum

(J21950) 14-FEB-74 15:57; Title: Author(s): Elizabeth J. (Jake) Feinler/JAKE; Distribution: /RWW; Sub-Collections: SRI-ARC; Clerk: JAKE; Origin: <FEINLER>RWW-MTS.NLS;5, 14-FEB-74 15:55 JAKE ;

explanation of line processor shipment to Dept. of Commerce

1

Sorry for what ever inconvenience this matter is causing. The item of concern, which was shipped to London for a two week demonstration at a conference in Sussex, has been returned and is presently in operation here at SRI in Menlo Park California. 2

Enclosed is a circuit diagram of the device, the only descriptive documentation we have. Also enclosed are all the copies of all invoices and bills of lading we maintained as records. 3

A recalled description of the event: 4

> At the time of shipment I called REA Airfreight representatives at the San Francisco airport. They advised me of the following method of shipment and procedure: when ready, bring the packaged item to them directly at the airport, and at that time fill out the proper paper work. This is exactly what I did and was under the impression that it was an acceptable method. 4a
>
> The shipper asked me to identify the device, which I did as follows: It is a developmental device designed and built by SRI under a goverment contract. Its purpose is to emulate a virtue display terminal to allow using our text-editing computer-based system with a particular class of low cost display terminals. 4b

Perhaps a clearer description than given to the shipper is: 5

> A developmental peripheral device that interfaces a display terminal to a remote computer, or, a digital communications controller for display terminals. 5a

I hope this description of the event and enclosed documentation provide the information you are seeking. If I can be of further help, please advise. 6

MEH 15-FEB-74 16:18 21953

explanation of line processor shipment to Dept. of Commerce

(J21953) 15-FEB-74 16:18; Title: Author(s): Martin E. Hardy/MEH;
Distribution: /MEH; Sub-Collections: SRI-ARC; Clerk: SRL;
Origin: <HARDY>LONDON.NLS;6, 12-FEB-74 16:18 JML ;

ARC Facility Costs, PDP-10, 1974-76

ARC Computer Cost Estimates (Feb 1974 to July 1976). 1

Contents: 1a

1. EQUIPMENT -- some buy and lease options 1a1

2. MAINTENANCE -- weekdays, weekends 1a2

(EQUIPMENT): 2

Costs do not include 5% sales tax. [Retail costs: 825,000] 2a

********** 2b

BUY: (least expensive) [cost: 410,000] 2c

Feb 10/74

Buy: X 410,000 2c1

********** 2d

EXTEND, THEN BUY: (most likely) (+ 82,683) [cost: 492,693] 2e

Feb 10 June 30/74

Extend: X-------X 22,105/mo 88,420
Buy: X 404,263 2e1

********** 2f

EXTEND, THEN LEASE-PURCHASE: (+ 128,612) [cost: 538,612] 2g

Feb 10 June 30/74 June 30/75 June 30/76

Extend: X-------X 22,105/mo 88,420
Lease-pur: X------18,758/mo------X 450,192 2g1

********** 2h

EXTEND, THEN LEASE: (+ 371,252) [cost: 781,252] 2i

Feb 10 June 30/74 June 30/75 June 30/76

Extend: X-------X 22,105/mo 88,420
Lease: X------28,868/mo------X 692,832 2i1

********** 2j

(MAINTENANCE): 3

We can anticipate an 8% increase in contract costs per year.
Contracts are one year maximum. [cost: 159,504] 3a

coverage:	remainder 74	75	76	3a1
weekdays - 16 hr/day:	16,588	53,748	57,804	3a2
weekends - 8 hr/day:	4,052	13,128	14,184	
	20,640	66,876	71,988	

remainder 74: 20,640
1975, 76: 138,864 3a3

MEH 15-FEB-74 17:39 21954

ARC Facility Costs, PDP-10, 1974-76

(J21954) 15-FEB-74 17:39; Title: Author(s): Martin E. Hardy/MEH;
Distribution: /JCN RWW DCE CHI PR MDK DVN; Sub-Collections: SRI-ARC;
Clerk: JML;
Origin: <HARDY>FAC-C.NLS;22, 13-FEB-74 07:50 MEH ;

AUTHORS

The following is the position paper from SRI-ARC concerning ARPANET TENEX Resource Management, prepared as a response to the 1-Feb-74 request from Craig Fields. The authors are:

Bill Ferguson (FERGUSON@SRI-ARC), and
Smokey Wallace (WALLACE@SRI-ARC)

INTRODUCTION

Before getting into specific recommendations and problems, we would like to state the fundamental position of SRI-ARC with respect to BBN and TENEX. We have basically been satisfied with the service that BBN has been providing in support of TENEX and related subsystems. This is not to say that things could not be improved. We have found that their releases are well thought out and on the whole reliable with a minimum of bugs. More important, we have found BBN co-operative in incorporating locally developed features into standard TENEX. We think it is important to share with you our method of interacting with BBN as it did not come easily and was filled with many years of mistakes and hard work we would not like to see redone at all TENEX sites. The process requires some extra work on both our and BBN's part, but so far the results have been very good.

We do not feel that a six month moratorium on TENEX modifications would accomplish much (except delay a lot of plans). Further, we do not believe that BBN should be restricted to bug fixes, and excluded from development work. We have been attendees at every TENEX Users Group meeting and have witnessed BBN's constant offer to be the coordinators and filters for local TENEX development. To the best of our knowledge ARC has been the only site to take BBN up on their offer and have been more than satisfied with the results.

TENEX SITES

After having attempted to run a combination service and research system for three years we heartily applaud the need for distinction between these fundamentally different roles. The most important difference between the two types of systems is in the expectations of the users. Users of service systems expect (demand?) the level of service to be consistent and constant and not subject to the instability inherent in a research operation.

SERVICE SITES

We completly agree that SERVICE SITES should conform to ARPANET-wide defined standards and run the current BBN released TENEX with no modifications. Our goals in initiating our OFFICE-1 service system are standard hardware and TENEX. We have not realised this as yet but are actively pursuing it.

SERVICE SITE DEFINITON

The following is a list of necessary attributes for a service site:

1) Must provide a user liaison to handle bugs, complaints, requests for information, and proposals for new features.

2) Must be readily accessible during advertised UP-HOURS - which should include liaison, operations, technical support, and hardware personnel.

3) Must be made up only of state-of-the-art hardware components.

4) Must provide a quality control function for new monitor and subsystem releases, ensuring stability and up-to-date user documentation.

CERTIFICATION AND MONITORING OF SERVICE SITES

There presently is no one responsible for this function. As a consequence, it is left up to each site, with the resultant lack of uniformity and quality control. There should be a full-time ARPANET role which is dedicated to the users' position and makes frequent checks of all service sites to insure that standards are being met.

RESEARCH SITES

The above mentioned requirements for service sites should also be goals of research sites. Deviation from standards and conventions should not be tolerated and local modifications should only be done with community wide interest, unless completely unavoidable.

STANDARD TENEX

The standard TENEX has been and should, in our opinion, continue to be the most recent release from BBN. We can not conceive of anyone else taking over this role without a major perturbation.

However, the whole process of TENEX development should be much more visible to interested TENEX sites.

HARDWARE INVENTORY (network wide)

Maintaining such an inventory does not seem to be a huge or complex task, and one interested person should be able to handle it. Also, there must be at each site a knowledgeable TENEX individual who is the technical person acting as an interface to the ARPANET community.

SOFTWARE PRODUCTION

SERVICE SITES

We agree with the basic positions stated in Craig Fields memo of 1-FEB-74 with the exception of the item on service sites generating software. The reliability requirements of a service site preclude any monitor-related development (and maybe even subsystem development).

RESEARCH SITES

We are assuming that it is desirable and benefitial to the ARPA community to facilitate some limited distributed development/extension of the TENEX timesharing system at research and devlopment sites. At first cut it might seem that BBN should do all TENEX work. We claim that this is not really feasible and that even if it were, BBN is not omniscient and does not know or appreciate all of the community's needs. What we think is in order is that a standard methodology for this distributed development be adopted and adhered to by the participants. In fact this development is going on at the present time in an ad hoc and parochial fashion with considerable duplication of effort. One thing seems very clear from our experience. Each site should not simply ask BBN to build all their new features. TENEX development should be a joint effort between BBN and the other interested TENEX's.

TENEX MODIFICATIONS

BUG FIXES

The present system using the BUGS file at BBN has been moderately successful, but reporting and dissemination has not been as sharp as needed and some management attention is necessary here. This again is a joint effort between the sites and BBN. Simply telling BBN that there is a problem, though sufficient for action, is really not enough. Most discovered bugs prevent some aspect of a group's work from being done. Since that site usually

takes the time to correct the bug, the fix should also be sent to BBN.

All fixes sould be distributed from BBN, as this will allow a more global view as to possible side effects to the fix. It is irritating at best to replace an existing bug with more non-functional code.

CHANGES AND ADDITIONS

We have found the following method quite successful for both ARC and BBN in making mods to TENEX:

1) Contact relevant person(?) at BBN and discuss the needed modification or extension to TENEX.

Is the modification of general use or can it be generalised?

Is the modification currently being implemented at BBN or elsewhere?

Arbitrate with BBN whether it can best be done locally or by BBN given:

Local / BBN priorities
Local / BBN talent
resources required

2) Assuming that the local site should program the change, write a carefully thought-out design document, and send this off to the appropriate person at BBN. This document should preferably be reviewed (and perhaps written) by several members of the local site.

3) BBN reviews the proposed changes and makes appropriate comments. Often we find that a change had been considered before, and solutions or difficulties have already been thought of. Requesting expertise from BBN has helped to prevent wild and useless coding efforts. (Steps 2 and 3 are, in fact, a multi-step process, as the local site and BBN work out a suitable design.)

4) After the design specification has been agreed upon, programming or reprogramming for the new feature should begin. We realise that some degree of experimentation is necessary for anything except the most minor of changes. The change should be coded in a style as close as possible to distributed BBN TENEX, with emphasis on comments.

5) After entensive debugging and hopefully being run at the local site for a reasonable period (at least a month), the code plus any relevant documentation should be sent to BBN. We have found it useful for the author(s) to actually travel to BBN, to discuss the implementation with BBN personnel and to aid in the task of integrating it into the TENEX sources. This may not be necessary, but is very helpful.

6) After review by BBN, the code will most likely be included in standard TENEX. It may eventually be implemented in modified form, but the feature will be there and the user interface will be maintained.

We would like to point out at this time that the above method was arrived at by making virtually every mistake possible in attempting to suit TENEX to our needs. We were the first non-BBN TENEX site and TENEX has come a long way since then (as has our attitude on modifications). We are committed to the concept of one "TENEX system" not as many TENEXes as there are sites. We have, in the past, diverged from this concept and have suffered the consequences when it came time to integrate a new release.

BASIC QUESTIONS

We have outlined a proven successful method for ARC TENEX interaction with BBN. This method may have limitations for given community sizes or because of special relationships between sites, but we offer it as one example of how to do things. The need for an ARPANET wide viewpoint on TENEX is long overdue (i.e. the TENEX Executive Committee). The need for a group (either within BBN or elsewhere) to establish network-wide conventions and standards is at the core of the current problems. The ARPA investment in TENEX is extremely large and to allow the current lack of management and coordination to continue is ridiculous.

RELIABILITY

It is not uncommon for our system to run, without failure, for periods up to 100 hours. We feel this is about as good as can be done in an R & D environment and recognize that in order to do significantly better requires a completly different staff and approach. It was this belief that prompted us to contract with a commercial timesharing vendor (TYMSHARE) to provide us with a real honest "service site" OFFICE-1. We feel that a key element in our relationship with TYMSHARE is that they are in business to provided reliable service not to do neat or technologically interesting things for us. It is this difference in attitude that makes the difference between satisfied customers and disgruntled users from a system standpoint. In our experience the largest

factor in our system reliability has been hardware not software. This falls into three catagories:

DEC supplied

In large part a site's success with DEC hardware lies in its ability to coerce, threaten, or buy the local DEC maintenance group into doing a reasonable job. The memories available for the PDP-10 deserve specific mention and are probably the weakest link in System-10 (as well as the most expensive).

Other vendors

In general there is a wide variety of good peripherals available. The two recurring problems with non-DEC hardware are getting competent maintenance personnel (if they exist) and fault isolation responsibility conflicts (whose trouble is it?)

Locally Developed Brand "X"

Always a bad idea from a reliability standpoint. The myth that it can be done locally cheaper and better continues to be quite popular in the community.

Of the system failures at ARC in the past six months at least 90% are definitely hardware, about 5% software, and 5% unresolvable. We have currently reached a point where it is virtually impossible to determine whether a non-obvious crash is spurious hardware or software.

RSEXEC

The principle problem with the RSEXEC work is that it has affected system load and reliabliity. Most of us have cooperated as passive partners, but have not been kept well informed of changes or progress. This has resulted in a general suspicion of the RSEXEC when unexplained or new glitches appear. We at ARC are most interested in the RSEXEC work and would like to see it become much more visible.

DOCUMENTATION

The area of documentation (not addressed in the list of questions) is probably the only one where BBN has really done poorly (as have most of us). Documentation, with respect to system programming and for user subsystem use, has obviously not been given proper attention. The source code is still the only

real documentation (except the jsys manual). "How does it work" type documents are non existant. The task of a new TENEX systems programmer is not a very enviable one unless he has an expert to query. Most of the transfer has been verbal. This is another area where a community effort could fill the void both faster and probably better than BBN alone. There is a great deal of knowledge about TENEX distributed around the network and this could be put to good use in the form of producing TENEX documentation. We think this would also be a valuable experiment in distributed collaboration (a necessary ingredient of a distibuted community).

IMMEDIATE REQUESTS (per 1-FEB-74 memo)

ARC HARDWARE INVENTORY

leased from DEC:

KA10 Arithmetic Processor
KM10 Fast Register
KT10A Dual Mem Protect Relocate
IM10A Mag Tape Control
ID10 DECTape Control
DC10A Data Line Scanner Control
IU30-B 7-Channel Mag Tape (two)
IU55 DECTape Transport (two)
DC10B 8-Line Group Unit
MA10 Core Memory (eight)
ME10 Core Memory (two)
MC10 Memory Ports (forty)
DF10 Data Channel (two)
RP10 Disk Controller
RP10C Disk Controller
RP02 Disk (six)

Other equipment:

BBN Pager
BBN ARPANET interface
Bryant Model 1851024 Autolift Drum
Data Products Printer Model M600-11a (local interface)
External Core interface (display memory)
Tasker Display System (12 work stations)

ARC MODS TO TENEX (by TENEX source module)

MAJOR

DSKPAK.MAC

1) Modified to handle two disc controllers (RP10)
2) Modified virtual - hardware and hardware - virtual mapping for more efficient use of disk packs

DSPLAY.NLS (Local Module)

Contains all JSYS code to support our display system

LINEPR.MAC

Major modification to support our Data Products Printer

SCHED.MAC

1) Major modifications to improve TENEX performance in our operating environment.
2) Added many meters to support our statistics gathering system (SUPERWATCH).
3) PC sampling routines for subsystem performance measurements.

SRICOD.ARC (Local module)

All our local non-display JSYS code

TIYSRV.MAC

Added "BIG CHARACTER" input facility. Allows a single "character" to be a multi-character sequence (ie:coordinate data etc.). This is done primarily for efficiency purposes. The user program could handle this but with much greater overhead.
NOTE: this facility is in the final negotiation stages with BBN to become part of BBN release TENEX.

MINCE

PAGEM.MAC

Altered memory initialization code to support "shared" memory for display system.

SWPMON.MAC

1) Start ARC local clock (TOD)
2) Do local terminal initialization based upon line numbers.
3) Several mods to alter terminal defaults and provide ARC specific job initialization.

OFFICE-1 HARDWARE INVENTORY

Digital Equipment Corp.:

KA10 Arithmetic Processor
KM10 Fast Register
KT10A Dual Mem Protect Relocate
IM10A Mag Tape Control
DC10A Data Line Scanner Control
IU10F 7-Channel Mag Tape (two)
DC10B 8-Line Group Unit
MF10 64-K Core Memory (two)
MC10 Memory Ports (eight)
DF10 Data Channel (two)
RP10C Disk Controller
RC10 Drum Controller
RM10B Drum
LP10D Line Printer

Other equipment:

BBN Pager
BBN ARPANET interface
CALCOMP 268 Disk (four)

OFFICE-1 MODS TO TENEX (by TENEX source module)

NOTE: The staff at TYMSHARE is prohibited from making modifications to TENEX. All the additions listed below are routines which have been written and debugged on the ARC system. Though these modifications are listed as being on the OFFICE-1 system, actually the ARC staff is responsible for them and their reliability. We are actively pursuing the goal of incorporating all of these modifications into standard TENEX, so that OFFICE-1 can run a strictly standard BBN TENEX.

MAJOR

DSKPAK.MAC

Modified virtual - hardware and hardware - virtual mapping for more efficient use of disk packs

SCHED.MAC

1) Major modifications to improve TENEX performance in our operating environment.
2) Added many meters to support our statistics gathering system (SUPERWATCH).

3) PC sampling routines for subsystem performance measurements.

SRICOD.ARC (Local module)

All our local non-display JSYS code

TIYSRV.MAC

Added "BIG CHARACTER" input facility. Allows a single "character" to be a multi-character sequence (ie:coordinate data etc.). This is done primarily for efficiency purposes. The user program could handle this but with much greater overhead.
NOTE: this facility is in the final negotiation stages with BBN to become part of BBN release TENEX.

MINOR

SWPMON.MAC

1) Do local terminal initialization based upon line numbers.
2) Several mods to alter terminal defaults and provide ARC specific job initialization.

(J21963) 17-FEB-74 05:37; Title: Author(s): Ferg R. Ferguson, Donald C. (Smokey) Wallace/WRF DCW ; Distribution: /cf sdc2 sri-arc dls jsp wrs2 ; Sub-Collections: SRI-ARC; Clerk: JCN ;
Origin: <NORTON>TENEX.NLS;1, 17-FEB-74 05:24 JCN ;

Re Dirk's <21904,>: 1

H*E*L*P* 1a

In trying to make reprints of the sections of the TNLS Users Guide, I was dismayed to discover that <USERGUIDES> is missing the following files: 1b

<userguides, tnls-tenex.nls;*,> 1b1

<userguides, tnls-tenex.print;*,> 1b2

<userguides, tnls-text.nls;*,> 1b3

<userguides, tnls-text.print;*,> 1b4

<userguides, tnls-editing.nls;*,> 1b5

<userguides, tnls-errormessages.nls;*,> 1b6

<userguides, tnls-errormessages.print;*,> 1b7

<userguides, tnls-commandsum.nls;*,> 1b8

<userguides, tnls-glossary.nls;*,> 1b9

<userguides, tnls-glossary.print;*,> 1b10

Here's the clincher--When I try to Interrogate any of these, I get the message, "no files archived in this directory" 1c

Here's a thought: I haven't really looked at Userguides Directory since that crash and rebuild a coulple of weeks ago????? -Hope not 1c1

Note: Strangely enough, tnls-editing and tnls-commandsum do have print files on line but not nls files. The others are missing both. 1d

What do you think happened to the files? 1e

(J21965) 15-FEB-74 00:07; Title: Author(s): Jeanne M. Beck/JMB;
Distribution: /KIRK DVN JCP; Sub-Collections: SRI-ARC; Clerk: JMB;

SRW 15-FEB-74 02:40 21966

ARPANET News and UK Users Group

Marcia:

In talking to Mil the other weekend a couple of things emerged on which you may be able to help.

We are currently building up local hard copy documentation which is held by and distributed to UK users of ARPANET by the British Lending Library (BLL). Among these documents is ARPANET News. Besides the copy at BLL, I keep a master copy, so at present I have to scrounge and Xerox ARPANET News for this purpose. I wonder, therefore, if it woud be possible to send me two copies of the News for this purpose, and also to send one copy also to Sylvia Kenney who is our UK Users liaison person. We are both at
Dept. of Statistics and Computer Science,
University College, London,
44 Gordon Square,
LONDON WC1H 0PD.

Secondly, we are providing a collection of working documents of specific interest to our UK users, and to US users of the 360. At present these fall into the following categories:

1. Monthly Newssheet,
2. User notices
3. "How to" guides,
4. Specific working papers,
5. Pocket Guides.

User notices contain technical information but which is often of short lived interest, eg. when power cuts are likely to affect the TIP. Items 3 and 4 are possibly of more general interst , eg the first "How to" guide is a three page intro to TECO, and one of the working documents would be a description of my POST system (<uk-ics>post.print at present).

I feel that this sort of information should be collected together, and a UK Users Group would achieve this.

Obviously, much of this documentation will be kept at the BLL in this country, but would you consider setting up the group and holding copies in the US? If you did so I would act as coordinator. It would seem sensible in such a case for us tc continue our local distribution as at present, and to include you on the circulation list so that you have file copies.

Looking at it another way, I am asking that the group be set up so that US users can get access to our documentation, see what we are doing and thus foster a richer cooperation between us, so preventing us from becoming too isolated and insular. Thus the normal group

distribution services that you perform eg. Xeroxing, would not be needed by the majority of members of the group, only the US ones would be more effectively covered by you. 8

I would welcome comments on the above, and I can shortly let you have a membership list if you agree to setting the group up,

Steve Wilbur 9

SRW 15-FEB-74 02:40 21966

ARPANET News and UK Users Group

(J21966) 15-FEB-74 02:40; Title: Author(s): Stephen R. Wilbur/SRW;
Distribution: /MLK; Sub-Collections: NIC; Clerk: SRW;
Origin: <UK-ICS>MARCIA.NLS;2, 15-FEB-74 02:37 SRW ;

MLK 15-FEB-74 08:54 21969

CCL membership change

I tried to send you a sndmsg yesterday, but today it is still unsent mail in my directory. Anyway, the gist of the message was this: Jean Iseli asked that I substitute JWB for EHF in the CCl membership. Just wanted to check this out with you as coordinator before I made any identfile changes.
Marcia

1

MLK 15-FEB-74 08:54 21969

CCL membership change

(J21969) 15-FEB-74 08:54; Title: Author(s): Marcia Lynn Keeney/MLK;
Distribution: /MAP; Sub-Collections: SRI-ARC; Clerk: MLK;

THINKPIECE ABOUT AN ENERGY INFORMATION NETWORK AND THE ROLE OF SRI 1

INTRODUCTION 2

Last week, a representative of Comshare, a timesharing company, has approached SRI to find out whether or not we would be willing to consider cooperating with them in the development and marketing of "energy data bases." He indicated that his company wants to get involved in that area and might be willing to devote some of their resources to a feasability study of such a project. We had to be noncommittal because we felt that we first need a policy decision in that general area and a review of SRI's alternatives. 2a

The question has been raised before: should SRI seek an opportunity to become an "Energy Information Center"? It is not clear whether or not we do have the marketable data bases that could give us a competitive advantage in that sort of venture, and, furthermore, all the consequences of our involvement or non-involvement in that area are not yet well understood. However, the conjuncture is right and we do have at SRI all the needed expertise and reputation to launch successfully such a project. Thus, it seems that we ought to consider with great atttention the issues involved and come up with a coherent policy decision stating our basic position in that general area. 2b

My intention in this note is to offer as a basis for discussion a sketchy outline of the problem as I see it. I make no claim to having delineated either accurately or exhaustively the problem area, and I readily acknowledge my bias in favor of computer networks and the powerful new information handling technologies that are now rapidly becoming available. 2c

THE PROBLEM 3

Computer based information systems are no more novelties and, althought they are still evolving very rapidly, their desirability and effectiveness are now taken for granted in many fields. In the energy-related fields much information is already economically available in machine-retrievable form from many scattered sources around the country and much effort is presently being made in many organizations to sort out this information and to streamline its flow. among users. 3a

But much remains to be done and although sometimes literally heroic efforts are being made, both the circumstances and the approaches that are being taken are accumulating the odds against many of these projects. This fact, in conjunction with some appalling experiences that attract much attention, leads to

discouragement and pessimism in some quarters. However, in my opinion, all these failures only indicate the general lack of real experience, poor judgment, dismal management, and perhaps, some unlucky circumstances. But the fact is that a real revolution is in the making in the information field. In due time, it will bring success to those who have enough stamina and imagination beyond their most optimistic dreams. I believe that it is a real challenge for a research organization like SRI to look down the road, recognize the opportunities and develop workable strategies that would make us leaders in that field. Furthermore, the time has come to stake one's territories and there are indications that the world might not be very charitable to those who fall behind in that domain. 3b

To summarize, the general area of energy information presents an opportunity for SRI. Our well established competence in energy economics, energy technologies, systems design and information handling technologies almost single us out to become leaders in that field and we ought to take adavantage of that fact to actively participate in the development and growth of large-scale user-oriented information networks. On the energy side, SRI could, in the long run, become the "network's information center" that would act as a focal point for all energy information and as a widley consulted center of expertise on all energy-related matters. To achieve that goal a very gradual and evolutionary strategy is necessary. 3c

SOME BASIC ALTERNATIVES 4

Whether or not it would be feasible and profitable for SRI to develop and operate a computer-based "energy information center" are obviously still open questions. 4a

It will be necessary to conduct a forward looking feasibility study, coupled with a realistic analysis extending way in the future, before we can focus on those factors that should affect SRI's decision. Thus, our first steps, should we decide to go ahead in that general direction, should be to find the right people and the appropriate funding for such studies. 4b

There are also some alternatives. The following ones might be considered. 4c

1) The point could be made that SRI's policy is not to get involved in any long range service agreements such as those contemplated here and that we should concentrate exclusively on R&D problem areas and on customer-oriented studies (the consulting function). The policy would be clear and we could stop spending energy in dead ends. 4c1

2) SRI could commit itself to developing, in a planned and coordinated fashion, real practical expertise in large scale computer-based information networks, and seek actively involvement as architects and designers in those information networks that are being contemplated and developed. 4c2

In particular, it appears that we could take the initiative in studying the feasibilty of a "National Energy Information Network", and proposing its development to those organizations that have responsibility in that domain. 4c2a

Such an information network could serve the whole energy community at large or only a subset of subscribers depending on the financial arrangements that could be made. 4c2b

That information network could be based on a computer communication network that would connect many specialized information centers, each dealing with some specific aspects of energy-related information and possibly maintain computer readable data bases in their field. 4c2c

This would insure accountability, compatibility, availability and relevance while the manageability of the whole system could still be preserved by appropriate decentralization. 4c2d

Some additional components of such a computerized energy information network could be the following: 4c2e

- a "mathematical modelling center" that could maintain for the whole community all the standard codes, develop general energy models that could be shared by the whole community, and provide online assistance in the development of special purpose models for specific customer-oriented needs. 4c2e1

- a "statistical analysis center" that would maintain statistical programs for the whole community and make available gradually information handling tools geared towards the analysis of time series and the generation of statistical reports. 4c2e2

- a "message center" (or mail service center) that would allow easy online communication among all users. Such a center could greatly enhance the communications of geographically distributed "special interest groups" and offer them the option of maintaining automatically, in an easily retrievable form, records of all or only part of their communications. 4c2e3

- a "news dissemination center" that would provide in particular the capability for online selective dissemination of energy news combined with automatic cataloguing and retrieval of past news items. For example, it is conceivable that the equivalent of the Platt's Oilgram could be put online and disseminated in a selective fashion as the news is written.. 4c2e4

Undoubtedly, the development of such an energy information network would be a long evolutionary process that would require long term commitments from its sponsors and developers. 4c2f

SRI might not wish to make such a commitment. But it still remains that the evolutionary development process would entail continual multidisciplinary R$D for which SRI seems to be well suited. 4c2g

3) Another alternative that might be worth considering is to get associated in some acceptable fashion with a company such as TYMSHARE or COMSHARE that would provide and operate the necessary computing infrastructure and possibly handle some marketing aspects of the services. 4c3

In such a case SRI could concentrate on the development and maintenance of appropriate data bases and really relevant information services. 4c3a

However, such an arrangement might present some contractual difficuties that must be carefully evaluated from the very beginning. 4c3b

4) Another type of association that might also be considered is to cooperate with an institution such as Battelle who apparently has a much greater experience than we have in developing and operating special purpose information centers. Our strong expertise in specialized areas might complement theirs. 4c4

5) Finally, we might consider setting up a subsidiary of SRI that would enter the non-profit computer-based information business. Such an organization could have contractual arrangements with SRI who could take on the responsibility for all R&D aspects of the development process. 4c5

Energy information might offer the initial opportunity to launch such an organization. 4c5a

INTRODUCTION 5

Thoughts about an Energy Information Network

On several occasions, the question has been raised whether or not SRI should get actively involved in the development and marketing of energy-related data bases. Last week again, a representative of COMSHARE - a timesharing company - has approached SRI to find out whether or not we would be willing to consider cooperating with them in the establishment and marketing of such data bases. He indicated that his company has decided to get involved in that area and might be willing to devote some of their resources to a feasibility study of the project. 5a

In these discussions, we were noncommittal because we need: 5b

1) a realistic inventory of SRI's resources in that area, and, most importantly, 5b1

2) a general policy on the subject. that considers the long range implications for SRI of our involvement or non-involvement in that area. 5b2

The stakes seem to be high and the decision time is running out if we want to take advantage of the present opportunities and remain ahead of our competition - if SRI is at all ahead-. A policy decision should probably be made soon. 5c

It appears that SRI's Energy Committee (or a representative subcommittee) should 5d

- debate the pros and cons of such an involvement or non-involvement 5d1
- consider its short and long range implications for SRI, and 5d2
- give its recommendations about what our strategy ought to be. 5d3

WHAT IS THE PROBLEM? 6

BASIC COMPONENTS 7

The message service center 7a

Center for Energy Models 7b

Dialog support system 7c

News service (SDI) 7d

Oil Platsgram (daily) 7d1

Energy Users Report (weekly review) 7d2

PR 15-FEB-74 14:59 21970

Thoughts about an Energy Information Network

(J21970) 15-FEB-74 14:59; Title: Author(s): Paul Rech/PR;
Sub-Collections: SRI-ARC; Clerk: PR;
Origin: <RECH>THINK.NLS;7, 4-FEB-74 13:14 PR ;

THE CONCEPT OF AN EVOLUTIONARY DEIS (REVISED VERSION) 1

In this section, we outline a conceptual framework for the development of an effective DOD "Energy Information System". It is an evolutionary approach based on user feedback and self corrective development procedures that are designed to ensure that the system keeps meeting the goals of its mission while remaining responsive to changing needs. 1a

The suggested approach brings into sharp focus the necessary interrelationships between Analysis, Systems Development, and Operations, which are the three basic components of all successful feedback loops. It is argued that this approach can now be implemented much better than ever before through the judicious use of the type of new information handling technology that is presently available on the ARPANET. 1b

INTRODUCTION 2

The goals of the contemplated DOD Energy Information System will be to meet specialized user needs, to do so at reasonable cost, and to respond to rapidly changing needs with up-to-date, accurate, timely information. These are the long term goals that must be met when the system is implemented. 2a

However, there are many short-term needs that must be met first. These short-term needs, which have been brought into limelight by the sudden urgency of the energy problems that the DOD must deal with now, are bound to influence the development of the contemplated Energy Information System. 2b

Hence, the first problem the designers of the system face is whether or not an attempt should be made to integrate short term with long term requirements. If they do, they must adopt a development approach that will lead from the initial ad-hoc system to the full-fledged, cost effective energy information system that will meet DOD's future needs. 2c

Just such an approach is recommended for the development of the DOD energy information system. It would preserve a constant sense of direction and a strong sense of purpose throughout the various development phases of the project. This evolutionary concept is outlined here: it forms the basis for this proposal. 2d

SOME GENERAL BACKGROUND CONSIDERATIONS 3

Goal-Oriented System Development Strategy (figure 1) 3a

It is universally acknowledged that the development of a problem-oriented system must begin with an analysis of the problem areas and user needs. This phase must be followed by a definition of the products and services that must be provided to meet the identified user needs. And this must be followed by the design phase that is to determine how the contemplated system is to be interfaced with other systems. 3a1

This theory is a linear one that works marvelously well when the needs are simple, easy to identify, and stable and reccuring in nature. However, for ill-defined needs, as well as for urgent needs occuring in a rapidly evolving environment, the situation is unfortunately not as simple. In such cases great caution must be exercised and flexible, iterative approaches must be adopted when an information system must be developed under those conditions. This is absolutely crucial because needs do change according to the tools available. 3a2

Analysis of User Needs (figure 2) 3b

In theory, a matrix of user needs exists which, if properly decomposed, shows how the potential user population can be decomposed into special interest groups (SIG), and exhibits those needs that are shared by the whole user community. 3b1

In practice, however, such a matrix can be obtained very rarely and an initial analysis of the problems to be dealt with must rely almost exclusively on educated guesses from tradition bound practitioners who might have some stake, real or imagined, in preserving the existing statu quo. 3b2

Thus the real problem one has to face explicitely is how to capture over time, and not only in the early phases of a development project, the essence of this matrix of needs, to understand the nature of its various elements, and to get reliable indications of their real values and permanence. 3b3

This calls for an evolutionary development approach if the resulting system is to fit the various specific needs the services are to fulfill. 3b4

Growth Pattern of Communities of Interest (figure 3) 3c

Most organizations, most communities of interest, as well as most growing and living organisms, usually exhibit an S-shaped growth pattern. 3c1

The early phase is usually characterized by a search of true identity, by the apparent chaos it entails, and by only a

relatively slow real growth. It is typically the R&D phase, the planning phase, or the pioneer's phase. Nothing is clearly settled and many future problems remain unrecognized altogether. It is essentially a phase of breakthroughs (or needed breakthroughs), of high potential, and of great hope. 3c1a

The next phase is usually a phase of rapid expansion. Problems have been clearly recognized, the needed resources are easily available and the pace of growth is often much faster than generally expected. 3c1b

The last phase is stabilization and maturation, the phase for linear systems development strategies. 3c1c

Obviously, the DOD Energy Community is only in its early phase as far as the changed energy environment is concerned. This seemingly trivial fact is of crucial importance to this project and must not be disregarded. 3c2

Implications for this Project (figure 4) 3d

The DOD energy information system will develop in a rapidly changing environment. In that environment specific information needs, although very real and urgent, will be largely unpredictable and might only recur infrequently. This instability makes the task of building up an effective information system rather difficult because actual user needs will not be known clearly and the values and priorities of the services to be provided will be hard to assess. 3d1

Consequently, the project cannot follow a linear design approach without running the risk of developing many sophisticated system features that will be only marginally useful to the user community. It must avoid responding to rapidly evolving needs with predefined levels and types of information services. 3d2

Consequently, an evolutionary development approach is really required that will emphasize in its early phases ad-hoc solution procedures to be replaced gradually by tailored, well defined computerized services (See figure 4). 3d3

WHAT IS MEANT BY "EVOLUTIONARY" 4

The evolutionary approach entails: 4a

1) Early creation of effective interim information services to respond to users' needs and facilitate dialog and information exchanges among all parties concerned. 4a1

2) Analysis of users' information requests and needs as they arise. 4a2

3) Gradual growth of a computerized information system that deals with the information needs as they become better defined. 4a3

4) In parallel with this development activity, there will be an independent analysis activity to evaluate the impact of all new system features on users and their needs and provide corresponding feedback to the development process. 4a4

5) Users will learn to use that system through their interactions with the staff of the imterim information services who will gradually turn them away towards the more cost effective computerized services as they become available. 4a5

6) The effectiveness of the whole iterative development process can be greatly enhanced through the use of the information handling technology that is available on the ARPANET. 4a6

7) Finally, the creation of a customer-oriented information network partially dedicated to the needs of the energy community must be considered. It would be an extremely powerful means for facilitating information exchanges and encouraging cooperation among members of special interest groups. This would greatly accelerate the evolution of the whole process towards stabilized efficient information services. 4a7

At first, the emphasis will be on effective interim services that will be staffed to respond rapidly to all short term needs as they arise. These operations will be observed and analyzed and that will lead to the concurrent development of more appropriate response mechanisms. 4b

As the usage builds up, the utilization of these new systems will be introduced gradually by the information center's personnel to the major users first and, as the usage develops further, to other users on a need to know basis. 4c

The whole process will be user-oriented, tutorial in nature, and constantly adaptable to the users' degree of sophistication in their utilization of the available information services. We have termed such an approach "evolutionary". 4d

This approach therefore entails a highly knowlegeable small central staff that meets the requests as they arise and observes and analyzes these needs. Over a period of time, a parallel development staff will gradually build computerized data bases,

query mechanisms, and appropriate on-line information handling procedures to deal efficiently with these needs as they become more stable. 4e

SERVICES TO BE PROVIDED BY THE INFORMATION SYSTEM 5

In this early phase of the project, it is not yet possible to determine exactly what user groups should be served by the contemplated information system (with what priorities), what the scope of its technical coverage should be, and what kinds of services should be provided, 5a

Many functions might be provided by the system and the next task is now to decide what specific services should be offered, taking into account the existing resources and related information services that are already available to the DOD. Within that context, it must be decided what should be incorporated, what should be duplicated, and who should do what, where and how. 5b

However, it is already quite apparent that a broad range of services will have to be provided. In particular, to an extent that still remains to be defined, the system will have to perform the following roles: 5c

1) Serve as a referral center for energy information. To provide a single place to which anyone within the DOD may turn for advice on where and how to obtain information on specific energy topics. 5c1

2) Provide access to large scale information storage and retrieval capabilities. 5c2

3) Provide the DOD with information analysis services for energy matters that would assist DOD users in the interpretation, assimilation, and utilization of accessible information about energy matters. 5c3

4) Provide a "problem-solving" capability that goes further than the preceding function in the direction of providing a full fledged consulting capability for assisting with, or solving energy related problems. 5c4

5) Support, via a computer communication network such as the ARPANET, dialogue and information exchange among the geographically distributed individuals and groups that constitute the DOD energy community. 5c5

6) Provide a convenient interface with non-DOD energy information systems and services. 5c6

A FEW REMARKS ABOUT THE NATURE OF INFORMATION NEEDS 6

A few remarks are in order at this point. 6a

1) At any point in time, information exhibits two degrees of currency: historical (published), and recent. 6b

Historical information can be indexed, catalogued, and distributed, but its fixed nature means that it does not require updating. Consequently, the means of managing and disseminating historical information can be reduced to a fairly straight-forward set of procedures. 6b1

Recent information is usually unorganized and distributed around the community, residing in such information sources as people's heads, intra-organizational memoranda, or fragmented computer data bases, rather than in published papers and books, or data management systems. 6b2

Recent information sources cannot be dealt with in the same fashion as historical sources. They can usually only be used when one has the right personal contacts. Flexibility and adaptability are required on the part of the user in utilizing these sources. 6b3

2) One reason that many information centers fail to serve the needs of their communities properly is that they do not adequately distinguish the different approaches needed to provide both recent and historical information to their clientele: 6c

Recent information cannot feasibly be kept sufficiently up to date and properly organized in computerized data bases or other files. Patterns of usage of recent information have to be observed before the information can be organized effectively for retrieval purposes. 6c1

To discern and respond to these usage patterns requires question/answer interactions, and a flexibility that formal data bases do not provide. 6c2

3) The new dialog support systems that are available on the ARPANET present a great potential for dealing rapidly and efficiently with the needs for more recent information. 6d

It is expected that these systems will greatly facilitate close cooperation among members of geographically distributed special interest groups who will share common information and establish personalized communication links among themselves that will greatly improve each individual's problem solving capability. 6d1

AN EVOLUTIONARY INFORMATION SYSTEM (Figure 5) 7

An ideal energy information center would provide for most of the information needs of the user community, and be able to meet new needs as they arise. It would be flexible enough to properly utilize both the recent and historical sources of information in its community. The concept that approximates this ideal solution is the following: 7a

1) Immediate creation of effective interim energy information services. 7a1

- This services constitute the initial core of the future energy information system. 7a1a

- Initially, their major roles are to respond, with whatever means at their disposal, to users' needs as these arise, and to facilitate as much as possible the information flow among all parties concerned. 7a1b

- This initial information center should be staffed with a sufficient number of experienced professionals to be able to operate effectively under stringent early conditions because the group must produce useful results from its very inception in order to gain sufficient credibility and build up usage. 7a1c

- The group will rely primarily on existing information sources and available communication means for performing its early tasks. 7a1d

- Hence, the first technical development tasks should be to establish these effective connections. 7a1e

- The group must also provide a skilled interface between the user community and its information sources. 7a1f

- This implies the existence of an effective communication network and the creation at an early date of data directories and other directories of available resources. 7a1g

- Finally, it implies an effective interface with non-DOD information systems and existing special data bases. 7a1h

2) Creation of a system evolution support group. 7a2

Itis group would have the following roles: 7a2a

- To provide gradually the interim information services

with computerized data bases, efficient query mechanisms, convenient file handling systems, an dialog support systems. 7a2a1

- To observe and analyze the user's information requests and needs and to evaluate the impact of the new computerized systems on ongoing operations. 7a2a2

- To identify special interest groups, to analyze their needs, and to facilitate their collaboration by connecting them via effective dialog support systems. 7a2a3

It would therefore be a parallel function of analysts and systems designers that would provide the necessary technical and analytical support for smooth system evolution and quick adaptation to changing needs. Such a group replaces the classical design and development team which is becoming inadequate for the design of complex evolving information systems. 7a2b

3) The whole information system is able to evolve because it is organized to gain knowledge of the types of questions (and types of users) it is serving. Through continuing analysis of these needs, it will be able to develop into a real customer-oriented system that will be responsive to changing needs. 7b

4) The augmentation technology developed on the ARPANET can be utilized for improving the overall evolution of the system. 7c

It could be utilized first by the core information services to increase their internal capacity to interact with each other and with users as they become connected to them. 7c1

The next step could be to connect users to each other through an information network using the ARPA technology. This step would probably have a great impact on the whole system as it would allow unprecedented possibilities for group cooperation. 7c2

PR 15-FEB-74 15:18 21971

The Concept of an Evolutionary DEIS (Revised Version)

(J21971) 15-FEB-74 15:18; Title: Author(s): Paul Rech/PR;
Distribution: /DCE; Sub-Collections: SRI-ARC; Clerk: PR;
Origin: <RECH>EVOL.NLS;5, 15-FEB-74 15:09 PR ;

JAKE 15-FEB-74 15:56 21973

PERT or Critical Path Analysis Programs

Is anyone on the network currently running PERT or other Critical Path analysis programs. If so, would you please contact Michael Marcus (VSC@USC-ISI) and/or myself (FEINLER@SRI-ARC) and let us know what is available. 1

JAKE 15-FEB-74 15:56 21973

PERT or Critical Path Analysis Programs

(J21973) 15-FEB-74 15:56; Title: Author(s): Elizabeth J. (Jake) Feinler/JAKE; Distribution: /NLG NSAG; Sub-Collections: SRI-ARC NLG NSAG; Clerk: JAKE;

MDK 15-FEB-74 18:08 21974

TENEX Meeting : NIC Needs

A description of the two principal items I would like to have discussed at the ARPA Tenex meeting next week.

TENEX Meeting : NIC Needs

The two principal issues I would like discussed at the Tenex meeting are: 1

1) Quota Partitioning
2) Batch Processing 1a

Quota Partitioning 2

Purpose: To provide a mechanism for partitioning a defineable subset of the quota allocations with these constraints: 2a

a) limited log-in period, not immediately reusable
b) limited software resources
c) scheduling of system usage, through a "hold-queue" and through pre-scheduling for available time. 2a1

These constraints are defined as follows: 2b

a) limited log-in period, not immediately reusable 2b1

- partition the usage of pre-determined quota slots into increments of X minutes. 2b1a

X is initially to be about 30, but must be programmed as a resettable parameter to make it easy to modify X as usage and experience dictates. 2b1a1

The purpose is to generate many effective slots for NIC users, given that there are only four actual slots in the group allocation scheme. 2b1a2

Perhaps also the slots should be reserved partly for west-coast users, partly for east-coast users to remove the time-zone bias (details yet to be defined, of course). 2b1a3

- provide that auto logout occurs for a NIC user under the quota partitioning scheme after X minutes of connect time (the same X as above, of course), with a warning message to appear Y minutes before the logout. 2b1b

(Y should also be a resettable parameter, its initial value being suggested as 5.) 2b1b1

- provide that a NIC user cannot log-in within Z minutes of a log-out by him (except perhaps through the off-quota mechanism, or by being placed at the end of the queue in a lower priority, "bumpable" status). 2b1c

(Z is also to be a parameter, like X, with Z initially set at 60). 2b1c1

b) limited software resources 2b2

- provide a mechanism to restrict the software resources (i.e. Tenex subsystems and commands) that a NIC user can access. 2b2a

Initially, I contemplate restricting ordinary (i.e., "X-minute") NIC users to QUERY, MDK's "HELP" (to be implemented imminently), the JOURNAL, and SNDMSG, with no general NLS access provided except for the scheduled users. 2b2a1

c) scheduling of system usage 2b3

"hold-queue" 2b3a

- provide that a NIC user attempting to log-in when all four NIC user slots are full would be put on "hold" if he chooses to do so. 2b3a1

The model I have in mind is any telephone reservation or information system, in which the caller is automatically put on hold until an operator is free to service his call. 2b3a1a

The analogous mechanism here of course would be a queue of log-in attempts, managed on a first-in first-out basis (relevant info to keep might be time of attempted log-in, log-in parameters (account, password, etc), and expected time a slot would be free). 2b3a1b

The Network connection for each user on the queue should be kept open for say an hour, so that the person didn't have to go through that again. 2b3a1c

In fact if he did break the connection, that might be a good reason to cause him to lose his place in the queue. 2b3a1d

An approximate time of log-in slot availability could be computed and made known to the user, and he could be required to take his turn within some grace interval (say five minutes) of that time, or lose his place on the queue. 2b3a1e

The queue should be interrogatable by a user who is on it: namely what's his status, how much time till a slot becomes available, etc. 2b3a1f

And, the user should be able to cancel his position on the hold-queue. 2b3a1g

"pre-scheduling" 2b3b

- provide a mechanism to allow users to schedule use of the system ahead of time: 2b3b1

Allow a user to schedule his time of log-in (within say five minutes), and the amount of time to be used (not upward modifiable once logged in). 2b3b1a

There might be only one quota slot (of the four NIC slots) usable by the scheduler. But this should be a settable parameter. Users would vie with one another, no two users being schedulable at the same time. 2b3b1b

A user should be able to interrogate the scheduler to refresh his memory about the committment he's made, and rescheduling should be allowed. 2b3b1c

Unscheduled time, if any, could be made available (in the X-minute log-in mode described above) to ordinary NIC users at the time they try to log-in. 2b3b1d

Batch Processing 3

This mechanism would allow a process to create a job that would be run in "background" i.e., batch mode at some later time. 3a

Examples that come to mind are output processor jobs, catalog and index processes, and other programs that consume large-ish amounts of CPU time and which would be better run at slack hours, without operator startup intervention required. 3b

A likely list of parameters required to be passed with such a job creation are the job's name, user account and password, maximum run time, priority (like no suspension, overnight, four-hour turnaround, etc.), printer requirements, maybe others. 3c

MDK 15-FEB-74 18:08 21974

TENEX Meeting : NIC Needs

(J21974) 15-FEB-74 18:08; Title: Author(s): Michael D. Kudlick/MDK;
Distribution: /DCE JCN RWW WRF PR DCW MDK; Sub-Collections: SRI-ARC;
Clerk: MDK;
Origin: <KUDLICK>TENEX.NLS;2, 15-FEB-74 17:57 MDK ;

JCN 16-FEB-74 17:01 21975

Response to (30063,) Directory Use at RADC and Other Sites

This is in response to your questions in (30063,) about special directories for RADC-related people in DC, ALABAMA, etc. 1

It's easy to set up directories within the RADC OFFICE-1 allocation and they can have non-people names, although some procedural problems may well arise for you. A dozen people infrequently using a directory seems workable ad long as it's infrequent. There's always the danger of interested people getting hooked and taking up your other prime space, though. 2

As it now stands RADC has a very full set of users even before Dick Nelson's group comes on--as I understand is still planned sometime. These new users seem to me to be a threat to that working well...you gents can tell better than I..but it already seemed very tight as it was. Deferred Execution (DEX) use might alleviate. Stoney knows about these thoughts. 2a

It's not in line with the basic NLS system as it now stands to set up one file with several user idents in it for receiving Journal mail. A directory yes..but not a file. Each ident assigned to a directory has its own initial file ejk dls jcn etc.. 3

We have found that it really is best to have a directory for each user individually where we can. The great number of NIC users prevents this in most cases, but orgs like RADC are workable...so we are doing that. The confusio over who deletes what file, who gets what message, etc has shown us the undesirable factors in shared directories. That is not to say you can't do it..you sure can. But it may well lead to troubles. 4

We are building the AKW to augment organizations for sure The effect of teams of "augmented" individuals..thus augmented teams with special methods that take advantage of the individual capabilities..we hope will be VERY great in the future. Convincing organizations seems most likely through showing teams augmented more than individuals..but of course that takes time. 5

You are right, these are problems for your architect..thanks for poiating that out. It's refreshing to hear it from someone else out there in the world. 6

Sorry to be so slow...yo wouldn't belive the pressure these past weeks. But now it's getting a little better and I have time for a trip to Wash DC, Boston, Montreal, etc. Get you guys next time. Jim 7

JCN 16-FEB-74 17:01 21975

Response to (30063,) Directory Use at RADC and Other Sites

(J21975) 16-FEB-74 17:01; Title: Author(s): James C. Norton/JCN;
Distribution: /EJK DLS JHB JCN; Sub-Collections: SRI-ARC; Clerk: JCN;

JMB 17-FEB-74 23:10 21976

In Help:

Dear Kirk, 1

The Function statements named "Quit" should NOT say "Quit SUBSYSTEM" in their first line. Look at the branch you are linking to in those statements (the Quit branch under Calculator) and you'll see that "Quit SUBSYSTEM" is only one of the commands under Quit (You can also Quit NLS and just Quit OK; we have all those in the one branch we want to link to at this point). The link will get to the right place, I just don't want to confuse the user. I took out the word SUBSYSTEM in statement 3a28, but haven't checked out the branches for the other subsystems. Would you please fix those? 1a

P.S. There is a question in my mind as to whether the actual branch for Quit should be at the end of FUNCTION in Calculator because:
if I want to link to "Quit Nls", don't I have to say, ##<calculator Quit NLS>## or will the search algorithm get there if I just say ##<Quit NLS>##? (search for name in branch through the link?) If the latter, no problem. Just let me know. 1a1

JMB 17-FEB-74 23:10 21976

In Help:

(J21976) 17-FEB-74 23:10; Title: Author(s): Jeanne M. Beck/JMB;
Distribution: /KIRK; Sub-Collections: SRI-ARC; Clerk: JMB;

ARC Facility Costs, PDP-10, 1974-76

ARC Computer Cost Estimates (Feb 1974 to July 1976). 1

Contents: 1a

(EQUIPMENT): 2

Costs do not include 5% sales tax. [Retail costs: 825,000] 2a

********** 2b

BUY: (least expensive) [cost: 410,000] 2c

Feb 10/74

Buy: X 410,000 2c1

********** 2d

EXTEND, THEN BUY: (most likely) (+ 82,683) [cost: 492,693] 2e

Feb 10 June 30/74

Extend: X-------X 22,105/mo 88,420
Buy: X 404,263 2e1

********** 2f

EXTEND, THEN LEASE-PURCHASE: (+ 128,612) [cost: 538,612] 2g

Feb 10 June 30/74 June 30/75 June 30/76

Extend: X-------X 22,105/mo 88,420
Lease-pur: X------18,758/mo------X 450,192 2g1

********** 2h

EXTEND, THEN LEASE: (+ 371,252) [cost: 781,252] 2i

Feb 10 June 30/74 June 30/75 June 30/76

Extend: X-------X 22,105/mo 88,420
Lease: X------28,868/mo------X 692,832 2i1

********** 2j

(MAINTENANCE): 3

We can anticipate an 8% increase in contract costs per year.
Contracts are one year maximum. [cost: 159,504] 3a

coverage:	remainder 74	75	76	3a1
weekdays - 16 hr/day:	16,588	53,748	57,804	3a2
weekends - 8 hr/day:	4,052	13,128	14,184	
	20,640	66,876	71,988	

remainder 74: 20,640
1975, 76: 138,864 3a3

MEH 18-FEB-74 17:36 21977

ARC Facility Costs, PDP-10, 1974-76

(J21977) 18-FEB-74 17:36; Title: Author(s): Martin E. Hardy/MEH;
Distribution: /JCN RWW DCE CHI PR MDK DVN; Sub-Collections: SRI-ARC;
Clerk: JML;
Origin: <HARDY>FAC-C.NLS;22, 13-FEB-74 07:50 MEH ;

MDK 19-FEB-74 11:58 21978

<MIT-MULTICS>

explaining how Don Cantor came to be a user of <MIT-MULTICS>, and what the NIC's policy is on such things.

MDK 19-FEB-74 11:58 21978

<MIT-MULTICS>

Mike ... I'm the culprit with regard to Don Cantor's use of <MIT-MULTICS> at OFFICE-1. I assumed --- incorrectly no doubt --- that being at MIT and being aware of the MIT-MULTICS directory and password, Don had prior agreement to use that at the NIC. So I set up an initial file in NLS for him. (If he hadn't known the password, I wouldn't have done that.) Without a doubt, you should have been asked beforehand, and for that I apologize. Incidentally you can always and easily change the password by typing the Tenex command "CHANGE PASSWORD" followed by the old password and then the new password, each password to be terminated with carriage return. 1

The policy at the NIC does indeed intend multi-plexing of site directories at the NIC. Not broad multi-plexing, just within a site. There simply isn't enough space within a TENEX system to set up an indefinitely large number of individual user directories (so I'm told by the Tenex experts). All other sites, like MITRE-TIP, ILL-ANTS, etc., also have multiple users funneling into a single dirrectory. This screws privacy of mail, and though I've been trying to have that corrected, 'tis been of no avail. Otherwise, the system doesn't care how many persons log in under a given account at the same time. 2

If you'd like me to undo what I've done, I'll do that. Let me know. ... Mike Kudlick 3

MDK 19-FEB-74 11:58 21978

<MIT-MULTICS>

(J21978) 19-FEB-74 11:58; Title: Author(s): Michael D. Kudlick/MDK;
Distribution: /MAP JCP MLK; Sub-Collections: SRI-ARC; Clerk: MDK;
Origin: <KUDLICK>ARCHIVE.NLS;2, 19-FEB-74 11:56 MDK ;

MDK 19-FEB-74 12:27 21979

Issues for TENEX Meeting End of February

If you received an earlier version of this (dated Feb 15) please ignore it. This supersedes that one, and covers three issues: Quota Partitioning, Batch Processing, and a Mail Directory. Descripptions of the need and conceptual outline of solutions are given.

Issues for TENEX Meeting End of February

The three principal issues I would like discussed at the Tenex meeting are: 1

1) Quota Partitioning
2) Batch Processing
3) A Mail Directory 1a

Quota Partitioning 2

Purpose: To provide a mechanism for partitioning a defineable subset of the quota allocations with these constraints: 2a

a) limited log-in period, not immediately reusable
b) limited software resources
c) scheduling of system usage, through a "hold-queue" and through pre-scheduling for available time. 2a1

These constraints are defined as follows: 2b

a) limited log-in period, not immediately reusable 2b1

- partition the usage of pre-determined quota slots into increments of X minutes. 2b1a

X is initially to be about 30, but must be programmed as a resettable parameter to make it easy to modify X as usage and experience dictates. 2b1a1

The purpose is to generate many effective slots for NIC users, given that there are only four actual slots in the group allocation scheme. 2b1a2

Perhaps also the slots should be reserved partly for west-coast users, partly for east-coast users to remove the time-zone bias (details yet to be defined, of course). 2b1a3

- provide that auto logout occurs for a NIC user under the quota partitioning scheme after X minutes of connect time (the same X as above, of course), with a warning message to appear Y minutes before the logout. 2b1b

(Y should also be a resettable parameter, its initial value being suggested as 5.) 2b1b1

- provide that a NIC user cannot log-in within Z minutes of a log-out by him (except perhaps through the off-quota mechanism, or by being placed at the end of the queue in a lower priority, "bumpable" status). 2b1c

(Z is also to be a parameter, like X, with Z initially set at 60). 2b1c1

b) limited software resources 2b2

- provide a mechanism to restrict the software resources (i.e. Tenex subsystems and commands) that a NIC user can access. 2b2a

Initially, I contemplate restricting ordinary (i.e., "X-minute") NIC users to QUERY, MDK's "HELP" (to be implemented imminently), the JOURNAL, and SNDMSG, with no general NLS access provided except for the scheduled users. 2b2a1

c) scheduling of system usage 2b3

"hold-queue" 2b3a

- provide that a NIC user attempting to log-in when all four NIC user slots are full would be put on "hold" if he chooses to do so. 2b3a1

The model I have in mind is any telephone reservation or information system, in which the caller is automatically put on hold until an operator is free to service his call. 2b3a1a

The analogous mechanism here of course would be a queue of log-in attempts, managed on a first-in first-out basis (relevant info to keep might be time of attempted log-in, log-in parameters (account, password, etc), and expected time a slot would be free). 2b3a1b

The Network connection for each user on the queue should be kept open for say an hour, so that the person didn't have to go through that again. 2b3a1c

In fact if he did break the connection, that might be a good reason to cause him to lose his place in the queue. 2b3a1d

An approximate time of log-in slot availability could be computed and made known to the user, and he could be required to take his turn within some grace interval (say five minutes) of that time, or lose his place on the queue. 2b3a1e

The queue should be interrogatable by a user who is on it: namely what's his status, how much time till a slot becomes available, etc. 2b3a1f

And, the user should be able to cancel his position on the hold-queue. 2b3a1g

"pre-scheduling" 2b3b

- provide a mechanism to allow users to schedule use of the system ahead of time: 2b3b1

Allow a user to schedule his time of log-in (within say five minutes), and the amount of time to be used (not upward modifiable once logged in). 2b3b1a

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Unscheduled time, if any, could be made available (in the X-minute log-in mode described above) to ordinary NIC users at the time they try to log-in. 2b3b1d

Batch Processing 3

This mechanism would allow a process to create a job that would be run in "background" i.e., batch mode at some later time. 3a

Examples that come to mind are output processor jobs, catalog and index processes, and other programs that consume large-ish amounts of CPU time and which would be better run at slack hours, without operator startup intervention required. 3b

A likely list of parameters required to be passed with such a job creation are the job's name, user account and password, maximum run time, priority (like no suspension, overnight, four-hour turnaround, etc.), printer requirements, maybe others. 3c

Mail Directory 4

The problem is that NIC users, and Utility users in general, access thesystem via a few "global" log in directories, such a <MITRE-TIP>, <ARPA>, etc. and there is no privacy of mail, and in

fact no individual addressing of mail through sndmsg type of facilities. 4a

Because of Tenex overhead and space constraints, we can't afford to set up individual directories for an indefinitely large number of users. But we could handle the problem with the following type of mechanism. 4b

The Tenex Mail system could be modified to allow all network mail for which there is no individual user directory to be stored in a single directory <MAIL>. 4c

Each file in that directory would be formatted like the current "message.txt" files, perhaps with the extension "username" rather than "txt". Each file in that directory wouuld be accessible CNLY by the individual whom the mail is intended for (in other words, privacy WITHIN a directory), "Accessible" means, of course, readable, deletable, copy-able, listable with a DIR command, etc. 4d

The directory contents might then look like this, at a given time: 4e

```
    <MAIL>

MESSAGE.PADLIPSKY;4
MESSAGE.ISELI;3
MESSAGE.FIELDS;2
MESSAGE.DCROCKER;7
MESSAGE.CERF;11
```
4e1

but no individual would ever see anything in <MAIL> except his own MESSAGE file. 4f

The "mailer" guy (or whoever does it) would be responsible for finding the right "MESSAGE" file to deposit the mail in. 4g

The "you have a message" guy would correctly notify the person whenever he logged in. This would undoubtedly require each individual to identify himself when he logs in to some global directory like <MITRE-TIP>. 4h

The "where is" guy might even be made smarter, given the knowledge of an individual's job # and tty # from the log-in info, so that "where is ISELI", for example, could be answered even though ISELI was logged in as <MITRE-TIP>. 4i

MDK 19-FEB-74 12:27 21979

Issues for TENEX Meeting End of February

(J21979) 19-FEB-74 12:27; Title: Author(s): Michael D. Kudlick/MDK;
Distribution: /DCE RWW JCN DCW WRF KEV PR JEW; Sub-Collections: SRI-ARC;
Clerk: MDK;
Origin: <KUDLICK>TENEX.NLS;4, 19-FEB-74 12:21 MDK ;

JEW 19-FEB-74 13:12 21980

Where is the Pathname Draft?

Dave-- Can't find <UCLA-NMC>LYNNRFC.NLS anywhere -- on-line or archived, SRI-ARC or OFFICE-1. Therefore, can't read it or comment upon it. --Jim 1

JEW 19-FEB-74 13:12 21980

Where is the Pathname Draft?

(J21980) 19-FEB-74 13:12; Title: Author(s): James E. (Jim) White/JEW; Distribution: /DHC; Sub-Collections: SRI-ARC; Clerk: JEW;

Document Requests

Marcia:

Could you please send me three copies of each of the following NIC documents
14689 18824 18801 16592 18587
18777 18599 16890 19228 18930
18928

Thanks ver much .. Stevve 1

Document Requests

(J21981) 20-FEB-74 03:14; Title: Author(s): Stephen R. Wilbur/SRW; Distribution: /MLK; Sub-Collections: NIC; AccessList: MLK SRW; Clerk: SRW;

DCE 19-FEB-74 13:56 21982

Phone Log: 19 Feb 74, Col. William Leubbert, West Point, about possible half-hour film production

Call from Col. William Leubbert, West Point. (914) 938-4744, or -4401. 1

He is setting up some special, half-hour presentations for next summer, to be given to some 80 senior research personnel at a summer session at West Point. Asking if I could cooperate in preparing one such on our AKW stuff. Wants half-hour film (or video tape?); aiming for professional, studio quality. He runs a complete TV studio (I gather at West Point) for making such -- studio-quality cameras, color equipment, scan converters, etc. I could spend a day there, bringing slides, film clips, video tape, etc., plus a script, and they could put together a high:quality finished product. 2

Each person who makes such a recorded presentation would also agree to be available for a half-hour telephone dialogue with the assembled group, after they have viewed his movie. 2a

I liked the idea of having a product that could be used for other purposes. We agreed to talk further about the possibility. He is visiting the area next week, will plan to visit me Monday afternoon, 25 Feb 74, at about 2 p.m. (His plane scheduled to land about 12:15, he'll come directly to SRI). 3

NOTE: He is scheduled to spend from Tues morning through Thurs noon at Ames; could also be available for more discussion here on Thursday afternoon, before catching his plane home. 3a

DCE 19-FEB-74 13:56 21982

Phone Log: 19 Feb 74, Col. William Leubbert, West Point, about possible half-hour film production

(J21982) 19-FEB-74 13:56; Title: Author(s): Douglas C. Engelbart/DCE ; Distribution: /rww jcn bc ; Sub-Collections: SRI-ARC; Clerk: DCE ;

MDK 19-FEB-74 14:12 21983

identfile data maintenance problem

Dave / Harvey ... (This repeats a sndmsg I sent recently; I agree with Harvey's complaint that sndmsg isn't a satisfactory method of communicating pblms.)
The NIC has a small problem in Ident file maintenance that I'd like to have fixed:
The organization NAME field will not accept the literal escape <control-V> as input. We need this capability to format the organization name for mailing labels, which only works on 30-character lines (i.e., we need to be able to insert a carriage return when in fact carriage return is our normal termination character). Could either of you add this capability (it already exists for other fields). ... Mike Kudlick 1

(J21983) 19-FEB-74 14:12; Title: Author(s): Michael D. Kudlick/MDK;
Distribution: /HGL JDH MLK; Sub-Collections: SRI-ARC; Clerk: MDK;

RWW 19-FEB-74 15:45 21984

Career Path and Salary Administration News

SRI is presently engaged in two activities that everyone should be aware of relative to career path and compensation administration. For non professional positions SRI has hired an outside consulting firm to study SRI's policies in comparison with outside firms. This study is expected to be completed in May and some actions are expected relative recommendations from this study by this summer. For professionals a complete redesign of the career path and salary structure is planned. I have a couple of copies of the initial thoughts of a committee that was set up to study the problem and contains the directions they are planning to take. There is much work yet to be done to implement the new scheme and they want feedback from the staff. They would like the feedbck and suggestions in writing. Copies of the draft plan are available on loan from me and your written suggestions can be given to JCN or myself and we'll pass them along or sent directly to Petersen in personnel who is planniing the implementation. Jim or I will be glad to try and answer any questions with what we know. Dick 1

RWW 19-FEB-74 15:45 21984

Career Path and Salary Administration News

(J21984) 19-FEB-74 15:45; Title: Author(s): Richard W. Watson/RWW;
Distribution: /SRI-ARC; Sub-Collections: SRI-ARC SRI-ARC; Clerk: RWW;

JEW 19-FEB-74 16:46 21985

Batch Program for Listing SMFS Files

Dave-- The file was called SMFSDIR.SRC, but I've long ago deleted my copy of it. Try MCK. --Jim 1

JEW 19-FEB-74 16:46 21985

Batch Program for Listing SMFS Files

(J21985) 19-FEB-74 16:46; Title: Author(s): James E. (Jim) White/JEW; Distribution: /DHC MCK; Sub-Collections: SRI-ARC; Clerk: JEW;

KIRK 19-FEB-74 19:09 21986

Me thinks the pot calleth the kettle black.

Other people's reasons for using sendmessage instead of the journal are probably the same yours. The reason I have been using sndmessage is (besides the fact that it is possible to get suspended) it cannot be used in xnls where I have been working for the past week. I find it very difficult to freely alternate between the old and new systems. I hear rumblings of what sounds like the experimental system getting ready to soon become the running system so maybe people will use the journal more at that time. However, there are tools to use for dealing with sndmessages as journal citations. In fact, the only reason I'm sending this message via the journal is because I happened to be in the running system because the INMES userprogram and Copy Sequential command don't yet work in xnls. 1

KIRK 19-FEB-74 19:09 21986

Me thinks the pot calleth the kettle black.

(J21986) 19-FEB-74 19:09; Title: Author(s): Kirk E. Kelley/KIRK ;
Distribution: /HGL MEJ (fyi) SRL (fyi) MDK (fyi) CHI (fyi) EKM (fyi) ;
Sub-Collections: SRI-ARC; Clerk: KIRK ;

Me thinks the pot calleth the kettle black.

Other people's reasons for using sendmessage instead of the journal are probably the same yours. The reason I have been using sndmessage, besides the fact that it is possible to get suspended using the journal, is that the journal cannot be used in xnls where I have been working for the past week. I find it very difficult to freely alternate between the old and new systems. I hear rumblings of what sounds like the experimental system getting ready to soon become the running system so maybe people will use the journal more at that time. However, there are tools to use for dealing with sndmessages as journal citations. In fact, the only reason I'm sending this message via the journal is because I happened to be in the running system because the INMES userprogram and Copy Sequential command don't yet work in xnls.

1

KIRK 19-FEB-74 19:11 21987

Me thinks the pot calleth the kettle black.

(J21987) 19-FEB-74 19:11; Title: Author(s): Kirk E. Kelley/KIRK ;
Distribution: /HGL MEJ (fyi) SRL (fyi) MDK (fyi) CHI (fyi) EKM (fyi) ;
Sub-Collections: SRI-ARC; Clerk: KIRK ;

INLS Insert problems

Three basic problems with the Insert command in New TNLS: 19-FEB-74 1

Why won't Insert Statement let me give a <control-b> or <ESC> to repeat the command (I know about <control-e> and agree that works, but...)? It takes the RPT character and puts it in the text as <control-b>, and then inserts a repetition of the last character I input before the RPT 1a

Why does Insert Word insert the word at the end of the statement when I've given an address within the statement, or left the CM at the beginning????? 1b

Insert STRING commands are still asking for Level 1c

JMB 19-FEB-74 22:14 21988

NLS Insert problems

(J21988) 19-FEB-74 22:14; Title: Author(s): Jeanne M. Beck/JMB;
Distribution: /NNLS; Sub-Collections: SRI-ARC; AccessList: NNLS JMB;
Clerk: JMB;

NIC # 21993
RFC # 620

Bill Ferguson
SRI-ARC
March 1, 1974 1

Request for Monitor Host Table Updates 2

The ARC/NIC group has successfully been running OFFICE-1 for several weeks now. Our NIC users have been transfered to that site, and are receiving all their computation from TYMSHARE. In conjunction with this change, we would like all sites to change their monitor HOST tables, effective Friday, March 8, 1974. 3

The net change we wish to accomplish is the following: 4

1) Site 53 (octal) is OFFICE-1 4a

2) Site 2 is SRI-ARC 4b

3) The nickname for site 2 is ARC (not NIC) 4c

4) The nickname for site 53 is NIC 4d

Please note that now that NIC services are available from OFFICE-1, they rather than SRI-ARC should be accessed over the network as "NIC". 4e

To effect this change, each TENEX site's monitor host table should be updated in the following manner. The actual host name section should contain the following entries (they may already be present). 5

CC.(2,SRI-ARC,USER SERVER TENEX) 5a

CC.(253,TYMSHARE-TIP,USER TIP) 5b

CC.(53,OFFICE-1,USER SERVER TENEX) 5c

Further, the NICKNAME table should contain the following entries. The entry for NIC should be changed to refer to site 53 (octal), and a new entry for ARC should be added. Specificaly, they are: 6

CC.(2,ARC,NICKNAME SERVER USER TENEX) 6a

CC.(53,NIC,NICKNAME SERVER USER TENEX) 6b

Other Network sites, not running TENEX, should make these changes in a manner consistent with their operating system. 7

As mentioned above, these changes are effective on March 8. We will

inform all our users to use the nickname NIC in reference to OFFICE-1 as of this date. Thank you for your co-oporation. 8

(J21993) 1-MAR-74 10:44; Title: Author(s): Ferg R. Ferguson/WRF;
Distribution: /RFC; Sub-Collections: NIC NWG SRI-ARC RFC; RFC# 620;
Clerk: WRF;
Origin: <FERGUSON>REQUEST.NLS;2, 1-MAR-74 10:36 WRF ;

NWG/RFC# 621 MLK 6-MAR-74 16:53 21994
NIC User Directories at SRI-ARC

On Friday evening 8-Mar-74, we will delete all those directories at SRI-ARC that belonged to NIC users who were transferred to OFFICE-1. 1

Sim ultaneously, there is to be a change at each Network Host such that the Hostname "NIC" will refer to OFFICE-1 (Host 53 octal), not to SRI-ARC. (See RFC# 620, NIC# 21993) 2

The effect of these changes is that Network mail sent to NIC users in the form
"nicusername@NIC"
will be delivered to OFFICE-1, as it should. 3

But if such mail is sent to
"nicusername@SRI-ARC"
it will not be accepted at SRI-ARC, because the NIC user's username will be no longer be known there. 4

PLEASE NOTE THAT IT IS YOUR RESPONSIBILITY TO READ ANY NETWORK MAIL THAT WAS DELIVERED TO YOU AT SRI-ARC PRIOR TO FRIDAY EVENING 8-MARCH. THIS MAIL WILL BE DELETED AT THAT TIME. 5

NWG/RFC# 621 MLK 6-MAR-74 16:53 21994

NIC User Directories at SRI-ARC

(J21994) 6-MAR-74 16:53; Title: Author(s): Marcia Lynn Keeney/MLK;
Distribution: /MLK; Sub-Collections: NIC NWG SRI-ARC; RFC# 621; Clerk:
MLK;
Origin: <KUDLICK>RFC.NLS;3, 6-MAR-74 16:19 MDK ;

NWG/RFC# 622 AAM 13-MAR-74 09:20 21995
Scheduling IMP/TIP Down Time

From time to time it is necessary for an IMP or TIP to be taken down other than during its scheduled Preventive Maintenance period. Examples of such cases are retrofit programs and the off-line diagnosis and repair of intermittant problems. In the past we have scheduled these downs with our "primary site contact" at the affected site; in our view this individual was responsible for representing all of the Hosts (and TIP users) connected to that IMP/TIP. Although this policy has worked well in the past, the recent proliferation of Very Distant Hosts, together with complaints from representatives of other (local or distant) Hosts, has caused us to review our procedures. 1

This note announces a modification of the previous policy. We will continue to schedule IMP/TIP downs with our "primary site contact." We will continue to consider this individual a representative of all Hosts connected to that IMP/TIP, with the following exception. Any Host organization wishing to be notified by telephone that down time has been scheduled for their IMP/TIP may nominate some individual as a "secondary contact." The name of the secondary contact, together with a telephone number where he/she can be reached, should be submitted to me by any of the following methods: 2

US mail 2a

Network Control Center
Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Mass. 02138
ATTN: Alexander McKenzie 2a1

Journal system 2b

Ident = AAM 2b1

Network mail 2c

MCKENZIE at BBN-TENEX 2c1

The NCC operators will notify the secondary contact by telephone after scheduling down time with the primary contact. 3

Following is the current list of "primary site contacts" (and backup "primary" contacts): 4

UCLA - Anita Coley (Dave Crocker, Lou Nelson) 4a

SRI - Jim White (Don Wallace) 4b

UCSB - Ron Stoughton (Bob Ploger) 4c

Utah - Dennis Ting 4d

BBN (IMP) - Steve Chipman 4e

MIT-MAC - Al Vezza (Abhay Bhushan) 4f

RAND - Roy Yashimura 4g

SDC - Ken Brandon (Doug Pintar) 4h

Harvard - Bob Nickerson 4i

Lincoln - John Laynor 4j

Stanford - Ted Panofsky (Lester Earnest) 4k

Illinois - Jack Bouknight (Gary Grossman) 4l

Case - Dave Reide (Alan Rosenfeld) 4m

Carnegie - Bill Broadley 4n

AMES IMP - John McConnell (Paul Zima, Dick Brown) 4o

AMES TIP - Bob Linebarger (Toby Gonzales, Glen Holtzer) 4p

MITRE - Jean Iseli (Susan Poh) 4q

RADC - Tom Lawrence (Grant Strength) 4r

NBS - Tom Pyke (Bob Rosenthal) 4s

BTAC - Capt. Petregal (John Smith) 4t

LLL - Robert Abbott (Bob Sherwood) 4u

ISI - Tom Boynton (Jerry Pipes) 4v

USC - James Pepin 4w

GWC - Capt. Goldsmith (Peggy Irving) 4x

DOCB - Dave Lillie (Sky Stevenson) 4y

SDAC - Buz Owen (Vernon Bruffey, Rick Perez, Bill Whyte) 4z

Belvoir - Ken Gibson (Larry Wright) 4a@

ARPA - Steve Crocker (Pam Cutler) 4aa

Aberdeen - Melvin Wrublewski 4ab

CCA - Phil Peterson (Hal Murray) 4ac

Xerox - Robert Taylor (Bob Metcalfe) 4ad

FNWC - R. Mottencamper (Merrill Peterson) 4ae

LBL - Bob Fink (Jose Alvarez) 4af

UCSD - Jim Madden (Grant Rostad) 4ag

Hawaii - John Davidson 4ah

RML - Mike Young 4ai

NORSAR - Per Tveitane (Oddnund Hansen) 4aj

London - Peter Kirstein (Hugh Gamble) 4ak

Tymshare - Mike Marrah (Robert Martinez) 4al

MIT-IPC - Leo J. Ryan (Mike Padlipsky) 4am

Moffett - Ed Mortenson (Gene Lichner) 4an

Rutgers - Tom Webb (Jeff Broido) 4ao

Wright-Patterson - Capt. Woodward (Fred Pitts) 4ap

Please let me know if the "primary" contact for your site should be changed. 5

NWG/RFC# 622 AAM 13-MAR-74 09:20 21995
Scheduling IMP/TIP Down Time

(J21995) 13-MAR-74 09:20; Title: Author(s): Alex A. McKenzie/AAM;
Distribution: /RFC; Sub-Collections: NWG NIC RFC; RFC# 622; Clerk: MLK;
Origin: <MCKENZIE>SCHEDULEDDOWNS.NLS;2, 12-MAR-74 13:36 AAM ;

MDK 20-FEB-74 11:33 21998

On LONDON and NORSAR TIP Users of the NIC

o This letter should be sent to NORSAR and LONDON TIP people as soon as possible. It is written to go out over Doug's signature, but won't be sent till Doug and ARPA approve. I have spoken with John Perry about this, and he is checking with NMRO to get their reactions to the transfer. The transfer of NORSAR and LONDON users to OFFICE-1 could take place this weekend (Feb 23-24) if approved.

On LONDON and NORSAR TIP Users of the NIC

With respect to use of the NIC and NLS facilities by NORSAR-TIP and LONDON-TIP users, we have decided to move those directories and files (and associated information) from SRI-ARC to the OFFICE-1 system during the weekend of Feb 23-24, 1974. 1

The move will commence at 8:00 PM Eastern time, Friday Feb 22. Files will be available at OFFICE-1 Monday Feb 25 at 8:00 AM Eastern Time. All relevant NLS files at SRI-ARC must be "updated" prior to the Friday night cut-off. 2

The reason for the move is to be able to provide a uniform level of on-line computer services, from a single host, to all NIC users. 3

We are sorry for any inconveniences you may encounter due to time-zone differences. We hope that in the future we will be able to extend the hours of operation at OFFICE-1, but we cannot promise that at this time. 4

The contract with TYMSHARE stipulates that the OFFICE-1 system is to be operational 16 hours per day (8:00 AM to 12 Midnight, Eastern times), six days per week. This arrangement was agreed to before we were aware that there would be NIC users outside the U.S. time zones. 4a

The OFFICE-1 system may be available at other times also, but we cannot presently guarantee that. (This is similar to the current arrangement at SRI-ARC, in which there has been no guarantee that the SRI-ARC system would be available outside our working hours.) 4b

Despite this obvious problem, we hope that the arran#ement at OFFICE-1 will be satisfactory. 5

... Doug Engelbart 6

On LONDON and NORSAR TIP Users of the NIC

(J21998) 20-FEB-74 11:33; Title: Author(s): Michael D. Kudlick/MDK;
Distribution: /DCE JSP RWW JCN; Sub-Collections: SRI-ARC; AccessList:
DCE JSP RWW JCN MDK; Clerk: MDK;
Origin: <KUDLICK>OSEAS.NLS;4, 20-FEB-74 11:23 MDK ;

DCE 20-FEB-74 12:23 21999

Wm. Paisley, Institute for Communication Research at Stanford, bringing party to visit ARC 1 Mar 74

Let me know if you'd like to join lunch, or post-lunch discussion.

Wm. Paisley, Institute for Communication Research at Stanford, bringing party to visit ARC 1 Mar 74

Call today from William Paisley, Institute for Communication Research at Stanford. A friend of his will be attending the AAAS (?) meeting next week in San Francisco, and asked Bill to arrange a visit to ARC to learn about AKW. Friend is Donald Pelz, Center for Research in Utilization of Scientific Knowledge, University of Michigan. (Pelz wrote a book on "Scientists and Organizations" (?); Bill will send a copy over.) 1

Bill would aso like to bring along three or four others from SU's ICR: 2

Nathan Maccoby, Director of ICR 2a

Matilda Paisley, Bill's wife 2b

Colin Mick 2c

Ed Parker (only 50-50 chance he can make it). 2d

Arranged tentatively for them to come at 1000, Friday, 1 Mar 74: two hours AKW show and tell, lunch at I Bldg., some follow-on discussion. 3

Note: Paisley may arrange for a different visit day; would let me know. Otherwise, we may include Drs. Taylor and Odell in the demo (visitors from Ballistic Research Lab). 3a

There are three main projects now in ICR, all dealing with disseminaton of scientific information, and the exchange of technical information among professionals. Maccoby, a social psychologist, is interested in large-scale public information sytems; Parker is into sattelite and cable-TV utilities; Matilda Paisley, also a social psychologist, is a field-research specialist in attitude research; Mick is working on medical communications. 4

DCE 20-FEB-74 12:23 21999

Wm. Paisley, Institute for Communication Research at Stanford, bringing party to visit ARC 1 Mar 74

(J21999) 20-FEB-74 12:23; Title: Author(s): Douglas C. Engelbart/DCE ; Distribution: /rww jcn pr mdk jbn jake ; Sub-Collections: SRI-ARC; AccessList: rww jcn pr mdk jbn jake DCE; Clerk: DCE ;

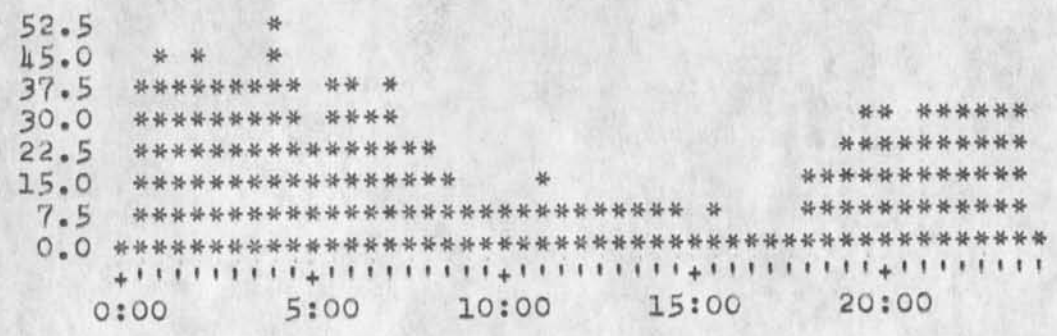
SRL 20-FEB-74 13:06 22000

Superwatch Average Graphs for Week of 2/10/74

As the first full week since all NIC users etc. were moved to the utility, these graphs show a marked drop in load average, number of network users, and an increase in idle time between 8 and 5.

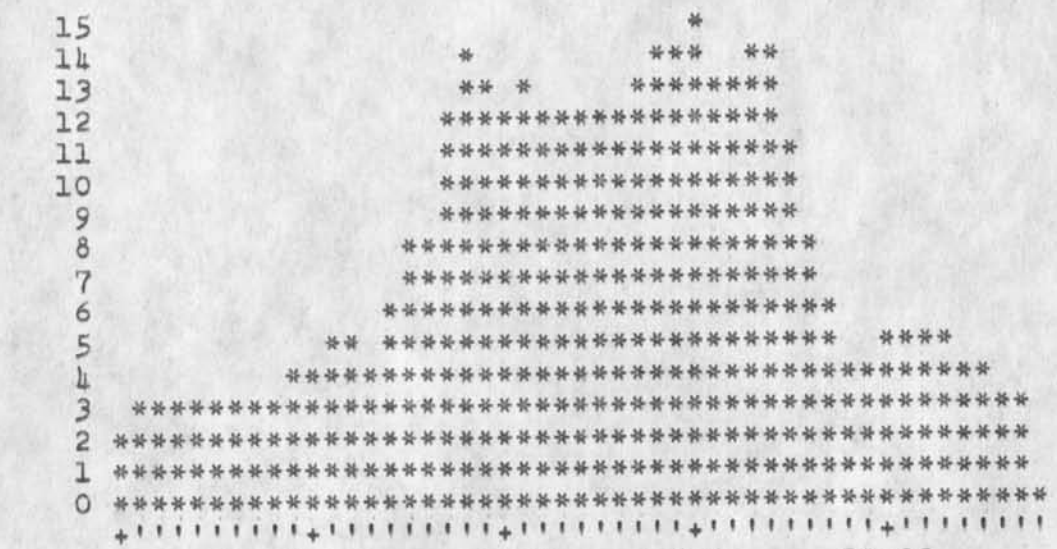
Superwatch Average Graphs for Week of 2/10/74

TIME PLOT OF AVERAGE IDLE TIME FOR WEEK OF 2/10/74
x axis labeled in units of hr:min, xunit = 30 minutes 1



1a

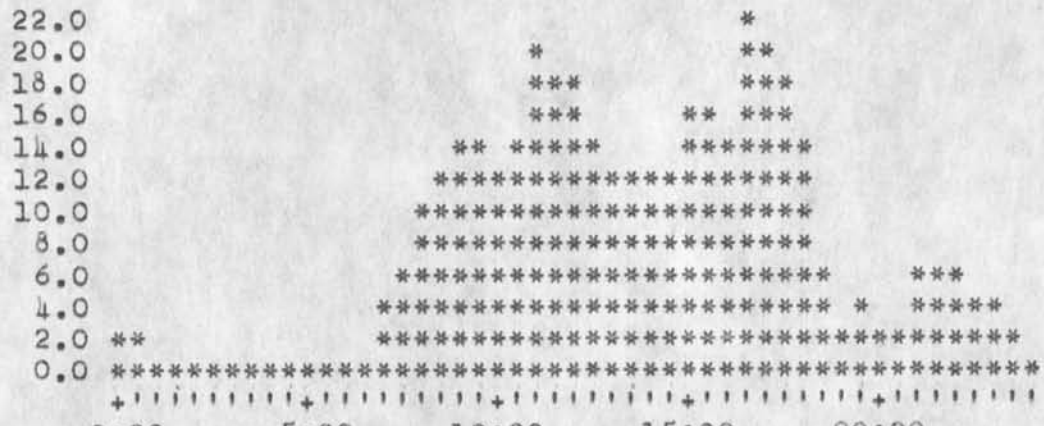
TIME PLOT OF AVERAGE NUMBER OF USERS FOR WEEK OF 2/10/74
x axis labeled in units of hr:min, xunit = 30 minutes 2



2a

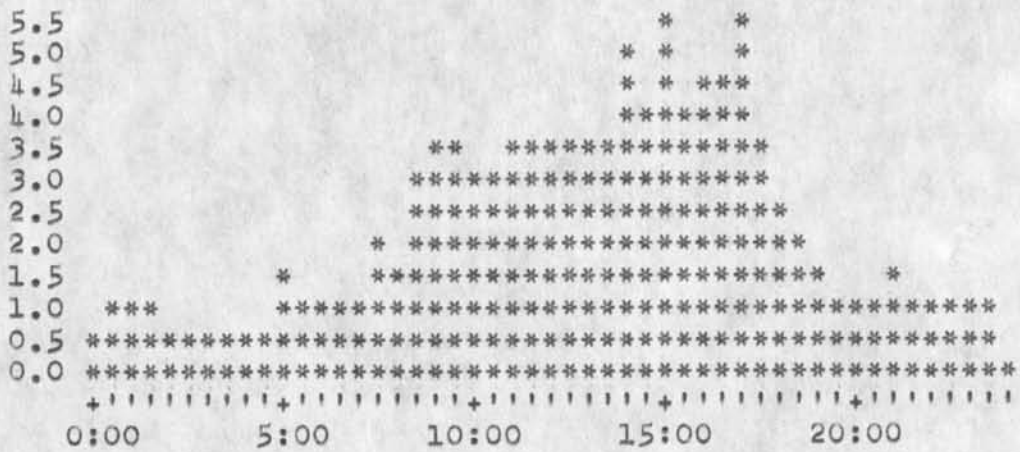
Superwatch Average Graphs for Week of 2/10/74

TIME PLOT OF AVERAGE PER CENT OF SYSTEM USED IN DNLS FOR WEEK OF 2/10/74
x axis labeled in units of hr:min, xunit = 30 minutes 3



3a

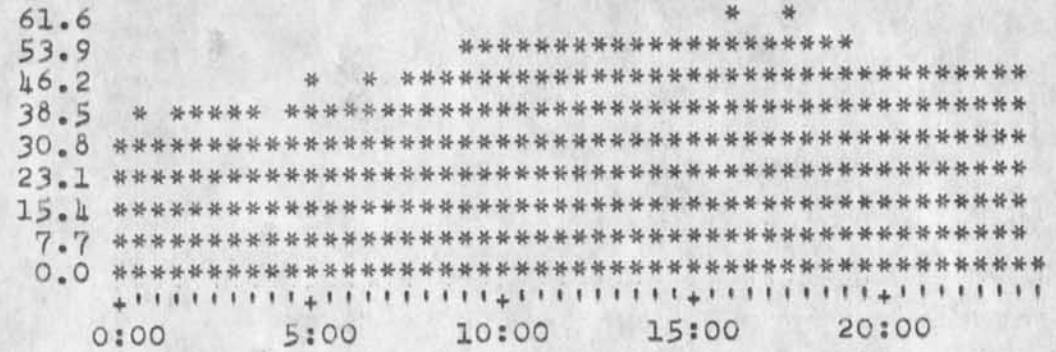
TIME PLOT OF AVERAGE NUMBER OF GO JOBS FOR WEEK OF 2/10/74
x axis labeled in units of hr:min, xunit = 30 minutes 4



4a

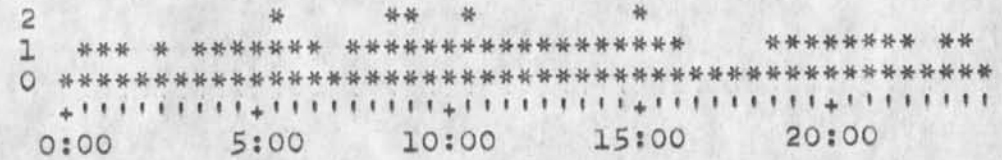
Superwatch Average Graphs for Week of 2/10/74

TIME PLOT OF AVERAGE PER CENT OF CPU TIME CHARGED TO USER ACCOUNTS
FOR WEEK OF 2/10/74
x axis labeled in units of hr:min, xunit = 30 minutes 5



5a

TIME PLOT OF AVERAGE NUMBER OF NETWORK USERS FOR WEEK OF 2/10/74
x axis labeled in units of hr:min, xunit = 30 minutes 6



6a

SRL 20-FEB-74 13:06 22000

Superwatch Average Graphs for Week of 2/10/74

(J22000) 20-FEB-74 13:06; Title: Author(s): Susan R. Lee/SRL;
Distribution: /JCN RWW DCE PR JCP DVN JAKE DLS BAH; Sub-Collections:
SRI-ARC; AccessList: JCN RWW DCE PR JCP DVN JAKE DLS BAH SRL; Clerk:
SRL;
Origin: <LEE>WEEK2/10GRAPHS.NLS;2, 20-FEB-74 12:57 SRL ;