DVN 24-JUL-75 22:53 26187

Good Writing

1 My compliments on some good writing in 26181, particularlly the intorduction. It's rare around here. 1

Good Writing

(J26187) 24-JUL-75 22:53;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /JLE([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: DVN;

RLL 25-JUL-75 00:28 26188

Interest in listening to UCB visitors

1 It woudl be especially pleasing to have research done in the area of human - computer interacction with regard to our system (even other text editors). I am interested in what they aave to say and in relaying the problem areas that I see in need of investigation. Rob 1

Interest in listening to UCB visitors

(J26188) 25-JUL-75 00:28;;;; Title: Author(s): Robert N. Lieberman/RLL; Distribution: /DCE([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: RLL;

DVN 25-JUL-75 11:54 26189

More on Loop to Marker

1 The morning three times in a rwo I came into NLS and jump to item giving as an address #a, in my initial file, and went into a loop. The running numbers were as follows: First time: 64072, 66732, 66707, 64065, 66722, 64073, 31630, 31627, 67206, 66726. Second time: 31636, 31627, 31746, 66727, . Third time: 64065, 31026, 67155, 316214. 1

More on Loop to Marker

(J26189) 25-JUL-75 11:54;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /JDH([ACTION]) FEEDBACK([INFO-ONLY]) ; Sub-Collections: SRI-ARC FEEDBACK; Clerk: DVN;

1 3-JUL-75 18:47:37-EDT,8601;000000000000
Mail from USC-ISI rcvd at 3-JUL-75 1847-EDT
Date: 3 JUL 1975 1439-PDT
From: CARLSON at USC-ISI
Subject: Steering Committee Guidance
To: warshall at BBNB
cc: [BBNB]<PCSTEL>NSW-DISTRIBUTION.LIST: 1

2 Dear Steve: 2

2a The Steering Committee would like to thank you for taking on the task of technical coordination for NSW System Software. Attached is a statement of the Steering Committee's objectives during the next eighteen months. NSW contractors will look to COMPASS for
resolution of technical issues and priorities for their work. The Steering Committee will support you in every way, including allocation of additional funds and changes to Statements of Work, so that these objectives can be attained on schedule. 2a

2a1 ARPA - Bill Carlson
AFDAA - L/C Tony Baggiano
AFDSDC - 1Lt Larry Crain
AFDSC - Maj Gary Hignett
RADC - 1Lt Mike Wingfield
RADC - Duane Stone 2a1

3 attch:
****
* 3

3a ARPA and the Air Force are jointly developing the National Software Works (NSW) to demonstrate a new approach to reducing both the cost and the time for DoD agencies to design, develop, test, document, and maintain computer software. A great deal of software to aid in program design, implementation, etc. has been developed, but numerous problems have been encounted in the distribution of these aids. A mechanism is needed to make these existing software tools available in a uniform manner to DoD. Thus, the concern of NSW is the development of this delivery mechanism (rather than the development of the tools themselves). This focus on the delivery mechanism is also required for the implementation of automated access control and management strategies, a necessary complement to the software tools. The consequences of this approach can be characterized as follows: 3a

3a1 - Software development and maintenance will take place in the software world's equivalent of a factory. The factory is to contain "tools" which aid programmers and managers. Despite the term "factory", no buildings are to be constructed, and for the most part existing computer facilities can be used. 3a1

3a2 - A large fraction of the software development and maintenance tools will be machine independent. That does not mean that tools (which are themselves computer programs) can run on arbitrarily chosen computers. Machine independence is meant to imply that computer specialists building software for many different kinds of computers can share a single version of a tool. Examples of capabilities which can be shared include text editors, the filing system, bookkeeping operations, project management tools, program test data generators, and documentation aids. 3a2

3a3 - Compilers and other execution dependent development and maintenance tools will be provided separately for each target machine (machine on which the software which is being written will run). 3a3

3a4 - The tools will be embedded in a resource-sharing framework which minimizes the user's awareness of the fact that resources are scattered over many hosts. Thus, the programmer requests resources in a uniform way, without having to learn the idiosyncrasies of different host operating systems or log-in procedures. The manager can contract for services with the NSW, without having to negotiate accounts on each host. 3a4

3a5 - A central design criterion for the framework is that it minimize the difficulties of appending new tools and new resource-bearing hosts to the set of facilities in the NSW. 3a5

3a6 - The framework will provide the project manager with much tighter controls over his project than are currently in use. There will be unified and consistent mechanisms for access and accounting control of resources, where the resources include tools and files on several dissimilar hosts. The control mechanisms will support sophisticated tools for the specification and implementation of management policies of project control. These policies typically will specify who may access and/ or change which modules, what crosschecks must be carried out whenever a module is changed, and what consequent actions are required for each change. 3a6

3b Planning for the NSW began in the Summer of 1973, with development starting a year later in July 1974. The initial version of the National Software Works is being implemented on the ARPANET. As capabilities become available, they will be tested by the Air Force Data Systems Design Center at Gunter AFB, Alabama and by the Air Force Data Services Center in the Pentagon.

Software for the Burroughs B3500, which is the standard Air Force Base level computer, is developed at Gunter and distributed to over 130 Air Force installations throughout the world. An important goal is to demonstrate the NSW's effectiveness in supporting the development of software to run on the B3500. 3b

3c The heart of the NSW system is a program called the Works Manager, which is a family of procedures designed to provide a unified and consistent mechanism for access control and accounting. The Works Manager has as its central data base a catalogue of resources. The information this catalogue contains about tools, users, and files is believed to be sufficiently general to represent extremely sophisticated strategies of management control and accounting, involving quite complex rules of access control and sophisticated strategies of fund commitment and expenditure restriction. 3c

3d Users will access the NSW through a hardware/software system called the Front-End, which provides a consistent interface to software development and maintenance tools running on a variety of dissimilar computers. The Front-End will standardize the control characters the user must type to interrupt an activity, initiate a command, erase a character or word, etc. The Front-End will also allow a wide variety of different kinds of terminals to be used with the NSW. Device dependent code will be isolated in the Front-End, so the remainder of the NSW can assume that terminals obey the conventions of a small number of device classes. It has been hypothesized that the Front-End can control almost all user interactions with NSW tools, using tables which define tool command languages. The NSW can operate with a less intelligent Front-End, but tighter standards for interactive tool user interfaces can be enforced if they share a common command interpreter. A prototype FrontEnd which offers generalized command interpretation is being constructed, and the production version of the Front-End will offer this service if the prototype is found to be sufficiently robust to support most if not all manners of dialogue between users and tools, and if the operating costs are not excessive. 3d

3e In order for the Works Manager to control resources in the collection of dissimilar computers where software tools will run, a set of standard software functions must be implemented in each of those computers. The functions will be invoked by the Works Manager using standard communications protocols. Functional requirements for this software to be implemented in each Tool-Bearing Host have been defined, and a first attempt at specifying the software and communications protocols in detail has been made. Initial Tool-Bearing Hosts will be TENEX,MULTICS, an IBM 360/91, and a Burroughs B4700 connected through a Network

Connection Subsystem. As these implementations proceed, the specifications will be reviewed and revised in ways which simplify implementation but still satisfy the functional requirements for the Works Manager to control resources throughout the NSW. 3e

3f During the eighteen months, July 1975 to December 1976, the initial NSW system will be completed and evaluated, and the feasibility of expanding the system and operating it costeffectively for production applications will be determined. The experiments will provide the NSW Steering Committee with the information it needs to project usage requirements. An analysis of the cost/performance tradeoffs in building a scale, hardened, optimized version of the NSW will be conducted. A detailed design will be prepared for a system which represents a reasonable compromise between performance and cost in satisfying projected usage requirements. 3f

4 ------- 4

5 5

NSW Steering Committee Letter

(J26190) 25-JUL-75 12:08;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /ARC-DEV([INFO-ONLY]) ; Sub-Collections: SRI-ARC ARC-DEV; Clerk: JBP;

1 26190 Distribution

1a Mary Ann Kellan, Andy poggio, David L. Retz, Jan A. Cornish, Larry L. Garlick, Delorse M. Brooks, Beverly Boli, James E. (Jim) White, Ann Weinberg, Kenneth E. (Ken) Victor, Dirk H. Van Nouhuys, Jonathan B. Postel, Elizabeth K. Michael, David S. Maynard, Karolyn J. Martin, Harvey G. Lehtman, Kirk E. Kelley, Charles H. Irby, Joseph L. Ehardt, Robert Louis Belleville, Don I. Andrews, Richard W. Watson, Douglas C. Engelbart, Please put me in the NSW group.

1 Please do. By the way my camer is finally well now and I haven't forgoten my picture taking project. 1

Please put me in the NSW group.

(J26191) 25-JUL-75 12:27;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /MLK([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: DVN;

1 26192 Distribution

1a Kirk Sattley, Delorse M. Brooks, Jonathan B. Postel, Priscilla A. Wold, Rita Hysmith, Pamela K. Allen, Delorse M. Brooks, Elizabeth F. Finney, Beverly Boli, Lawrence A. Crain, Kirk Sattley, Susan Gail Roetter, Robert N. Lieberman, Ann Weinberg, Kenneth E. (Ken) Victor, Douglas C. Engelbart, James H. Bair, Elizabeth K. Michael, Richard W. Watson, Elizabeth J. Feinler, Harvey G. Lehtman, Kirk E. Kelley, Laura E. Gould, Jeanne M. Beck, Dirk H. Van Nouhuys, James C. Norton,

More Dialogue on The Help Data Base for the Worksmanager.

1 Here are the comments I promissed on (sattley, Wm-help,) I hope you find them useful. When you are ready to have it become the help file, we are. 1

2 Somewhere in Helpd Kirk says we try to write for an intellegent secretary. Or an sargent at Gunter AFB might be more appropriate here. I find paragraphs like (sattley,wm-help,NSW-filenames) too complicated for an uninitiated sargent. I have been guilty of the same thing in my draft. Below is a try at rewriting that guy. In particular I have found that learners are not interested in planned changes. It is hard enough for them to understand what is happening now, (i.e..."initially..."). 2

2a NSW-filenames. Complete NSW-filenames have a slash (/) in the middle. The items on the left of the slash are called attributes. They give technical information about the file. The system attaches attiributes. On the right are name componenets. They are what you use to call files. Sometimes the system attaches a name component, but the user always speicifes atleast one of them. The name components are separated by periods, and the attributes by semicolons. There can be up to ten name components. The first name component is always NSW, the second will generally be the name of a project. The order of name components matters: NSW.IVTRAN.PARSE.BOLDUC is not the same as NSW.IVTRAN.BOLDUC.PARSE. The order of attributes does not matter. You will seldom, if ever, have to type a full NSW filename. When you are working, you will have several active scopes which automatically supply the first few name components, so in using NSW filenames in commands you need to type in only enough parts of the name to specify it uniquely within your scope.
> See: Name-components, Attributes, Scope, File-spec, Entry-name. 2a

3 Re Projects (2g2)...I fear "a tree of nodes" will blow the mind of our Airforce sargent. 3

4 Re 2b3b for appearances in a menu and future links, you might put something like "Creation identification<CR>" in front of this statement. Also we need "warrant" in the concepts. 4

5 Re 2b3a. For Menuepurposes and future links you might put "Duplication of names <CR>" infront of this node or something like that. 5

6 Re File-spec (2b2). I think it is well to assign responsibility clearly for such things. How about "The worksmanager will extend the file-spec by appropriate scope..." 6

More Dialogue on The Help Data Base for the Worksmanager.

7 Re: Userid (2d). In that case I think we don't need to talk about it in the Help data base. 7

8 Maybe everything that used the word "gripe" could use"protest" 8

More Dialogue on The Help Data Base for the Worksmanager.

(J26192) 25-JUL-75 12:52;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /KS([ACTION]) DMB([ACTION] dirt notebook please) DIRT([INFO-ONLY]) ; Sub-Collections: SRI-ARC DIRT; Clerk: DVN; Origin: < VANNOUHUYS, MYLIN.NLS;117, >, 25-JUL-75 12:45 DVN ;;;;####;

JBP 25-JUL-75 15:12 26193

PDP 11 FE Memo Response from Millstein

1 25-JUL-75 14:09:03-EDT,377;000000000000
Date: 25 JUL 1975 1409-EDT
From: MILLSTEIN
Subject: PDP-11 FE
To: POSTEL
cc: MILLSTEIN, WARSHALL, WATSON 1

2 Jon: 2

2a Thank you for your FE memo. I would like to see, if possible, one additional section. To wit: a discussion of the functionality of the FE which is, in your view, necessary to meet the Steering Committee desires. 2a

3 Regards, 3

4 Bob
------- 4

PDP 11 FE Memo Response from Millstein

(J26193) 25-JUL-75 15:12;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /RWW([INFO-ONLY]) JLE([INFO-ONLY]) JBP([INFO-ONLY]) JEW([INFO-ONLY]) CHI([INFO-ONLY]) DLR([INFO-ONLY]) ANDY([INFO-ONLY]) LLG([INFO-ONLY]) DIA([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JBP;

1 26193 Distribution
    1a Richard W. Watson, Joseph L. Ehardt, Jonathan B. Postel, James E. (Jim) White, Charles H. Irby, David L. Retz, Andy Poggio, Larry L. Garlick, Don I. Andrews,

JBP 25-JUL-75 15:31 26194

Millstein's comments on our Milestones

1 25-JUL-75 14:34:56-EDT,1035;000000000000
Date: 25 JUL 1975 1434-EDT
From: MILLSTEIN
Subject: Milestones
To: POSTEL
cc: MILLSTEIN, WARSHALL, WATSON 1

2 Jon: 2

3 In no particlar order, the following questions arise: 3

4 Front End
1) new tool - old tool, Is the distinction here due to user TELNET? If so, then we have a serious problem since there are no tools now other than encapsulated ones. 4

5 2) What does "runs" mean - "fully" debugged or just available for use? 5

6 3) You don't have milestones for FE-10 (display, old tool), FE-11 (half duplex tty, new and old tool), FE-11 (display, old tool). Aren't these part of FE task 3? 6

7 4) How much resource will be diverted to produce the three reports? 7

8 Tools
1) You don't say when you're taking the cake out of the oven. I.e., what are milestones for installing NLS in NSW (per your SOW Tools task 1)? Could you split these milestones into two heaps - one relating to NLS installation and the other to NLS enhancements (per Tools tasks 3 and 4)? 8

9 Regards, 9

10 Bob
------- 10

Millstein's comments on our Milestones

(J26194) 25-JUL-75 15:31;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /BEV([INFO-ONLY]) CHI([INFO-ONLY]) JEW([INFO-ONLY]) EKM([INFO-ONLY]) JBP([INFO-ONLY]) RWW([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JBP;

1 26194 Distribution
la Beverly Boli, Charles H. Irby, James E. (Jim) White, Elizabeth K. Michael, Jonathan B. Postel, Richard W. Watson,

KWAC Fall 75 meeting: watch out for holidays

1 Any week in October is fine with me. I understand that the week of Oct 27 is a conference as well as the first week in October (either 6 Oct or Sept 29 we willhave to check). Also watch out for the two federal holidays, Oct 13 and 27th. This doesn't matter to us and perhaps not to most of the governement people but htey should be told of it. Rob 1

KWAC Fall 75 meeting: watch out for holidays

(J26195) 25-JUL-75 15:40;;;; Title: Author(s): Robert N. Lieberman/RLL; Distribution: /RMS2([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: RLL;

JAKE 25-JUL-75 16:49 26196

Boston Kwac Meeting

1 KWAC IV 1975 1

1a Will you be able to attend? Yes, if NIC contract is renewed 1a

1b Would you like to have the meeting in Cambridge? Yes 1b

1c Do you prefer a 4 or 5 day meeting? 5 1c

1d What is you choice of dates? Oct 20-24 (I would like to attend ASIS afterwards) 1d

1e Would you like me to arrange your hotel/motel room? Not necessary 1e

1f Would you like a list of hotels and prices in the Boston-MIT area Yes? 1f

1g ::::::::::::::::::::::: 1g

1h Dear Bob,

I think an MIT Kwac meeting would be great. Personally I would like to visit the various MIT hosts while there but others may not be interested. An afternoon tour of some sort would be interesting and add a change of pace. Once we have decided on place and time, think we might concentrat on a tentative agenda also. Let me know if you want input for that.

Regards,
Jake 1h

Boston Kwac Meeting

(J26196) 25-JUL-75 16:49;;;; Title: Author(s): Elizabeth J. Feinler/JAKE; Distribution: /RMS2([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: JAKE; Origin: < FEINLER, KWAC.NLS;2, >, 25-JUL-75 16:31 JAKE ;;;;####;

DDPCS Session for KWAC Meeting

1 Jim, I understand you are co-ordinating the KWAC meeting in Boston in September or October. I would like to be able to be there and to arrange for a DDPCS session. We should talk. 1

DDPCS session for KWAC Meeting

(J26197) 25-JUL-75 18:10;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /JCN([ACTION]) DPCS([INFO-ONLY]) DOCPLAN([INFO-ONLY]) ; Sub-Collections: SRI-ARC DPCS DOCPLAN; Clerk: DVN;

1 26197 Distribution

1a Dirk H. Van Nouhuys,

1b James C. Norton, Delorse M. Brooks, Elizabeth F. Finney, Beverly Boli, Joseph L. Ehardt, James H. Bair, Robert N. Lieberman, Pat Whiting O'Keefe, James H. Bair, Robert Louis Belleville, Ann Weinberg, Thomas L. Humphrey, Jeanne M. Leavitt, Kirk E. Kelley, Duane L. Stone, Elizabeth J. Feinler, N. Dean Meyer, Dirk H. Van Nouhuys, Douglas C. Engelbart, James C. Norton, Richard W. Watson, Charles H. Irby, James H. Bair, David R. Brown, Glenn A. Sherwood, N. Dean Meyer, Kathey L. Mabrey, Norman R. Nielsen, Thomas L. Humphrey, Robert Louis Belleville, Elizabeth K. Michael, Richard W. Watson, James C. Norton, Robert N. Lieberman, Pat Whiting O'Keefe, Douglas C. Engelbart

Foiled Interogation

1 I tried it again and suceeded. 1

Foiled Interogation

(J26198) 25-JUL-75 18:12;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /FEEDBACK([INFO-ONLY]) ; Sub-Collections: SRI-ARC FEEDBACK; Clerk: DVN;

CONTACT: NSF, Hal Bamford on 25 Jul 75

1 (NSF) Contact report 26199 1

1a (DATE) 25-JUL-75 1a

1b (BY) Lieberman 1b

1c (ATTENDEES) 1c

1c1 Hal Bamford - NSF 1c1

1c2 Robert Lieberman - SRI-ARC 1c2

1d (ADDRESSES) Full name of organization, address, and phone number 1d

1e (MEDIUM) PHONE 1e

1f (WHERE) Menlo Park, CA and Washington, DC 1f

1g (ACTION-ITEMS) 1g

1g1 send Announcement of workshop to Bamford 1g1

1h (DISTRIBUTION) ARC-LOG DCE JCN RWW RLL 1h

1i (REFERENCES) 26178 1i

1j (DOCUMENTS) Hard copy given and received 1j

1j1 (GIVEN) Date and documents given 1j1

1j2 (RECEIVED) Date and documents received 1j2

1k (REMARKS) 1k

1k1 Bamford called me on the draft proposal we are sending him for a utility slot. 1k1

1k2 In the course of the conversation he mentioned the program solicitation (NSF 75-23) that was just sent out that we might be interested in. I believe DCE has a copy but Hal said he would send me it to be sure. 1k2

1k3 Additionally, he spoke of a RFP (NSF 75-136) that will be coming out very soon on analysis of scientific and technical communication. This might be interesting to us if we wish to get into analysis of our sort of system. (DCE: This was the RFP we spotted in the Commerce Business Daily). 1k3

CONTACT: NSF, Hal Bamford on 25 Jul 75

1k4 Mrs. Rose of Bamford shop will be here in August to see what we have. I told Bamford of our seminar the week of 25 August. He said it seemed interesting but $1000 might preclude any staff member from going. He will let me know. 1k4

1k5 He expressed a very strong desire to have our unsolicited proposal for the utility slot locked up by October 1975. This means we must make some decisions on next year's proposal very soon. 1k5

CONTACT: NSF, Hal Bamford on 25 Jul 75

(J26199) 25-JUL-75 19:46;;;; Title: Author(s): Robert N. Lieberman/RLL; Sub-Collections: NIC; Clerk: RLL;

KEV 25-JUL-75 10:39 26200

samoyod puppies for sale

1 a friend of mine has 5 (4-male, 1-female) 7 week old AKC registered samoyod puupies for sale ($65 - $100). Contact me or call Dennis or Melinda at (408) 438-2511. 1

samoyod puppies for sale

(J26200) 25-JUL-75 10:39;;;; Title: Author(s): Kenneth E. (Ken) Victor/KEV; Distribution: /SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: KEV;

KEV 25-JUL-75 16:47 26201

XL10 VALUE construct

1 I have modified (and brought up) a new xl10 runtime package, the modification involves a modification to the procedure <nls,xl10runtime,srval> which is used by the language construct VALUE. (special note to jle and dia: i didnt modify 11011 because i forgot where it is, but one of you should make corresponding mod.) The modification allows for conversion of strings for bases greater than 10, the mods will not effect the conversion of purely numeric strings, but for strings that contain alphabetics, they will now have a different value. herein follow the old and new algorithms: 1

```
   1a new:                                                  1a

      1a1 (srval) PROCEDURE(astrng, base);                  1a1

         1a1a %convert string to value%                     1a1a

         1a1b LOCAL value, cnt, char;                       1a1b

         1a1c REF astrng;                                   1a1c

         1a1d value _ 0;                                    1a1d

         1a1e cnt _ 1;                                      1a1e

         1a1f UNTIL cnt > astrng.L DO                       1a1f

            1a1f1 BEGIN                                     1a1f1

            1a1f2 char _ *astrng*[cnt];                     1a1f2

            1a1f3 char _ (CASE char OF                      1a1f3

               1a1f3a IN [ '0, '9]: char - '0;              1a1f3a

               1a1f3b IN ['A, 'Z]: char - 'A + 10;          1a1f3b

               1a1f3c IN ['a, 'z]: char - 'a + 10;          1a1f3c

               1a1f3d ENDCASE char - '0);                   1a1f3d

            1a1f4 value _ value*base + char;                1a1f4

            1a1f5 BUMP cnt;                                 1a1f5

            1a1f6 END;                                      1a1f6

         1a1g RETURN (value) END.
                                                            1a1g
```

```
  1b old:                                                       1b

     1b1 (srval) PROCEDURE(astrng, base);                       1b1

        1b1a %convert string to value%                          1b1a

        1b1b LOCAL value, cnt, char;                            1b1b

        1b1c REF astrng;                                        1b1c

        1b1d value _ 0;                                         1b1d

        1b1e cnt _ 1;                                           1b1e

        1b1f UNTIL cnt > astrng.L DO                            1b1f

           1b1f1 BEGIN                                         1b1f1

           1b1f2 char _ *astrng*[cnt];                         1b1f2

           1b1f3 value _ value*base + char - '0;               1b1f3

           1b1f4 BUMP cnt;                                     1b1f4

           1b1f5 END;                                          1b1f5

        1b1g RETURN (value) END.
                                                                1b1g
```

XL10 VALUE construct

(J26201) 25-JUL-75 16:47;;;; Title: Author(s): Kenneth E. (Ken) Victor/KEV; Distribution: /SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: KEV;

1 26201 Distribution

1a Douglas C. Engelbart, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, James C. Norton, Jeffrey C. Peters, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Richard W. Watson, Don I. Andrews,

1b Mary Ann Kellan, Buddie J. Pine, Andy Poggio, David L. Retz, Laura J. Metzger, Karolyn J. Martin, Jan A. Cornish, Larry L. Garlick, Priscilla A. Wold, Pamela K. Allen, Delorse M. Brooks, Beverly Boli, Rita Hysmith, Log Augmentation, Joseph L. Ehardt, Raymond R. Panko, Susan Gail Roetter, Robert Louis Belleville, Rene C. Ochoa, Ann Weinberg, Joan Hamilton, Adrian C. McGinnis, Robert S. Ratner, David S. Maynard, Robert N. Lieberman, Sandy L. Johnson, James H. Bair, Jeanne M. Leavitt, Rodney A. Bondurant, Jeanne M. Beck, Marcia L. Keeney, Elizabeth K. Michael, Jonathan B. Postel, Elizabeth J. Feinler, Kirk E. Kelley, N. Dean Meyer, James E. (Jim) White

A Marginal Existence

1 I currently have my print margin set to 72, my display right margin set to 72, and my output quickprint margin set to 72 in Useroptions. As of Saturday the TNLS terminal output was 70, output quickprint was 71, output printer is actually 72, my display is 72, output sequential is 71, and a sendprint file made from a print file is 72. A conservative estimate is that this nagging but trivial problem has cost us a month's time and money in work being redone. Again I request that default right margins on all devices be standardized to 72 with useroptions available for deviations from the standard. 1

A Marginal Existence

(J26202) 26-JUL-75 20:01;;;; Title: Author(s): Elizabeth J. Feinler/JAKE; Distribution: /SRI-ARC([ACTION]) FEEDBACK([ACTION]) ; Sub-Collections: SRI-ARC FEEDBACK; Clerk: JAKE;

1 26202 Distribution

1a Douglas C. Engelbart, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, James C. Norton, Jeffrey C. Peters, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Richard W. Watson, Don I. Andrews, Special Jhb Feedback,

1b Mary Ann Kellan, Buddie J. Pine, Andy Poggio, David L. Retz, Laura J. Metzger, Karolyn J. Martin, Jan A. Cornish, Larry L. Garlick, Priscilla A. Wold, Pamela K. Allen, Delorse M. Brooks, Beverly Boli, Rita Hysmith, Log Augmentation, Joseph L. Ehardt, Raymond R. Panko, Susan Gail Poetter, Robert Louis Belleville, Rene C. Ochoa, Ann Weinberg, Joan Hamilton, Adrian C. McGinnis, Robert S. Ratner, David S. Maynard, Robert N. Lieberman, Sandy L. Johnson, James H. Bair, Jeanne M. Leavitt, Rodney A. Bondurant, Jeanne M. Beck, Marcia L. Keeney, Elizabeth K. Michael, Jonathan B. Postel, Elizabeth J. Feinler, Kirk E. Kelley, N. Dean Meyer, James E. (Jim) White

Documentation Weekly Report

ARC tool interface file (Help) name changed to Core; sample sessions in final form; Quarterly Management Report first draft; Air Force Format revisions.

Documentation Weekly Report

1 Week ending 7/25/75 1

1a Bev 1a

1a1 This Week 1a1

1a1a Completed revisions of Sample Sessions, except for Sendmail I and II. All of Applications suggestions included. Gave Format SS to Dirk for some clean-up. 1a1a

1a1b Wrote first draft of Quarterly Management Report. 1a1b

1a1c Reviewed with App. group the viewgraphs to be used with courses. 1a1c

1a1d Went over doc. milestones with Jon. 1a1d

1a1e Toured NASA. 1a1e

1a2 Next Week 1a2

1a2a Revamp Sendmail SS I and II. 1a2a

1a2b Complete final version of QMR. 1a2b

1a2c Work on Help with Kirk. 1a2c

1b Kirk 1b

1b1 Done last week to July 25 1b1

1b1a Changed name of ARC tool interface file to "Core" (for "Core AKW") and began re-organization from this point of view. Set up all existing tool description files to work in the new multi-file environment. 1b1a

1b1b Discussed general documentation transfer and maintenance procedures with Jeanne B. to be carried out with the new Substitute command in Modify tool/subsystem. 1b1b

1b1c Made further modifications to AFM format program. Found a bug in OP to COM. 1b1c

1b2 Do 1b2

1b2a Continue re-organization of Core, prioritize and responsibilitize the parts of Help with Bev. 1b2a

1b2b Begin on Letter Program. 1b2b

Documentation Weekly Report

(J26203) 28-JUL-75 12:36;;;; Title: Author(s): Beverly Boli, Kirk E. Kelley/BEV KIRK; Distribution: /DIRT([INFO-ONLY]) SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC DIRT; Clerk: BEV;

1 26203 Distribution

1a Log Augmentation, Joseph L. Ehardt, Raymond R. Panko, Susan Gail Roetter, Robert Louis Belleville, Rene C. Ochoa, Ann Weinberg, Joan Hamilton, Adrian C. McGinnis, Robert S. Ratner, David S. Maynard, Robert N. Lieberman, Sandy L. Johnson, James H. Bair, Jeanne M. Leavitt, Rodney A. Bondurant, Jeanne M. Beck, Marcia L. Keeney, Elizabeth K. Michael, Jonathan B. Postel, Elizabeth J. Feinler, Kirk E. Kelley, N. Dean Meyer, James E. (Jim) White, Douglas C. Engelbart, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, James C. Norton, Jeffrey C. Peters, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Richard W. Watson, Don I. Andrews,

1b Jonathan B. Postel, Priscilla A. Wold, Rita Hysmith, Pamela K. Allen, Delorse M. Brooks, Elizabeth F. Finney, Beverly Boli, Lawrence A. Crain, Kirk Sattley, Susan Gail Roetter, Robert N. Lieberman, Ann Weinberg, Kenneth E. (Ken) Victor, Douglas C. Engelbart, James H. Bair, Elizabeth K. Michael, Richard W. Watson, Elizabeth J. Feinler, Harvey G. Lehtman, Kirk E. Kelley, Laura E. Gould, Jeanne M. Beck, Dirk H. Van Nouhuys, James C. Norton, Mary Ann Kellan, Buddie J. Pine, Andy Poggio, David L. Retz, Laura J. Metzger, Karolyn J. Martin, Jan A. Cornish, Larry L. Garlick, Priscilla A. Wold, Pamela K. Allen, Delorse M. Brooks, Beverly Boli, Rita Hysmith

Clarifications on Cassette Restriction Document (26163,)

Prompted by Kirk's questios questions (33043,)

HGL 28-JUL-75 15:09 26204

Clarifications on Cassette Restriction Document (26163,)

1 Kirk's questions (33043,) about our Cassette restriction document (26163,) were quite good. Control-W is indeed used by Termicettes as the rewind control character. Thus the suggestion in our earlier document about the appropriate escape character setting for operating the cassette system through TELNET should have been generalized to suggest that the escape character should not be one of the control characters which activate the cassette terminal being used. (I think control-P is OK, but we shouldn't generalize about all terminal types: they may each require a different TELNET escape character.) 1

2 The second question is more difficult to answer: there is NO command to change TIP input buffers! The TIP, as stressed by Joel Malman of NCC, was not designed to handle cassette terminals. TIP buffer sizes are assigned by NCC and must be changed by them. I can assure you that they would not want to change them frequently. All we can do is find out from the user which port is being used if data is being lost and suggest they get on a port with bigger buffers. This is not possible on some TIPs which have phone lines assigned to non-specific ports. If some customers are assigned dedicated lines (and ports) it may be possible to set one or two of them to a size large enough to be used by a cassette terminal. The ultimate solution awaits the development of buffering flow control hardware in the LSI-11 lineprocessor. 2

3 Martin Hardy has suggested that our phrasing of required functions to be present on the Cassette terminal device was confusing: none of our current devices has a stop read control. We meant to imply that the read record command should stop reading at the end of a reasonably sized record, generally a line of text. 3

Clarifications on Cassette Restriction Document (26163,)

(J26204) 28-JUL-75 15;09;;;; Title: Author(s): Harvey G. Lehtman/HGL; Distribution: /SRI-ARC([ACTION]) JHK([ACTION] we should incorporate this in a revised document) KIRK([ACTION] Thank you) ; Sub-Collections: SRI-ARC; Clerk: HGL;

1 26204 Distribution

1a Douglas C. Engelbart, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, James C. Norton, Jeffrey C. Peters, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Richard W. Watson, Don I. Andrews, Jan H. Kremers, Kirk E. Kelley,

1b Mary Ann Kellan, Buddie J. Pine, Andy Poggio, David L. Retz, Laura J. Metzger, Karolyn J. Martin, Jan A. Cornish, Larry L. Garlick, Priscilla A. Wold, Pamela K. Allen, Delorse M. Brooks, Beverly Boli, Rita Hysmith, Log Augmentation, Joseph L. Ehardt, Raymond R. Panko, Susan Gail Roetter, Robert Louis Belleville, Rene C. Ochoa, Ann Weinberg, Joan Hamilton, Adrian C. McGinnis, Robert S. Ratner, David S. Maynard, Robert N. Lieberman, Sandy L. Johnson, James H. Bair, Jeanne M. Leavitt, Rodney A. Bondurant, Jeanne M. Beck, Marcia L. Keeney, Elizabeth K. Michael, Jonathan B. Postel, Elizabeth J. Feinler, Kirk E. Kelley, N. Dean Meyer, James E. (Jim) White weekly report

1 Last Week 1

1a nsw protocols 1a

1a1 worked not at all on updating the file package document as agreed to at the june protocol meeting 1a1

1a2 worked on the "pseudo user telnet" program for old tool interaction 1a2

1b project management 1b

1b1 Milestones sent to Compass 1b1

1c arpa protocols 1c

1c1 Put 1 RFC online at Office-1 1c1

1c2 Read "Message Protocol" report 1c2

2 Next Week 2

2a nsw protocols 2a

2a1 get the "Pseudo user telnet" Program for old tool interaction to an operational state 2a1

2a2 complete updating the file package specification documents 2a2

2b project management 2b

2b1 send updated milestones to Compass, re their questions (26194,) 2b1

2c operations at isic 2c

2c1 Next goal is to have NLS 8.5 as standard NLS at ISIC 2c1

2d arpa protocols 2d

2d1 Work on response to "Message Protocol" report 2d1

2d2 Read INWG notes 2d2

2d3 Read Network Measurement notes 2d3

weekly report

(J26205) 28-JUL-75 15:53;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /ARC-DEV([INFO-ONLY]) ; Sub-Collections: SRI-ARC ARC-DEV; Clerk: JBP;

1 26205 Distribution

1a Mary Ann Kellan, Andy Poggio, David L. Retz, Jan A. Cornish, Larry L. Garlick, Delorse M. Brooks, Beverly Boli, James E. (Jim) White, Ann Weinberg, Kenneth E. (Ken) Victor, Dirk H. Van Nouhuys, Jonathan B. Postel, Elizabeth K. Michael, David S. Maynard, Karolyn J. Martin, Harvey G. Lehtman, Kirk E. Kelley, Charles H. Irby, Joseph L. Ehardt, Robert Louis Belleville, Don I. Andrews, Richard W. Watson, Douglas C. Engelbart, cml selection routines

the file (isic, nsw-debugger, p2func.nls,) contains modified versions of rdlit (modified version called r2dlit) and gettext (modified version called g2exttext) and a number of selection routines (listed below). you are welcome to take what you want from there. let me know which ones you build into the language. we should probably talk about what i did in person, but herein follows a summary of what i did: (if you care to try any of these you can use <isic,nsw-debugger,c2ml.nls,> as a test cml to drive these selection routines or just run <isic,nsw-debugger,c2ml.sav,>) 1

r2dlit: 1a

takes an additional parameter, ccnt. if ccnt is 0 then it operates as the old rdlit. if ccnt is greater than 0, then it is a count of the exact number of characters to be collected. for example if ccnt is 2 and a user inputs 1 char followed by a CA, the CA will look like a disallowed character and the user must input exactly ccnt characters. after inputting ccnt characters, no final confirmation character is required. if ccnt is less than 0 (e.g. -N), then N is an uper bound on the number of allowed characters to collect. if the user inputs N allowed characters then no final confirmation is required. if the user inputs less than N allowed characters followed by a terminator or a disallowed character, then this last character will act as a confirmation character and if it is a disallowed character it will be unput. 1a1

g2ettext 1b

takes 5 additional parameters: an allowed char string, a disallowed char string, a terminators char string, a ccnt, and an intbase. the first 4 of these parameters are the same as in rdlit; the last parameter if non-zero means select an integer in base intbase. 1b1

selection routines 1c

(t1char) % get one and only one typed character % 1c1

(t2char) % get two and only two typed characters % 1c2

(t3char) % get three and only three typed characters % 1c3

(tu1char) % get up to one typed character % 1c4

(tu2char) % get up to two typed characters % 1c5

(tu3char) % get up to three typed characters % 1c6 (tdigit) % get any number of typed digits, CA to terminate % 1c7

(tudigit) % get any number of typed digits, terminate on non-digit % 1c8

(t1digit) % get one and only one typed digit % 1c9

(t2digit) % get two and only two typed digits % 1c10

(t3digit) % get three and only three typed digits % 1c11

(tu1digit) % get up to one typed digit % 1c12

(tu2digit) % get up to two typed digits % 1c13

(tu3digit) % get up to three typed digits % 1c14

(t1alnm) % get one and only one typed alphanumeric % 1c15

(t2alnm) % get two and only two typed alphanumerics % 1c16

(t3alnm) % get three and only three typed alphanumerics % 1c17

(tu1alnm) % get up to one typed alphanumeric % 1c18

(tu2alnm) % get up to two typed alphanumerics % 1c19

(tu3alnm) % get up to three typed alphanumerics % 1c20

(t1alpha) % get one and only one typed alphabetic % 1c21

(t2alpha) % get two and only two typed alphabetics % 1c22

(t3alpha) % get three and only three typed alphabetics % 1c23

(tu1alpha) % get up to one typed alphabetic % 1c24

(tu2alpha) % get up to two typed alphabetics % 1c25

(tu3alpha) % get up to three typed alphabetics % 1c26

(t1naln) % get one and only one typed non-alphanumeric % 1c27

(t2naln) % get two and only two typed non-alphanumerics % 1c28

(t3naln) % get three and only three typed non-alphanumerics % 1c29

(tu1naln) % get up to one typed non-alphanumeric % 1c30 (tu2naln) % get up to two typed non-alphanumerics % 1c31

(tu3naln) % get up to three typed non-alphanumerics % 1c32

(t1punc) % get one and only one typed punctuation character % 1c33

(t2punc) % get two and only two typed punctuation characters % 1c34

(t3punc) % get three and only three typed punctuation characters % 1c35

(tu1punc) % get up to one typed punctuation character % 1c36

(tu2punc) % get up to two typed punctuation characters % 1c37

(tu3punc) % get up to three typed punctuation characters % 1c38

(ttint) % get a base ten integer, CA to terminate % 1c39

(tutint) % get a base ten integer, terminate on non base ten input% 1c40

(toint) % get a base 8 integer, CA to terminate % 1c41

(tuoint) % get a base 8 integer, terminate on non base 8 input% 1c42

(thint) % get a base 16 integer, CA to terminate % 1c43

(tuhint) % get a base 16 integer, terminate on non base 16 input% 1c44

% the following selection routines make use of the cml variable: cmlradix - which is declared in p2funct, but which probably should be a builtin cli variable. % 1c45

> (tbint) % get a base cmlradix integer, CA to terminate % 1c45a
>
> (tubint) % get a base cmlradix integer, terminate on non base cmlradix input% 1c45b
>
> (tbdigit) % get any number of typed digits in base cmlradix, CA to terminate % 1c45c
>
> (tubdigit) % get any number of typed digits in base cmlradix, terminate on non-digit % 1c45d
>
> (t1bdigit) % get one and only one typed digit in base cmlradix % 1c45e

(t2bdigit) % get two and only two typed digits in base cmlradix % 1c45f

(t3bdigit) % get three and only three typed digits in base cmlradix % 1c45g

(tu1bdigit) % get up to one typed digit in base cmlradix % 1c45h

(tu2bdigit) % get up to two typed digits in base cmlradix % 1c45i

(tu3bdigit) % get up to three typed digits in base cmlradix % 1c45j cml selection routines

(J26206) 28-JUL-75 11:56;;;; Title: Author(s): Kenneth E. (Ken) Victor/KEV; Distribution: /CHI([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: KEV;

improvement to xcml

how about doing away with all implicit declarations in xcml thereby forcing people to declare all local/external variables/rules in the hope that the declarations will be commented 1 improvement to xcml

(J26207) 28-JUL-75 12:47;;;; Title: Author(s): Kenneth E. (Ken) Victor/KEV; Distribution: /NPG([ACTION]) ; Sub-Collections: SRI-ARC NPG; Clerk: KEV;

26207 Distribution

Andy Poggio, David L. Retz, Jan A. Cornish, Larry L. Garlick, Robert Louis Belleville, Elizabeth J. Feinler, Joseph L. Ehardt, Jonathan B. Postel, Kirk E. Kelley, Karolyn J. Martin, David S. Maynard, Kenneth E. (Ken) Victor, James E. (Jim) White, Elizabeth K. Michael, Don I. Andrews, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, Pun of the year award goes to...

You've got to be kidding! A marginal existence!!!! (72 cols, no less) -dave 1

Pun of the year award goes to...

(J26208) 28-JUL-75 22:36;;;; Title: Author(s): David L. Retz/DLR;
Distribution: /JAKE([ACTION]) JAKE([INFO-ONLY]) ;
Sub-Collections: SRI-ARC; Clerk: DLR;

JBP 29-JUL-75 01:15 26209

Answer to Millstein on Milestones

Bob: 1

Here are answers to your questions on the milestones we sent last week, these are a preliminary response and we will be send a updated set in the next week. 2

Front End 3

1) new tool - old tool, is the distinction here due to user TELNET? If so, then we have a serious problem since there are no tools now other than encapsulated ones. 3a

*** The old vs. new tool distinction is accurately characterized by the use or not of Telnet for communication between the Front End and the tool. *** 3a1

*** NLS is a new tool and is not encapsulated. *** 3a2

2) What does "runs" mean - "fully" debugged or just available for use? 3b

*** "runs" means available for use. *** 3b1

3) You don't have milestones for FE-10 (display, old tool), FE-11 (half duplex tty, new and old tool), FE-11 (display, old tool). Aren't these part of FE task 3? 3c

*** We are not sure that it makes sense to talk about accessing old tools in display mode. This should not be a difficult task to do if it does prove to be desirable. *** 3c1

*** We are NOT planning to implement half duplex access via the PDP-11 version of the Front End. *** 3c2

4) How much resource will be diverted to produce the three reports? 3d

The reports on: 3d1

a) Front End Measurements and Efficiency 3d1a

b) CML evaluation 3d1b

c) New Front End Features 3d1c

are a scheduled part of our work and do not represent a diversion of effort. 3d2

Tools 4

1) You don't say when you're taking the cake out of the oven. I.e., what are milestones for installing NLS in NSW (per your SOW Tools task 1)? Could you split these milestones into two heaps - one relating to NLS installation and the other to NLS enhancements (per Tools tasks 3 and 4)? 4a

*** Our milestone "Base in NSW accessed in char tty mode" is the first step in "taking the cake out of the oven". We now realize that by the date given we will only be able to access this core set of nls via the front end, not have nls use the works manager file system. i would not claim nls (or any tool) was installed in nsw until it both (1) was controlled by the works manager and interacted with the user via the front end, and (2) utilized the works manager file system. We now believe that we can only achieve part 1 by mid august. The second and i think very important part depends on you. We need very definate and specific specifications of the interface to the nsw file system, either the works manager primitives or the "tenex forman", and we need to know when these procedures will be available for use. We cant take the cake out of the oven till we know what kind of oven it is and when it will be turnned on. *** 4a1

As i said this is a preliminary response, we will try to get our note reorganized as you suggest and take another look at the items you ask about. We will be sending along a revised list in the next week. 5

--jon. 6

Answer to Millstein on Milestones

(J26209) 29-JUL-75 01:15;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /RWW([INFO-ONLY]) JBP([INFO-ONLY]) EKM([INFO-ONLY]) CHI([INFO-ONLY]) JEW([INFO-ONLY]) BEV([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JBP; Origin: < POSTEL, JUNK.NLS;1, >, 28-JUL-75 20:46 JBP ;;;;####;

HGL 29-JUL-75 09:46 26210

Notes About Case Shift at ISIC: Solution to Content Searching Problems in TNLS

A warning to those of us using TNLS at ISIC: 1

Have you iscovered substitutes not working? Have you discovered content searches not working? Do not be deceived as I once was. Just because you don't need to say NO RAI at ISIC doesn't mean you can get away without telling it you are a TERMINAL TYPE TI733! Without doing this, all your characters (even with shifts) are taken to be lower case for the sake of content searches, etc. in TNLS. After much frustration, I discovered this quite by accident and discovered that others were similarly ignorant. Note that this secret holds even though you are able to get Upper and Lower case text in upon entry. Ah, sweet mystery of NLS. Note also that you cannot just quit or control-C to the EXEC, change your terminal type, and continue. You must change your terminal type and start over with a fresh NLS. 2

Note to Applications: Could this be a bug? 3

Notes About Case Shift at ISIC: Solution to Content Searching Problems in TNLS

(J26210) 29-JUL-75 09:46;;;; Title: Author(s): Harvey G. Lehtman/HGL; Distribution: /FEEDBACK([ACTION]) SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC FEEDBACK; Clerk: HGL;

26210 Distribution

James E. (Jim) White, Douglas C. Engelbart, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, James C. Norton, Jeffrey C. Peters, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Richard W. Watson, Don I. Andrews,

Special Jhb Feedback, Mary Ann Kellan, Buddie J. Pine, Andy Poggio, David L. Retz, Laura J. Metzger, Karolyn J. Martin, Jan A. Cornish, Larry L. Garlick, Priscilla A. Wold, Pamela K. Allen, Delorse M. Brooks, Beverly Boli, Rita Hysmith, Log Augmentation, Joseph L. Ehardt, Raymond R. Panko, Susan Gail Roetter, Robert Louis Belleville, Rene C. Ochoa, Ann Weinberg, Joan Hamilton, Adrian C. McGinnis, Robert S. Ratner, David S. Maynard, Robert N. Lieberman, Sandy L. Johnson, James H. Bair, Jeanne M. Leavitt, Rodney A. Bondurant, Jeanne M. Beck, Marcia L. Keeney, Elizabeth K. Michael, Jonathan B. Postel, Elizabeth J. Feinler, Kirk E. Kelley, N. Dean Meyer

Inconsitencies in Margins

Rejournalized to put it in the DPCS subcollection

JAKE 29-JUL-75 11:36 26211

A Marginal Existence

I currently have my print margin set to 72, my display right margin set to 72, and my output quickprint margin set to 72 in Useroptions. As of Saturday the TNLS terminal output was 70, output quickprint was 71, output printer is actually 72, my display is 72, output sequential is 71, and a sendprint file made from a print file is 72. A conservative estimate is that this nagging but trivial problem has cost us a month's time and money in work being redone. Again I request that default right margins on all devices be standardized to 72 with useroptions available for deviations from the standard. 1a

Inconsitencies in Margins

(J26202) 26-JUL-75 20:01;;;; Title: Author(s): Elizabeth J. Feinler/JAKE; Distribution: /SRI-ARC([ACTION]) FEEDBACK([ACTION]) ; Sub-Collections: SRI-ARC FEEDBACK; Clerk: JAKE;

1

26211 Distribution

Delorse M. Brooks, Documentation Production and Control System Interest Group , Thomas L. Humphrey, Pat Whiting O'Keefe, Duane L. Stone, DPCS Domains

message journalized for the record

18-JUL-75 1138-EDT VANNOUHUYS: Parts of DPCS, distribution of planning documents
Distribution: WATSON, vannouhuys, michael
Received at: 18-JUL-75 11:38:34-EDT 1

By chance I was looking at Elizabeth's screen when a message from you about staged growth od DEXlike things came across. If we are talkiing about the"the DPCS thing" there are two parts you don't mention but are relevant in my mind: aids to editing (things like devices that will work like blue pencil and further developments of the kind of editing aids recetnly added to Modify) and Control mechanisms for published docuements, rpresumably related to the journal.
I see it as part of nucleation that I know about these things and relay ARC thinking to appropriate people, e.g. Tom Humphry. I hope if this planning goes on it gets into some like a journal item that helps recording and relay.
That sounds a little snippy. HmmmI didn't mean it that way, as Jim Norton would 1a

DPCS Domains

(J26212) 29-JUL-75 12:37;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /&DOCPLAN([INFO-ONLY]) ; Sub-Collections: SRI-ARC DOCPLAN; Clerk: DVN;

26212 Distribution
Documentation Development Production and Control Community Planning Group ,

Request for Permission to Journalize old Message

I am trying to throw away or or journalize my old messages. Do you see any objection to my journalizing your message of: the 16th about details of final report publication? 1

Request for Permission to Journalize old Message

(J26213) 29-JUL-75 12:53;;;; Title: Author(s): Dirk H. Van Nouhuys/DVN; Distribution: /DCE([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: DVN;

Weekly Report of the NLS Development Group

Belleville 1

Done last week (July 21 to 25) 1a

Vacation 1a1

To do next week 1b

Work on the graphics to COM path. 1b1

Work on the cluster think piece. 1b2

Cornish 2

Done week of 07/21 2a

Substantial progress on detailed coding and debugging of formatting part of COBOLAID. Reread LAC's original COBOL memo and journalized a response (kjournal, 26186, 1:w) setting forth the formatting algorithm for COBOLAID. 2a1

To do next week 2b

Finish COBOLAID, await LAC's response to my comments. Begin study of routines I am to inherit from Kelley, these include Help and user subsystems. 2b1

Kelley 3

Done last week to July 25 3a

Changed name of ARC tool interface file to "Core" (for "Core AKW") and began re-organization from this point of view. Set up all existing tool description files to work in the new multi-file environment. 3a1

Discussed general documentation transfer and maintenance procedures with Jeanne B. to be carried out with the new Substitute command in Modify tool/subsystem. 3a2

Made further modifications to AFM format program. Found a bug in OP to COM. 3a3

Do 3b

Continue re-organization of Core, prioritize and responsibilitize the parts of Help with Bev. 3b1

Begin on Letter Program. 3b2

Lehtman 4

- 1 August 4a
  - Done 4a1
    - File interface document 4a1a
    - Output processor directives 4a1b
  - To do 4a2
    - Advise Kirk and Jan. 4a2a
    - Continue debugging NLS-9. 4a2b
    - Finish DEX/LSI-11 Cluster terminal document. 4a2c
    - Finish IOEXEC document. 4a2d
    - Work with Ra3y on DSS paper. 4a2e
    - Work on IDENT document. 4a2f
    - Design DSPGEN rewrite. 4a2g
- 25 July 4b
  - Done 4b1
    - Finished Final report rewrite. 4b1a
    - Found bug in NLS-9. 4b1b
    - Assisted Kirk and Jan Cornish. 4b1c
    - Sent off Cassette documents to the Journal. 4b1d
    - Tell Told Don about L10 bug with DROPping CATCHPHRASES. 4b1e
    - Worked on IOEXEC File system interface document. 4b1f
    - Added new directives to Output Processor. 4b1g
  - To do 4b2
    - Advise Kirk and Jan. 4b2a
    - Continue debugging NLS-9. 4b2b

Finish DEX/LSI-11 Cluster terminal document in Bob's absence. 4b2c

Finish IDEXEC document. 4b2d

Work with Ra3y on DSS paper. 4b2e

work on IDENT document. 4b2f

Design DSPGEN rewrite. 4b2g

Maynard 5

25 July 5a

Done last week 5a1

Re-configured the Middle-end into a general purpose 110 component and an NLS specific component 5a1a

To do next week 5a2

integrate nls-Be and KEV's debugger with the middle-end and test with DPS. 5a2a

Michael 6

Done last week (July 7 through July 25 3 weeks) 6a

Fixed Singer character size tables in O.P. 6a1

Made new Com tape for sample AF manual 6a2

Test NLS9 editor- NOT DONE 6a3

Helped Jan Cornish 6a4

Got ready for trip 6a5

Finally got blank tapes to tymshare 6a6

Try to find out how WM file system will work 6a7

Work on milestones for NSW proposal 6a8

Trip to Montogmery to assess and plan experiments for NSW in document production and COBOL programming 6a9

Trip to D>C> (Pentagon) to determine status and future of AFM 66-1 and other NSW problems 6a10

Write critique of the Analysis of 5 Text Editors including NLS done at the Pentagon 6a11

Fix problems in the AF Format program 6a12

Revise two sections of the 'Final Report' 6a13

Write NLS accomplishments for the quartly management report 6a14

Review File package document written by HGL 6a15

Create (with HGL) a new OP directive to facilitate formatting Air Force documents for COM, the printer, and microfiche 6a16

To do next week (july 28 - Aug 1) 6b

Catch up on what's going on, find out where we stand in relation to schedules, and make a plan. 6b1

Assign Karolyns work to DSM, HGL, EKM 6b2

Assign Kirk's work to Cornish 6b3

Review File Package Document and make sure it gets off 6b4

Work on Ident system Document and very rough Journal design 6b5

Get proofs of Vol 3 Ch 1 to Pentagon and Gunter 6b6

Review time cards to see what's getting charged to the NLS NSW subprojects 6b7

Assorted meetings - no doubt 6b8

Weekly Report of the NLS Development Group

(J26219) 30-JUL-75 11:32;;;; Title: Author(s): Elizabeth K. Michael/EKM; Distribution: /RWW([ACTION]) SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: EKM; Origin: < NLS, WEEKLY.NLS;16, >, 30-JUL-75 11:29 EKM ;;;;####;

26219 Distribution

James E. (Jim) White, Douglas C. Engelbart, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, James C. Norton, Jeffrey C. Peters, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Richard W. Watson, Don I. Andrews,

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Front End Meeting Notes

This note summarizes a series of meetings about the NSW Front End (FE) implementation. 1

The attendees were : rww dlr jle chi jew llg jbp andy dia 2

Our current estimates of the sizes of the various code and data modules are given in the file <ehardt, fe-memory-consumption,>. 3

The following issues and tasks have evolved over the series of meetings, under each issue or task is the current status or resolution. 4

(1) CHI - reduce to size of the CLI context: goal 8K 4a

8K is ok 4a1

(2) CHI JEW LLG - combine DPS and CLI into a single process 4b

case 1 - B4700 code also works with DPS 4b1

case 2 - only CLI uses DPS 4b2

This appears not to be promising, rather a design utilizing a shared page between DPS and CLI containing both code and data, and using signals or EMTs to communicate events to each other looks more interesting. (see--number 11) 4b2a

(3) DIA - fix L1011 compliler to parse large segments of code to generate more optimal code (this version of the compiler will not run under nls but from the exec) 4c

This looks to be more work that previously discussed, but is still being explored. (See--number 18) 4c1

(4) JEW - reduce the size of the DPS context: goal 2K 4d

2K appears to be fine. 4d1

(5) JLE DLR - investigate the buffer and memory magement in ELF, investigate buffer and code optimization in exec and telnet. 4e

Suggested that demand paging system would be a win, but this appears to be far more work than we want to take on. 4e1

For system with no normal TELNET, only special TELNET for CLI old tool access the TELNET code could be reduced from 1000 to 600 words for a savings of 400 words. In such a system if the CLI were to play the role of the EXEC the 3000 word EXEC would be eliminated. 4e2

JLE now says that this cant be right but dosent know what the true statement is. 4e2a

(6) JLE - talk to DEC about prices for disks, memory etc, for 11/40, 11/45, and 11/70. 4f

Price List Obtained 4f1

(7) CHI - figure out the size of the code for CLI mannaged context switching and for display featurets 4g

Display Code on 10 takes 4K, so estimate 6-8K on 11. 4g1

Context switch code should be small a few hundred words at the most. 4g2

(8) LLG - investigate the ELF facilities that can be used to reduce the size of the DPS code 4h

There is not very much to be saved here, but the ELF primitives will be used where appropriate. An estimate of 20-24K for the DPS code is reasonable. 4h1

This goes with (2) above. 4h2

(9) DLR JEW CHI - investigate eliminating ELF. 4i

There is not much to be saved, but it would be useful to list the primitives along with the amount of space that would be saved if the primitive were deleted and the programs that would be impacted if the primitive were deleted. 4i1

*** Still Not Done *** 4i2

(10) JLE DLR - Evaluate the relative merits of ELF, UNIX and RSX11 for our needs. 4j

prepare a note for our internal use that compares these systems and our requirements especially noting their facilities relating to: 4j1

real and virtual address space management 4j1a

disk management 4j1b

process structure 4j1c

interprocess communication 4j1d

*** Still Not Done *** 4j2

(11) LLG - DPS-CLI communication 4k

prepare a note on the design for the DPS - CLI communication considering both the shared page and message mapping techniques, incorporating comments by CHI and JEW. 4k1

*** Still Not Done *** 4k2

(12) JLE - Prepare order for disk 4l

Order for 512 K fixed head disk to be prepared ASAP. (Also an order for an additional 32 K of memory). 4l1

*** Still Not Done *** 4l2

(13) RWW - Send note stating our general problem to nsw steering committee. 4m

A note was sent (see -- 26099,). 4m1

(14)CHI JEW LLG - Review of the proposed DPS/CLI interface design with attention to the single vs. multi- process alternatives. 4n

Done (see-- number 11) 4n1

(15) DLR JLE - Investigate alternative memory management schemes 4o

Rough estimate is that 4 man months would be required to revise ELF to use variable size real pages, and that this would be desirable for other reasons (eg input output management). To revise ELF to allow variable size virtual pages might be accomplished with 1 man month of effort. 4o1

[to be scheduled] note on implications and effort involved if this task is undertaken. 4o1a

*** Still Not Done *** 4o1b

(16) JLE - Develop the position paper for the steering committee, deliver a draft version to COMPASS. 4p

Position Paper sent, (See -- 26181,). 4p1

(17) CHI - Breakdown of CLI code. 4q

Done (see--26144) 4q1

(18) DIA - L1011 status report: what remains to be done, current expectations of savings. 4r

Done <see--26176,> 4r1

(19) ??? - Study the relative efficiency of L1011 vs assembly code. 4s

[to be scheduled] 4s1

*** Still Not Done *** 4s2

(20) LLG DLR - Storage Management 4t

prepare a note on storage management techniques, there must be a choice between the following: 4t1

current ELF primitives 4t1a

L10 runtime 4t1b

new (or modified) routines 4t1c

if the l10 routines were chosen and compiled by l1011 the savings to be made by hand coding are estimated to be 20% by CHI and 50% by JLE 4t2

Done. (See--Garlick,stgmngt,) 4t3

(21) JLE - B4700 code 4u

Estimate received from Triolo that the "null-IP" will take 7000-8000 words. 4u1

(22) ??? - coordinate KEV's debugger with PP-11 testing. 4v

*** Still Not Done *** 4v1

(23) LLG ANDY CHI DLR JLE - Design the FE-11 4w

Prepare a draft design document on the FE-11 that is based on the following assumptions: 4w1

Mimimal ELF changes 4w1a

A clean interface between CLI and DPS so that DPS could be run in another machine if necessary 4w1b

CLI and DPS do self overlays and control disk i/o themselves 4w1c

The design should enable us to answer questions such as the following: 4w2

How many processes are there in the FE 4w2a

How many address spaces are there in the FE 4w2b

What are the modification we want to make to ELF 4w2c

For storage management 4w2c1

For Disk i/o management 4w2c2

*** Still Not Done *** 4w3

(24) ANDY LLG JLE DLR - FE-11 Implementation 4x

It was also resolved that we should proceed to construct a test version of the system even tho it may only support one or two users. 4x1

This requires several pieces to be operational: 4x2

VM ELF - DLR 4x2a

Loader - ANDY 4x2b

Flea DDT - DLR 4x2c

CLI-11 - JLE & ANDY 4x2d

DPS-11 - LLG 4x2e

*** Still Not Done *** 4x3

(24) RWW JBP - FE functionality vs. minimial implementation 4y

We will be called on to defend the need for specific functional capabilities in the FE vs. the expense and difficulty of implementation. 4y1

*** Still Not Done *** 4y2

(25) JLE JBP - Design FE-11 using alternate architectures 4z

- Using PDP11/70 4z1

- Using PDP11/03 (=LSI11) distributed CLIs 4z2

*** Still Not Done *** 4z3

The next meeting is scheduled for 10 am Tuesday 5 August. 5

Front End Meeting Notes

(J26220) 30-JUL-75 17:47;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /RWW([INFO-ONLY]) DLR([INFO-ONLY]) JLE([INFO-ONLY]) CHI([INFO-ONLY]) JEW([INFO-ONLY]) LLG([INFO-ONLY]) JBP([INFO-ONLY]) ANDY([INFO-ONLY]) DIA([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JBP; Origin: < POSTEL, FE-PROBLEMS.NLS;11, >, 30-JUL-75 17:45 JBP ;;;;####;

NLS Backend / Works Manager File System Interface Requirements

Sent to Millstein@BBN, Schantz@BBN, and Carlson@ISI via SNDMSG.

Overview-- Works Manager / NLS-Backend File System Interface 1

For the NLS Backend (NLS-BE) to be fully integrated into the NSW environment, it must make use of the Works Manager (WM) file system for file management. Discussions held earlier in July between ARC staff, Bob Millstein of MCA and Rick Schantz of BBN concerned the mode of interfacing the NLS Backend operation to the Works Manager file system. 1a

Before these discussions we had intended to directly access WM functions such as those outlined in Millstein's memo of 22 May 1975, WM-PROCEDURES. Schantz' development of the Encapsulator for existing tools with its implicit calls on these functions and the related development of the Foreman would permit us to avoid such direct access. Our earlier understanding of the intention of the Foreman (outlined in an earlier draft of this note dated 3 July 1975) has been supplemented by further discussions with Millstein. 1b

Thus two different but related approaches have been considered: in the first NLS-BE would interract with the WM through direct DPS calls on WM procedures; NLS-BE would be responsible for maintenance of the Local Name Dictionary (LND). In the second approach, NLS would access the necessary WM file system functions through a component known as the Foreman. As we currently understand the Foreman, calls would be in the form of pseudo-JSYSs. It would appear to the NLS-BE as an extension of the TENEX operating system. The Foreman would manage the LND; all necessary interaction with the WM would be through this channel. 1c

The only documentation we have of WM procedures is Millstein's memo of 22 May 1975. To a large extent the functions listed would be sufficient to allow us to develop the NLS code changes necessary to interface to the WM file system. There are some minor exceptions: we feel some functions need clarification and possibly minor redefinitions in order to handle some NLS-BE capabilities described below (e.g., SETSEMAPHORE and UNSETSEMAPHORE); at least one new function would be desirable (READSEMAPHORE). These additions are described in a later section. Parameter specifications in Millstein's memo need elaboration and confirmation before code can be written from the procedure descriptions. 1d

Our conversations with Millstein in early July opened the possibility of the use of the Foreman, but did not expand upon the document we had. No design currently exists for the Foreman, though our assumption has been that at least all the WM file system functions would be accessible. Again, no interface code in NLS-BE can be written until a detailed design document is produced. 1e

To create the NLS-BE interface to the WM file system via either of these approaches will require almost the same amount of work. Given the fact that NLS-BE is embedded in DPS, the code differences between direct calls on the WM and pseudo-JSYS Foreman calls is largely syntactic with minor exceptions. 1f

NLS-BE can operate in the NSW environment as a tool talking through DPS to the FE even without using the WM file system; we can continue to use the local TENEX file system. We feel, however, that this hole needs to be filled as soon as possible since other tasks must await its completion. For example, our design for the installation into NSW of a Journal system necessarily requires knowledge and experience with the WM file system. We must select between the Foreman and direct calls to the WM: the latter may be useable sooner, but the former is esthetically more attractive. We feel it will take about one calendar month after final specification of the WM functions (or the Foreman functions/syntax) for us to complete the necessary code modifications to NLS-BE with the exact time dependent on vacation schedules and other commitments. In order to firmly set our milestone date for NLS-BE operating in NSW completely interfaced to the WM file system, we must have a date for the publication of these specifications and an estimated date of implementation. 1g

> For our purposes the publication of the design is more critical: we can code without the Foreman or WM file system being completed as long as the procedures and their parameters are well specified. 1g1

The rest of this note outlines some of these considerations in greater detail and describes some of the file operations currently performed in NLS. 1h

Our Current Understanding of the Foreman 2

The running version of NLS accesses the TENEX file system through the use of various JSYSs such as GTJFN, OPENF, and CLOSF with certain flag settings. The Foreman would make available a set of additional pseudo-JSYSs (the set to be determined) which would gain control through the TENEX JSYS trap mechanism. The Foreman would do appropriate WM calls and maintain the Local Name Dictionary (LND). 2a

> Note that such functions are implicit in the Encapsulator for exsisting tools developed by Schantz at BBN. The Encapsulator, however, additionally does TELNET interaction for the tool and handles DPS interaction. Tools such as the NLS-BE live in a DPS environment and already have terminal interaction handled

by the FE. Thus while there is some overlap between the Encapsulator and the Foreman, and while some of the code modules may be identical, the Foreman may be more properly thought of as being an extension to the operating system (TENEX in this case, but potentially others as well) which serves as the WM interface to NSW tools. 2a1

Jon Postel and Jim White have considered in a preliminary manner possible modifications to the TENEX implementation of DPS necessary for the Foreman to coexist with the NLS BE. Minor changes are probably needed to handle interrupts and fork structure communication. They should be made aware of any decisions concerning the Foreman design. 2a2

Aside from minor code to manage the LND in the direct-call-on-the-WM approach, the NLS code involving these direct calls would be structurally identical to code calling Foreman pseudo-JSYSs: in one case we would make Foreman pseudo-JSYS calls; in the other case, we would make PCP calls on the WM. While the former would be esthetically preferable since the WM functions would appear as extensions to the operating system, the amount of design and coding effort at ARC would be about the same in both cases. 2b

Current NLS Use of File JSYSs 3

In the parts of the NLS Backend which will be used in NSW, GTJFN, OPENF and CLOSF are used in fairly unexotic and straightforward manners. For instance, we do not have the JSYSs complete the names of files or ask the user for confirmation. All terminal interaction is isolated in higher level procedures in the current NLS and will probably be handled by the FE under NSW. 3a

In only one case do we currently attempt to get a JFN on an unusual device: this is in the "Connect terminal" command to accomplish shared screens. This command, if implemented at all in the NSW environment, will probably be handled through the Front End anyway. 3a1

There will be no problem putting a file name into the appropriate form for the pseudo-JSYSs of the Foreman: either Works Manager or TENEX format are acceptable to us since we currently are doing an internal translation most of the time in NLS anyway. We could map one form into the other as necessary. Extensive use is made of the JFNS (JFN to string) JSYS, but in fairly non-critical areas (i.e., to display error messages when files are not opened, to obtain strings for internal tables). Again, the format required by the Foreman does not appear to be critical. 3b

This is not to say that we will not have to put many changes into the current code to get into the correct NSW file name format, but such additions to the code were anticipated under any implementation. 3b1

Rick Schantz was concerned with session termination and special uses of terminals. We feel such questions are irrelevant in our case: all terminal interaction and termination is handled by the FE. We are not interested in the parts of the Encapsulator which do TELNET interaction: this part is not needed by us as, again, we will be communicating via DPS with the FE. 3c

Creation of New Files 4

Another unusual file operation done by NLS occurs in the creation of a new file: because of some problems in TENEX, a file does not really exist until it has been closed. We therefore open, close and open the file at creation. In the NSW environment, we assume that on creation a copy of the file exists in the NSW environment, even if there is a subsequent crash. This is in keeping with our goal of minimizing the amount of work which can be lost in the event of a crash. 4a

Non-NSW Files 5

NLS will make minimal use of non-NSW files. Instances in which non-NSW files would occur include temporary work files and general system files (save files of processors or system data bases). Since we will issue Foreman pseudo-JSYSs or calls on the WM when necessary in addition to the usual TENEX file JSYSs, we can selectively avoid dealing with the Foreman and the WM in the case of non-NSW system or work files. Thus, an escape mechanism for non-NSW files in the Foreman is not essential for NLS (though it may be necessary for other tools.) 5a

Simultaneous Multi-user Access to Files-- Locking Mechanism and File Data Validity 6

NLS has implemented code which deals with the problem of files which have (possibly) multiple readers with one writer. The solution additionally provides a file system which is very secure across system crashes. While it is anticipated that the exact current implementation (which makes use of a locking mechanism based in the TENEX user settable word and something known as a "Partial Copy File" described below) will not be used in NSW, we feel Foreman / WM file system functions which permit similar capabilities are necessary. In this section we discuss the user view of the mechanism as well as the current implementation and some system commands it makes possible. We abstract what we feel are essential features to be carried over to the NSW. 6a

NLS currently permits files to be opened for read access; if a user tries to write on the file, an attempt is made to "lock" the file. When a file is locked, it may be modified only by the user who has it locked. Other users may examine the file with read access, but do not see the current editor's changes while the lock is still on the file. When a locked file is loaded by a user other than the one who has the file locked, the file is seen in the state it was in at the time the lock was set; only read access may be obtained, and a message is displayed stating that the file is locked along with the name of the user who has it locked. This information often proves useful in personal negotiations between members of a group who may wish to work on the same material. The fact that only one person may have the file locked at a time implies that only one person may make edits at a time. This minimizes the problems involved in collating simultaneous changes to the same file by more than one user. 6b

In the current NLS a file is locked by changing a bit in the user settable word using the CHNFDB JSYS followed by creating a partial copy file opened for write access; changes in the contents of the original file are reflected only in the partial copy until an explicit update causes the data to be merged. 6b1

Note that unlike the TECO edit buffer, the partial copy is a real file: output is made to the disk and the data is as safe as data in the original file. The partial copy is NOT a buffer. In most instances in the event of a crash, barring only massive hardware failure, users would lose only material currently being entered, i.e., one line or statement. We aim for this level of security on NSW as well. 6b2

The mechanism is invisible to the user and is reasonably secure. It permits many people safe access to a body of data; if a user loads a file which someone else has locked, he will not be able to edit it, but will be able to see its state before the edits began. Works in progress are not visible to anyone other than their creator until an update which also unlocks the file. This concept has proven to be very useful in the case of users making major edits: files may be locked indefinitely and personal negotiation may be carried out by other users with the user who has the file locked. In a programming environment such as the one at ARC, the locking mechanism has saved costly integration of code changes made on a file simultaneously by more than one user. This feature would be valuable in the NSW as well. 6c

In the NSW environment, we will not be using the partial copy mechanism directly. Because the WM maintains a secure version of the original file, a user may make his edits in his copy of the file and incorporate them upon delivery in the WM sense. The locking mechanism is however still useful and could be implemented through the use of the SETSEMAPHORE and UNSETSEMAPHORE WM commands. Semaphores should be settable after a file has been transmitted to the NLS tool. Users may just want to read a file and not deprive other users of the possibility of obtaining the file for write access and locking if desired. (It goes without saying that one should only be able to set the semaphore if one has write access in the TENEX sense, delete access in the WM sense.) Delivery back to NSW should not imply the resetting of the semaphore. A user may want to keep a file locked for several sessions; for security, however, it is desirable for the file to be delivered back to the WM at the end of sessions, perhaps with a different name which may be calculated by NLS from the original name. The semaphore on the original would remain set. 6d

The description of the OPEN function in Millstein's memo suggests that most of this is possible. OPEN checks if the user has COPY access to the file (read access in the TENEX sense.) If the user also has DELETE access and a parameter is true or the i/a tool descriptor (which we don't fully understand) has a particular value, the semaphore is set if it is not set already and the file copied to the current tool. An earlier version of the file may be obtained if the user so indicates. In NLS we do not want the semaphore to be set upon OPEN. We definitely want to be able to get an earlier version of the file if the semaphore is already set by another user; it may be useful for us to have the file in which edits are made have another file name to prevent "trims" of directories (deletions of all but the highest versions). This would suggest a slightly different use of the semaphore mechanism; of course, implementation details can be worked out and must be done in conjunction with MCA. While we are not committed to a particular implementation, we are committed to the user view of the system described above. 6d1

It would be useful for us to have a user id associated with the setting of the semaphore. It would also be useful to be able to read the semaphore before doing the OPEN; this reading function would return a false if the semaphore of the file is not set and, if it is, would return the user id of the user who has the semaphore set. The exact implications of a set semaphore are not clear from the 22 May memo. A clear understanding of the function is essential both by ARC and by MCA. 6d2

For the system to work efficiently there may have to be provision in the Foreman and the WM for reading the semaphore to find out if a file is locked and by whom; this information could be used by NLS to translate the name of the original file into the file in which edits are being made. If a file is locked by the current user, the request may be "changed" by NLS to a request for the related file with modifications in it; all other users would access the original file and would not be permitted write access. We want to minimize and if possible eliminate the necessity of the Foreman knowing about NLS, but efficient facilities to handle the locking mechanism are desirable. 6d3

This area appears to be the one which poses the most potential difficulty in our use of the Foreman and the WM File system as it is currently designed. 6d4

The NLS command "Delete Modifications" may be used by a user who has a file locked and has been making edits. Upon execution of this command, all changes made since the last update disappear and the file is unlocked. The "Delete Modifications" command may be implemented in NSW by deleting the copy of the file with the modifications, unsetting the semaphore in the original and getting a new copy of the original from the WM. 6e

Functions Needed in the WM File System or Foreman by the NLS-BE 7

The following is a list of functions described in Millstein's 22 May memo which are essential to the implementation of the NLS-BE file system interface; the more detailed specifications in that document are assumed to be in effect. The parameters need a bit more elaboration before we can program from them. Cases which require minor redefinition and suggested new functions follow. 7a

DELETE 7a1

RENAME 7a2

SETSEMAPHORE (see below) 7a3

UNSETSEMAPHORE (see below) 7a4

CLOSE 7a5

COPY 7a6

OPEN (possibly acceptable, but read the discussion on the locking mechanism above) 7a7

DELIVER 7a8

The semaphore mechanism needs clarification; as noted above we would like to have a user id associated with a set semaphore. Moreover, we would like to be able to read this value without copying the file. A careful (perhaps too careful) reading of the 22 May memo suggests that ids can be supplied as parameters to WM functions only by the FE! (See the paragraph in section 1 of that document which discusses ids as parameters.) Assuming this was a mistake, we make the following suggestions for the semaphore commands. 7b

SETSEMAPHORE(id, filespec, maxlist, qhelp)
-> NSW-filename 7b1

The WM verifies that the tool can use SETSEMAPHORE, that filespec designates a unique file to which the user has delete access, and that the semaphore is not already set. Assistance is obtained via PCP HELP return or direct FE call as in the file system memo. If all is well, the semaphore is set on behalf of the user whose id is passed and the NSW-filename is returned. 7b1a

UNSETSEMAPHORE(id, filespec, maxlist, qhelp)
-> NSW-filename 7b2

The WM verifies that filespec designates a unique file to which the user has delete access, and that the semaphore is set on behalf of the user. Assistance is obtained as usual. If all is well, the semaphore is unset on behalf of the user whose id is passed and the NSW-filename is returned. 7b2a

READSEMAPHORE(filespec, maxlist, qhelp)
-> file-semaphore-value 7b3

The WM verifies that filespec designates a unique file to which the user has COPY access. Assistance is obtained as usual. If all is well, the semaphore value of the file is returned. It is either FALSE if the semaphore is not set or the id of the user who has the semaphore set. 7b3a

The OPEN function may need slight modification to avoid implicit semaphore setting if it is not desired. Other parameters need clarification. 7c

We stress again that we are not committed to a particular implementation; we just want the functional characteristics of the NLS-BE to be as described in the other sections of this document. Other suggestions will be welcomed. 7d

NLS-BE / NSW File System Interface Time Requirements 8

It will take approximately one calendar month after the receipt of detailed Foreman or WM file system specifications to implement the NLS-BE interface to the NSW file system whether the Foreman or direct WM call approach is selected. Note that this estimate does not take into account considerations such as vacations which are scheduled in the near future by key members of the NLS-BE team. In order to get exact dates for our milestone estimates, we should receive a date for the expected publication of these detailed specifications of either or both the Foreman or NSW File System functions from MCA as soon as possible. The expected date of complete implementation of these functions would also be useful for estimating when debugging could take place. Only upon receipt of these estimates can we decide which approach to follow. 8a

NLS Backend / Works Manager File System Interface Requirements

(J26221) 30-JUL-75 13:54;;;; Title: Author(s): Harvey G. Lehtman/HGL; Distribution: /HGL([ACTION]) JBP([ACTION]) CHI([ACTION]) EKM([ACTION]) DSM([ACTION]) JEW([ACTION]) RWW([ACTION]) SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: HGL; Origin: < LEHTMAN, FILE.NLS;6, >, 30-JUL-75 13:48 HGL ;;;;####;

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HGL 30-JUL-75 13:54 26222

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Sent to Millstein@BBN, Schantz@BBN, and Carlson@ISI via SNDMSG.

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Thus two different but related approaches have been considered: in the first NLS-BE would interract with the WM through direct DPS calls on WM procedures; NLS-BE would be responsible for maintenance of the Local Name Dictionary (LND). In the second approach, NLS would access the necessary WM file system functions through a component known as the Foreman. As we currently understand the Foreman, calls would be in the form of pseudo-JSYSs. It would appear to the NLS-BE as an extension of the TENEX operating system. The Foreman would manage the LND; all necessary interaction with the WM would be through this channel. 1c

The only documentation we have of WM procedures is Millstein's memo of 22 May 1975. To a large extent the functions listed would be sufficient to allow us to develop the NLS code changes necessary to interface to the WM file system. There are some minor exceptions: we feel some functions need clarification and possibly minor redefinitions in order to handle some NLS-BE capabilities described below (e.g., SETSEMAPHORE and UNSETSEMAPHORE); at least one new function would be desirable (READSEMAPHORE). These additions are described in a later section. Parameter specifications in Millstein's memo need elaboration and confirmation before code can be written from the procedure descriptions. 1d

Our conversations with Millstein in early July opened the possibility of the use of the Foreman, but did not expand upon the document we had. No design currently exists for the Foreman, though our assumption has been that at least all the WM file system functions would be accessible. Again, no interface code in NLS-BE can be written until a detailed design document is produced. 1e

To create the NLS-BE interface to the WM file system via either of these approaches will require almost the same amount of work. Given the fact that NLS-BE is embedded in DPS, the code differences between direct calls on the WM and pseudo-JSYS Foreman calls is largely syntactic with minor exceptions. 1f

NLS-BE can operate in the NSW environment as a tool talking through DPS to the FE even without using the WM file system; we can continue to use the local TENEX file system. We feel, however, that this hole needs to be filled as soon as possible since other tasks must await its completion. For example, our design for the installation into NSW of a Journal system necessarily requires knowledge and experience with the WM file system. We must select between the Foreman and direct calls to the WM: the latter may be useable sooner, but the former is esthetically more attractive. We feel it will take about one calendar month after final specification of the WM functions (or the Foreman functions/syntax) for us to complete the necessary code modifications to NLS-BE with the exact time dependent on vacation schedules and other commitments. In order to firmly set our milestone date for NLS-BE operating in NSW completely interfaced to the WM file system, we must have a date for the publication of these specifications and an estimated date of implementation. 1g

For our purposes the publication of the design is more critical: we can code without the Foreman or WM file system being completed as long as the procedures and their parameters are well specified. 1g1

The rest of this note outlines some of these considerations in greater detail and describes some of the file operations currently performed in NLS. 1h

Our Current Understanding of the Foreman 2

The running version of NLS accesses the TENEX file system through the use of various JSYSs such as GTJFN, OPENF, and CLOSF with certain flag settings. The Foreman would make available a set of additional pseudo-JSYSs (the set to be determined) which would gain control through the TENEX JSYS trap mechanism. The Foreman would do appropriate WM calls and maintain the Local Name Dictionary (LND). 2a

Note that such functions are implicit in the Encapsulator for exsisting tools developed by Schantz at BBN. The Encapsulator, however, additionally does TELNET interaction for the tool and handles DPS interaction. Tools such as the NLS-BE live in a DPS environment and already have terminal interaction handled by the FE. Thus while there is some overlap between the Encapsulator and the Foreman, and while some of the code modules may be identical, the Foreman may be more properly thought of as being an extension to the operating system (TENEX in this case, but potentially others as well) which serves as the WM interface to NSW tools. 2a1

Jon Postel and Jim White have considered in a preliminary manner possible modifications to the TENEX implementation of DPS necessary for the Foreman to coexist with the NLS BE. Minor changes are probably needed to handle interrupts and fork structure communication. They should be made aware of any decisions concerning the Foreman design. 2a2

Aside from minor code to manage the LND in the direct-call-on-the-WM approach, the NLS code involving these direct calls would be structurally identical to code calling Foreman pseudo-JSYSs: in one case we would make Foreman pseudo-JSYS calls; in the other case, we would make PCP calls on the WM. While the former would be esthetically preferable since the WM functions would appear as extensions to the operating system, the amount of design and coding effort at ARC would be about the same in both cases. 2b

Current NLS Use of File JSYSs 3

In the parts of the NLS Backend which will be used in NSW, GTJFN, OPENF and CLOSF are used in fairly unexotic and straightforward manners. For instance, we do not have the JSYSs complete the names of files or ask the user for confirmation. All terminal interaction is isolated in higher level procedures in the current NLS and will probably be handled by the FE under NSW. 3a

In only one case do we currently attempt to get a JFN on an unusual device: this is in the "Connect terminal" command to accomplish shared screens. This command, if implemented at all in the NSW environment, will probably be handled through the Front End anyway. 3a1

There will be no problem putting a file name into the appropriate form for the pseudo-JSYSs of the Foreman: either Works Manager or TENEX format are acceptable to us since we currently are doing an internal translation most of the time in NLS anyway. We could map one form into the other as necessary. Extensive use is made of the JFNS (JFN to string) JSYS, but in fairly non-critical areas (i.e., to display error messages when files are not opened, to obtain strings for internal tables). Again, the format required by the Foreman does not appear to be critical. 3b

This is not to say that we will not have to put many changes into the current code to get into the correct NSW file name format, but such additions to the code were anticipated under any implementation. 3b1

Rick Schantz was concerned with session termination and special uses of terminals. We feel such questions are irrelevant in our case: all terminal interaction and termination is handled by the FE. We are not interested in the parts of the Encapsulator which do TELNET interaction: this part is not needed by us as, again, we will be communicating via DPS with the FE. 3c

Creation of New Files 4

Another unusual file operation done by NLS occurs in the creation of a new file: because of some problems in TENEX, a file does not really exist until it has been closed. We therefore open, close and open the file at creation. In the NSW environment, we assume that on creation a copy of the file exists in the NSW environment, even if there is a subsequent crash. This is in keeping with our goal of minimizing the amount of work which can be lost in the event of a crash. 4a

Non-NSW Files 5

NLS will make minimal use of non-NSW files. Instances in which non-NSW files would occur include temporary work files and general system files (save files of processors or system data bases). Since we will issue Foreman pseudo-JSYSs or calls on the WM when necessary in addition to the usual TENEX file JSYSs, we can selectively avoid dealing with the Foreman and the WM in the case of non-NSW system or work files. Thus, an escape mechanism for non-NSW files in the Foreman is not essential for NLS (though it may be necessary for other tools.) 5a

Simultaneous Multi-user Access to Files-- Locking Mechanism and File Data Validity 6

NLS has implemented code which deals with the problem of files which have (possibly) multiple readers with one writer. The solution additionally provides a file system which is very secure across system crashes. While it is anticipated that the exact current implementation (which makes use of a locking mechanism based in the TENEX user settable word and something known as a "Partial Copy File" described below) will not be used in NSW, we feel Foreman / WM file system functions which permit similar capabilities are necessary. In this section we discuss the user view of the mechanism as well as the current implementation and some system commands it makes possible. We abstract what we feel are essential features to be carried over to the NSW. 6a

NLS currently permits files to be opened for read access; if a user tries to write on the file, an attempt is made to "lock" the file. When a file is locked, it may be modified only by the user who has it locked. Other users may examine the file with read access, but do not see the current editor's changes while the lock is still on the file. When a locked file is loaded by a user other than the one who has the file locked, the file is seen in the state it was in at the time the lock was set; only read access may be obtained, and a message is displayed stating that the file is locked along with the name of the user who has it locked. This information often proves useful in personal negotiations between members of a group who may wish to work on the same material. The fact that only one person may have the file locked at a time implies that only one person may make edits at a time. This minimizes the problems involved in collating simultaneous changes to the same file by more than one user. 6b

In the current NLS a file is locked by changing a bit in the user settable word using the CHNFDB JSYS followed by creating a partial copy file opened for write access; changes in the contents of the original file are reflected only in the partial copy until an explicit update causes the data to be merged. 6b1

Note that unlike the TECO edit buffer, the partial copy is a real file: output is made to the disk and the data is as safe as data in the original file. The partial copy is NOT a buffer. In most instances in the event of a crash, barring only massive hardware failure, users would lose only material currently being entered, i.e., one line or statement. We aim for this level of security on NSW as well. 6b2

The mechanism is invisible to the user and is reasonably secure. It permits many people safe access to a body of data; if a user loads a file which someone else has locked, he will not be able to edit it, but will be able to see its state before the edits began. Works in progress are not visible to anyone other than their creator until an update which also unlocks the file. This concept has proven to be very useful in the case of users making major edits: files may be locked indefinitely and personal negotiation may be carried out by other users with the user who has the file locked. In a programming environment such as the one at ARC, the locking mechanism has saved costly integration of code changes made on a file simultaneously by more than one user. This feature would be valuable in the NSW as well. 6c

In the NSW environment, we will not be using the partial copy mechanism directly. Because the WM maintains a secure version of the original file, a user may make his edits in his copy of the file and incorporate them upon delivery in the WM sense. The locking mechanism is however still useful and could be implemented through the use of the SETSEMAPHORE and UNSETSEMAPHORE WM commands. Semaphores should be settable after a file has been transmitted to the NLS tool. Users may just want to read a file and not deprive other users of the possibility of obtaining the file for write access and locking if desired. (It goes without saying that one should only be able to set the semaphore if one has write access in the TENEX sense, delete access in the WM sense.) Delivery back to NSW should not imply the resetting of the semaphore. A user may want to keep a file locked for several sessions; for security, however, it is desirable for the file to be delivered back to the WM at the end of sessions, perhaps with a different name which may be calculated by NLS from the original name. The semaphore on the original would remain set. 6d

The description of the OPEN function in Millstein's memo suggests that most of this is possible. OPEN checks if the user has COPY access to the file (read access in the TENEX sense.) If the user also has DELETE access and a parameter is true or the i/a tool descriptor (which we don't fully understand) has a particular value, the semaphore is set if it is not set already and the file copied to the current tool. An earlier version of the file may be obtained if the user so indicates. In NLS we do not want the semaphore to be set upon OPEN. We definitely want to be able to get an earlier version of the file if the semaphore is already set by another user; it may be useful for us to have the file in which edits are made have another file name to prevent "trims" of directories (deletions of all but the highest versions). This would suggest a slightly different use of the semaphore mechanism; of course, implementation details can be worked out and must be done in conjunction with MCA. While we are not committed to a particular implementation, we are committed to the user view of the system described above. 6d1

It would be useful for us to have a user id associated with the setting of the semaphore. It would also be useful to be able to read the semaphore before doing the OPEN; this reading function would return a false if the semaphore of the file is not set and, if it is, would return the user id of the user who has the semaphore set. The exact implications of a set semaphore are not clear from the 22 May memo. A clear understanding of the function is essential both by ARC and by MCA. 6d2

For the system to work efficiently there may have to be provision in the Foreman and the WM for reading the semaphore to find out if a file is locked and by whom; this information could be used by NLS to translate the name of the original file into the file in which edits are being made. If a file is locked by the current user, the request may be "changed" by NLS to a request for the related file with modifications in it; all other users would access the original file and would not be permitted write access. We want to minimize and if possible eliminate the necessity of the Foreman knowing about NLS, but efficient facilities to handle the locking mechanism are desirable. 6d3

This area appears to be the one which poses the most potential difficulty in our use of the Foreman and the WM File system as it is currently designed. 6d4

The NLS command "Delete Modifications" may be used by a user who has a file locked and has been making edits. Upon execution of this command, all changes made since the last update disappear and the file is unlocked. The "Delete Modifications" command may be implemented in NSW by deleting the copy of the file with the modifications, unsetting the semaphore in the original and getting a new copy of the original from the WM. 6e

Functions Needed in the WM File System or Foreman by the NLS-BE 7

The following is a list of functions described in Millstein's 22 May memo which are essential to the implementation of the NLS-BE file system interface; the more detailed specifications in that document are assumed to be in effect. The parameters need a bit more elaboration before we can program from them. Cases which require minor redefinition and suggested new functions follow. 7a

DELETE 7a1

RENAME 7a2

SETSEMAPHORE (see below) 7a3

UNSETSEMAPHORE (see below) 7a4

CLOSE 7a5

COPY 7a6

OPEN (possibly acceptable, but read the discussion on the locking mechanism above) 7a7

DELIVER 7a8

The semaphore mechanism needs clarification; as noted above we would like to have a user id associated with a set semaphore. Moreover, we would like to be able to read this value without copying the file. A careful (perhaps too careful) reading of the 22 May memo suggests that ids can be supplied as parameters to WM functions only by the FE! (See the paragraph in section 1 of that document which discusses ids as parameters.) Assuming this was a mistake, we make the following suggestions for the semaphore commands. 7b

SETSEMAPHORE(id, filespec, maxlist, qhelp)
-> NSW-filename 7b1

The WM verifies that the tool can use SETSEMAPHORE, that filespec designates a unique file to which the user has delete access, and that the semaphore is not already set. Assistance is obtained via PCP HELP return or direct FE call as in the file system memo. If all is well, the semaphore is set on behalf of the user whose id is passed and the NSW-filename is returned. 7b1a

UNSETSEMAPHORE(id, filespec, maxlist, qhelp)
-> NSW-filename 7b2

The WM verifies that filespec designates a unique file to which the user has delete access, and that the semaphore is set on behalf of the user. Assistance is obtained as usual. If all is well, the semaphore is unset on behalf of the user whose id is passed and the NSW-filename is returned. 7b2a

READSEMAPHORE(filespec, maxlist, qhelp)
-> file-semaphore-value 7b3

The WM verifies that filespec designates a unique file to which the user has COPY access. Assistance is obtained as usual. If all is well, the semaphore value of the file is returned. It is either FALSE if the semaphore is not set or the id of the user who has the semaphore set. 7b3a

The OPEN function may need slight modification to avoid implicit semaphore setting if it is not desired. Other parameters need clarification. 7c

We stress again that we are not committed to a particular implementation; we just want the functional characteristics of the NLS-BE to be as described in the other sections of this document. Other suggestions will be welcomed. 7d

NLS-BE / NSW File System Interface Time Requirements 8

It will take approximately one calendar month after the receipt of detailed Foreman or WM file system specifications to implement the NLS-BE interface to the NSW file system whether the Foreman or direct WM call approach is selected. Note that this estimate does not take into account considerations such as vacations which are scheduled in the near future by key members of the NLS-BE team. In order to get exact dates for our milestone estimates, we should receive a date for the expected publication of these detailed specifications of either or both the Foreman or NSW File System functions from MCA as soon as possible. The expected date of complete implementation of these functions would also be useful for estimating when debugging could take place. Only upon receipt of these estimates can we decide which approach to follow. 8a

(J26222) 30-JUL-75 13:54;;;; Title: Author(s): Harvey G. Lehtman/HGL; Distribution: /HGL([ACTION]) JBP([ACTION]) CHI([ACTION]) EKM([ACTION]) DSM([ACTION]) JEW([ACTION]) RWW([ACTION]) SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: HGL; Origin: < LEHTMAN, FILE.NLS;6, >, 30-JUL-75 13:48 HGL ;;;;####;

26222 Distribution

Marcia L. Keeney, Elizabeth K. Michael, Jonathan B. Postel, Elizabeth J. Feinler, Kirk E. Kelley, N. Dean Meyer, James E. (Jim) White, Douglas C. Engelbart, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, James C. Norton, Jeffrey C. Peters, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Richard W. Watson, Don I. Andrews, Harvey G. Lehtman, Jonathan B. Postel, Charles H. Irby, Elizabeth K. Michael, David S. Maynard, James E. (Jim) White, Richard W. Watson, Mary Ann Kellan, Buddie J. Pine, Andy Poggio, David L. Retz, Laura J. Metzger, Karolyn J. Martin, Jan A. Cornish, Larry L. Garlick, Priscilla A. Wold, Pamela K. Allen, Delorse M. Brooks, Beverly Boli, Rita Hysmith, Log Augmentation, Joseph L. Ehardt, Raymond R. Panko, Susan Gail Roetter, Robert Louis Belleville, Rene C. Ochoa, Ann Weinberg, Joan Hamilton, Adrian C. McGinnis, Robert S. Ratner, David S. Maynard, Robert N. Lieberman, Sandy L. Johnson, James H. Bair, Jeanne M. Leavitt, Rodney A. Bondurant, Jeanne M. Beck

Annotated DPS-10 Storage Breakdown

An annotated version of (32949,) for SNDMSG to Bill Carlson and Steve Warshall.

Annotated DPS-10 Storage Breakdown

This memo presents the current sizes in decimal words of the various components of DPS-10. This breakdown does not include the L10 runtime environment or writable storage. 1

Symbols to the right of the various size figures are defined as follows: 2

#	code which is present in another form in DPS-11	2a
<	code of which only part is present in DPS-11	2b
-	code absent in DPS-11	2c

15530		Total		3
184		Global catchphrases [for error handling]		3a
220		Main program		3b
230	<	Record definitions	[defining internal data structures]	3c
395		Main programs for various DPS contexts		3d
509	#	Processor operation processing routines	[IVDPS, RRDPS, etc.]	3e
778		Incoming message processing routines	[CALPE, RTNPE, etc.]	3f
790		Read-only tables		3g
5	#	Processor operation dispatch table	[IVDPS, RRDPS, etc.]	3g1
18	<	IPC dispatch table	[inter-fork/inter-host]	3g2
24		Message definitions	[CALPE, RTNPE, etc.]	3g3
28		Data structure definitions	[USER INFO, PSEL, DSEL, etc.]	3g4
100	<	System procedure definitions	[HLPPE, ABRPE, etc.]	3g5
100	<	User call definitions	[PECAL, LRDDT, etc.]	3g6
105	<	Table definitions	[describing internal tables]	3g7
210	<	System call definitions	[CRTPS, CALPE, etc.]	3g8

1555 Incoming system procedure call processing routines 3h

  116 Channels [create, allocate, release] 3h1

  210 < Procedures [interrupt/resume/abort,help] 3h2

  309 Packages [open/close] 3h3

  374 < Processes [initialize/terminate, introduce/separate] 3h4

  546 - Data stores [create/delete, read/write, lock/unlock] 3h5

2895 System call processing routines 3i

  64 Packages [open/close] 3i1

  99 - Data stores [create/delete, read/write, lock/unlock] 3i2

  145 - Locks [create/delete, set/remove] 3i3

  172 - Subprocesses [create/delete] 3i4

  265 - Events [create/delete, signal/test/wait] 3i5

  322 - Channels [create/delete, send/receive] 3i6

  437 < Processors [create/delete, signin/ready] 3i7

  455 < Processes [create/delete, introduce/separate] 3i8

  936 Procedures [call/visit, allocate/release, acquire/release, interrupt/resume, note/help] 3i9

7974 Support subroutines 3j

  820 Operating system interface 3j1

  2221 Internal bookkeeping 3j2

    85 # Event management 3j2a

    102 Error handling 3j2b

    215 # Context management 3j2c

    226 Table searching 3j2d

    234 Storage management 3j2e

634	Queue and table management	3j2f
725 <	Table entry appendages (initialize, terminate, etc.)	3j2g
4933	Communication	3j3
580	Message transmission; remote system procedure calling	3j3a
738	Resource control (locking)	3j3b
934	Inter-process communication	3j3c
45 #	Inter-host (skeleton only)	3j3c1
410 -	Intra-host	3j3c2
479	Common	3j3c3
1222	Data structure conversion	3j3d
1459 -	Processor address space manipulation	3j3e

Annotated DPS-10 Storage Breakdown

(J26223) 31-JUL-75 13:01;;;; Title: Author(s): James E. (Jim) White/JEW; Distribution: /SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JEW;   Origin: < JWHITE, BREAKDOWN.NLS;2, >, 31-JUL-75 12:56 JEW ;;;;####;

26223 Distribution

Douglas C. Engelbart, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, James C. Norton, Jeffrey C. Peters, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Richard W. Watson, Don I. Andrews, Mary Ann Kellan, Buddie J. Pine, Andy Poggio, David L. Retz, Laura J. Metzger, Karolyn J. Martin, Jan A. Cornish, Larry L. Garlick, Priscilla A. Wold, Pamela K. Allen, Delorse M. Brooks, Beverly Boli, Rita Hysmith, Log Augmentation, Joseph L. Ehardt, Raymond R. Panko, Susan Gail Roetter, Robert Louis Belleville, Rene C. Ochoa, Ann Weinberg, Joan Hamilton, Adrian C. McGinnis, Robert S. Ratner, David S. Maynard, Robert N. Lieberman, Sandy L. Johnson, James H. Bair, Jeanne M. Leavitt, Rodney A. Bondurant, Jeanne M. Beck, Marcia L. Keeney, Elizabeth K. Michael, Jonathan B. Postel, Elizabeth J. Feinler, Kirk E. Kelley, N. Dean Meyer, James E. (Jim) White

HGL 31-JUL-75 14:22 26224

Recently Published Cassette Information Collected and Sent to Larry Crain at Gunter

These are being reentered into the Journal in order to have a record of their collective transmission to Larry.

HGL 31-JUL-75 14:22 26224

Recently Published Cassette Information Collected and Sent to Larry Crain at Gunter

The following are copies of recent Journal items which reflect our current policies with respect to the CASSETTE system. Please note that some of the limitations are due to TIP buffer sizes and the lack of any flow control on the network. We can only guarantee the validity of cassette material read in under the circumstances described below until further notice. There will be some minor changes made to some of the support programs upon Jan Kremers return from his vacation. 1

JHK HGL 21-JUL-75 19:24 26163-- Current (15-JUL-75) Cassette Restrictions 2

The following restrictions currently apply to the use of the CASSETTE utility and DEX. Software modifications to be made within the next weeks will offer greater security of data capture through the network and will permit a wider variety of cassette hardware to be used, but problems with the nature of the TIP device (which was not designed with the cassette process in mind) preclude major improvements without further developments which will be outlined in later notes. 2a

The Cassette recorder used must have the folowing remotely addressable controls: 2a1

1) rewind 2a1a

2) record 2a1b

3) stop record 2a1c

4) read 2a1d

5) stop read 2a1e

Additional cassette hardware specifications may be found in the WORKSTATION EQUIPMENT REFERENCE MANUAL, NIC # 23809. 2a2

At present (7/15/75) the only (!) specific cassette drives supported are the following: 2a3

ICP-TERMICETTE 3100 2a3a

TECHTRAN 4100 2a3b

Operation of the CASSETTE UTILITY and hence DEX itself cannot be guaranteed when any other type of drive is used. This list will be expanded in the future. 2a4

At the present time cassette input through line processor terminals is not supported. This facility will be available in the new version of the CASSETTE UTILITY. 2a5

When the CASSETTE UTILITY is used on a TIP line one must be absolutely sure that the size of the TIP buffer for the line being used is greater than the size of the longest tape record to be processed. This restriction is necessary because the cassette drive cannot be stopped while it is reading a record. If this rule is not followed, the program will hang, drop characters and in general behave in an unpredictable and unreliable manner. In some cases, modifications to the sizes of buffers used for cassette input will have to be arranged with the Network Control Center to follow specifications of ARC. If there is difficulty getting all data through the network, ARC should be consulted with information about the TIP used, the TIP port, and the tape record size. 2a6

When the CASSETTE UTILITY is used via a TELNET connection the TELNET escape character must be changed to something other that the default ^Z. (^W is recommended). TELNET must also be told to operate in "transparent mode" to avoid interception of control and special characters from the tape. 2a7

We are in the process of investigating the CASSETTE problem and hope to have a somewhat more reliable software package available within the next few weeks. The above restricions, however, will remain in force. Problems and questions concerning the DEX and CASSETTE UTILITY systems should be forwarded to LEHTMAN@BBNB, or KREMERS@BBNB. 2a8

HGL 21-JUL-75 20:44 26164-- Some TIP buffer sizes 3

The following list of TIP buffer assignments was provided by Joel Malman of the Network Control Center on 16 and 18 July. They should be useful in the analysis of Cassette problems. The list of TIPs was obtained from Applications; there are a few others which should also be included (such as RADC?) Numbers are octal. Input buffers are measured in words at two characters per word. Output buffers are double buffered; therefore the output buffer listed may be taken as the octal buffer size in characters. Except for AMES and Tymshare, the list was compiled over the phone and may be incorrect in places due to my stenographic ineptitude. 3a

Note also the fact that Joel expressed shock that we would even consider putting the TIP which was designed "for people typing at keyboards" to use in the middle of a cassette based system. There is no flow control in the TIP and buffers will indeed overflow. 3b

AMES:

PORT	INBUF	OUTBUF		
1,2	253	527	(9600/9600 SCOPE)	
3-64	34	71	(300 MODEMS)	
65	1	1	(SPARE)	
66	34	162	(150/1200 TTY)	
67	1	1	(SPARE)	
70-74		34	71	(300 MODEMS)
75	1	1	(SPARE)	
76-77		34	71	(300 MODEMS)

3c

ARPA:

PORT	INBUF	OUTBUF	
1	0	173	
2	244	511	
3	122	164	
4	122	173	
5-7	122	164	
10	122	173	
11	104	51	
12-77		44	51

3d

KIRKLAND:

PORT	INBUF	OUTBUF	
1-3	266	554	
4-7	133	266	
10-17		55	133
20-37		26	55
40-77		13	26

3e

MITRE:

PORT	INBUF	OUTBUF	
2-7	17	37	
10	17	176	
13	17	37	
16,17		1	2
20-26		17	37
27	77	176	
30-33		17	37
34	77	104	
35-37		17	37
40,41		77	204

3f

Recently Published Cassette Information Collected and Sent to Larry Crain at Gunter

RML:

PORT	INBUF	OUTBUF	
1	10	21	
2	37	77	
3-14	10	21	
15	21	42	
16-25		10	21
26	37	77	
27-34		10	21
35	50	21	
36-61		10	21
62	31	63	
63-65		10	21
66	31	63	
66-77		10	21

3g

RUTGERS:

PORT	INBUF	OUTBUF	
2-5	22	44	
6-10	4	6	
11-12		22	44
13	4	6	
14	22	44	
15,16		4	6
17	44	111	
20-33		4	6
34,35		111	223
36-63		4	6
64	0	156	
65	0	223	
66-71		4	6
72	111	215	
73-77		4	6

3h

SDAC:

PORT	INBUF	OUTBUF	
1	22	70	
2	22	160	
3-5	22	70	
6	40	214	
7	22	70	
10-12		40	214
13	22	70	
14	22	124	
17	151	16	
21,23,26		22	16

31

TYMSH:

```
PORT INBUF   OUTBUF
1-14 101     64      (300 MODEMS)
15,17        202     202     (208A EXTERNAL CLOCK MODEMS)
```
3j

HGL 28-JUL-75 15:09 26204-- Clarifications on Cassette Restriction Document (26163,) 4

Kirk's questions (33043,) about our Cassette restriction document (26163,) were quite good. Control-W is indeed used by Termicettes as the rewind control character. Thus the suggestion in our earlier document about the appropriate escape character setting for operating the cassette system through TELNET should have been generalized to suggest that the escape character should not be one of the control characters which activate the cassette terminal being used. (I think control-P is OK, but we shouldn't generalize about all terminal types: they may each require a different TELNET escape character.) 4a

The second question is more difficult to answer: there is NO command to change TIP input buffers! The TIP, as stressed by Joel Malman of NCC, was not designed to handle cassette terminals. TIP buffer sizes are assigned by NCC and must be changed by them. I can assure you that they would not want to change them frequently. All we can do is find out from the user which port is being used if data is being lost and suggest they get on a port with bigger buffers. This is not possible on some TIPs which have phone lines assigned to non-specific ports. If some customers are assigned dedicated lines (and ports) it may be possible to set one or two of them to a size large enough to be used by a cassette terminal. The ultimate solution awaits the development of buffering flow control hardware in the LSI-11 lineprocessor. 4b

Martin Hardy has suggested that our phrasing of required functions to be present on the Cassette terminal device was confusing: none of our current devices has a stop read control. We meant to imply that the read record command should stop reading at the end of a reasonably sized record, generally a line of text. 4c

Recently Published Cassette Information Collected and Sent to Larry Crain at Gunter

(J26224) 31-JUL-75 14:22;;;; Title: Author(s): Harvey G. Lehtman/HGL; Distribution: /LAC([ACTION]) JCN([ACTION]) RWW([ACTION]) JBP([ACTION]) POOH([ACTION]) EKM([ACTION]) SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: HGL; Origin: < LEHTMAN, DEXMES.NLS;1, >, 31-JUL-75 14:00 HGL ;;;;####;

26224 Distribution

Elizabeth K. Michael, Jonathan B. Postel, Elizabeth J. Feinler, Kirk E. Kelley, N. Dean Meyer, James E. (Jim) White, Douglas C. Engelbart, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, James C. Norton, Jeffrey C. Peters, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Richard W. Watson, Don I. Andrews, Lawrence A. Crain, James C. Norton, Richard W. Watson, Jonathan B. Postel, Ann Weinberg, Elizabeth K. Michael, Mary Ann Kellan, Buddie J. Pine, Andy Poggio, David L. Retz, Laura J. Metzger, Karolyn J. Martin, Jan A. Cornish, Larry L. Garlick, Priscilla A. Wold, Pamela K. Allen, Delorse M. Brooks, Beverly Boli, Rita Hysmith, Log Augmentation, Joseph L. Ehardt, Raymond R. Panko, Susan Gail Roetter, Robert Louis Belleville, Rene C. Ochoa, Ann Weinberg, Joan Hamilton, Adrian C. McGinnis, Robert S. Ratner, David S. Maynard, Robert N. Lieberman, Sandy L. Johnson, James H. Bair, Jeanne M. Leavitt, Rodney A. Bondurant, Jeanne M. Beck, Marcia L. Keeney

messages from watson

(work) temporary work space 1

28-JUL-75 18:28:29-EDT,398;000000000000
Mail from USC-ISIC rcvd at 28-JUL-75 1828-EDT
Date: 28 JUL 1975 1531-PDT
From: WATSON at USC-ISIC
Subject: hignetts mailsbox
To: carlson at ISI
cc: postel at BBNB 1a

Bill I just tried to send a message to the steering committee including hignett and it did not recognize him at isi did I spell his name wrong or does he get mail someplace else like maybe Office 1? Thanks Dick
----
30-JUL-75 10:23:21-EDT,1185;000000000000
Mail from BBN-TENEXB rcvd at 30-JUL-75 1023-EDT
Date: 30 JUL 1975 1020-EDT
Sender: WATSON at BBN-TENEXB
Subject: PDP 11 costs
From: WATSON at BBN-TENEXB
To: carlson at ISI
Cc: WARSHALL, POSTEL, EHARDT
Message-ID: <[BBN-TENEXB]30-JUL-75 10:20:42-EDT.WATSON> 1b

Bill, we will get together a detailed breakdown of the cost comparison of 11/40 and 11/70 along with cost of 11/05 and send you. The 11/05 used on a per terminal basis will need to interface to some sort of host or TIP and we will want to discuss the various considerations and likely total system and per terminal costs for various likely cases ie a situation like at Gunter where there wil be many terminals, a case where a site might only want a couple etc. That will be the subject of a think piece we will get together. The cost of PDP 11 type hardware is coming down at a fair rate. Will get difference in cost of PDP 11 memory today versus what it was a year ago as example. As mentioned yesterday I think cost of 16K from DEC is around $3K today and can be obtained from independent suppliers for as little as $2.3K for 16K, will look up what it was a year ago. Back with more details soon. Dick -------
30-JUL-75 21:42:51-EDT,6756;000000000000
Date: 30 JUL 1975 2142-EDT
From: WATSON
Subject: two quick stream of consciousness type notes sent to carlson to keep his head loose on fe To: engelbart at OFFICE-1, postel 1c

30-JUL-75 19:15:36-EDT,2101;000000000001
Date: 30 JUL 1975 1915-EDT

messages from watson

From: WATSON
Subject: perspective on FE costs
To: carlson at ISI
cc: watson, warshall 1d

in thinking about FE costs there are many angles that one can go at it. Some useful in comparing different design approaches but the couple that are really dominant economically are raw hardware costs for fe as part of the total computing picture for the user, his time, training time, communications across the network, , cost of TBH time etc. For example taking one incomplete example using BBN prices of 600K per year to run a machine. The cost of the 11/40 fe is about 100K amortized over 4 years yields $25K / year. On the assumption that each one supports 20 users the cost for a one user slice is 1,250 for fe and $30K for TBH use or fe is about 4% of total cost, if network packet costs are thrown in it is less. Now if fe supported 40 users cost per year per user would be $625 and percent would be around 2. The second point is the decrease in hardware cost at about 20% per year. Such that a $100K system today will be around $30K in the 1979-80 time frame reduces above percents for fe even more. One can go on to show significant savings for communications and in TBH if fe begins to do tasks thus allowing more users to be supported in TBH. For NLS as an example we expect fe to free TBH of from 10-30% of its cycles. If one then adds to above cost savings to tool builders of being able to write user interface program rather than building terminal control parser etc the total picture for NSW fe can be painted very economically attractive even when cost of memory requirements are as described. On top of that one gets into the hard to define cost savings of various user services, more responsive service of having fe close to user etc. The above crude outline is type that would need to be used to look at economics and cost benefit of fe or various approaches. I think the present approach when compared on such a basis with simpler ones will come out very favorably. Just thought I would throw above at you for mind fodder. Best Dick ------- 1e

30-JUL-75 21:11:47-EDT,4377;000000000000
Date: 30 JUL 1975 2111-EDT
From: WATSON
Subject: some after thoughts on fe economics
To: carlson at ISI
cc: watson 1f

Bill, 1g

As pointed out in previous note we are talking about a very small amount of money per year per terminal for the fe no

matter what approach is used and it does concern me to see you worrying so hard at this stage of a new development about trying to find ways to optimize that small percentage.
The point I did not make in the previous note which to me may be the most important one is that there is so much to learn about what facilities we want in the NSW that is really going to be scaled for delivery in the 78-80 time frame, that we want to offer as advanced services as we can with in reason now so we can get experience with them ourselves, users can get experience, tool vendors can get experience etc so we can spec the final product from real knowledge. 1g1

The fe 10 is going to be essentially done in next week or so before WM demo. With out modifying their tools old tool vendors could write the CML interface spec for their tool and we provide the full range of fe services to their users with very little work assumming of course they can turn off the normal messages from their tool when it parses the command string that finally gets sent. We think it would only take Charles for example 2-4 hours max to write the CML discription of the SOS editer. Its even easier to insert old tools with less service for user. A simpler fe approach may save a few dollars initially but will deprive us of a chance to test services and ideas that could prove directly or in their next pass or two to be worth far far more even if they only prove we do not want them in the final product. It is this important developmental exploratory flavor even with real users doing real work that seems to me to be getting lost. 1g2

I remember back 7-8 years ago when I was getting some graphics and interactive R&D going in Shell that when management saw the price tag for general graphics terminals which back then cost around $100K they got stuck with that number stuck with that number. But even with that number, which is an order of magnitude almost bigger than the per terminal numbers we are talking about for fe, when you pointed out the amortization and computed the hourly cost of running one and placed it in perspective with communications costs and the costs of the timesharing system behind it they could relax think in whole system terms including the users overheaded salary and support what was going on.
Now we are talking in order of magnitude per user smaller numbers but same big picture needs to be kept in mind. 1g3

Bill if you are being pressured from some body on steering committee who does not see this type of picture I would be glad to try and put it in perspective for them as on a sensitivity basis the whole NSW system economics are just not very sensitive to fe costs or whether it supports 20 or 60 users. 1g3a

The economics are very sensitive some quick arithmetic shows to savings fe can give to TBH cycles and communication costs. Quick assumptions show me that for NLS the fe could save possibly as much as $5,000 per year in communications costs per terminal and from10-30% per year in TBH costs depending on assumptions on TBH CPU cycle savings assumed. For other tools it could be more or less. I used Telenet rates in thinking about packets above. 1g4

This quick analysis shows me we want to push more functions out of the large TBHs like the Tenexes into the local machine and favors the larger 11/70 running tools locally like NLS editing etc that are frequently used even if fewer users are supported and we want to encourage tool suppliers to do their parsing in the fe and other functions that would reduce TBH loads. 1g5

We need the NSW evaluation contractor who has the time to work with people like us to get all these full picture ways to look at things out on the table. I sure would appreciate some feedback on these two notes as to whether or not they were useful. Must get home now. Dick 1g6

------- 1h

30-JUL-75 22:04:45-EDT,1827;000000000000
Date: 30 JUL 1975 2204-EDT
From: WATSON
Subject: Now for some good news
To: [BBNB]<POSTEL>NSW-STEERING-COMMITTEE.LIST:
cc: postel, ehardt, watson 1i

TO NSW STEERING COMMITTEE 1j

Our document sent out last week listing address requirements for FE software (we need to be careful to distinguish term "address requirement" from "memory requirement" as the two are independent assuming a secondary storage device; however, then transfer bandwidth and memory access interference between CPU and secondary device need to be considered) indicated that the 11/40 with limitations on both main memory size and bandwidth while useful in the short term was not the best intermediate to long term choice. 1j1

We have been looking at configurations in two directions - one the features and cost of the 11/70, the other a configuration based on very small 11/03 or 4 to take over for Line Processor, display (terminal) control, and CLI. 1j2

The former is (somewhere in $15k-30k difference range for comparable configurations) so close in cost to the 11/40 and offers so much more both in bandwidth and memory capacity, that our preliminary look indicates the 11/40 is already obsolete for this type of application. The 11/70 offers other advantages as well. 1j3

The other approach using the small 11/03 or 4 also looks very attractive. It appears very cost competitive and to have nice scaling properties. A think piece on these approaches is in the works with costs. Either approach follows nicely on work to-date. 1j4

I am sending this note now hopefully not premature, to share the good news, after having had one sent out with some bad news. 1j5

My only regret is that I have two 11/40's sitting on my floor. 1j6

```
-------
31-JUL-75 11:08:37-EDT,520;000000000000
Date: 31 JUL 1975 1108-EDT
From: WATSON
Subject: carlsons reply to my notes of yesterday
To:   engelbart at OFFICE-1, postel                              1k

31-JUL-75 0607-PDT  CARLSON at USC-ISI:  Notes on Front-end costs
Distribution:  WATSON AT BBNB, carlson Received at: 31-JUL-75 I
agree with your ideas. My problem is that we are supposed to have
an operational system in 1978, including sufficient
AFDSC and AFDSDC now own PDP-11/40s.
That will be the NSW FE computer, at least for thenext couple of
bill
-------                                                          1l
```

messages from watson

(J26225) 31-JUL-75 15:21;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /JBP([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JBP;

NSW Protocols Weekly Status Report: 31-JUL-75 1

JIM WHITE 1a

Major Responsibility: DPS-10 1a1

Accomplished Last Week 1a2

- Continued debugging CLI/DPS/NLS system with DSM/CHI. 1a2a

- Implemented most of the new DPS-10 features outlined in last week's status report. 1a2b

- Sent memo to Stu Schaffner suggesting that the WM make available to tools, an INDEX data store called "FEPH" containing the tool's process handle for the FE. 1a2c

- Touched bases with Rick Schantz regarding his progress interfacing the encapsulator to DPS. 1a2d

Learned that he's working with Schaffner (whose DPS interface code he's using) but has yet to really get off the ground; the ball rests with Schaffner at the moment, but I indicated my readiness to assist whenever required. Learned also that he's ready to test the encapsulator with JBP's user Telnet code, as soon as it is made available to him. 1a2d1

- Reviewed second draft of LLG's DPS-11 user interface spec. 1a2e

- Annotated previously published DPS-10 storage breakdown and SNDMSGed it to Warshall and Carlson. 1a2f

- Reviewed Doug Wells' NSW Protocol Meeting minutes. 1a2g

- Wrote initial and final draft of reply to proposed Message Transmission Protocol Subcommittee, incorporating the comments of CHI, JBP, JDH, and RWW. 1a2h

- Proofed Journal section of final report. 1a2i

- Mailed a copy of the 22-NOV-74 PCP documentation to Marty Michael at Brown university, at his request. 1a2j

- No debugging of CLI/DPS/WM system with Stu Schaffner this past week. 1a2k

Scheduled Next Week 1a3

- Continue debugging CLI/DPS/NLS system with DSM/CHI, CLI/DPS/DEBUGGER system with KEV, CLI/DPS/WM system with Stu Schaffner, and CLI/DPS/ENCAPSULATOR system with Rick Schantz, as required. 1a3a

- Complete implementation of new DPS-10 features and update DPSJSYS accordingly. 1a3b

Queued 1a4

- Code inter-host inter-process communication (this is not critical path). 1a4a

Problems Encountered 1a5

- System response (apparently the Network) has been extremely poor this week! 1a5a

- Having to respond to the proposed message protocol adversely affected my ability to respond to DSM's debugging needs, primarily because installation of the new DPS features was abruptly interrupted with the source file in a state such that it couldn't be recompiled. 1a5b

LARRY GARLICK 1b

Major Responsibility: DPS-11 1b1

Accomplished Last Week 1b2

- Journalized final (?) draft of DPS-11 user interface description. 1b2a

- Prepared a note on storage management issues with DLR. 1b2b

- Continued coding DPS-11 event and manager management. 1b2c

- Began coding a message block allocation monitor to be shared by DPS-11 and CLI-11, which relieves the caller of ELF-level calls of responsibility for controlling access to message blocks. 1b2d

- Learned DDT and debugged my first piece of code -- the process address parser. 1b2e

Scheduled for Short Term 1b3

- Continue DPS-10 => DPS-11 conversion. 1b3a

> Install new VJSYS/VJUSR call mechanisms. 1b3a1

> Remove subprocess and processor management. 1b3a2

> Code data format conversion routines for PCPB8. 1b3a3

- Shooting for a test of DPS-11 with CLI-11 by 1-SEP. 1b3b

Scheduled for Long Term 1b4

Install DPS-11. 1b4a

NSW Protocols Weekly Status Report: 31-JUL-75

(J26226) 31-JUL-75 16:15;;;; Title: Author(s): James E. (Jim) White/JEW; Distribution: /SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JEW; Origin: < JWHITE, PROSTS.NLS;7, >, 31-JUL-75 16:10 JEW ;;;;####;

26226 Distribution

Douglas C. Engelbart, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, James C. Norton, Jeffrey C. Peters, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Richard W. Watson, Don I. Andrews, Mary Ann Kellan, Buddie J. Pine, Andy Poggio, David L. Retz, Laura J. Metzger, Karolyn J. Martin, Jan A. Cornish, Larry L. Garlick, Priscilla A. Wold, Pamela K. Allen, Delorse M. Brooks, Beverly Boli, Rita Hysmith, Log Augmentation, Joseph L. Ehardt, Raymond R. Panko, Susan Gail Roetter, Robert Louis Belleville, Rene C. Ochoa, Ann Weinberg, Joan Hamilton, Adrian C. McGinnis, Robert S. Ratner, David S. Maynard, Robert N. Lieberman, Sandy L. Johnson, James H. Bair, Jeanne M. Leavitt, Rodney A. Bondurant, Jeanne M. Beck, Marcia L. Keeney, Elizabeth K. Michael, Jonathan B. Postel, Elizabeth J. Feinler, Kirk E. Kelley, N. Dean Meyer, James E. (Jim) White

Tripping around, (final?) Glossary to COM, QMR, start on 8.5 help files: Documentation weekly report for week ending August 1

POOH 1

This Week 1a

spent monday and tuesday at the pentagon meeting with pople about the 66-1 document the are going to be revising at gunter 1a1

spent the rest of the week getting ready for the gunter trip...working with DEX, talking with Larry Crain to make arrangements, looking at the documents we are going to produce 1a2

Next Week 1b

i will be at gunter for the next two weeks. 1b1

Bev 2

This Week 2a

Reviewed proofs from COM file of Glossary. Fixed errors. Off to isic again, this time for K-5's. 2a1

Completed final draft of Quarterly Management Report, except for short blurb on NLS 7 to NLS 8 conversion. 2a2

Revamped Sendmail Sample Sessions. 2a3

Outlined documentation tasks for next nine months with Kirk. Divided up responsibilities among bev, kirk, pooh. 2a4

Went over Help with Kirk; began working on CORE, then switched to Base file. 2a5

Next Week 2b

work on Help Base file. 2b1

Complete and format QMR. 2b2

Discuss packaging sample sessions with Jim Bair. Find out print runs. Send off to SRI printing. 2b3

Discuss documentation technology transfer procedures with Jim Bair. 2b4

Kirk 3

Done 3a

Tripping around, (final?) Glossary to COM, QMR, start on 8.5 help files: Documentation weekly report for week ending August 1

Re-did and un-did various AFMFormat program directives. 3a1

Consulted on various ways of teaching and using DEX. 3a2

Set up documentation schedule with Bev. 3a3

Consulted on formatting various Air Force manuals with tables and different numberings. 3a4

Discovered a search bug in Help, re-wrote (and simplified) the code in response. 3a5

Got Bev started on writing description files. 3a6

Introduced Jan to Help code. 3a7

Do 3b

Put the current list of development documentation on line. 3b1

Finish getting Help files in order for bringing up 8.5. 3b2

Work with Bev and review her help writing. 3b3

Continue transfer to Jan of Help and Class-I user programs (which now includes Calculator?). 3b4

Continue hassling with AFMFormat. 3b5

Begin on Letter Program. 3b6

Tripping around, (final?) Glossary to COM, QMR, start on 8.5 help files: Documentation weekly report for week ending August 1

(J26227) 1-AUG-75 23:15;;;; Title: Author(s): Kirk E. Kelley/KIRK; Distribution: /SRI-ARC([INFO-ONLY]) DMB([INFO-ONLY] dirt) ; Sub-Collections: SRI-ARC; Clerk: KIRK;

26227 Distribution

Douglas C. Engelbart, Martin E. Hardy, J. D. Hopper, Charles H. Irby, Harvey G. Lehtman, James C. Norton, Jeffrey C. Peters, Dirk H. Van Nouhuys, Kenneth E. (Ken) Victor, Richard W. Watson, Don I. Andrews, Delorse M. Brooks,

Mary Ann Kellan, Buddie J. Pine, Andy Poggio, David L. Retz, Laura J. Metzger, Karolyn J. Martin, Jan A. Cornish, Larry L. Garlick, Priscilla A. Wold, Pamela K. Allen, Delorse M. Brooks, Beverly Boli, Rita Hysmith, Log Augmentation, Joseph L. Ehardt, Raymond R. Panko, Susan Gail Roetter, Robert Louis Belleville, Rene C. Ochoa, Ann Weinberg, Joan Hamilton, Adrian C. McGinnis, Robert S. Ratner, David S. Maynard, Robert N. Lieberman, Sandy L. Johnson, James H. Bair, Jeanne M. Leavitt, Rodney A. Bondurant, Jeanne M. Beck, Marcia L. Keeney, Elizabeth K. Michael, Jonathan B. Postel, Elizabeth J. Feinler, Kirk E. Kelley, N. Dean Meyer, James E. (Jim) White

Concerning Shared Screens at OFFICE-1

In talking with KEV (and indirectly with CHI) it appears that the nescessary modifications to TENEX to support NLS shared screens for non-enabled users would take Jeff about a week to do. It would require another week or two to get the changes through Tymshare. 1

It should be noted that this change represents a departure from standard TENEX. It is unlikely that we could get BBN to pick it up for standard release. This not only means that the feature would not be available at BBN and ISI, but for each future TENEX release, the edits and reassemblies would have to be repeated for OFFICE-1. 2

Concerning Shared Screens at OFFICE-1

(J26228) 3-AUG-75 19:34;;;; Title: Author(s): J. D. Hopper/JDH; Distribution: /BJP([ACTION]) JCN([ACTION]) DCE([INFO-ONLY]) JCP([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JDH;

Notes on the NSW Protocol Meeting June 11-13, 1975 1

by Douglas M. Wells 1a
(DWells at MIT-Multics) 1b

07/31/75 1c

SECRETARY'S COMMENTS 2

This meeting, which was held at SRI-ARC, was called to discuss the NSW protocols. This was the first large-scale meeting at which MIT and UCLA were prepared to be other than interested spectators. The agenda announced included: a report on the the current implementation status of DPS, a discussion of features which were hard/impossible to implement on the other hosts (primarily Multics and OS/360), a discussion of the File Package, and a discussion of problem areas which might be handled in a re-design of DPS. 3

As the meeting wore on, however, it became obvious that the group as a whole was uncertain as to the direction that it should be proceeding. In particular, there seems to be no reference source (either a written document or a particular person) to which specific questions can be directed (with reasonable expectations of a correct reply). The types of questions that keep coming up are of the form: 4

Is feature X to be included in NSW? 4a

Is it to be included in the first demonstration? 4b

where feature X is such things as automatic validation of Air Force standard COBOL source format, or association of use-types with NSW files. It is to be hoped that the appointment of COMPASS as Technical Coordinator as of July 1 will help this situation tremendously. 5

The primary result of this meeting, I believe, was the familiarity gained with concepts of implementation of other parts of NSW and of other operating systems. The fact that a day and a half were spent considering how to interface the NSW file system to Network host's native file systems can only indicate the magnitude of the problems that were faced and (hopefully) partially solved. 6

[In the time between the meeting and the publication of these notes, the Steering Committee has written a public letter to Steve Warshall of COMPASS which goes a long way towards the defining of goals, both long-range and immediate, of the NSW. It is to be hoped that iteration of these goals will lead to a interesting and useful product.] 7

These meeting notes have been prepared with the expectation that some of the overview material is of more importance to non-attendees than the particulars of some of the later discussions. Accordingly, there has been an attempt in these meeting notes to reproduce more of the substance of the first day overviews and status reports when compared to the brief summary of the discussions that occured during the last two days of the meeting. (It is also the case that the substance of the discussion of the File Package and the other protocols will eventually appear as protocol descriptions.) 8

Finally, it should be noted that the opinions expressed herein are mine... 9

ATTENDEES: 10

Bob Braden	UCLA-CCN	BRADEN@CCN	10a
Bill Carlson	ARPA	Carlson@ISI	10b
Steve Crocker	USC-ISI	Crocker@ISIB	10c
Larry Garlick	SRI-ARC	Garlick@BBNB	10d
Charles Irby	SRI-ARC	Irby@BBNB	10e
Raj Kanodia	MIT	Kanodia@MIT-Multics	10f
Bob Millstein	COMPASS	MILLSTEIN@BBNB	10g
Charles Muntz	COMPASS	Muntz@BBNB	10h
Jon Postel	SRI-ARC	POSTEL@BBNB	10i
Stuart Schaffner	COMPASS	Schaffner@BBNB	10j
Rick Schantz	BBN	Schantz@BBN	10k
Bob Thomas	BBN	THOMAS@BBN	10l
Doug Wells	MIT	DWells@MIT-Multics	10m
Jim White	SRI-ARC	JWHITE@BBNB	10n
Dave Wilczynski	USC-ISI	WILCZYNSKI@ISIB	10o
Mike Wingfield	RADC	Wingfield@Office-1	10p
Stephen Wolfe	UCLA-CCN	WOLFE@CCN	10q

DAY 1: WEDNESDAY, JUNE 11, 1975 11

The meeting commenced at 9:00 AM. After introductions, Jim White proceeded to report on DPS version 2.5. Jim explained that DPS was currently coded and he was in the process of debugging. At the time of the report, Jim was using the TENEX version of the FE to debug the intra-host communication facilities of DPS. 12

12a

For the benefit of all present, Jim then gave a overview of DPS: 13

The Distributed Programming System (DPS) has a higher-level model in which the world is viewed as processes communicating with other processes. DPS processes remain undefined but are characterized by having associated with them such things as Procedures, Data Stores, and Processors. The Procedures and Data Stores are organized into Packages primarily for purposes of access control. Each package consists of one or more procedures, and zero or more data stores.) Furthermore, each process has one or more Processors. A processor is akin to an execution point moving in an address space 13a

Among the concepts supported by DPS are: a Procedure Call to allow a program to call another program (possibly on another host), a Coroutine Linkage mechanism to allow two or more procedures to pass control back and forth among themselves, a Note facility to allow lower-level routines to inform higher-level routines that some event of possible interest to it has occurred, and a HELP return to allow a higher-level routine to provide assistance and additional information in anomalous situations. 13b

DPS has a small number of Data Types to allow communication of information between processes. Data Types allowed include: INTEGER, BOOLEAN, BIT-STRING, CHARACTER-STRING, INDEX, EMPTY, and LIST. 13c

DPS allows processes to interact in a number of ways. One process can create another (thus inferior) process. A process may be introduced to another, pre-existing process (by a different process that already knows about each of the two processes). Finally, a process may "splice" inself to another, pre-existing process (with no interaction with another process). 13d

The discussion which followed raised several issues about the protocol: 14

- because of the tree structure of processes encouraged by DPS, the relationships among "spliced" equivalent (pre-existing) processes seems unclear, 14a

- the inclusion of the concept of processors seems to cause some problems in terms of simplicity of implementation, 14b

- because the note facility (as implemented by the DPS NTEPE IPC message) is defined to send the note all the way to the top of the procedure call stack, the use of this information by both programs and human users seems uncertain, 14c

- the actual use of the help facility (as implemented by a DPS co-routine call) seems unclear - particularly when there is an attempt to solve a real problem several levels down in the procedure call stack, 14d

Bob Millstein then gave a status report on the Works Manager, He said that large portions of the WM were running using dummy procedures for certain cross-net functions, He stated that since May 15, they have been using the Command Level Interpreter (CLI - the TENEX version of the FE developed by Charles Irby) to debug the WM, 15

Following his status report, Bob proceeded to give the group an overview of the Works Manager; an overview which he described as "largely theoretical", i.e., without considering an implementation within DPS, 16

The Works Manager takes a viewpoint of being a mediator in an interconnection of processes, The WM is a collection of non-identical processes sharing a common data base, The WM is primarily a resource allocator, In order to allocate and control resources, the WM arbitrates at request time to check the validity of the semantics of the call, and then may bless the request, The primary resource that the WM controls is the NSW File System, Other resources that the WM controls are Tools (on TBH's), and other WM procedures (such as the batch job stagers), 16a

In order to provide an actual service, the WM has error report collection processes and needs the ability to communicate with other processes, The WM is viewed as one entity rather than a set of shared-goal entities, In order to remain simple, the WM procedures want to be rather ignorant in regard to their knowledge of the outside world. 16b

From the outside world, the WM appears to be a transaction processor to which requests are sent. The transactions performed are invocations of the WM Black Boxes described in previous documentation. The WM queues requests that it cannot fulfill immediately. 16c

To complete the tour of current progress, Charles Irby then described the Front End as it is to be implemented under ELF. He described it from a functional viewpoint: 17

The FE is currently envisioned as several processors (of the DPS variety) running in one process which is spliced to the WM. To emphasize that this was an implementation viewpoint, Charles pointed out that the TENEX version of the FE now running (CLI) causes each user to have a private process which is individually spliced to the WM. 17a

Somehow at the beginning of time, NSW EXEC is loaded and begins execution under ELF. This program/process creates a connection to the WM and is given an initial set of grammars. At this point, the FE is ready to provide service to human users at their terminals. 17b

When a user indicates to the FE process that he/she wants to start a session, the FE collects login information from the user (according to an initial grammar) and then makes a procedure call on the WM LOGIN function. At this point, the WM is aware of the presence of the user and the capabilities/restrictions of the user are known to the WM. 17c

If the user desires to perform some simple action such as deleting a file, he must perform some action (as defined by the grammar that he is using) to cause the FE to perform a DELETE-FILE call to the WM. After this call, the WM will return a "yes", return a "no, because ...", or will make a HELP call indicating that more information is needed as, for example, would happen if the name specified by the user were ambiguous. 17d

If the user desires to perform some more complicated action such as running NLS, he must cause the FE to call the RUN-TOOL procedure in the WM. If the WM will allow the user to use the NLS tool, it will then choose a TBH on which to run NLS, create a process at the TBH to run the NLS tool. Assuming things are still going smoothly, the WM will then introduce the newly-created tool process to the FE process and supply the appropriate NLS grammar table to the FE. Now the FE uses the NLS grammar to allow the human user to perform procedure calls (with arguments) directly upon the NLS tool process. 17e

Following the status reports, the discussion moved to questions about how the WM should be viewed by other components in NSW (in particular, TB_H's and the FE's). This discussion finally arrived at the viewpoint that the WM is one entity which lives on one host (until the implementation of multiple WM's - whatever that means) and which requires some help from the TBH's, e.g., Local Name Directory maintenance, file trapping. There was also some discussion about the use of the terms authorization, revocation, and budget with respect to the use of NSW Tools. 18

In the afternoon session, the subject of "how should the WM look" arose. This discussion wandered through various side-roads without ever coming to much of a conclusion. Along those side-roads, however, several points did appear: 19

- the WM takes a transaction approach rather than a process control viewpoint because the latter does not seem to lend itself to the problems associated with a user who has two (or more) tools active simultaneously, nor to the user who has multiple instances of himself/herself. (1) 19a

  (1) The notion of a transaction processor here is akin to the way that airline reservation systems (for example) handle requests. That is, there are one or more anonymous virtual processors which can handle any type of request. No information about a particular user is remembered in a processor. 19a1

  In a process-oriented system, however, a particular processor (process) is assigned the task of interfacing to a particular requestor. In this type of system information is not always immediatedly updated into a common data base. 19a2

- the Black Boxes defined for use by the WM are such that even if a user process control type system were used, the global WM data base would still have to be updated at approximately the same points. 19b

- in a hint at what multiple WM's might look like, Millstein offered the viewpoint that a single WM should control a user's session and that the updating and use of the various data bases of the multiple WM's would have to be synchronized in order that effective control of users (by human supervisors, in particular) could be maintained, 19c

- finally, it was reaffirmed that the user should view the WM as his operating system supervisor, 19d

In an attempt to get back to the announced agenda, the meeting again picked up the discussion of DPS as a protocol; specifically as a protocol to be used in implementing NSW, This started as a attempt to determine if the suitablility of DPS should be evaluated separately from a WM viewpoint and from a TBH viewpoint, After an obscure side trip to consider how the TIP accounting system handled the problem of multiple-site data bases, the group got back on the path and proposed two initial opinions: No, there should be only one protocol, and Yes, DPS was designed to support the WM and a number of special purpose features had been included in DPS in direct support of a previous design of the WM, This brought up a point as to whether DPS was targeted at the exact goal of implementing those functions necessary to support NSW or as it was actually phrased: whether DPS was at the same time, both too grandiose and too restrictive, having, for example, both NOTE and HELP, and, having both INTERRUPT and ABORT, [Secretary's Note: the interpretation of these examples and the attendant discussion won't be explained here and probably can't be explained at all,] 20

After a realization that such a discussion could easily take several weeks, it seemed to be accepted that for the time being, we would discuss only that part of DPS which was needed by the TBH's -- something which came to be called the TBH subset of DPS, After some thought, it was generally agreed that the only readily identifiable part of DPS which TBH's did not need to implement were the concept of multiple processors running in a single process, In response to a question about why the WM needed multiple processors, it was argued that processors were an answer to two problems: concurrency of execution on behalf of multiple users (to gain real-time speed) and prevention of deadlocks, Because the WM may queue input requests for transactions, it runs risks of creating deadlock situations, 21

In order to force a solution, Carlson then outlined four courses of action which could be taken in the near future: 22

1) Throw out DPS and start over, 22a

2) Go through DPS 2,5 and remove, add, and change the primitives as necessary, 22b

3) Accept DPS as is, 22c

4) Define a TBH subset and then choose 1, 2, or 3 above, 22d

This immediately led to a question as to whether or not there was a strong commitment to DPS 3,0, The reason for this question is that some of the people present felt that DPS is not organized in such a fashion as to strongly encourage a interprocess communication model of the world; thus if there is no commitment to DPS 3,0, then there is a strong desire to fix the problems in DPS 2,75, but if DPS is going to be altered later, then the various systems could live with DPS as it stands today, Carlson stated that there was no strong commitment to DPS 3,0; a statement which led SRI to state that they had been previously given to believe otherwise, 23

In any case, it was widely believed that choice 4 above (choose a TBH subset, and then choose something else) would eventually be the necessary choice, At this time, Crocker proposed that that the choice be 4-3 with the proviso that only the TENEX implementation proceed over the next few months, The only real objections raised to this direction was that NSW would again proceed along the path of encouraging the creation of TENEX dependencies, [It will be pointed out here that this issue was not resolved at the meeting and remains unresolved today,] 24

Proceeding along the parallel paths of determining what portions of DPS were to be in the TBH subset, and also of determining what software was required in a TBH, the group drew up a list of requirements for TBH's: 25

In order to support the WM, a TBH must provide: 25a

- an encapsulator for tools (at least for "old" tools, 25a1
- an interface to access files from the WM, 25a2
- (possibly) to support version numbers for files (ala TENEX and ITS), 25a3

- to maintain a LND to provide a crash-resistant correspondence between NSW file names and native file names. 25a4

In order to provide a background system to support NSW, a TBH must provide: 25b

- a dispatcher to respond to ICP's on socket 25 and create DPS processes, 25b1
- a File Package to move files in and out of workspaces, this function was further divided into: 25b2
  - # provision of temporary files (copies of NSW files and local tool temporary files) in direct support of NSW Tools,
  - # maintenance of Permanent Files (storage for NSW files). [It should be remembered that this is really for support of File Bearing Hosts.]

The group then expressed this list in terms of functional requirements on a TBH: 26

1) must talk to WM, 26a

2) must use NSW File System instead of native one, 26b

3) must be able to tell somebody (as yet unspecified) that a Tool has stopped, 26c

4) must be able to setup communication paths, 26d

5) must report accounting information both periodically and on request, 26e

At this time, there was an attempt to consider scenarios of how an actual TBH would function. In response to a proposal to consider the B4700 as such a strawman TBH, a discussion about whether or not the B4700-PDP11 combination should, in fact, be considered a TBH. The primary argument for consideration of the B4700 as a TBH was that there is going to be one of these beasts and thus it shouldn't be considered special. The primary argument for not considering the B4700 as a TBH is that it is so deficient in resources and functionality that it might be better to consider that the B4700 uses special protocols to communicate with special purpose tools (residing on TBH's). The result of this discussion was an announcement by the WM group that they were not prepared to run Tools other than on direct behalf and at the behest of a user; thus, the IBS could not run a Tool on a TENEX, for example. 27

At this point, Carlson attempted to combine the two previous requirement lists into one re-organized list. This new list stated that a TBH must provide for: 28

Communication paths with the WM. 28a

Accepting a message to dispatch a tool acknowledgment 28b

- acknowledgment 28b1
- establish user communication paths 28b2
- notify somebody (?) that a tool stopped 28b3
- send accounting data to WM 28b4
- translation of all file references into WM calls. 28b5

Movement of Files 28c

- Permanent NSW File System 28c1
    # interhost movement
    # intrahost movement
- Temporary Files 28c2
    # true temporaries
    # copies of NSW files

The group then turned to a discussion of the consequences of using DPS, both in the past and in the future. Crocker re-offered his suggestion that DPS probably hasn't been the optimal way to go, but that it probably is close; it probably doesn't solve all the problems of NSW and it probably solves some extraneous problems. In response to a general question about the state of the various TBH implementations, Schantz implied that the TENEX Tool Encapsulator would be finished by the end of June. Wells stated that much of an earlier version of DPS had been implemented, and thus Multics had many of the primitives of DPS 2.5 implemented, but that the completion of the entire implementation was not particularly close. Braden stated that CCN had not started any implementation, but that the group was currently in the process of performing design choices and evaluating implementation languages. 29

Continuing the examination of the consequences of using DPS, the group considered the efficiency of DPS. Two measures of implementation efficiency were offered: the number of network messages, and the number of procedure calls required to perform a function. It was also noted that two measure of network efficeincy existed: throughput (bandwidth), and real-time delay. It was thought by a few present that the use of DPS caused too many network messages to be passed back and forth. [Secretary's Note: though this issue of the large number of network messages required by DPS has been raised periodically and was raised throughout the meeting, there has not been one single instance of a proposed simple protocol change (short of grossly modifying the Host-Host protocol - and thus requiring all hosts to totally rewrite their NCP's and operating system interfaces) which would reduce the number of network messages necessary to transmit a file, for example. This would tend to suggest that the number of messages used withing DPS is close to the lower bound of messages needed. Rather, a number of suggestions were made later as to how to reduce the number of procedure calls (and thus network messages) in support of the File Package.] 30

For the remainder of the day, the group discussed the Interprocess Communication Messages defined within DPS. Because these messages (as well as the basic procedure calls within DPS) will eventually be documented elsewhere, these notes will be limited to a brief summary of the message's function together with the gist of any important comments: 31

INIPS - Initialize Process. 31a

This message is passed after an ICP to the TBH dispatcher in order to get a DPS process running at the host on behalf of a particular user. Information included in the call provides data about what program to run, what userid to use, and some startup data to be passed to the newly executing program. 31a1

This message is typically sent from the WM to the TBH dispatcher in order to start a tool process on the host. The program to run is usually an indication of the tool, the start-up info will be used by NLS as the user's ID. 31a2

INIACK - Initialize Process Acknowledge 31b

This message is passed back to the sender of an INIPS message as an acknowledgment that the process has been created and is running, or that such a process could not be started. 31b1

This message is typically sent from the Tool to the WM as an indication that the Tool is ready to run. 31b2

CALPE - Call Local Procedure 31c

This message provides for calling a procedure local to the receiver of the message. Provisions are made for masks to minimize the amount of data that must be transferred over the Network. There is also a priority associated with the call. 31c1

This message is used by processes to call procedures in other processes. The WM will always have to make this call upon a Tool; if the Tool uses files or the like, then the Tool will have to call upon procedures in the WM. The priority has no use in NSW, but was included at the request of Dick Mandel at ISI; the priority must always be set to 1 when used in the NSW environment. 31c2

RTNPE - Return to Local Caller 31d

This message is the acknowledgement that a call has taken place and furthermore that the called procedure has returned. Provision is made for standardized reporting of the success/failure of the call, as well as the cost of the procedure invocation. 31d1

This message will travel from the Tool to the WM. If the Tool has made any calls upon procedures in the WM, then this message will go from the WM to the Tool. Among the types of returns that can be made are: success, failure, abort, and temporary return (co-routine linkage). 31d2

RECPE - Recall Local Procedure 31e

This message allows for the continuation of a procedure which has previously performed a temporary return. 31e1

In the TBH subset of DPS, the use of this call is restricted to cases wherein the procedure to be recalled is the outstanding call that most recently sent a RTNPE message, i.e., there must be a stack discipline maintained with respect to outstanding temporary returns. It was agreed that the WM would never make such calls on a TBH, and that the only place that such non-stacked calls could originate was in the grammar supplied with a Tool. (Thus if a host chooses not to implement this feature, it need only make sure that grammars for tools that it supports do not use the function.) 31e2

NTEPE - Note to Local Caller 31f

This message is originated by some procedure currently running. It must be sent to all procedures in the call stack. An event, as well as a description, is associated with each note message. 31f1

It was noted that the events used in this message are currently defined in such a manner than the eventids must be globally defined, i.e., there must be a registration list within NSW of all events used in notes. 31f2

The meeting was adjourned at 6:45 PM. 32

DAY 2; THURSDAY, JUNE 12, 1975 33

The meeting reconvened at 8:15 AM. The first part of the morning was a rehash of some of yesterday's discussion together with the introduction of a number of ideas which still remain unresolved. Due to the fact that there was little discussion on each issue, only the issues are listed here: 34

- It was agreed by all TBH implementers that the note facility (NTEPE message) could (and would be implemented). 34a

--> we don't seem to have a model of notes, and in general, of "unsolicited messages." 34b

- one use of a note created so far is that a particular event will cause the associated message to be printed on a user's terminal by the FE. 34c

--> it seems that for DPS 3.0, it is desired to reconsider the IPC messages that pass between DPS processes. 34d

--> It seems desirable to set ("wire") the limits of all DPS implementation choices. The primary examples here are the lengths of character strings, and the range of allowable integers. 34e

- it seems desirable (though no one seems to know quite how to implement) to define the queue length for unprocessed DPS messages between processes. 34f

- Packages are the access control mechanism in NSW. It is to be considered out of the ordinary to attempt to revoke access to a package after a process has opened the package. 34g

- Millstein says that the WM is not going to use DPS internally; what it will use was not stated. 34h

- Millstein says that DPS does meet the needs of the WM; this seemed to be an affirmation that the WM can be implemented using DPS to communicate with other network hosts (TBH's for example). 34i

At this time, the meeting was directed towards the question of: Are we missing a statement of what NSW is, what the WM is, what the requirements of the system are? The general consensus of the group seemed to be that we were missing these primary descriptions, and that the lack of these primary descriptions caused the descriptions of the FE and the tools to be fuzzy, also. Amidst the general discussion, Millstein repeated parts of his earlier description of NSW and the WM, namely that the purpose of the WM (and thus that of the NSW) is to control resources; the real problem to be resolved is what are the resources to be controlled, and what control is to be placed over the resources. 35

As a finale to the discussion about general NSW issues, the group attempted a discussion on two further issues: 1) should there be an NSW, and 2) how should we proceed from the current state. There were no apparent conclusions to this discussion. 36

From this point until the end of the meeting, discussion centered around specific protocols, in general, and the File Package, in particular. The resolution of these issues will be described in two separate documents (a description of PCPB8 and a description of the File Package), but discussions of side issues, as well as points of general interest in the FP, will be summarized below. 37

> Braden pointed ourt that his experience at CCN has shown that there are two schools of philosophy about files: One school believes that files should look like a paper tape; the other school believes that files should look like punched cards. This leads to the stream vs. records controversy which shows up so clearly in the File Transfer Protocol (FTP). 37a
>
> In determining how to process a file that is to be shipped across the net, it is important to determine if the file is being transferred to be stored at the foreign host or to be used by some tool at the foreign host. (The underlying premise being that almost all conversions performed upon filess are irreversable and cause information to be lost. If a file is to be shipped for storage only, it should only be converted by reversable transformations.) 37b

There was then a short discussion (unresolved) about the obligation to install "old" tools (i.e., tools that do not understand NSW protocols). An early resolve to include only "new" tools and to upgrade outside resources into "new" tools, seemed to be slipping. 38

> The proposed model of transferring files is: there exists one process which desires to transfer a file across the net. This control process must create a File Package process at the origin host to send the file, and it must also create a File Package process at the target host to receive the file. 38a

The original Black Boxes document created by COMPASS is not equivalent to the File Package proposed, In particular, the File Package does not address issues of where the file comes from, nor what conversions must be performed, 38b

The file is accepted as the smallest unit that the WM is supposed to deal with, 38c

Transmission of files (for use at the target host) seems to cause particular difficulties when the source is a stream-oriented host and the target is a record-oriented host, One specific problem is that the maximum record length must be computed by examining the entire file, 38d

It appears that in order to cope with the transmission (and conversion) of files between different types of hosts, several file descriptors will need to be associated with files/specific-transfers, For example, a tool requesting a file for use might specify a host-dependent descriptor (readable by the FP on the same host) indicating how the file should be formatted for use, e.g., blocking factor, record size, 38e

A discussion of issues within DPS transfer protocols was resolved as follows: 39

- PCPTXT will be dropped in favor of PCPB8, 39a

- PCPB72 will not be adopted, 39b

- PCPB36 will continue to exist, but it will be negotiated into by some as yet unspecified mechanism, 39c

- Limits were placed on many types of items -- INTEGERS have 32 bits of precision; LISTS, BITSTRS, and CHARSTRS have a maximum length of 16,777,215 (2**24-1), 39d

- PCPB36 will be altered in some way to make it equivalent (in terms of allowing long strings and lists) to PCPB8, 39e

The meeting adjourned at 6:30 PM, 40

DAY 3: FRIDAY, JUNE 13, 1975 41

The final day of the meeting began at 8:05 AM. 42

This final day of the meeting was characterized by general acquiescence to the resolutions of the discussions of Thursday, and some worry about use of the File Package by the WM. The majority of the day was spent in further discussion of issues within the File Package and the WM interface to the FP. 43

A description of how the WM was currently dealing with the conversion of files for the B4700 and TENEX led some present to express concern about the amount of detail being built into the WM about the operating systems. This discussion culminated in the use of Maps (file descriptors) as information to the various File Packages in peforming transformations. 43a

The introduction of a question as to why the WM couldn't use the already existing FTP servers at the various hosts led to another discussion about the problems of converting between stream-oriented and record-oriented files. The horror tales related about use of FTP seemed to convince everyone present. 43b

In the last discussion of the meeting, Millstein raised the question of whether the concept of "appending" to files was a useful concept to implement at this stage. Pointing out that this required all File Packages to implement the concept, the meeting seemed to decide that the ability to append to files was a useful addition. 43c

After a promise by MIT to publish the notes, and a promise by Postel to produce a new PCPB8 document and a new FP document, the meeting was finally adjourned at 3:30 PM. 44

Documents distributed or re-distributed at the meeting: 45

List of Attendees. (See above list.) 45a

Description of Interprocess Communication Primitives provided by DPS. (Distributed by White.) 45b

A description of the TENEX JSYS calls used to access DPS. (Available as <NLS>DPSJSYS.TXT at BBNB.) 45c

"Some Comments on the Procedure Call Protocol". (Distributed by Kanodia.) 45d

"L10 Helper", a brief description of the L10 language, in which DPS and NLS are written. (Available as <NLS>26020.TXT at BBNB.) 45e

A description of Black Boxes required by the WM. (Distributed by Millstein.) 45f

The WM's view of running Batch Tools. (Distributed by Millstein.) 45g

A description of White Boxes required by the WM. (Distributed by Millstein.) 45h

"PCPB72" - a proposal for a 72 bit data structure mechanism to replace/supplement PCPB36 and PCPTXT. (Distributed by Wolfe.) 45i

"NSW Files - Package, Format, Types, Movement, Conversion". (Available as <NLS>FILES.TXT at BBNB.) 45j

"PCPB8" - proposal for a 8 bit data structure mechanism to replace/supplement PCPTXT. (Distributed by Postel.) 45k

Glossary of Terms 46

B4700. 46a

A Burroughs 4700 computer at Gunter, which will be connected to the ARPANET. The initial goal of NSW is to allow programmers to write and debug programs for this machine using the sophisticated tools (such as NLS) developed at the various nodes. The B4700 will be connected to the ARPANET via a PDP-11 front end processor running under ELF. 46a1

BCPL. 46b

The language in which the Works Manager is being coded. 46b1

Black Box. 46c

A software concept analogous to the engineering term of the same name. This term is mostly used in regards to implementing WM functions. 46c1

CLI - Command Language Interpreter. 46d

A TENEX program which acts as a Front End. 46d1

DPS - Distributed Programming System. 46e

DPS is a set of protocols and standard packages for supporting cooperating processes and procedures. Several Levels of DPS are distinguished: DPS 2.5 is that version currently being implemented on TENEX; DPS 2.75 is a slightly modified version of DPS 2.5 which, when finally specified, will be implemented on TENEX, Multics, OS/360, and ELF; DPS 3.0 is the alluded-to next major revision of DPS. 46e1

ELF. 46f

An operating system for the DEC PDP-11 computer. The FE runs under ELF, and the B4700 IP interpreter runs under ELF. 46f1

FBH - File Bearing Host. 46g

A host which will provide permanent storage for files in the NSW file system. FBH's and TBH's generally require the same support programming, but a distinction is made to allow TBH's which do not wish to retain files on a permanent basis. 46g1

FE - Front End. 46h

The component of the NSW software system which interfaces the user. It is this component which tailors the user's interface and calls for the execution of tools. 46h1

FP - File Package. 46i

A component supplied at each TBH to enable the WM to transfer files among the various TBH's. 46i1

Grammar. 46j

A tool-specific interpretable table that is supplied to the FE so that is can translate user requests into procedure calls on the actual tool running on a TBH. 46j1

Gunter - Gunter Air Force Base, Alabama. 46k

Location of the Air Force Data Systems Design Center (AFDSDC), the group which will be the first user of the NSW. 46k1

IBS - Interactive Batch Specifier. 46l

A procedure in the WM which interacts with a user requesting a batch job to guarantee that all necessary information is provided. 46l1

IP - Interface Protocol. 46m

The protocol used in communicating with the B4700 from TENEX (via a PDP-11). 46m1

L10. 46n

The language in which DPS and NLS are written. 46n1

LND - Local Name Directory. 46o

A table maintained by each TBH in which correspondences between NSW Files System names and Native system names. The purpose of this table is to allow a degree of recovery if communication between the TBH and the WM should be severed. 46o1

Multics. 46p

A operating system for the Honeywell Level 68 computer. The MIT group is developing this system as a TBH. 46p1

NLS - Online System. 46q

The text manipuation system developed by SRI-ARC. This system is being developed as an NSW tool to run under TENEX. 46q1

NSW - National Software Works. 46r

This project. 46r1

OS/360. 46s

An operating system for the IBM 360 computer. The UCLA group is developing the CCN 360/91 as a TBH. 46s1

PCP - Procedure Call Protocol. 46t

A previous name of DPS. 46t1

TBH - Tool Bearing Host. 46u

A network host which acts a a tool purveyor. 46u1

TENEX. 46v

An operating system for the DEC PDP-10. The BBN group is developing this system as a TBH. The WM is being implemented to run under TENEX. 46v1

Tool. 46w

A non-special functional element in the NSW. Any service or function which is to be supplied to users of the NSW, but which is not inherent to the design of the WM is configured as a tool. 46w1

White Box. 46x

A function which differs substantially from a Black Box (q.v.) by having its functionality more visible. 46x1

WM - Works Manager. 46y

The component of the NSW software system which acts as a operating system supervisor. This component is being developed by COMPASS. 46y1

WMO - Works Manager Operator. 46z

A portion of the Works Manager which controls the operation of some aspect of its work, e.g. there is a WMO for controlling B4700 Batch jobs. 46z1

Notes on the NSW Protocol Meeting June 11-13, 1975

(J26229) 4-AUG-75 12:27;;;; Title: Author(s): Jonathan B. Postel/JBP; Distribution: /SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: JBP; Origin: < POSTEL, WELLS,NLS;5, >, 1-AUG-75 19:01 JBP ;;;; ####;

26229 Distribution

Douglas C, Engelbart, Martin E, Hardy, J, D, Hopper, Charles H, Irby, Harvey G, Lehtman, James C, Norton, Jeffrey C, Peters, Dirk H, Van Nouhuys, Kenneth E, (Ken) Victor, Richard W, Watson, Don I, Andrews, Mary Ann Kellan, Buddie J, Pine, Andy Poggio, David L, Retz, Laura J, Metzger, Karolyn J, Martin, Jan A, Cornish, Larry L, Garlick, Priscilla A, Wold, Pamela K, Allen, Delorse M, Brooks, Beverly Boli, Rita Hysmith, Log Augmentation, Joseph L, Ehardt, Raymond R, Panko, Susan Gail Roetter, Robert Louis Belleville, Rene C, Ochoa, Ann Weinberg, Joan Hamilton, Adrian C, McGinnis, Robert S, Ratner, David S, Maynard, Robert N, Lieberman, Sandy L, Johnson, James H, Bair, Jeanne M, Leavitt, Rodney A, Bondurant, Jeanne M, Beck, Marcia L, Keeney, Elizabeth K, Michael, Jonathan B, Postel, Elizabeth J, Feinler, Kirk E, Kelley, N, Dean Meyer, James E, (Jim) White

JAC3 4-AUG-75 13:21 26230

NLS IS SUPPOSED TO BE AN INTUITIVE SYSTEM

The following "bug/feature/unfeature" confused me enough so that I lost a journal item from my initial file. 1

Given a branch which is at the top of the screen, a Move Branch causes the screen to be refreshed relative to the new locaction of the branch, and not relative to the old location of the branch. 1a

The "moved" branch is still at the top of the screen. 1b

Moreover, what is much worse, if the branch to be moved happens to fill the screen, NOTHING HAPPENS on the screen. 1c

My intuitive understanding, and NLS IS SUPPOSED TO BE AN INTUITIVE SYSTEM, is that on the screen when an entity is moved, that entity disappears. 1d

And in fact, if the entity is not at the top of the screen it does disappear. 1e

JBP has taken the time to explain to me the system rationale for this counter-intuitive phenomena: 2

The screen is refreshed relative to the current location and the top of the screen is the current location. 2a

Therefore, if the top of the screen is moved, the current location is changed; but if something in the middle of the screen is moved, the current location does not change. 2b

In summary, I think that a MOVE should always be the same as a COPY follwed by a DELETE. 3

NLS IS SUPPOSED TO BE AN INTUITIVE SYSTEM

(J26230) 4-AUG-75 13:21;;;; Title: Author(s): Jan A. Cornish/JAC3; Distribution: /FEEDBACK([ACTION]) SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC FEEDBACK; Clerk: JAC3; Origin: < CORNISH, WEIRDNESS.NLS;4, >, 4-AUG-75 13:06 JAC3 ;;;;####;

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NLS Backend / Works Manager File System Interface: Comments
Supplementary to (26222,)

Sent via SNDMSG to Millstein@BBNB, Schantz@BBNB, and Carlson@ISI, HGL 4-AUG-75 14:46 26231

NLS Backend / Works Manager File System Interface: Comments Supplementary to (26222,)

Introductory Comment 1

This note is a supplement to the earlier memo "NLS Backend / Works Manager File System Interface Requirements" (26222,) and is prompted by some comments by Charles Irby concerning the earlier document. References are to NLS statement numbers of the earlier memo and titles correspond to those of related sections in that document. The only substantive change is the suggestion that the semaphore contain some additional information, namely the date and time the semaphore was set, which may be accessed by the WM functions. 1a

Current NLS Use of File JSYSs-- (26222, 3) 2

Charles points out that we do filename completion in NLS if requested by the user. This feature may be omitted in NSW. 2a

Simultaneous Multi-user Access to Files-- Locking Mechanism and File Data Validity-- (26222, 6b1) 3

The statement 6b1 maintains that "a file is locked by changing a bit in the user settable word..." While we indeed use a bit in the user settable word to indicate the file is locked, we also store other information such as the ident of the user who has the file locked. 3a

Functions Needed in the WM File System or Foreman by the NLS-BE-- (26222, 7) 4

The semaphore value should either be a null list if it is not set or a list containing the id of the user who set the semaphore and the date and time it was set. The definition of READSEMAPHORE should be modified accordingly. This information should also be returned upon OPEN and upon unsuccessful attempts to SETSEMAPHORE. 4a

NLS Backend / Works Manager File System Interface: Comments
Supplementary to (26222,)

(J26231) 4-AUG-75 14:46;;;; Title: Author(s): Harvey G. Lehtman/HGL;
Distribution: /NPG([ACTION]) JBP([ACTION]) RWW([ACTION])
SRI-ARC([INFO-ONLY]) ; Sub-Collections: SRI-ARC NPG; Clerk: HGL;
Origin: < LEHTMAN, MORE.NLS;1, >, 4-AUG-75 13:44 HGL ;;;;####;

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