

A Report from the Field: For DEX, against Help

I was in the ARPA office on Tuesday the 27th, to talk with Connie McLinden about printers. 25288 gives some information about that. But I also chatted with her about DEX and Help. 1

Connie strongly discourages the use of Help by people there because it consumes time on their five slots. "We've trained 60 people here and created all kinds of interest", declares Connie "but with five slots we just don't have time for people to be browsing around online". 2

It should be added that Connie likes manuals (although she did not like the old TNL user's guide) and if she felt help were more helpful she might see more time for browsing. 3

Connie is also very anxious for DEX to work over the Net. I'm sure if DEX worked as well for them as it does for Bell Canada, they would use it as much. Besides the pressure of many users on few slots, fast typists don't like to type directly into NLS through the TIP input buffer because they frequently type ahead of it, and that is nerve wracking for them. 4

A report from the Field: For DEX, against Help

(J25334) 10-FEB-75 17:39;;; Title: Author(s): Dirk H. Van
Nouhuys/DVN; Distribution: /HGL([ACTION]) JOAN([ACTION] dpcs and
dirt notebooks please) CKM([INFO-ONLY]) DCE([INFO-ONLY]) KIRK([
INFO-ONLY]) POOH([INFO-ONLY]) JHB([INFO-ONLY]) JCN([
INFO-ONLY]) RLL([INFO-ONLY]) ; Sub-Collections: DPCS DIRT
SRI-ARC; Clerk: DVN; Origin: < HAMILTON, CONNIECHAT.NLS;2, >,
10-FEB-75 17:32 DVN ;;;;####;

No resources for documenting bugs

If we do not have the resources to comment out commands that do not work as stated in JHB's 25321, we certainly do not have the resources to realistically hope that someone will see when such a command has been implemented and notify all of the appropriate people to go around and change all of the documentation. It is true that there are many such cases, not just Undelete Modifications. I suggest that the documentation (at least the NLS-8 glossary) have a description of the command as it is supposed to work if the command is available to the user. We do not have the resources to document nor update the documentation of bugs. Commands that are not implemented should not be made available to the user.

1

No resources for documenting bugs

(J25335) 10-FEB-75 17:44;;; Title: Author(s): Kirk E. Kelley/KIRK;
Distribution: /JHB([INFO-ONLY]) DIRT([INFO-ONLY]) UD([
INFO-ONLY]) RLL([INFO-ONLY]) RAZY([INFO-ONLY]) MEH([
INFO-ONLY]) JCN([INFO-ONLY]) ; Sub-Collections: SRI-ARC DIRT UD;
Clerk: KIRK;

oldmessages

14-JAN-75 15:23:26,84
 Date: 14 JAN 1975 1523-PST
 From: POSTEL
 Subject: test
 To: postel

1

 15-JAN-75 14:02:32,851
 Date: 15 JAN 1975 1402-PST
 From: POSTEL
 Subject: RFCs
 To: Schantz at BBN
 cc: postel

2

Rick:
 I have now (at long last) copied the RFCs 671 & 672 to Office-1 to live in directory <Netinfo> with other recent RFCs. The pathnames for these is of the form [Office-1]<NETINFO>RFCxxx.TXT where xxx is the rfc number.

3

Have you received any comment on the reconnection suggestions that would indicate any opposition to replacing the current telnet option with your proposal? I still urge that the <IAC><SE> acknowledgement be replaced by <IAC><SUB><RECONNECT><OK><IAC><SE>. In the case that your proposal does replace the existing telnet option we will need a new document for the protocol notebook, are you prepared to create such a document? I am willing to assist to the extent of editorial suggestions etc.?

4

--jon.

 15-JAN-75 16:04:08,8709
 Date: 15 JAN 1975 1604-PST
 From: POSTEL
 Subject: Mail Protocol
 To: AV at MIT-DMS, Burchfiel at BBN, Watson at SRI-ARC,
 To: Destreicher at IgIB
 cc: postel

5

Dick has been letting me see some of the recent notes on mail system proposals and one note or another suggested that the current transmission protocol limited the number of recipients of a message at a host to one. This is not the case, and for your reference I include the current protocol definition which clearly indicates that each message may be addressed to a list of users at the host it is transmitted to.

Mail Protocol Jon Postel 4 December 1974

6

Mail Protocol

6a

oldmessages

Introduction

7

This document describes the existing mail sending protocols. The mail sending protocol is a subset of the File Transfer protocol, consisting of two additional commands to the set of commands described in the specification of the File Transfer protocol.

7a

Old FTP

7a1

A. McKenzie "File Transfer protocol," RFC 454, NIC 14333, 16-feb-73.

7a1a

New FTP

7a2

N. Neigus "File Transfer Protocol," RFC 542, NIC 17759, 12-Jul-73.

7a2a

J. Postel "Revised FTP Reply Codes," RFC 640, NIC 30843, 5-Jun-74.

7a2b

Commands

8

Mail File (MLFL)

8a

The intent of this command is to enable a user site to mail data (in form of a file) to another user at the server site. It should be noted that the files to be mailed are transmitted via the data connection in ASCII or EBCDIC type. (It is the user's responsibility to ensure that the type is correct.) These files should be appended to the destination user's mail by the server in accordance with serving HOST mail conventions. The mail may be marked as sent from the particular using HOST and the user specified by the 'USER' command. The argument field may contain one or more system or NIC idents (it is recommended that multiple idents be allowed so the same mail can easily be sent to several users), or it may be empty. If the argument field is empty or blank (one or more spaces), then the mail is destined for a printer or other designated place for site mail.

8a1

A NIC ident refers to the standard identification described in the NIC directory of Network Participants. A serving host may keep a table mapping NIC idents into system idents, although NIC idents are not required in the implementation. A system ident is the user's normal identification at the serving HOST.

8a2

Mail Protocol Jon Postel 4 December 1974

8a2a

The use of system idents would allow a network user to send

oldmessages

mail to other users who do not have NIC identification but whose system ident is known.

8a3

Mail (MAIL)

8b

This command allows a user to send mail that is NOT in a file over the TELNET connection. The argument field may contain one or more system or NIC idents, or it may be empty. The idents are defined as above for the MLFL command. After the 'Mail' command is received, the server is to treat the following lines as text of the mail sent by the user. The mail text is to be terminated by a line containing only a single period, that is, the character sequence ".CRLF" in a new line. It is suggested that a modest volume of mail service should be free; i.e., it may be entered before a USGR command.

8b1

Reply Codes

9

The MAIL and MLFL commands have the same reply codes as the Append (APPE) command, with the addition of the reply code for MAIL stating that mail is expected over the Telnet connection.

9a

Old FTP

9a1

350 - Enter mail, terminate with <CR><LF>,<CR><LF>

9a1a

New FTP

9a2

354 - Start mail input, end with <CR><LF>,<CR><LF>

9a2a

Syntax

10

It is strongly urged that for consistency in the handling of mail at the various hosts that all mail sending subsystems or programs use these standard syntax convention for the text of the mail. This will help a great deal in allowing a user or program to intelligently process incoming mail.

10a

The text of the mail, whether transmitted over the FTP Telnet connection (via the MAIL command) or over the separate data connection (via the MLFL command), is governed by the syntax below:

10a1

1

10a1a

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10a1a1

Example:

10a1b

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From: White at SRI-ARC
 Date: 24 JUL 1973 1527-PDT
 Subject: Multi-Site Journal Meeting Announcement
 NIC: 17996

10a1b1

At 10 AM Wednesday 25-JULY there will be a meeting to discuss a Multi-Site Journal in the context of the Utility. Y'all be here.

10a1b2

Formal Syntax:

10a1c

```

<mailtext> ::= <header> <CRLF> <message>
<header> ::= <headeritem> ! <headeritem> <header>
<headeritem> ::= <item> <CRLF>
<item> ::= <authoritem> ! <dateitem> !
<subjectitem> ! <miscitem>
<authoritem> ::= FROM: <SP> <user> <SP> AT <SP> <host>
<dateitem> ::= DATE: <SP> <date> <SP> <time> - <zone>
<subjectitem> ::= SUBJECT: <SP> <line>
<miscitem> ::= <keyword> ; <SP> <line>
<date> ::= <vdate> ! <tdate>
<vdate> ::= <dayofmonth> <SP> <vmonth> <SP> <vyear>
<tdate> ::= <tmonth> / <dayofmonth> / <tyear>
<dayofmonth> ::= one or two decimal digits
<vmonth> ::= JAN ! FEB ! MAR ! APR ! MAY ! JUN ! JUL
! AUG ! SEP ! OCT ! NOV ! DEC <tmonth> ::= one or
two decimal digits
<vyear> ::= four decimal digits
<tyear> ::= two decimal digits
<zone> ::= EST ! EDT ! CST ! CDT ! MST ! MDT ! PST
! PDT ! GMT ! GDT
<time> ::= four decimal digits
<user> ::= <word>
<host> ::= a standard host name
<message> ::= <line> <CRLF> ! <line> <CRLF> <message>
<keyword> ::= <word>
<line> ::= a string containing any of the 128
ASCII
characters except CR and LF
<word> ::= a string containing any of the 128
ASCII
characters except CR, LF, and SP <CRLF> ::= CR LF
<SP> ::= space

```

10a1c1

2

10a1c1a

Mail Protocol Jon Postel 4 December 1974

10a1c1a1

please note the following:

10a1d

oldmessages

(1) <authoritem>, <dateitem>, and <subjectitem> may each appear at most once in <header>; <miscitem> may occur any number of times. The order of <authoritem>, <dateitem>, and <subjectitem> is insignificant, but they must proceed all occurrences of <miscitem>.

(2) The case (upper or lower) of keywords -- specifically, 'FROM', 'DATE', 'SUBJECT', 'AT', <host>, <zone>, <vmonth> and <keyword> -- is insignificant. Although 'FROM', for example, appears in upper-case in the formal syntax above, in the header of an actual message it may appear as 'From' (as in the example), or 'from', or 'FRom', etc.

(3) No attempt has been made to legislate the format of <user>, except to exclude spaces from it.

(4) The time has no internal punctuation.

(5) No provision is made for multiple authors.

10a1d1

3

15-JAN-75 17:14:03,1278

Net mail from site SRI=ARC rcvd at 15-JAN-75 17:13:58

Date: 15 JAN 1975 1713-PST

From: POSTEL at SRI=ARC

Subject: NEW NSW & PCP DOCUMENTS

To: NSW-DISTRIBUTION:

11

There are three new documents of interest to NSW and PCP workers:

12

1) NSWSTRUC --Defines the process structure of NSW,

13

2) NTP -- NSW Tool Package which contains NSW-specific procedures and data stores required of a process for use as a tool within the NSW.

14

3) PCPV2CHANGES -- documents the divergence of the implementation from the version 2 documentation. This is a dynamic document,

15

The documents are available online at SRI=ARC in the directory <NLS> as text files. They may be pulled from ARC using FTP by supplying the username ANONYMOUS and password GUEST. The pathnames are:

[SRI=ARC]<NLS>NSWSTRUC.TXT

[SRI=ARC]<NLS>NTP.TXT

[SRI=ARC]<NLS>PCPV2CHANGES.TXT

16

We will be sending these out in hardcopy in the next week or two,

17

We also would like to offer our assistance in understanding these and the other documents and concepts in the NSW and PCP designs. If you would like to discuss any of these topics please call or sndmsg Jon Postel at (415) 326-6200 x3718 or POSTEL at SRI=ARC,

18

oldmessages

--Jon,

18-JAN-75 23:59:29,780
 Net mail from site ISIB rcvd at 18-JAN-75 23:59:27
 Date: 18 JAN 1975 2359-PST
 From: COHEN at USC-ISIB
 Subject: NVP.
 To: POSTEL at SRI=ARC, POSTEL at ISI
 cc: COHEN

19

Jon,

20

here are some words re NVP, you might want to include under
 "recent developments" for NVP :

21

AN INITIAL VERSION OF NVP WAS IMPLEMENTED FIRST FOR REAL-TIME VOICE
 EXPERIMENTS BETWEEN ISI AND LINCOLN LABORATORY, ON AUGUST 1974. A
 MORE EXPANDED VERSION IS IN OPERATION SINCE DECEMBER 1974, FOR
 REAL-TIME VOICE COMMUNICATION (BETWEEN LINCOLN AND CHI, AT SANTA
 BARBARA).
 NVP USES BOTH TYPE-0 AND TYPE-3 MESSAGES, AND ALLOWS INCREASED
 BANDWIDTH AND DECREASED DELAYS AT THE POSSIBLE COST OF RELIABILITY.

22

cheers,
 Danny.

22a

P.S. my address is at isib, not isi. thanks.

23

20-JAN-75 07:33:59,800
 Net mail from site BBN-TENEXA rcvd at 20-JAN-75 07:33:55
 Date: 20 JAN 1975 1032-EST
 From: sCHANTZ at BBN-TENEXA
 Subject: RFC 671
 To: Postel at SRI=ARC
 cc: Schantz

24

Jon:

I have received no objections to the reconnection proposal (other
 than your suggested acknowledgement change). On the other hand, I
 haven't heard anything from most network sites. I assume no comment
 is synonymous with acquiescence. I would gladly volunteer to prepare a
 new option definition document. It would probably consist of a
 revision of the existing document more than a complete rewrite.

25

Shifting gears now, I am beginning devote my attentions to BBN's NSW
 project commitments, and will be going over your documents this week.
 I'm sure I'll have some questions/comments on them soon. --Rick

oldmessages

20-JAN-75 10:24:42,20602
Net mail from site SRI-ARC rcvd at 20-JAN-75 10:24:06
Date: 20 JAN 1975 1024-PST
From: POSTEL at SRI-ARC
Subject: Batch Job Models
To: NSW-DISTRIBUTION:

26

< POSTEL, BATCH-JOB-MODEL,NLS;6, >, 17-JAN-75 15:24 JBP ;;;;

27

Bill:

Here is commented version of your message on batch jobs. Following these comments is a description of my model for batch jobs in the NSW. The main differences are in the break down of functions to particular processes (wm, fe, grammar, tool, etc.), and in which processes touch which kinds of files.
--jon.

28

Comments on your message:

29

Date: 12 JAN 1975 1136-PDT
From: CARLSON at OFFICE-1
Subject: batch tools

29a

< CARLSON, BATCH-TOOLS,NLS;2, >, 12-JAN-75 11:26 WEC ;;;;

29b

I have a simplified model of batch tools which I use to make decision.

29c

%% How does this model compare with the model presented in the documents RJE-MODEL, and BJP by Postel and the notes by Warshall and Millstein ? %%

29c1

%% What decisions ? %%

29c2

%% It would be very helpful to have your comments keyed to the previously distributed documents. %%

29c3

Please evaluate the model and, by 16 Jan 75, send a message indicating agreement or identify pitfalls in the model by describing scenarios where it fails, and propose SIMPLE revisions which resolve the pitfalls

29d

%% Should this suspend progress on the implementation of NSW ? %%

29d1

A batch job cannot communicate with the user during execution.

29e

%% Is this a definition or an attribute of batch jobs shared by other types of jobs ? %%

29e1

oldmessages

%% Millstein defined the terms BATCH, DETACHED, AND INTERACTIVE in a useful way, lets use his definitions, %% 29e2

Background jobs on Multics or other time-sharing systems qualify as batch jobs. 29f

%% Does "background" include TENEX Detatched jobs ? %% 29f1

The following classes of batch jobs are of interest: 29g

Predefined NSW Tools: allow a user talking to the Works Manager to say the logical equivalent of "execute TESTDATA using CRITERIA as input and producing MONTHLY as output," CRITERIA and MONTHLY are NSW files. Optionally, the user might specify a host, ie "execute TESTDATA at UCLA91", 29g1

%% "predefined" is a new term to me perhaps a further explanation would be helpful, I take it to mean that it is a program that has been made known to the Works Manager as a tool and has a Grammar. %% 29g1a

%% Which 360 should we be getting up to speed on NSW/PCP -- RAND or UCLA ? %% 29g1b

The WM will know whether the TBH requires all files to be resident before a batch job is submitted, or if it supports delayed staging of files. If files must be prestaged, the WM will move or create the files and remember the local names. 29g1c

%% Perhaps the works manager dosent need to know this but the batch job package can take care of fetching the required files. %% 29g1c1

%% The idea of prestaging vs delayed staging of files is what distinguishes BATCH and DETACHED tools in Millstein's document, lets use one set of definitions, %% 29g1c2

The WM will know the local name of the tool. It will send a message to the TBH of the form "run Local-Tool-Name on Local-File-1, Local-File-2, NSW-File-3 producing Local-File-4 and NSW-File-5 using TEXT-ARG=1,TEXT-ARG=2." 29g1d

%% This assumes that it is easy to distinguish local (to what) filenames from NSW filenames -- i for one don't buy that assumption. Although i do agree that the probability of confusion can be greatly reduced by a sutiable prefix name for all NSW file names. %% 29g1d1

%% By now everyone should think in terms of Procedure

Call Protocol, The procedure call your "message" maps into is defined in the Batch Job Package (BJP) and is named CRTJOB.

29g1d2

CRTJOB (infiles, outfiles => jobid)

29g1d2a

The files in the lists infiles and outfiles are filenames that can be handled by file packages, the batch job package calls on a file package either in the same TBH or another TBH to get the files for input or store the result files, %%

29g1d3

If the TBH does not support delayed staging, then of course there will be no NSW files in the list, Note that since this message is in an NSW format, we should easily be able to mark local file names, NSW file names, and textual arguments,

29g1e

%% By "in NSW format" do you mean it is a PCP Call ? %%

29g1e1

One implementation (not only one) would have the local tool name be a text file or catalogued procedure, The Foreman component in the TBH would ask the WORKS MANAGER for a correct local name corresponding to each NSW filename (if there is delayed staging of files), The local filenames and the textual arguments would be substituted into the control file, which would be given to the standard scheduler to be executed at its convenience, The only uses I have thought of for textual arguments thus far are run time parameters like core size, time limit, priority, etc,

29g1f

%% What is the "Foreman component" ? Perhaps this is the role of the Batch Job Package ? %%

29g1f1

%% The textual arguments you suggest are already handled in every case we know of by parameters in the control file required by the batch processing facility, why should this aspect of host specific job control be replicated in the general purpose batch job package ? %%

29g1f2

%% These "textual arguments" could be accepted from the user by the grammar driven front end, which calls on a simple procedure to edit the control card file by substituting the arguments for place holders, %%

29g1f3

The TBH must provide the WM with a job ID, The WM must be able to get job status information for a given JOBID,

29g1g

oldmessages

%% See the CRTJOB and STSJOB procedures specified in the Batch Job Package, %% 29g1g1

The TBH must signal the WM whenever a job terminates, 29g1h

%% An interesting point. To do this the Works Manager must provide a procedure that a batch job package may call when a job terminates, %% 29g1h1

RESPONSIBILITIES 29g1i

COMPASS- define language for invoking tools(the WM command language), provide tool for defining other tools to the WM (CML is part of it, but I don't think all of it), Provide a document telling how to define tools. It must identify options with regard to numbers and attributes of input & output files, checking of textual arguments, optional files, warranties, etc, 29g1i1

TBH Installer- provide a mechanism for accepting WM messages and invoking tools, 29g1i2

%% Shouldn't "a mechanism for accepting WM messages" be a "mechanism for accepting and making PCP Calls", %% 29g1i2a

Create ident/jobid/account card with info sent by WM, 29g1i3

%% This card is generally the first card in the control card file which is required by the batch processing facility. This info should be sent in the control file which is one of the infiles in the CRTJOB call to the batch job package. %% 29g1i3a

Provide for status probing, signal WM when tools complete, 29g1i4

%% See the batch job package %% 29g1i4a

Provide a reasonable way to send output reports onto the ARPANET, 29g1i5

%% I think this is a call for a reformatting program to make line printer oriented output presentable on display and teletype terminals. %% 29g1i5a

Provide a document telling how to install additional tools on that machine. 29g1i6

oldmessages

General Issue: How does the WM know how much space to allocate for output files? COMPASS to take responsibility for formulating and documenting some reasonable answer. 29g117

%% How does anybody know ? %% 29g117a

Sequences of NSW Batch Tools: One can envision jobs consisting of several "standard" NSW batch tools to be run in succession on the same TBH. On many hosts, the scheduling algorithm will make it advantageous to have the sequence lumped into a multi-activity job. Yet the WM should know when each activity completes, and have some options with regard to file disposition and conditional tool invocation, passing files between activities may also necessitate control stream changes. 29g2

%% Why should the works manager notice the jobstep completion for multistep one host jobs ? It may be very difficult to get access to this information in any case. %% 29g2a

Responsibilities: UCLA should take the lead in resolving these issues, with inputs from COMPASS and all TBH installers. 29g2b

"Perfect" Batch Control Streams: contain only local file names. We want to discourage these in the NSW, but must provide the capability so users don't have to leave the NSW just to type in a few simple control cards and run a batch job on their own machine. All the TBH must do is append the ident/jobid/account into to the control stream and retrieve status and output. 29g3

%% It would be easy for a NSW user to create a file (either with a special tool or with any text editor) that contained control cards and file names specific to a particular batch processing facility. %% 29g3a

Responsibilities: 29g3b

COMPASS: WM must accept a command like "run file at place", move the file, signal TBH to invoke it 29g3b1

%% BY "file" are you now refering to a control file ? %% 29g3b1a

TBH Installer: responsible for start-up, status and output reporting. 29g3b2

Batch Control Streams Containing NSW Filenames: 29g4

oldmessages

The user builds a job control stream ready to run, except he wants to refer to files by NSW names. In general case, would also want to be able to defer file movement(not this year). Solution to delayed staging of files should use same TBH features as for predefined NSW Tools.

29g5

Responsibility

29g5a

SRI: build an interactive tool which works on typewriter terminals as well as displays and replaces NSW filenames with LOCAL names. Eventually, will instead simply identify some of the names as NSW names and will also be able to handle priority etc. After the substitutions are complete, the tool will invoke the WM to initiate the job

29g5a1

%% There could easily be a tool that assisted users in replacing NSWfilenames by filenames local to a particular batch processing facility, this would be useful in preparing the control files for a program developed in the NSW to be turned over for use outside the NSW. %%

29g5a1a

%% This aside on typewriter terminals and display terminals is out of place and shows a lack of conviction that the front end will provide means to use a range of terminal classes to use the same tools. %%

29g5a1b

COMPASS and TBH Installers are responsible for providing the same capabilities as for "perfect" batch control streams and (eventually) as for NSW defined tools.

29g5a2

%% The user wants a nsw-wide control file that is like the existing host specific control files but allows each job step to be executed on a different host. The user can construct such a file with any text editor or perhaps a special control file construction tool. When the user wants to have this control file "executed" a tool is called upon to translate (by calling on the works manager) the nsw filenames to file package file names and to call the appropriate batch job packages for each job step. %%

29g6

29h

Description of my model:

30

Here is a scenario of use of a batch tool which is an elaboration of the discussion contained in the RJE-MODEL document.

30a

oldmessages

Note that there are two case for batch jobs in the NSW: one is the traditional batch processing facility which normally expects as its primary input a control card file; the other is an interactive time sharing system which allows input to come from a file instead of interactively from a user at a terminal.

30a1

MODEL

30b

First we discuss the entities involved in the process of composing a batch job, having it run, and examining the results.

30b1

The principal entity is a batch processing facility. This is expected to be an existing hardware & software unit that will be only minimally changed to interface to the NSW.

30b1a

Examples of batch job processing facilities are the B4700 and the IBM 360.

30b1a1

Another type of batch job capability is is the TENEX runfil or the Multics execom facility.

30b1a2

The NSW talks to the batch processing facility via a procedure package called the Batch Job Package (BJP).

30b1b

The batch job package in a sense referees the flow of information between its PCP callers and the batch processing facility. For example the batch job package collects all the input files that are resident on other hosts before turning the job over to the batch processing facility, and the batch job package may distribute the result files to other hosts when the job is completed by the batch processing facility.

30b1b1

The Batch Job Package interacts with File Packages (FP) to effect the movement of files to and from the Batch Processing Facility.

30b1c

The call on the batch job package to get a job submitted to a batch processing facility is:

30b1c1

CRTJOB (infiles, outfiles => jobid)

30b1c1a

The files referenced in infiles and outfiles are named so that the batch job package can get them from and put them into the directories owned by NSW at various hosts and manipulated by file packages. Thus these files are named by "file=package-filenames".

30b1c2

oldmessages

The user sees only NSW-filenames so there must be a language/grammar that controls the users interaction which results in the generation of a create job call on a batch job package. This processing for the user must include the mediation of the NSW-filenames the user supplies into the file-package-filenames included in the create job call.

30b1c3

The files themselves are created and examined using the text editors (e.g. NLS) available in the NSW.

30b1d

Some files that are included in a create job call may be standard library files and from the users point of view part of the system. The user may not even be aware of their existence since their names could be supplied by the grammar internally.

30b1d1

The input files are probably in most cases job control files in a particular batch processing facilities specific job control language. There might be grammars/tools to aid the user in constructing such control files for specific batch processing facilities and applications programs.

30b1d2

A scenario for a user creating, submitting, retrieving, and examining a batch job follows:

30b2

The user interacts with the front end. The front end contains a command language interpreter that is driven by a grammar. The particular grammar in use for this user at any time depends on which tool the user is accessing.

30b2a

The user interacts with an editing tool to create a source program and to concatenate it with a standard file of job control information particular to the Batch Processing Facility to which it will be submitted. The concatenation is accomplished using regular editing commands (not batch specific commands).

30b2b

The user then interacts with the Workg Manager and the Batch Job Package mediated by a Grammar to submit the file he has created. The grammar and the Batch Job package will require enough information from the user that the Batch Job Package can retrieve the input files from File packages, and store the output files. The Batch Job package will return an identifier for this job which can be used to request status information at a later time.

30b2c

Some of the information needed to run a batch job could

be in a standard file that the user always appends his file to, OR this type of information could be in a separate file that is included by the grammar in the create job call automatically, and the grammar could call on a function to edit a standard file to contain user and run specific parameters such as user-name, priority, run-time-limit,

30b2c1

When the job has been processed the user may use an editing tool to examine the output file. Note that the output files have been stored as specified in File Packages and are thus accessible to tools as permitted by the Works manager,

30b2d

It may be necessary to construct special tools to reformat the output of other tools for presentation on the users terminal.

30b2d1

In particular the tools which were designed to output to line printers will produce output difficult to view adequately on narrower display and teletype terminals, 30b2d1a

A discussion of a batch program as a tool.

30b3

An applications program which lives on a batch processing facility can be made into a tool in the NSW such that the users of it as a tool do not need to know the control language of the facility where it lives. To do this the tool installer must create a control card file and a grammar which are stored in the Works Manager under the toolname assigned to this program,

30b3a

When the user accesses the tool the front end gets the grammar from the works manager and follows it to collect the parameters from the user. Once all the arguments are collected the front end (or the works manager) can call the batch job package. Note that one of the arguments is the name of the control card file. This argument may be built in to the grammar or supplied by the works manager,

30b3b

A discussion of multi-host batch jobs.

30b4

Suppose a user wanted to run a series of batch jobs steps where each step was to be carried out on a different host. It is not difficult to envision a NSW=batch-control-language in which one could say things like:

30b4a

"If the previous job step was successful then use its output file WALDO appended to control file DOITTOIT as

oldmessages

card input to the batch processing facility ABC and call the printer output file GEORGE".

30b4a1

This requires a tool to "execute" files of this NSW=batch-control=language to be written.

30b4b

 20-JAN-75 11:25:46,312
 Date: 20 JAN 1975 1125-PST
 From: POSTEL
 Subject: Reconnection
 To: Schantz at BBN
 cc: postel

31

Rick:
 ok, go ahead on a revised reconnection option document for the protocol notebook following the standard format, when you have a draft ready ill review it for any holes or glitches,
 --jon,

 20-JAN-75 13:13:27,2014
 Net mail from site OFFICE-1 rcvd at 20-JAN-75 13:13:22
 Date: 20 JAN 1975 1313-PDT
 From: WINGFIELD at OFFICE-1
 subject: NSW meeting
 To: crocker at 226, balzer at 226, holg at 226, carlson at ISI, To: lloyd at ISI, baggiano at ISI, mayhen at ISI, crain at ISI, To: waal at SRI-ARC, postel at SRI-ARC, watson at SRI-ARC, To: warshall at SRI-ARC, millstein at SRI-ARC, To: irby at SRI-ARC, triolo at SRI-ARC, schaffner at SRI-ARC, To: schantz at BBN, burchfiel at BBN, thomas at BBN, To: braden at CCN, pogram at MIT-MULTICS, wingfield at OFFICE-1, To: stone at OFFICE-1, lawrence at OFFICE-1, uhlig at OFFICE-1, To: weeks at OFFICE-1, riddle at OFFICE-1

32

We should be at the halfway point in the development of the basic hardware/software packages required by the NSW. In order to insure that the requirements of the Data Systems Design Center are implemented by 1 July, Crain and I would like to schedule a meeting of the steering committee and principal investigators sometime next week.

The agenda will essentially cover an indepth review of how the various components of the NSW will interact to implement certain DSDC scenarios. For efficiency, I would like to minimize the number of persons present to include only one (1) person from the following organizations:

SRI - postel/white/watson
 ADR - triolo/waal
 MCA - warshall/millstein

oldmessages

RADC - wingfield
 ARPA - carlson
 ISI - crocker/balzer
 SAI - douglas
 AFSDC - crain
 AFDC - lloyd
 BBN - burchfiel

33

The meeting will be two days sometime next week [or else the second week in Feb], at a location on the east coast. Limited TDY funds for government organizations make the east coast a better choice. Please indicate who will be coming and which days are best. Unfortunately, the success of such a large project as the NSW may be determined by the operational status on 1 July. It behooves us to address these short term goals now.

Thanks,
 Mike

 20=JAN=75 14:06:37,3499

Net mail from site OFFICE=1 rcvd at 20=JAN=75 14:06:34

Date: 20 JAN 1975 1406=PDT

From: CRAIN at OFFICE=1

subject: MEETING to discuss people=process=process interactions to:
 NSW=DISTRIBUTION:

34

< CRAIN, MEETING=MSG,NLS;5, >, 20=JAN=75 13:55 LAC ;;;;

35

1 Greetings

36

2 We should be at the halfway point in the development of the basic hardware/software packages required by the NSW. In order to insure that the requirements of the Data Systems Design Center are implemented by 1 July, Crain and I would like to schedule a meeting of the steering committee and principal investigators sometime next week. Unfortunately, the success of such a large project as the NSW may be determined by the operational status on 1 July. It behooves us to address these short term goals now. The purpose of the meeting is:

37

2A determine exactly what will be available on 1 Jul, and make sure everyone is in phase on this; and

37a

2B develop scenarios for the process=process and process=user interactions for each procedure available to the user on 1 Jul. We mean to concentrate on content (information required to be passed) and stay away, as much as possible, from form (syntax/format of info exchanged).

37b

3 The agenda will essentially cover an indepth review of how the

oldmessages

various components of the NSW will interact to implement certain DSDC scenarios. Among the Items we wish to address are:	38
3A Login and logout sequence	38a
3B Invoking, using, and leaving TELNET/ELF Tool	38b
3C Creating a Batch Job	38c
3D Calling, using, and leaving NLS	38d
3E Calling for proofs, then publication to COM/Hardcopy	38e
3F Explicit (user directed) movement of files, into, out of, and within NSW,	38f
3G Help features,	38g
3H Invoking a TBH (TENEX, Multics, ?OS360/370)	38h
3I Escaping to the WM and returning to a tool,	38i
3J Passing messages in NSW (not NLS Journal or Netmail)	38j
3K Reading/sending Journal and Network Mail	38k
3L,There may be others, please consider...	38l
4 The meeting will be two days sometime next week [or else the second week in Feb], at a location on the east coast. Limited TDY funds for government organizations make the east coast a better choice.. Bill Carlson suggested Boston as the meeting place, but I(crain) would prefer Princeton (at ADR), as they have not yet had the privelege(?) of hosting such a session. The tentative date we suggest is 28 and 29 Jan. We hope to get everything done in a day and a half, but don't plan anything critical for the rest of the second day so We can run over if necessary.	39
5 We are requesting, to keep the group managable and efficient, only one (1) representative from each group:	40
5A ARPA [Carlson, Crocker, or Balzer]	40a
5B ADR [Triclo of Waa]	40b
5C SA1 [Douglass or Hamrick]	40c
5D RADC [Wingfield]	40d

oldmessages

5E MCA [Warshall or Milstein] 40e
 5F SRI-protocols [White or Postell] 40f
 5G SRI-NLS/FE [watson or?] 40g
 5H BBN [Burchfiel or?] 40h
 5I AFDSC [Lloyd] 40i
 5J AFSDC [Crain] 40j
 5K *Please note: those are exclusive 'or's. If we have too big a group, we won't get anything done. 40k

6 We would like to have the date and location firm NLT Thursday afternoon, so please comment ASAP on: 41

6A Can you attend? 41a

6B any problems with the date or location(Princeton). (ADR has veto power= There's always Montgomery... 41b

6C Who will attend from each group? 41c

7 Thanks, Mike and Larry 42

20-JAN-75 17:47:41,6132
 Net mail from site USC-ISI recvd at 20-JAN-75 17:47:35
 Date: 20 JAN 1975 1746-PST
 From: POSTEL at USC-ISI
 subject: Traffic Graphs
 To: TRAFFIC=GRAPH=DISTRIBUTION: 43

Here are the ARPANET Traffic Graphs updated to include December 1974 with the data provided by Alex McKenzie of BBN. 44

TOTAL INTERNODE TRAFFIC
 PACKETS PER MONTH (MILLIONS)

Sep71	1.5 *
Oct71	3.0 *
Nov71	3.5 *
Dec71	3.3 *
Jan72	5.3 **
Feb72	6.5 ***
Mar72	6.7 ***
Apr72	10.1 *****
May72	15.2 *****

oldmessages

Jun72	24.2	*****
Jul72	15.0	*****
Aug72	21.0	*****
Sep72	24.0	*****
Oct72	40.0	*****
Nov72	25.0	*****
Dec72	28.0	*****
Jan73	45.0	*****
Feb73	41.0	*****
Mar73	56.0	*****
Apr73	67.0	*****
May73	72.0	*****
Jun73	70.0	*****
Jul73	83.0	*****
Aug73	99.0	*****
Sep73	86.7	*****
Oct73	93.5	*****
Nov73	85.3	*****
Dec73	73.8	*****
Jan74	91.9	*****
Feb74	79.9	*****
Mar74	102.9	*****
Apr74	100.0	*****
May74	104.3	*****
Jun74	90.6	*****
JUL74	115.2	*****
***** AUG74		
116.4	*****	*****
SEP74	85.8	*****
OCT74	113.3	*****
***** NOV74		
105.2	*****	***** DEC74
115.7	*****	*****

44a

TOTAL INTERNODE TRAFFIC
 AVERAGE PACKETS PER DAY (MILLIONS)

Sep71	0.1	*
Oct71	0.1	*
Nov71	0.1	*
Dec71	0.1	*
Jan72	0.2	**
Feb72	0.2	***
Mar72	0.2	***
Apr72	0.4	*****
May72	0.5	*****
Jun72	0.8	*****
Jul72	0.5	*****
Aug72	0.7	*****
Sep72	0.8	*****

oldmessages

```

Oct72  1.3 *****
Nov72  1.2 *****
Dec72  1.1 *****
Jan73  1.4 *****
Feb73  1.6 *****
Mar73  1.9 *****
Apr73  2.4 *****
May73  2.3 *****
Jun73  2.3 *****
Jul73  2.7 *****
Aug73  3.2 *****
Sep73  2.9 *****
Oct73  3.0 *****
Nov73  2.8 *****
Dec73  2.4 *****
Jan74  2.9 *****
Feb74  3.0 *****
Mar74  3.3 *****
Apr74  3.3 *****
May74  3.4 *****
Jun74  3.1 *****
3.8 *****
AUG74  3.8 *****
***** SEP74
3.3 ***** OCT74  3.8
***** NOV74
3.8 ***** DEC74
3.7 *****

```

44b

TOTAL INTERNODE TRAFFIC
AVERAGE PACKETS PER NODE=DAY (THOUSANDS)

```

Sep71  2.9 *
Oct71  5.3 **
Nov71  6.5 ***
Dec71  5.7 **
Jan72  9.1 *****
Feb72  12.1 *****
Mar72  11.6 *****
Apr72  14.8 *****
May72  20.2 *****
Jun72  28.3 *****
Jul72  17.0 *****
Aug72  23.0 *****
Sep72  27.0 *****
Oct72  43.0 *****
Nov72  37.0 *****
Dec72  34.0 *****
Jan73  41.0 *****
Feb73  45.0 *****

```

oldmessages

```

Mar73 54.0 *****
Apr73 66.0 *****
May73 64.0 *****
Jun73 64.0 *****
Jul73 72.0 *****
Aug73 86.0 *****
***** Sep73
73.8 ***** Oct73
73.8 ***** Nov73
64.7 *****
Dec73 52.9 *****
Jan74 65.8 *****
Feb74 68.3 *****
Mar74 72.8 *****
Apr74 72.4 *****
May74 73.2 *****
Jun74 67.9 *****
JUL74 83.5 *****
***** AUG74
79.1 ***** SEP74
68.5 *****
OCT74 75.6 *****
NOV74 72.8 *****
DEC74 72.6 *****

```

44c

```

-----
21-JAN-75 06:33:09,1611
Net mail from site USC-ISI rcvd at 21-JAN-75 06:33:05
Date: 21 JAN 1975 0626-PST
From: CARLSON at USC-ISI
subject: NSW MEETING
To: CROCKER at ISIB, BALZER at ISIB, POSTEL at SRI-ARC,
To: CARLSON at ISI, LLOYD at ISI, BAGGIANO at ISI, MAYHAN at ISI,
To: CRAIN at ISI, WATSON at SRI-ARC, WARSHALL at SRI-ARC,
To: MILLSTEIN at SRI-ARC, WHITE at SRI-ARC, IRBY at SRI-ARC, To:
STONE at OFFICE-1, WINGFIELD at OFFICE-1,
To: RIDDLE at OFFICE-1, WEEKS at OFFICE-1,
To: LAWRENCE at OFFICE-1, UHLIG at OFFICE-1, JACOBS at BBN, To:
BURCHFIEL at BBN, THOMAS at BBN, SCHANTZ at BBN,
To: WAAL at SRI-ARC, TRIOLO at SRI-ARC, SCHAFFNER at SRI-ARC, To:
HOLG at ISIB, BRADEN at CCN, POGAN at MIT-MULTICS

```

45

THANKS TO LARRY AND MIKE FOR ORGANIZING THE MEETING.

46

I WANT TO REEMPHASIZE THE LIMITED FOCUS; THE OBJECTIVE IS TO GUARANTEE THAT ALL PIECES OF THE 1 JULY DEMONSTRATION SYSTEM ARE BEING BUILT AND THAT WE HAVE A COMMON UNDERSTANDING OF WHAT THE RESULT WILL LOOK LIKE.

47

oldmessages

I THINK NEXT WEEK IS TOO EARLY TO HAVE THE MEETING. FOR ONE THING, I CANNOT AFFORD THE TIME BEFORE 1 FEB. A MORE SUBSTANTIVE COMMENT IS THAT THE SCENARIOS TO BE DISCUSSED SHOULD BE DISTRIBUTED IN ADVANCE OF THE MEETING AND A FIRST PASS ANALYSIS DONE BY TELEPHONE. TWO DAYS WILL NOT BE ENOUGH TO DO IT ALL, AND WE CANNOT AFFORD TO BREAK UP WITHOUT COMPLETING THE JOB.

48

IN LARRY'S NOTE ABOUT THE MEETING, THERE WAS A LIST OF ACTIVITIES TO BE PERFORMED IN JULY. THOSE NEED TO BE FLESHED OUT IN GREATER DETAIL.

49

THE FIRST TWO WEEKS IN FEB ARE BOTH OK WITH ME EXCEPT FOR 11FEB.

50

THANKS,
BILL

51

21-JAN-75 12:29:08,1412
Net mail from site BBN-TENEX rcvd at 21-JAN-75 12:29:00
Date: 21 JAN 1975 1520-EST
From: MCKENZIE at BBN-TENEX
Subject: RFC 662
To: Kanodia at MIT-MULTICS
cc: Pogram at MIT-MULTICS, pogram,CompNet at MIT-MULTICS,
cc: walden, mcquillan, mckenzie, postel at SRI-ARC

52

Raj,
I have just gotten around to reading RFC #662. In response to your statements in the second paragraph of the section labeled "PROBLEM", namely "the protocol does not specify any way to recover from transmission errors that occur while more than one RFNM is pending on the same connection", I would like to call RFC's 533 and 534 to your attention. If the "protocol" referred to in the quotation above is the Host/IMP protocol then your statement is incorrect. Of course, if you refer to the Host/Host protocol then you are correct. However, I believe it would be possible for you to program Multics to use the features described in RFC's 533 and 534 EVEN IF NO OTHER HOST IMPLEMENTED THE CHANGE. I believe you could then get higher bandwidth sending TO any Host (provided sufficient buffer allocation was made available); of course you could only CORRECT errors when sending to a Host which also implemented the change (you would have to abort the transfer and start over if errors were detected in sending to Hosts which were not known to have implemented the change).
Regards,
Alex McKenzie

21-JAN-75 17:07:48,5675
Net mail from site SRI-ARC rcvd at 21-JAN-75 17:07:43
Date: 21 JAN 1975 1707-PST

oldmessages

From: POSTEL at SRI-ARC
 Subject: Terminal, Tools and the NVTP in NSW
 To: NSW-DISTRIBUTION:

53

Bill:

In response to your message of 12-JAN-75 and our subsequent telephone conversations on the role of Telnet in the connection of user's terminals to old programs being used as tools I have prepared the following note. --jon.
 < POSTEL, NVTP-COMMENTS,NLS;8, >, 21-JAN-75 16:42 JBP ;;;;

54

This is an attempt to clarify the role of the Network Virtual Terminal Package (NVTP) in interfacing "Old Programs" to the National Software Works (NSW). The discussion here assumes that the reader is familiar with the Procedure Call Protocol (PCP) and the Telnet protocol.

55

The NSW is composed of two principal entities and a group of auxiliary entities. The principals are a Works Manager (WM) and a Front END (FE). The auxiliaries are called Tool Bearing Hosts (TBHs).

56

The WM and the FE always communicate with each other and with the TBHs using PCP. This is a simplifying principle that allows for a cleaner and quicker implementation of the WM and the FE.

57

(We note that at times the same machine that supports the FE may be used in a non-NSW context to communicate with other machines, including those that support the WM or those that are also TBHs, using other protocols. This does not alter our basic simplifying principle since those other communications protocols and programs are completely independent of the NSW.)

57a

The active agent in the FE that carries out the users requests as interpreted using the grammar and the user profile is the Command Language Interpreter (CLI).

58

The TBHs support applications programs (e.g. text editors, compilers, reformatters, ...) called tools. These tools are or will be constructed with the NSW in mind, and will expect to communicate via PCP. Other applications programs, here called "Old Programs", were constructed to communicate only with a controlling teletype. The Telnet protocol has been designed and implemented such that a remote user's terminal can appear to be the controlling teletype when the remote user utilizes a "user Telnet" process to communicate via the network with a "server Telnet" process that directly controls the application program.

59

To interface such Old Programs into the NSW a NVTP has been designed to act as a converter between PCP and Telnet protocol. There are two

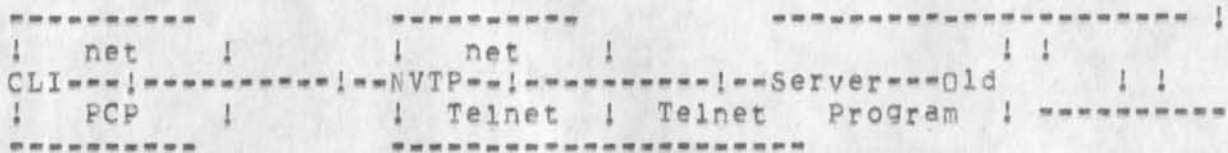
oldmessages

cases to be distinguished: first the case where the NVTP is in a third host, and second where the NVTP is directly controlling the Old Program. Note that in either case from the point of view of the WM and the FE the NVTP is the tool.

60

Case 1

61



61a

Notes:

61b

CLI only does PCP calls,

61b1

NVTP merely copies data,

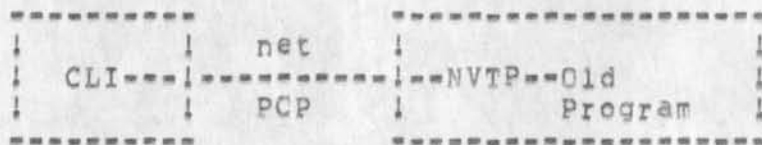
61b2

Server telnet acts as controlling teletype to Old Program,

61b3

Case 2

62



62a

Notes:

62b

CLI only does PCP calls,

62b1

NVTP acts as controlling teletype to Old Program,

62b2

NVTP is a SMALL extension of Server Telnet program,

62b3

In the NSW environment the control features of telnet are generally unnecessary since these functions are performed by the FE.

63

Most of Telnet's control options are for controlling aspects of the users interaction that can be specified by a grammar or user profile. The difference is that in Telnet the parameters are dynamically controlled and transmitted between the user and server for each use of a program; in the NSW case these parameters are incorporated in the grammar and are therefore relatively static, but they are not renegotiated with each use of the tool and thus there is less network traffic. A user should be able to change

oldmessages

aspects of the interaction by commands to the FE which do not require network traffic,

63a

For example the most powerful Telnet Option == Remote Controlled Transmission and Echoing (RCTE) == is completely replaced by a grammar tailored to the serving host and tool. And the strategy of dynamic control used in RCTE requires substantially more network traffic than is necessary in the NSW case,

63a1

An alternative communication strategy for Old Programs has been suggested that would have the FE communicate with the Old Program using Telnet protocol,

64

The WM is the only NSW process that initiates tool processes and the WM always communicates using PCP. It would be quite awkward to have the tool process initiated using PCP and subsequently communicate using Telnet protocol. The Telnet protocol does have a reconnection option (there are no known implementations of this feature), so that (in theory) control of a process created by a Telnet initiation by the WM could be switched to the FE, such a procedure requires both the WM and the FE to treat Old Programs differently than new tools, and requires both the WM and the FE to implement both PCP and Telnet protocol,

64a

 22-JAN-75 06:00:58,1281
 Net mail from site BBN-TENEXA rcvd at 22-JAN-75 06:00:55
 Date: 22 JAN 1975 0900-EST
 From: BTHOMAS at BBN-TENEXA
 Subject: NSW-DISTRIBUTION LIST
 To: POSTEL at ARC

65

JON,
 I HAVE RECEIVED 2 COPIES OF YOUR LAST TWO NSW MESSAGES. PLEASE CHECK YOUR DISTRIBUTION LIST. NOTE THAT MESSAGES FOR THOMAS@BBN ARE NOW FORWARDED TO BTHOMAS@BBN,

66

ALSO, FOR YOUR INFORMATION, AN IMPLEMENTATION OF THE TELNET RECONNECTON PROTOCOL HAS BEEN TESTED FOR TENEX WITHIN CONTEXT OF RSEXEC - SEE RFC #671 BY SCHANTZ,

67

ALSO, I JUST READ YOUR NOTE ON NVTP-COMMENTS. THE COMMENTS WERE ABOUT WHAT WE EXPECTED THE NSW "SOLUTION" TO THE OLD PROGRAM PROBLEM TO BE. I PERSONALLY BELIEVE THAT NSW IS MAKING A SERIOUS MISTAKE BY NOT DIRECTLY SUPPORTING "ORDINARY" NETWORK CONNECTIONS AND "ORDINARY" TELNET CONNECTIONS IN ADDITION TO THE "LOGICAL" AND "PHYSICAL" CHANNELS DESCRIBED IN JIM'S PCP DOCUMENTS.
 IN THE OLD PROGRAM CASE IT APPEARS THAT THE PCP REGIMEN

oldmessages

IS FORCING AN INEFFICIENT IMPLEMENTATION BY, FOR EXAMPLE, FORCING TWO
 TERMINAL I/O WAKEUPS RATHER THAN ONE. THIS COULD BE CORRECTED BY
 ADMITTING THE NOTION OF ORDINARY CONNECTIONS AND TELNET CONNECTIONS
 TO PCP - I BELIEVE THIS COULD BE DONE IN A WAY THAT DOES NOT
 SERIOUS COMPROMISE THE PCP DESIGN PHILOSOPHY.

68

BOB

22-JAN-75 08:50:47,237
 Net mail from site USC-ISI rcvd at 22-JAN-75 08:50:44
 Date: 22 JAN 1975 0848-PST
 From: CARLSON at USC-ISI
 subject: TERMINALS,TOOLS,NVTP IN NSW
 To: POSTEL at SRI-ARC
 cc: WATSON at SRI-ARC

69

THANKS FOR THE PAPER JON.

70

22-JAN-75 09:06:58,1827
 Date: 22 JAN 1975 0906-PST
 From: WHITE
 Subject: Answers to PCP Questions
 To: mandell at ISIB
 cc: postel

71

Dick--

72

1) My current intention is to abort (return type PERMANENT and
 subtype ABORTED) a procedure call request when all processors are in
 use. There are a couple of other possibilities, one or more of which
 may prove desirable:

73

The process could, as you suggest, queue the request until a
 processor becomes available. Clearly there's some limit to the
 buffering capacity of the process, so queuing probably just delays
 the inevitable.

73a

The process could abort the request and promise to notify the
 calling process (with a new type of message) when a processor
 becomes available, and force him to reissue the request at that
 time.

73b

We could add an argument to the CALPRO procedure which lets the
 caller decide how this situation is to be handled.

73c

Suggestions? Preferences?

73d

2) The user descriptor is assumed by the PCP code to be addressed by

oldmessages

the external symbol "USRDSC". The loader resolves the reference at load time. The system descriptor is known to the applications code by a similar mechanism.

74

3) I'm behind schedule on implementation, and am now shooting to have PCP running and NLS using it by the end of FEB.

75

4) BUPRSM is indeed missing from the bundle descriptor. Thanks. Assume that it follows BUPDSP.

76

New (even readable) hardcopy documentation went out to you in the mail yesterday. Among it is a document called PCPV2CHANGES whose on-line version will be regularly updated and will contain bug fixes, design changes and additions, clarifications, etc. Once we have a running implementation, I will merge this file with the Version 2 documents to generate Version 3.

77

--Jim

77a

 22-JAN-75 10:56:25,707
 Net mail from site BBN-TENEX rcvd at 22-JAN-75 10:56:21
 Date: 22 JAN 1975 1357-EST
 From: MCKENZIE at BBN-TENEX
 Subject: RFC's
 To: postel at SRI-ARC
 cc: mckenzie

78

Jon,
 Since my inundation with papers starting in about November, my filing system hasn't been perfect, and things may have gotten lost. The last RFC I received was numbered 674 (Postel & White). Working backward, there are the following "missing" RFC's:

#673
 #670
 #668
 #665
 #664
 #648-#650
 #646
 #641
 #639

Do you know if any of these numbers correspond to documents which were actually written? If any do, would you mind telling me the source of the document, so that I can try to get a copy?

Thanks,
 Alex

 22-JAN-75 11:18:10,857

oldmessages

Date: 22 JAN 1975 1118-PST
 From: POSTEL
 Subject: NSW interface to old programs
 To: Thomas at BBN
 cc: Postel, White

79

Bob:

In principle the NVTP should sit in the same place in the processing of the data as Server Telnet. (See my case 2.) When this is true there should be no difference in the number of wake-ups (or any other measure) between the NSW and non-NSW cases. The reason for the difference you correctly point out is that in TENEX the Server Telnet has been pushed into the monitor. It could be that the NVTP is eventually pushed into the monitor too (or instead). But we do not advocate that approach. We believe that new tools (that know PCP) which are constructed for and fully integrated into the NSW will be so much more attractive to users that the use of old programs will become insignificant.
 --jon.

 22-JAN-75 14:16:38,509
 Date: 22 JAN 1975 1416-PST
 From: POSTEL
 Subject: RFCs
 To: MCKenzie at BBN
 cc: postel

80

Alex:

Your list of missing RFCs is exactly right, none of the numbers you mention is assigned to an actual document. There are some additional numbers assigned: 675 is Cerfs TCP Spec (ask Cerf for hardcopy), 676 is no document, 677 is assigned to Paul Johnson at BBN but I haven't received a document yet, and 678 is by me on File Formats and is online at Office-1 as <NETINFO>RFC678.TXT
 --jon.

81

 22-JAN-75 15:08:26,755
 Date: 22 JAN 1975 1508-PST
 From: WHITE
 Subject: A Suggestion for Handling Processor Assignment
 To: mandell at ISIB
 cc: postel

82

I suggest the following:

83

- 1) implement (some reasonable amount of) queuing in the CF,
- 2) add a BOOLEAN argument to the CALPRO procedure by which the

83a

oldmessages

caller can either take advantage of or ignore the CF's queuing ability,

83b

3) add an INTEGER priority argument to the CALPRO procedure, allow the applications code (by way of the USRDSC) to specify USPRCT priorities (one for each processor), and then assign a procedure call request to a processor only if the request's priority is greater than or equal to that of the processor.

83c

What sayest thou?

84

--Jim

84a

 22-JAN-75 17:36:24,1261
 Net mail from site ISIB rcvd at 22-JAN-75 17:36:17
 Date: 22 JAN 1975 1736-PST
 From: MANDELL at USC-ISIB
 subject: response to priority proposal
 To: James E. White:
 cc: postel at ARC

85

My first reactions to the use of priority numbers for processors and calls is that it looks like a good idea. Perhaps, the amount of buffering required in the call queues can be suggested by the processes that create logical channels. The number of queue spaces could be arbitrated between the processes at each end of the channel. I think that the use of priority numbers for processor allocation is cleaner than my suggestion of allowing a user routine to handle queuing. Our application can probably benefit by the ability to reserve some processors for high priority calls. Your proposal also allows all processors or most processors to have the same priority. In order to avoid deadlocks, it is probably necessary to select candidates for assignment to processors in a priority order. This can be done by priority ordering of the call queue or by some other equivalent means. In our application it would be convenient to be able to change the priority of processors from time to time to adjust to load conditions.

 22-JAN-75 17:37:00,1264
 Net mail from site ISIB rcvd at 22-JAN-75 17:36:53
 Date: 22 JAN 1975 1730-PST
 From: MANDELL at USC-ISIB
 Subject: Response to processor priority
 To: James E. White:
 cc: POSTEL at ARC

86

oldmessages

My first reactions to the use of priority numbers for processors and calls is that it looks like a good idea. Perhaps, the amount of buffering required in the call queues can be suggested by the processes that create logical channels. The number of queue spaces could be arbitrated between the processes at each end of the channel.

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Our application can probably benefit by the ability to reserve some processors for high priority calls. Your proposal also allows all processors or most processors to have the same priority. In order to avoid deadlocks, it is probably necessary to select candidates for assignment to processors in a priority order. This can be done by priority ordering of the call queue or by some other equivalent means. In our application it would be convenient to be able to change the priority of processors from time to time to adjust to load conditions.

87

22-JAN-75 18:32:41,233
 Net mail from site BBN-TENEX rcvd at 22-JAN-75 18:32:39
 Date: 22 JAN 1975 2123-EST
 From: WALDEN at BBN-TENEX
 Subject: book chapter
 To: postel at SRI-ARC
 cc: walden

88

how is book chapter on protocols coming?
 dave

22-JAN-75 20:19:30,5961
 Net mail from site OFFICE=1 rcvd at 22-JAN-75 20:19:22
 Date: 22 JAN 1975 1851-PDT
 From: CRAIN at OFFICE=1
 subject: more on meeting
 To: nsw-all:

89

< CRAIN, MSG=MEETING,NLS;5, >, 22-JAN-75 18:13 LAC ;;;;

90

Hello, again;
 There seems to be considerable (and I must admit well founded) objections to having the meeting next week. However, it is imperative that we hold it as soon as possible, so we get the important issues it will address resolved. Therefore, let's move it back a week, to Wed-Fri, 5-7 Feb. I feel that we must make time to attend, and that that date is probably the latest one reasonable. It should also fit better into the schedules of those who have already responded, particularly Watson, who plans to be in Boston the 4th already. You

oldmessages

might also notice that the length has been extended to three days, at the request of Bill, who doesn't think we can get everything done in two. Judging by past meetings, he may be right, so let's plan on 2+ days, and reserve Friday if we need it. Pete Waal says that he will be happy to host it, and we have no other major objections yet voiced, so let's set Princeton as the place. Pete: We would appreciate directions, and the name of one good motel (for everyone else) and one cheap one (for a certain poor Lt.) when you get a chance.

1

91

In response to some "Comments on Scenarios for Meeting" by Bill:

2

92

1. BY CREATING BATCH JOB, I ASSUME YOUU MEAN B4700 BATCH JOB?
2A

92a

I mean B4700 batch jobs, but I suspect AFDS would read that to mean 360 or Multics Batch jobs. This brings up an interesting question: do we let users of a TBH such as a 360 or Multics use the operating system's facilities to create batch jobs directly, or do we require them to invoke a separate batch tool? The former seems like it would be difficult to recover the accounting information, but the latter involves trapping any commands the user might try which would create a batch job, as well as building an additional tool.

2A1

92a1

2. ARE WE GOING TO CALL/USE/LEAVE NLS, OR IS THERE GOING TO BE AN NLS EDITOR, AN NLS PUBLICATION SSSYTEM, AN L10 COMPILE/DEBUG SYSTEM (OF COURSE WITH SLEWING AMONG TOOLS PER IRBY'S RECENT NOTE)
2B

92b

Conceptually, I prefer separate tools, but practically, I am worried about implementing them in time. I must have missed the referenced note from Irby- Charles: could you point me at a copy? 2B1 3. WHAT EXPLICIT MOVEMENT OF FILES WITHIN NSW DO YOU WANT, THE ONLY CASE I AM AWARE OF IS FOR LOWER COST STORAGE.
2C

2C

92b1

I thought that movement of files to the Batch TBH would be necessary in the 1 Jul system. (correct me if I'm wrong.) I think that implies Explicit movement.
2C1

2C1

92b2

4. MIT AND UCLA ARE JUST STARTING TO GET INVOLVED IN THE NSW, AND THEY HAVE NOT YET COMMITTED TO A DATE FOR TBH IMPLEMENTATIONS ON MULTICS OR THE 360.
2D

2D

92c

oldmessages

The Multics, and to some extent the 360, were mentioned for DSC. Jim Lloyd: what is your feeling on this?

2D1

92c1

5. THE MESSAGE THING WORRIES ME. THE STATEMENT OF THE SCENARIO IMPLIES I MUST NOW LEARN NSW MAIL AS WELL AS SNDMSG AND JOURNAL,
2E

92d

Steve Warshall mentioned this facility at a previous meeting, so I'll drop it in his lap. I tend to agree that it is definitely undesirable to have message systems start proliferating like coathangers in a dark closet.

2E1

92d1

6. I WISH THERE WAS ONE PROGRAM ON THE B4700 WE COULD INSTALL AS A REAL NSW TOOL. IT SHOULD BE A BATCH PROGRAM. BY REAL TOOL, I MEAN THAT I WANT TO INVOKE IT AND RETRIEVE THE RESULTS WITHOUT EVER SEEING B4700 JOB CONTROL.

2F

92e

One candidate for such a role I have been considering is a program our Support branch developed. Called %-EXECUTE, it takes a COBOL source deck, instruments it, compiles it, then executes it to see if your test data has exercised all possible control paths. If this sounds like a reasonable choice to all of you, I'll see what we can do about getting it installed as a batch tool on the B4700.

2F1

92e1

To Bill, especially, but others might take note also; I would appreciate you using the Distribution List feature whenever possible. ISI-KA users can use <nsw>all, Distribution-list, pi.D., and Steering. Office one users have <crain>NSW-ALL., NSW-PI., and NSW-Steering. I think there are also lists available at SRI-ARC, under similar names. The reason for this request is very simply that it seems about a quarter of my mailbox is filled with lists of addressees. If you have a spare minute, please review the respective "ALL" file at your site, and let me know if any names are "ALL" file at your site, and let me know if any names should be added. This is basically a "shotgun" file, and anyone interested in the project should be included.

3

93

so much for the work. Now for a little frivolity: For those of you who are secret Batman Freaks, or who just like bad puns and veiled references, may I commend to your reading the works of one of my distinguished fellow inmates here at GAFS (Gunter Air Force something, for you troupes who dont understand Military talk). See [ISI-ka]<NSW>Capt.ARPA;6.

4

94

oldmessages

Thanks for your attention, and I'll see you all a week from
Wednesday, 5 95

/Larry
5A 95a

----- 96

23-JAN-75 15:02:49,590
Net mail from site USC-ISIA rcvd at 23-JAN-75 15:02:48
Date: 23 JAN 1975 1458-PST
From: CARLSON at USC-ISI
Subject: 360 NCP
To: POSTEL at SRI-ARC
cc: CARLSON 97

NOWHERE IN THE ARPA OFFICE IS A COPY OF THE PAPER YOU DID AT MITRE ON
NETWORK NCP. I DESPERATELY NEED TO KNOW HOW BIG THE NCPS
ARE AT UCLA AND AT SANTA BARBARA. DO YOU HAVE A COPY OF YOUR
PAPER? ALSO, DOES IT GIVE ANY INFO ABOUT THEIR TELE HANDLER AND HOW
IT IS INTERFACED TO TELNET? ARE FTP DONE THROUGH THE TELE HANDLER, OR
DOES IT GO MORE DIRECTLY TO THE FILE SYSTEM, HOW ABOUT RJE? 98

THANKS,
BILL
----- 99

23-JAN-75 16:13:28,1302
Net mail from site USC-ISIA rcvd at 23-JAN-75 16:13:23
Date: 23 JAN 1975 1603-PST
From: DCROCKER at USC-ISI
Subject: Protocol Information file
To: Postel at ARC 100

Hi, Jon, How's tricks? 101

A small suggestion for the Protocol information file:
Use numbering to help the user parse segments of the
document. Because most of the statements are only one line
long and there is a great deal of indentation
variation, it is sometimes difficult to scan for
a specific section. 102

Additions/corrections: 103

1. You were second author of RFC 539 (Thoughts on White's Mail
protocol). 104

2. My RFC 577 isn't on the list, for Proposed Mail. It is

oldmessages

a very short note and may not have said enough to be worth including, but...

105

3. The people and documents referring to CCN's RJS are all CCN people. There have been several implementations of User processes (e.g., the Harslem/Fagan one that I modified). Might be worth listing them. Harslem issued RFC 307 on his initial version. The document on my mods to the program is a NUTS note (!).

106

4. Destreicher (at ISIB) has issued an addendum to RFC 561, with some additional mail header fields. It was a small-distribution document, but he may be interested in making it an RFC.

107

Any exciting happening?

108

Hello to Joanne, Dave.

109

23-JAN-75 20:50:09,1369

Net mail from site SRI-AI rcvd at 23-JAN-75 20:50:07

Date: 23 JAN 1975 2051-PST

From: LYNCH at sri-AI

Subject: NEED FOR A GIVER OF NAMES

To: POSTEL at ARC, WHITE at ARC

110

I AM READING YOUR RECENT TONES (AND GETTING AN EDUCATION, THANKS) AND I KEEP SEEING A COMMON PROBLEM CROP UP -- THAT IS THE ONE OF "UNIQUE" NAMES FOR THINGS. IS IT TOO MUCH TO ASK THAT THERE BE A UNIVERSAL NAME GIVER IMPLANTED IN THE SCHEME? OBVIOUSLY A SIMPLE "ADD ONE AND HAND IT TO HIM" PROCESS EXISTING IN HEAVEN OR SOMEWHERE WOULD DO THE TRICK. SUCH A SIMPLE SOLUTION, THAT I SUPPOSE IT CAN'T WORK. REALLY, THOUGHT IT IS A TERRIBLE PROBLEM AS THINGS START TO GROW IN THE WORLD, BUT PHYSICISTS ABSOLUTELY REFUSE TO WORK WITHOUT CERTAIN INSTRUMENTS AND I THINK THAT NAME MANIPULATORS OUGHT TO ADOPT THE SAME STANCE. IS ALL THIS SILLY? CAN YOU IMAGINE A PROCESS SOMEWHERE THAT YOU SEND A "STRING OF WHATEVER GIBBERISH YOU DESIRE" AND IT SENDS YOU A VIRGIN "NAME" (NUMBER) THAT YOU CAN USE FOREVER AND BE ASSURED THAT NO ONE ELSE WILL EVER GET TO CREATE THAT NAME? LAST WEEK AT ARPA LICK WAS ACTUALLY VERY CONCERNED ABOUT WHO GIVES OUT NAMES (FOR USER IDS) AND I THINK THAT IT WOULD BE A HANDY THING IF THERE COULD BE A TECHNICALLY FEASIBLE WAY TO ESTABLISH SUCH A GENERATOR OF NAMES FOR PROCESSES THAT HAD TO HAVE UNIQUENESS FOR ITS NAMES.

OH WELL,

DAN

24-JAN-75 08:52:06,1452

Date: 24 JAN 1975 0852-PDT

oldmessages

From: POSTEL
 Subject: NCPs and Survey
 To: Carlson at ISI
 cc: postel

111

Bill:

I am sending you my last "extra" copy of the report, for future reference the appropriate source of copies is MITRE, the person to contact is Howard Duffield (thats at MITRE Washington).

112

As to the info you requested i think that be "tele handler" you mean local interactive terminal handler, and will try to answer what i know on that assumption.

113

NCP Size these numbers should be taken in perspective, they dont measure the same things in every case in particular across the 12 systems surveyed the size reported varies by more than a decimal order of magnitude. The total size is composed of three factors the code, the tables, and the buffers. The last (buffers) is quite variable and in some cases dynamic so the size given may represent the size in use with a (at the time of the survey) average load. Now the numbers: UCLA = 25K bytes, UCSB= 105K bytes, RAND =47K bytes.

114

The UCLA and UCSB implementations are very different in organization. To my understanding neither interfaces to the local interactive terminal handling code.

115

The other questions you ask take a bit of picture drawing and should really be refered to the appropriate guys at the sites. I did not cover those aspects of the network code in my survey. N.B. the NCP is only a part of the network related code in a host.

116

--jon.

24-JAN-75 09:07:14,783

Date: 24 JAN 1975 0907-PDT

From: WATSON

Subject: critical questions still open

To: irby, michael, maynard, postel, white, martin, lehtman, To: belleville, andrews, victor

cc: watson

117

The file (nls=sources,nls=questions) contains critical unanswered questions. Please read, will assume that CHI and EKM are responsible for getting them answered by next thurs at latest. I do not see how we can freeze the split desing until they are answered. We need to decide what is importnat and must be thre by July and what can be pushed to after July. We must aim to be integrating the system by April, NLS Frontend and hopefully WM if we really hope to be up in

oldmessages

July. Our reputation depends on this. If there is any slack anywhere lets pick it up. Thanks Dick -----

24-JAN-75 09:34:28,876

Date: 24 JAN 1975 0934-PDT

From: WATSON

Subject: attendance at next NSW meeting

To: carlson at ISI, crain at ISI

cc: postel, irby

118

Jon Postel and I will definitely be there. Since this meeting is crucial in the sense that this is basically the last chance to get any unanswered questions answered Charles maybe should also go although he just recently had a fairly serious hand accident and it may not be possible for him to travel extensively at this time. We are preparing scenarios and questions will send a suggested agenda from our point of view next week. Bill should I still plan to come down to DC to talk with Russell, if so I would like it to be on Monday or Fri of that week. I basically object to three day meetings. If they are organized properly two should be enough. I didn't like the last one much as it was not very productive. Dick -----

24-JAN-75 10:38:43,1128

Net mail from site USC-ISIA rcvd at 24-JAN-75 10:38:39

Date: 24 JAN 1975 1033-PST

From: DCROCKER at USC-ISI

Subject: Telnet option sub-acknowledgement

To: Schantz at BBNA

cc: Postel at ARC, DCROCKER

119

Rick -- I, also, like the idea of a uniform handling of parameter acknowledgement. I wish I could think of an approach that appealed to me.

120

<IAC><SB><OPTION><OK><AIC><SE> is fraught with problems, since each option deals with the first byte after <option> is different ways. I don't believe it will be possible to get agreement on its handling. That leads me to wonder about putting the <OK> (and, by implication, <NOT=OK>) on the other side. That is (brace yourself, Jon): <IAC><ACK/NAK><SB><OPTION><IAC><SE>. This has many problems, but may work. In fact, the SB and SE parts may not be necessary, depending upon how self-identifying the Ack needs to be. (Will an option, at any point in time, be awaiting at most one ack?).

121

A larger, and uglier, problem with this approach is the part of the subnegotiation would now take place "outside" of the SB/SE parentheses.

122

Yuch.

123

oldmessages

Dave,

124

24-JAN-75 14:20:30,276
 Date: 24 JAN 1975 1420-PDT
 From: FEINLER
 Subject: Visit from Craig Fields
 To: postel

125

Craig Fields will be at the Institute next Friday for a "general friendly visit". Just thought I would pass on the info. Don't know time or particular occasion.

126

Jake

24-JAN-75 16:28:47,2347
 Net mail from site MIT-MULTICS rcvd at 24-JAN-75 16:28:04
 From: Kanodia,CompNet at MIT-Multics
 Date: 01/24/75 1926=est
 Subject: RFC 662

127

Alex:

128

In response to your remarks on RFC 662, I would like to offer the following comments:

129

1 - The complete sentence that you refer to (and the one preceding it reads as follows:

130

An old version of the IMP-to-Host protocol requires that a host may not transmit another message on a network connection unless a Request-for-Next-Message (RFNM) has been received in response to the previous message. Even though this restriction has now been relaxed, the protocol does not specify any way to recover from transmission errors that occur while more than one RFNM is pending on the same connection.

130a

I believe that the terms "network connection" and "connection" are crucial in these sentences. At one time the IMP-to-Host protocol recognized the concept of a network connection in terms of links. In as much as the IMP-to-Host protocol no longer recognizes the concept of links, it is certainly ambiguous to state that "the protocol does not specify any way to recover from transmission errors on the same connection." It is up to the Host-to-Host protocol to specify recovery procedures; it may use the IMP-to-Host protocol features of message-id and "Incomplete Transmission Message". I am sorry for this inadvertent ambiguity/error.

131

oldmessages

2 - Your conclusion that features described in RFCs 533 and 534 could be used to improve bandwidth, even if no other host implements these features, is partly incorrect. Consider a Host A which uses message sequence numbers while sending messages to a host B which does not use message sequence numbers and can not detect the loss of messages. It is quite possible that B will receive a sequence of messages with a hole in it (undetected by B), and take some disastrous action (unimplied by A) even before A could abort the connection.

132

3 - I have tried to deal with some of these problems in my RFC 663 and, as pointed out in the same RFC, the proposed recovery protocol uses the ideas developed in RFC 534.

133

- Raj

134

copy to: walden, mcquillan at bbn=tenex
 copy to: postel at sri=arc
 copy to: pogram, clark at mit=multics
 24-JAN-75 18:17:03,894
 Net mail from site SRI-AI rcvd at 24-JAN-75 18:17:01
 Date: 24 JAN 1975 1716-PST
 From: LYNCH at SRI-AI
 subject: PCP
 To: white at ARC, postel at ARC

135

Hey guys,
 I have finally absorbed the first pass at your stuff and have one huge worry. It appears to me that you are moving "system programming" considerations UP to the user programmer instead of DOWN from him. I got seduced into thinking what you were saying was good stuff until I realized that it was my kind of daily consumption you were formalizing. Maybe I am on the wrong track, but aren't we (the cs world) supposed to be making the world better for non-specialists? I probably have missed something in the total scheme, but I do want to chat with you about this to settle my mind and to give you the benefit of my tears about system programming...

Dan

PS As a spec for an operating system it is great.

25-JAN-75 18:49:37,380
 Date: 25 JAN 1975 1849-PDT
 From: IRBY
 Subject: nls-questions
 To: watson, MICHAEL, white, postel, MAYNARD, martin, kelley, To:
 andrews, victor, BELLEVILLE, LEHMAN

136

I have added comments to <nsw-sources, nls-questions,>. I suggest you reread it. -- Charles, p.s. I understand we will meet about

oldmessages

this on monday, please read before the meeting to save time, -----

27-JAN-75 12:08:26,541

Net mail from site OFFICE-1 rcvd at 27-JAN-75 12:08:22

Date: 27 JAN 1975 1111-PST

From: CRAIN at OFFICE-1

Subject: NSW Long-range Scenario

To: NSW-DISTRIBUTION:

cc: crain

137

Please see [Office-1]<crain>Scenario.txt;1 for a long range view of how I expect the NSW will fit into the working environment of AFDSDC. This should allow you to better see some of the high level scenarios I expect will be supported by NSW (in its 'mature' incarnation), and what I think should be available early in the project.

/Larry

138

27-JAN-75 13:15:29,207

Net mail from site USC-ISIA rcvd at 27-JAN-75 13:15:28

Date: 27 JAN 1975 1308-PST

From: CARLSON at USC-ISI

Subject: MITRE REPORT

To: POSTEL at SRI-ARC

139

CAME IN TODAYS MAIL

THANKS,

BILL

140

27-JAN-75 14:27:37,424

Date: 27 JAN 1975 1427-PDT

From: POSTEL

Subject: Reconnection Protocol

To: Dcrocke at ISI

cc: Schantz at BBN, postel

141

Dave:

My comment on your suggestions==OOO!

142

Rick and I have previously discussed the inclusion of the option name and an "OK" byte in the acknowledgement. I feel that it is a satisfactory situation. Your idea to put the ACK outside the SB,,,SE phrase is unacceptable.

--jon,

143

28-JAN-75 11:38:25,7296

Date: 28 JAN 1975 1138-PST

From: WHITE

oldmessages

Subject: Answers to PCP Questions

To: mandell at ISIB

cc: postel

144

Dick==

145

Processor Priority

146

I prefer at the moment, I think, to let your suggestions for dynamically variable processor priority, and call-queue depth assignment via ITDPRCS, sit in my post-implementation queue. Although I can see the possibility of their utility, they tend to make processors much fancier than I intended, and I don't think I'm willing to commit to that yet. I'd rather wait until we have some experience with a running NSW system first.

146a

Inter-Entity Synchronization

147

The event and signal subroutines defined in PCPTNXINT are indeed for intra-process synchronization (between CF-PF and PF-PF).

147a

The lock procedures defined in PMP, however, are provided for INTER-process as well as intra-process synchronization. A data store is locked by a particular processor within a particular process. Thus locking a data store for write prevents read/write attempts by other processors within the locker's process, and other processes within the tree.

147b

We may want to add a BOOLEAN argument to LCKDATA to allow locking by an entire process with free access by ALL processors, not just one.

147b1

The lack of consistency you see between the methods by which SYLOCK and LCKDATA report the successful setting of the lock disappears if you take a larger view. In BOTH cases an event is signalled if you decide to wait. In one case, the event is specified as an argument to SYLOCK; in the other, it's specified as an argument to the CALPRD procedure by which you invoked LCKDATA.

147c

It is indeed the responsibility of PKDSMN to check the lock associated with the data store to be manipulated. The system code can't possibly do it, since it knows absolutely nothing about the data stores within a user package (not even whether one of a particular name exists). I will state that fact explicitly in Version 3.

147d

A user package presumably maintains a control block that contains such things as the name and current value of each data

oldmessages

store within the package. This control block must also contain a lock for each data store.

147d1

I also need to define a new USS that LCKDATA can call to lock/unlock a data store or at least hand me the address of the ECB associated with it.

147d2

Temporary Data Stores

148

Temporary data stores, since they are contained within PSP, are implemented entirely by PSP.

148a

Temporary data stores were intended for use in conjunction with CALPRO's argument- and result-list masks, providing a place where a caller could temporarily save the results of one procedure and then use them as arguments to a subsequent procedure. Furthermore, their use was only thought practical when the intermediate results were fairly large, in which case efficiencies would probably result from not having to ship them back to the caller and later to the (new) callee. None of this is meant to suggest that any other use ISI may see is necessarily unreasonable, but rather just to provide some background.

148b

Consistent with the above, a temporary data store is "known" only to the process containing the procedure that made the call to CRTTMP which created it. That fact allows, for example, two inferiors of some process P to each independently create a temp with name "TEMP" without running into a name conflict, which is just what one wants PROVIDED the intended application is as suggested above.

148c

The word "known" refers to who PCP will permit to reference an entity, whether it be a procedure, data store, process, etc.; rather than what portions of the user code happen to be aware that the entity has been created.

148c1

If one section of user code creates a temp whose name is chosen at random at run-time, then of course that temp is not "known" (in a DIFFERENT sense of the word, one which I never use) to other sections of the code until its name is communicated to them. However, from PCP's standpoint, the temp is known (i.e., addressable) from anywhere within the process.

148c2

From your questions, I gather you want to use temps just like one uses builtin data stores, i.e., you want them to be addressable by any process that has a PH for the process that contains the temp. We could, of course, add a BOOLEAN argument to CRTTMP, which specifies the scope of the data store you wish to create. Is there a reason that you can't simply build in the data stores you

oldmessages

need at compile time, rather than defining them as temps at run time? 148d

I strongly resist your desire to give user code control of temps by means other than RDDATA/WRDATA. I think you need to use standard data stores, over which you already have complete control. 148e

It turns out, now that I think of it, that since you DO have complete control of the data stores in your own package, you CAN define any additional ones you need at run-time (i.e. you can implement temporary data stores in packages other than PSP). Such data stores would, however, violate the definition given in the PCP document (i.e. data stores exist throughout the life of a process). If you decide you want to do this, I would like to know about it; it may be entirely reasonable. 148f

PSI System 149

The details of system-code PSI usage aren't entirely worked out yet, but I will if possible use just one channel. I expect my usage of the PSI system to be confined mainly to implementation of SYLOCK and SYUNLK. 149a

I may need to provide some SSS's by which user code can manipulate the PSI system. I can't, short of using the JSYS trap mechanism, PREVENT their doing so directly. 149b

Processor Composition 150

Each PF will in fact contain a shared copy of the same SAV file, and thus will contain the same packages (procedures and data stores) as every other PF. Doing otherwise seems a bad idea and would be difficult to implement. 150a

I cringe at the thought of building an entire "system" as a single process. A process is a COMPONENT of a system, and a system of any size will consist of SEVERAL processes. It seems unnecessary (at least at this point) to develop disciplines for solving the address-space-size problem within a single process, when one of the powerful things about PCP is that it permits you to solve that problem by partitioning the system into SEVERAL processes. 150b

New Arguments in RSMPRO 151

The new arguments supplied to a previously-called procedure via RSMPRO bear no necessary relationship, either in number, form, or content, to the original arguments supplied via CALPRO. 151a

oldmessages

The arguments supplied via CALPRO are available to the caller until he makes a permanent return, while those supplied via RSMPRO are available only until he makes his next temporary return (or of course a permanent one).

151b

--Jim

29-JAN-75 12:05:22,3013

Net mail from site OFFICE-1 rcvd at 29-JAN-75 12:05:13

Date: 29 JAN 1975 1159-PST

From: WINGFIELD at OFFICE-1

subject: NSW meeting agenda

To: NSW steering committee;

152

The following are agendas for the two NSW meetings next week,

153

1. Boston meeting

153a

date

153a1

5,6 Feb.

153a1a

Agenda

153a2

Wed morn: COMPASS, BBN, SRI, Carlson, (MIT) discuss TENEX TBH questions,

153a2a

Wed aft: COMPASS, BBN, SRI meet to discuss SRI proposed WM issues:

153a2b

1. userid system

153a2b1

2. mail ident

153a2b2

Thurs morn: COMPASS, SRI, MIT discussions to be announced.

153a2c

2. Princeton meeting

153b

date

153b1

6,7 Feb.

153b1a

Agenda

153b2

Thurs morn at 0900: SAI, Triolo, Muntz, Crain, and Wingfield meet to discuss B4700 interface hardware/software, user interaction and scenarios. Crain will discuss the scenarios that are expected to be implemented by 1 July.

153b2a

oldmessages

RJE- In this scenario the user sits down at a terminal, wakes up the WM (or FE?) and engages NLS to create three files: a JCL file, a COBOL source file, and a data file. He then specifies that the three files be sent to the B4700 for submission as a remote job entry. Upon completion of the job, the user is notified (if still on-line) or a message is sent to him if off-line. The user then peruses his output file for errors. 153b2a1

TIP- The user requests NSW to go into TIP mode. NSW provides a TIP-like service for general network access. (The actual user interactions can follow TIP, ELF, or TENEX/TELNET patterns). The user requests a connection to a NON-NSW host, does some work at that site, then closes that connection, and exits from the TIP mode. 153b2a2

File Transfer- The user specifies that an NSW file be moved to storage at the B4700 site. 153b2a3

Tool invocation on B4700- There is a tool which checks whether all logical paths are exercised by the input data by imbedding in the source language counters and traps at branch points before compilation. The user specifies that this tool be run against his COBOL source file to produce another COBOL source file which is then sent to RJE. 153b2a4

Thurs aft: Discussion of the B4700 NSW software requirements, the PDP-11 DEC IMP-11a interface driver software. A discussion of the responsibilities of ADR in regards to implementation of the TBH software will also occur. 153b2b

Fri morn: SRI and Carlson will join us in discussions of how the Front-end software interacts with the TBH software. Any problems brought up the previous day in regards to the ADR software will be discussed. 153b2c

154

29-JAN-75 12:50:47,286
 Net mail from site OFFICE=1 rcvd at 29-JAN-75 12:50:44
 Date: 29 JAN 1975 1231-PST
 From: WINGFIELD at OFFICE=1
 Subject: changes
 To: NSW steering committee:, NSW PI's and others: 155

Let me know if there are any changes to the NSW meeting agendas I just sent out,

oldmessages

Mike

156

29-JAN-75 18:33:31,698

Net mail from site SRI-ARC rcvd at 29-JAN-75 18:33:29

Date: 29 JAN 1975 1833-PST

From: POSTEL at SRI-ARC

Subject: NSW protocols

To: NSW-DISTRIBUTION:

157

There is now available a document that describes changes to the NSW Protocols set of documents. This is a dynamic document that will evolve as the implementations emerge and it will be the basis for an eventual version 3 of the documents. The new document is available on line at SRI-ARC in three forms:

158

for NLS viewing <POSTEL>NSWV2CHANGES.NLS

159

for printing at ARC <NSW-SOURCES>NSWV2CHANGES.PRT

160

for copying over the net <NLS>NSWV2CHANGES.TXT

161

note that this is a companion to the PCPV2CHANGES document.

--jon

30-JAN-75 08:06:29,1822

Net mail from site MIT-MULTICS rcvd at 30-JAN-75 08:06:15

From: Pogram,CompNet at MIT-Multics

Date: 01/30/75 1020-est

subject: suggestions for improving NSW protocol document format

162

To: Jon Postel

Copy to: Jim White, Raj Kanodia, Bill Carlson, Steve Warshall,

Dick Watson

163

Jon,

164

As you know, we have been looking at various NSW documents here. Our secretary has lamented the lack of organization or cataloging of these documents. And so have we. For example, consider that each of the Version 2 protocol documents contains, on its cover page, a reference to the "procedure Call Protocol (PCP -- 24459)". On none of these documents is the document's OWN NIC # to be found on the cover page! (This is true even of the PCP document which is referenced by NIC # on the cover page of every other NSW Protocol document.) Furthermore, it would be nice if the page headers inside the document, instead of giving the NLS user's name and date (the first of which is useless for external distribution), gave the package abbreviation and the document's NIC # also.

165

oldmessages

Thus, I would like to see in the upper right-hand corner of the cover page of each of the documents two lines: one with the package abbreviation and one with the NIC #. On the header line of each inside page I would like to see the same two pieces of information.

166

There is a further problem with the cataloging of "documents" distributed solely as Network mail. There is no way to reference these except by the sender's name and the date (unfortunately). Perhaps as NSW work begins to shape up, people could spend a little more time in document preparation before distributing them via Network mail, and take a moment to get a NIC # to put on the document.

167

Hope these comments are helpful.
See you next week?!

168

Ken
28-JAN-75 14:48:04,832
Date: 28 JAN 1975 1448-PST
From: POSTEL
Subject: NSW Meeting
To: Watson
cc: irby, postel

169

I had a call from Carlson this morning. He is contemplating re-organizing the meeting, and after I talked with him about our concerns on mail, idents, file names, he was even more sure that a restructuring of the mtg would be helpful. The plan at the end of our phone conversation was:
wed am: SRI & MCA & MIT people meet at MCA to discuss NSW in general
bring MIT up to speed

170

WED pm: SRI & MCA & BBN & Carlson meet at MCA to discuss Tenex as
TBH (MIT people may stay to observe)

171

THURS: SRI & MCA & BBN(?) & Carlson meet in Boston (MCA?) to
discuss MAIL, IDENTs, Filenames.

172

THURS ADR & Crain meet at Princeton to discuss B4700 interface.
(should SRI person be there ?)

173

FRI: ???

174

--jon,

31-JAN-75 09:38:47,1744
Date: 31 JAN 1975 0938-PST
From: WHITE

oldmessages

Subject: Document Identification

To: pogram at MULTICS

cc: postel, watson, warshall, carlson at ISI, kanodia at MULTICS

175

Ken==

176

Thanks for your comments re documentation identification. Each document in both the original and the more recent bound PCP and NSW document collections, as well as the three individual documents sent by mail a week ago have the author's ident, the date, and NIC catalog number on every page, including the title page. This information is "stamped" on each page automatically by our Journal as a byproduct of recording the document.

177

As you point out, however, the ON-LINE versions of some of these same documents do NOT have that stamp. The lack of header information there resulted from our efforts to make the documentation suitable for printing on remote line printers. In addition to stamping each page, the Journal stamps each statement's number in the right margin. The resulting increase in line length normally causes each line to be folded by remote systems. We have since learned how to alter the margins before journalization so that documents can have both stamps and still be presentable to remote users. For the several documents you mention, however, we chose to forgo the header information rather than modify, rejournalize, and have new catalog numbers assigned to them all.

178

We've been trying fairly hard to provide reasonable documentation, but we still have some things to learn. We'll try harder with Version 3. Addition of the document name to the header information on each page is a good idea that we'll incorporate in future material.

179

Thanks for the suggestions. --Jim

179a

 31-JAN-75 09:48:13,601
 Date: 31 JAN 1975 0948-PST
 From: WATSON
 Subject: scenario documetation
 To: irby, michael, postel

180

There are a number of scenarios in prepartation that need to be assembled together and shipped out to the NSW world as background for next weeks meetings. They should go out late today or monday by noon. Jon's are basically noops but should go out, Charles is reworking his from meeting, Elizabeth is reworking a couple rom meeting and others I have not yet seen I think. Would appreciate it if Elizabeth would take on job of getting them all together and shipped out. Thanks Dick -----

oldmessages

31-JAN-75 10:48:32,758
 Net mail from site MIT-MULTICS rcvd at 31-JAN-75 10:48:24
 From: Pogram,CompNet at MIT-Multics
 Date: 01/31/75 1349=est
 Subject: NSW Document Collections 181

To: Jim White
 Copy to: Jon Postel, Dick Watson, Bill Carlson, Steve Warshall,
 Raj Kanodia 182

Jim, 183

Say, are we supposed to be getting documentation by U.S. mail? If so,
 is anyone here on that distribution list? I personally don't recall
 ever having seen NSW documentation here which was distributed via
 U.S. mail! 184

And what is this mention of "bound PCP and NSW document collections"?
 Again, all we have is loose stuff pulled over the Net.
 Are we missing something? 185

Is anyone maintaining a running catalog/index of NSW documentation?
 Our secretary has been clamoring for same. 186

Ken
 31-JAN-75 13:52:45,557
 Net mail from site MIT-MULTICS rcvd at 31-JAN-75 13:52:37
 From: Pogram,CompNet at MIT-Multics
 Date: 01/31/75 1653=est
 Subject: Bound volumes of protocol documents 187

To: Jim White
 Copy to: Jon Postel, Dick Watson, Bill Carlson, Steve Warshall,
 Raj Kanodia 188

Jim, 189

Raj Kanodia just informed me that he did receive the bound volumes of
 protocol documents but squirreled them away because they were totally
 unreadable. And indeed they were, so that clears up the mystery of
 the bound volumes == but is there a mailing list we should be on? 190

Ken
 3-FEB-75 07:02:43,450
 Net mail from site CCA-TENEX rcvd at 3-FEB-75 07:02:40
 Date: 3 FEB 1975 1002=EST
 From: JF at CCA
 Subject: DFTP AVAILABLE AT SRI-ARC & ISI

oldmessages

To: POSTEL at ARC
cc: DALE 191

AS YOU MAY KNOW, DFTP HAS BEEN INSTALLED IN <SUBSYS> AT ARC,
IT ALSO EXISTS, WITH TWO OTHER PROGRAMS THAT TALK TO THE
DATACOMPUTER, RDC & SMART, IN THE <CCA> DIRECTORY AT ISI. MEMOS
ACCOMPANY
DFTP & RDC IN <CCA>; ALL OF THIS SHOULD BE GENERALLY ACCESSIBLE.

3-FEB-75 07:31:55,548
Net mail from site MIT-MULTICS rcvd at 3-FEB-75 07:31:48
From: Pogran,CompNet at MIT-Multics
Date: 02/03/75 1032=est
Subject: Bound NSW Documents 192

To: Jon Postel
Copy to: Jim White, Dave Clark, Raj Kanodia 193

Jon, 194

The bound documents popped out of Dave Clark's in-basket
Friday. Apparently there was no cover letter with them, and
Dave had no idea that HE had been sent THE copy for our group. In
fact, he had no idea why he should have been so blessed,
but ... 195

Well, it looks like we now have good-quality documentation. 196

Ken
3-FEB-75 08:36:20,405
Date: 3 FEB 1975 0836=PST
From: WHITE
Subject: PCP Documentation for VLDB Committee
To: balzer at ISIB
cc: watson, postel, carlson at ISI, fields at ISI,
cc: crocker at ISIB 197

Bob-- I put hardcopy in the mail today to Gains, Skinner, and
Srinivasan. Benoit and Goldberg were already on the distribution
list and the most recent documents have already been sent to them.
--Jim

3-FEB-75 11:14:20,586
Date: 3 FEB 1975 1114=PST
From: WHITE
Subject: PCP User=System Interface
To: mandell at ISIB
cc: Postel 198

oldmessages

Dick-- 199

1) The parameter list does indeed contain the address of the result list in (PCPTNXINT,6a3b3). Sorry. 200

2) The parameter list lifetime you suggest is exactly what I had in mind. Just one of the myriad details missing from the documentation. I appreciate all the feedback; Version 3 may even turn out to be self-consistent. 201

3) [SRI=ARC]<NLS>PCPV2CHANGES.TXT has been updated. You may want to suck over a fresh copy. 202

--Jim 202a

3-FEB-75 11:52:15,1909

Date: 3 FEB 1975 1152-PST

From: IRBY

Subject: talk with millstein

To: watson, postel 203

just had a phone conversasion with bob millstein:

1) he does not want to write up the "white box" descriptions at all except to tell us about the ones we say we need. He says writing is physically difficult for him. I asked why not use a secretary, he mumbled something. I agreed to write a memo describing what we need to know as a guide to what he must provide. This should be raised as an issue at meeting. I think it can work by just having them provide what we need but there may be some differences in our world models that we cant see because they have never written down their model of what wm would do for fe and tools. 204

2) he wanted to know if he should call a fixed routine in fe when handed a file name that was ambiguous. I told him I could imagine cases where the tool created the file name and going straight to the user would not allow the tool to react to the problem. I thought a help return was better way to handle the problem. 205

3) he had a different model of tool interaction that required thatt the grammars for the tools be changed to allow them to interact. this would clearly work but forces changes in grammars each time you want two tools to interact that didnt previously. 206

4) the matter of use-types and file conversions came up. he seemed quite fuzzy on the subject and talked about usetypes as though they were inconsequential. I suggested they were attributes of the file and foormed the bases for invoking conversuion routines when needed.

oldmessages

we assume they are providing the facility to do the conversion and that we will provide conversion routines for nls files. 207

In general I felt discouraged by the call. They feel like they are way behind to me and I fear they will not be able to provide what we need to make the NSW work by July. 208

-- Charles.

3-FEB-75 23:41:46,67007

Net mail from site SRI-ARC rcvd at 3-FEB-75 23:40:59

Date: 3 FEB 1975 2250-PST

From: MICHAEL at SRI-ARC

subject: scenarios, help, problems: NSW Meeting

To: NSW=DISTRIBUTION: 209

SCENARIOS 210

The following scenarios are in response to Larry Crain's memo announcing the Feb NSW review meeting. We have numbered the points we are addressing according to the numbers in Larry's original memo. 210a

3A) LOGIN AND LOGOUT 210b

This hasn't changed enough from CHI's earlier scenario (JOURNAL # 24534) to warrant much discussion. When a user types some character on an unused terminal, the FE collects project, username and password and calls login procedure in WM [We would write actual call here but don't have WM documentation]. The WM returns user-id, user profile for FE-interaction, and list of tools available to this user. User is then talking to NSW-EXEC grammar with commands to manipulate whole files, perform terminal-specific operations, get accounting information, logout, etc. In addition the user always has available (while running any integrated tool) the universal commands to run tools, terminate tools, get semantic help with tools or the NSW as a whole. The number of commands in the universal set should be kept small to avoid undue restrictions on other tool command languages. 210b1

[Since FE has list of allowed tools, must it get permission from the WM before allowing user to run a tool?] 210b1a

3B) INVOKING, USING, AND LEAVING THE TELNET-ELF TOOL 210c

a) using ELF outside NSW 210c1

There will probably be a command in the NSW-EXEC that allows

oldmessages

the user to leave the NSW FE and use the normal ELF exec. Once this is done, the user is on his own until he returns to the NSW FE.

210c1a

The user will not be able to reference NSW files by their NSW names. He will not be able to talk to the WM or NSW tools.

210c1a1

b) using a non-integrated tool

210c2

The NSW will allow users to use tools that are not fully integrated into the NSW. These tools will be accessed either a) through a common tool grammar that knows nothing of the behavior or intended function of the tool or b) through a tool grammar that has been tailored somewhat for that tool.

210c2a

In case (a) the user will type characters or strings to the tool and it will respond, with the FE doing all or no echoing. This will be much like operating a full-duplex or half-duplex character-at-a-time or a line-at-a-time terminal. There will be no commands given to the tool in the normal NSW sense of command words and parameters. The user will be able to get very little help from the FE for this type of tool since it has only one command which is just the collection of a literal string from the user, but he will have the universal commands available to him by typing an escape character. There will also be a command in the NSW-EXEC to allow the user to change his escape character. Please note that while running such a character-at-a-time tool, the normal characters for <back-space-character>, <back-space-word>, <help>, etc. will not have their normal NSW function but will transmit that character to the un-integrated tool. Note also, that for line-at-a-time tools, the writer of the grammar may specify whether or not to send a carriage-return linefeed at the end of each string.

210c2b

In case (b) above, the tool grammar will contain commands tailored to the function of the tool and will appear to be more like an integrated tool.

210c2c

In both of these cases the NVT package will be used to drive the actual tool through telnet. The only difference is in the commands that are available to the user. In both cases the user may reference NSW files and may slue to other tools from the un-integrated one (see CHI's memo on tool interaction, 25120).

210c2d

oldmessages

The use of file names requires that the tool's attempt to access the file be trapped and that the file be moved to the local host by the WM,

210c2d1

3C) CREATING BATCH JOB

210d

This is covered in the NSWV2CHANGES file under the RJE=MODEL section.

210d1

3D) CALLING, USING, AND LEAVING NLS

210e

It should be understood that NLS like NSW represents a system for accessing a number of different tools. Thus, within the NSW the various tools contained in NLS will be tools in the NSW. There will be no single NLS tool. There will be an editor, a calculator, a send-mail, a user-profile tool, and perhaps other tools.

210e1

The universal command for running a tool is used to specify the desired tool, say the editor.

210e2

There is a tool naming issue here. We should not, for example, use up all of the obvious good names just because we are adding the first few tools. We propose that the user or his project leader supply the simple name which he will use and that this be translated into a unique system-wide name for the tool. Thus the user may ask to run the "editor" and for him that translates into "NLS=EDITOR." For another user, "editor" might mean some other editor tool.

210e2a

When the user logs into the NSW, the FE fetches from the WM a list of the tools this user is allowed to access. This list could consist of (simple name, system name) pairs.

210e2b

When the user issues the run-tool command he may type ? to find out which tools he may run. When the user specifies which tool is to be run, the FE calls the WM, passing it the (system) name of the tool and gets back the tool-id for this tool [is this necessary?]. If the grammar for the tool is already in the FE, then it is not reloaded. Otherwise, the FE calls the WM with the toolid and gets back the grammar for the tool.

210e3

We could implement this in such a way that the FE keeps track of tools used and does not bother to call the WM if this user has previously in this session run this tool. As mentioned above, we could not bother the WM at all if the tool name is in the list of legal tools for this user. The WM can still stop a user from running a tool on a particular file since all file references must pass through the WM.

210e3a

oldmessages

The FE then inspects the grammar to determine which pcp process(es) must be created to support this tool. For each such process the WM is called to create it and introduce it to the FE. The FE opens the appropriate packages and allows the user to specify commands to the tool. 210e4

While the tool is being used, various procedures in the processes are called to carry out the semantics of the commands. 210e5

If the tool needs to read or write on a file it calls the WM to get the file. 210e6

While the user is using the tool, he may give a universal command such as run another tool or terminate the current tool. If he elects to run another tool without first terminating the current tool, the FE simply switches grammars and holds any output from the old tool. The user may later terminate the new tool and resume the old tool or he may give the resume command for the old tool without terminating the new tool. This is what is meant by the term "slueing". When this happens, the FE switches back to the original grammar. 210e7

When the user terminates a tool, the WM is called to delete the process(es) that support this tool and the grammar's use count is decreased by one. If the use count is zero, then no user is using that tool and the core occupied by the grammar can be reclaimed if needed. 210e8

3E) CALLING FOR PROOFS, PUBLICATION TO COM 210f

A document has been entered into an NLS file and edited for content, spelling, grammar, etc. 210f1

The document is an Air Force 177 series manual in standard format and is to be produced, using COM, in both hardcopy and microfiche. 210f2

The user logs in to NSW and starts the NLS-Format tool. The Format grammar asks him to specify the name of the file to be formatted, whether it is to be formatted for COM or the line printer, and which of the standard formats to use. 210f3

The Frontend makes an out-of-line call on the Formater backend and the user is free to do other work while the formater inserts output processor directives in the file. 210f4

The user is notified when the process completes. 210f5

oldmessages

He may now examine the file containing directives, using the NLS-editor or immediately start the Output Processor tool. This tool produces two files: one is a sequential file, formatted for a COM device to do the actual production of the document. The other is a file that serves as a page index both to the sequential COM file and the source file. In addition to pointers to the beginning and end of each page, the file contains the state information necessary to allow the output processor to start processing in the middle of a file. The pointers in this file are used to display formatted pages on the graphics scope and to permit reprocessing of single or groups of pages from the source file.

210f6

Using the NLS-editor tool, the user may display his source file on the alphanumeric display and request the editor to display the COM formatted version on the graphics display.

210f7

Viewing the COM formatted document one page at a time, he may edit both text and directives in the source file. Hard copy proofs of all, or selected pages of the formatted file may be made on the copy printer at the workstation.

210f8

When editing is finished, the user then processes those pages that have changed creating new sequential and pointer files.

210f9

When the output processor produces a satisfactory set of proofs, the works manager is used to transfer the sequential file to a tape at whatever host maintains contact with the COM facility. (Note: this might not be an NSW host.)

210f10

3F) EXPLICIT (USER DIRECTED) FILE MOVEMENT INTO, OUT OF, AND WITHIN NSW

210g

This is accomplished via the NSW-EXEC's rename/copy/delete file commands. For copying files into and out of the NSW, the user must supply the necessary information to allow the file to be properly transferred and use-typed.

210g1

The FE will provide some abbreviations for the local card reader, printer, and tape drive for use in these commands. If the file to be inserted into the NSW file system is online somewhere the user must supply the pathname to the file.

210gia

We expect that the path names will look just like those used now in FTP. We also expect that MCA will provide procedures (in the WM or in a separate process) that are capable of talking old FTP and NSW file names (this could

be done using the monitor call trapping mechanism for un-integrated tools).

210g1a1

It should be pointed out that we expect the WM to provide a file-name and file-name=field completion facility to the FE so that the user need only supply part of a file name and request the system to supply the rest for him (ala ESC and ^F in TENEX).

210g1b

In addition, we should state that since all tools must be able to refer file references to the WM, we see no value in the FE doing so also. Thus, we are not planning to report file references to the WM except, of course, as arguments to calls on WM procedures to support NSW-EXEC file commands, etc.

210g1c

We would also hope that the WM file system will provide the user with a facility like the MULTICS working directory or the TENEX connected directory. If so, there will be a command in the NSW-EXEC to specify this.

210g1d

3G) HELP FEATURES

210h

This is accomplished via a universal command and keys on the user's terminal.

210h1

Keys:

210h1a

?: The user may type ? whenever specifying a command (except in the middle of literal text, of course). The FE responds with a list of current alternatives.

210h1a1

[We must decide what is meant by ? typed as the first character of a literal. Is the user asking what is wanted next or is the ? part of the literal text he is expected to type? We debated this for a long time for NLS-8 and finally decided to interpret it as a request for help. This occasionally causes a problem but it is easily understood by the user and happens rarely. If we use the other choice, the user will be unable to get help at times. This may be difficult to justify to the user, especially when he has several alternatives, only one of which is a literal.]

210h1a1a

SYNTAX: The user may type this key to learn the full syntax of a command, part of a command, or all commands in a tool.

210h1a2

HELP: The user may type this at any point in specifying a

oldmessages

command to obtain semantic, functional help with the command, the tool containing the command, or with basic concepts in the NSW as a whole.

210h1a3

This is simply another way of accessing the semantic help facilities as described below.

210h1a3a

Command:

210h1b

The "HELP" command is in the universal commands and is thus available while using any integrated tool. It allows the user to specify a concept or command or a tool, etc, and attempts to provide the user with useful explanations thereof. The data base for this semantic help facility will be structured nls-editor files for first-year NSW. There will be one or more such files associated (by the WM or a declaration in the CML grammar) with each tool plus one or more containing overall NSW concepts, lists of available tools, and guidelines for installing tools and tool help data bases. We are publishing guidelines for building such data bases.

210h1b1

[We should point out that it is not in our charter to supply the part of the data base describing the NSW as a whole, tools available within the NSW, and so forth. We strongly recommend that these exist but it is up to NSW management to charter and fund someone to supply these valuable aids to new users.]

210h1b1a

The process that interprets the structured data base and presents help to the user will be an instance of the nls-editor process, created at login time by the WM at the FE's request. When the user first requests semantic help this process is called with the name of the data base for the current tool. It obtains this file(s) plus the NSW-help file(s) from the WM and attempts to help the user. On subsequent invocations of the help facility, no new files will have to be obtained from the WM unless the user has switched tools.

210h1b2

Given our current model of how the help facility would work, it would be difficult for a user to find out detailed things about tools other than his current tool. We recommend that only an overview of other tools would be available to him.

210h1b2a

3H) INVOKING A TBH (TENEX, MULTICS, ?OS360/370)

210i

oldmessages

It is difficult for us to write a scenario about this since it violates our model of the NSW. The thing we think is implied here is starting a tool. It might mean starting a tool that is the interactive executive.

21011

This should be no different than starting any other tool so the scenario should be the same as 3d (Calling using and leaving NLS).

21012

3I) ESCAPING TO THE WM AND RETURNING TO A TOOL

210J

Escaping to the WM amounts to running the NSW-EXEC (this is done via a universal command or via an escape character). This "tool" is always immediately available (the grammar is always in the satellite machine and the WM process is always available). Once there the user may if he wishes suspend the current tool (in the middle of execution ala control-c in TENEX). We envision a "resume" command to be used to resume such a suspended tool when the user wishes this to happen. If the tool being resumed was not suspended, but rather the user merely slued (via the escape-to-NSW-EXEC key, a "resume", or a "run" command) to another tool and is now sluing back, any output that was waiting for the user from the tool is now presented to him.

210j1

Following is a first pass at the set of universal commands and the commands in the NSW-EXEC:

210j2

universal commands

210j2a

run tool

210j2a1

("GOTO"!L2! (<tool=name>/"ELF"/"NSWEXEC") <confirm>) 210j2a1a

Note: The !L2! is CML notation to indicate that should the user request that frequently used commands be recognized based on their first letter, that this command will not be so recognized. It will require that the user type <space> before the command. This allows tools to have commands that begin with the same letter without causing a problem for such a user. If the user types a "g" in this case, he will get the tools command starting with "g", not the GOTO command.

210j2a1a1

terminate current tool

210j2a2

("QUIT"!L2! <confirm>)

210j2a2a

oldmessages

logout	210j2a3
("LOGOUT"!L2! <confirm>)	210j2a3a
resume tool	210j2a4
("RESUME"!L2! <tool-instance-name> <confirm>)	210j2a4a
execute command in another active tool	210j2a5
("EXECUTE"!L2! <tool-instance-name> <command>)	210j2a5a
comment	210j2a6
("; " <text> <confirm>)	210j2a6a
semantic help	210j2a7
("HELP" <optional-item-list> <confirm>) or	210j2a7a
Note: The "help" command will be recognized by its first letter for users who are using this type of recognition. This command is likely to be used by new users who may not understand the <space> to get to other commands. The system help facilities should always be readily available,	210j2a7a1
("<help>")	210j2a7b
show current commands	210j2a8
("?")	210j2a8a
show syntax of commands	210j2a9
("<syntax>")	210j2a9a
NSW-EXEC commands	210j2b
rename file	210j2b1
copy file	210j2b2
includes copying files into/out of the NSW.	210j2b2a
delete file	210j2b3
show	210j2b4

oldmessages

accounting info	210j2b4a
status of active tool(s)	210j2b4b
list of files	210j2b4c
working directory	210j2b4d
escape character	210j2b4e
set	210j2b5
working directory	210j2b5a
escape character	210j2b5b
tty window position and size (display terminal only)	210j2b5c
reset	210j2b6
working directory	210j2b6a
escape character	210j2b6b
tty window position and size (display terminal only)	210j2b6c
start/stop recording session (typescript)	210j2b7
playback session	210j2b8
connect/disconnect terminals	210j2b9
simulate terminal type	210j2b10
scroll back tty window (display only)	210j2b11
3J) PASSING MESSAGES IN NSW (NOT NLS JOURNAL OR NETMAIL)	210K
This will not happen. The only mechanism for user to exchange arbitrary text messages will be a mail tool either based on SNDMSG or the JOURNAL (most likely SNDMSG), with some interaction with a Works Manager maintained data base like an "Ident file",	210K1
3K) READING/SENDING JOURNAL NETWORK MAIL	210I
sending a Letter Scenario	
You have a CRT and line-processor console hooked up to the NSW, You want to compose and send a letter via U.S. mail to John,	210I1

oldmessages

Type qs. The words "Goto (subsystem) Sendmail" appear at the top of your screen in what is called the "command feedback line". you hit the CONFIRM key and type l (the letter). 21011a

"Letter (Dear) T:" replaces the "Goto (subsystem) Sendmail" and you type John (the name of your recipient) and then the CONFIRM key. 21011b

"(Body) C:" appears in the command feedback line, 21011c

"C:" is a prompt for a command-word.
To discover what command-words are available, you hit the questionmark key. The screen contains the following words: 21011c1

Current Alternatives are 21011c1a

Branch, Group, File, Plex, Statement, or Text. 21011c1a1

You type t. "Text B/T:" is appended to the command feedback line. Type the text of the business letter. The text appears on your video screen as you type it in. Use the key marked BC to backspace characters and the key marked BW to backspace words. You may type without worrying about the end of the line as new lines start automatically when needed. After you finish typing the paragraph, you hit two carriage returns. Your screen is cleared ready for the next paragraph. When you have finished typing the body of the letter, you hit the CONFIRM key. 21011c2

"(Sincerely?) Y/N:" then appears in the command feedback line. You hit the CONFIRM key which means "yes". You are sincere. Typing n would allow you to specify another closing. 21011d

"(Author ident:) B/T:", appears. You type the author's NSW identifier. If you hit the NULL key, you are assumed to be the author. 21011e

"(To) B/T:" appears. You type in John's name and address. If John had an ident, you could have typed it instead. Multiple mixed idents and addresses are also possible here and in the "Copies to" field which follows. Lists of idents cannot contain carriage returns and addresses must contain at least one carriage return and each address or group of idents must be separated by double carriage returns as was done to terminate paragraphs above. 21011f

oldmessages

"(Copies to) B/T:" appears. Although a copy will be kept for your records, you are not sending any copies to anyone so you hit the NULL key. 21011g

"(Show Status?) Y/N/P/I:" appears. You type p CONFIRM for "Print" and your letter prints at your local printer along with all of your status information. The letter is formatted containing a letter-head, heading, salutation, body, closing, and tracings. 21011h

"(Send the Mail?) OK/C:" appears. 21011i

You don't want to send it now because you notice a misspelled word in your letter. A questionmark shows you your 21011ii

Current alternatives are:

Delete (this letter)

Modify (the letter)

Sendmail (commands)

OK

21011iii

You type m and CONFIRM, 21011ii

"Modify (the letter) OK:" flashes by and your letter along with all of it's status information in a special, clearly marked form fills your screen. You are placed in an editor with which you can modify the status form. See Modifying a Document in the documentation production section. When you are done modifying, type q CONFIRM s CONFIRM, 21011j

"Quit OK:" and "Send (the mail) OK:" appear. 21011k

The letter prints at your local printer formatted with the letter-head, heading, salutation, body, closing, and tracings. A separate page with John's address in the middle of the lower half and your address just below the middle against the left margin accompanies the letter. This can be folded in half over the letter page(s), stapled, stamped, and mailed. Or it can be cut out as a label and pasted to a printed stamped envelope. 21011l

If you specify that the letter is to be Archived before you say "Send the mail", a copy of the letter is stored in the computer which you can retrieve by its filename which is its NSW archive number. Also, a reference to the letter is placed in the list of Sendmail items you have authored. 21011m

3L) GRAPHICS USER INTERFACES

210m

Graphics user interface takes three forms - user command set, virtual graphics interface, and physical graphics interface. The later two forms are further split into two sets, one for the data structure manipulation and the other for the terminal itself.

210m1

USER COMMAND SET

210m2

The user command set is the interface level which is utilized directly to manually create, view, and manipulate the diagrams stored with an NLS file. Generally speaking this interface takes two forms - manipulative commands, and drafting aids.

210m2a

Manipulative Commands

210m2a1

The commands in this class represent those used to create and modify a display. Since these commands are defined by the CML they can be easily tailored to user preference. While the exact command forms have not yet been formulated, this set of commands would include commands to:

210m2a1a

1) create and delete whole diagrams and to move them from one part of a file to another, or from file to file,

210m2a1a1

2) create, delete, and modify the atomic elements of a diagram, such as lines, curves, points, captions and text.

210m2a1a2

3) group collections of these atomic elements into structures for the creation of "templates" which can be stored and recalled; and for general modification of the diagram. For example, flowchart symbols would be constructed from the line and text elements, recalled with additional caption material, and added to the diagram being created.

210m2a1a3

Drafting Aids

210m2a2

Drafting aids include not only commands, but also environmental variables which constrain the cursor, provide scaling information, and aid the user in determining where a line or figure should be placed. For example, one command will set the resolution of the cursor, to effectively place a grid work over the

oldmessages

screen so that alignment of figures within the drawing
can be accomplished, 210m2a2a

VIRTUAL GRAPHICS INTERFACE 210m3

A virtual graphics interface will be needed to insure upward
compatibility with new graphics hardware (for example the
moderate cost minicomputer based graphics terminal), and to
provide the programmer with a consistent set of primitive
routines on which to base specific graphic user programs, 210m3a

PHYSICAL GRAPHICS INTERFACE 210m4

The virtual graphics interface will call the appropriate set
of routines within the physical graphics interface,
primitive calls in this group will maintain and move around
within the NLS file system storing, modifying and retrieving
graphics data (as do the current text handling routines);
and provide access to the physical graphics hardware (the
routines which actually write on the display), 210m4a

The file system and the atomic elements for graphics are
described in (belleville,nls=file-structure,), 210m4b

The physical terminal primitives for the initial (or
minimum) graphics configuration are: 210m4c

gbegin() open the graphics port and stop tracking the
cursor, 210m4c1

gend() resume cursor tracking, 210m4c2

gclear() clear the screen, 210m4c3

gline(pointer to linework data structure,pointer to
coordinate transformation matrix,pointer to line type
descriptor data structure) draw a line of the type
specified using the given transformation, 210m4c4

gcap(pointer to a text data structure,pointer to a
window,pointer to a transformation for the window,pointer
to a text type (font etc) data structure) place the text
within the window as given, 210m4c5

glexport(coordinate data structure) return the coordinates
of the last cursor coordinate picked by the user at the
terminal, (constrained by existing environment
variables) 210m4c6

oldmessages

3M) DOCUMENT PRODUCTION SCENARIO

210n

You have a hand-written report with several sections that you wish to input on to a cassette, place into the NSW file system, format, and print. You have only a typewriter-like terminal with a cassette device plugged into an NSW frontend computer. Note that the scenario using a CRT and line-processor instead would be considerably simpler than this. There are three major sections in this scenario. 1) typing onto the cassette tape and reading it into an NSW file, 2) viewing and editing the file online, 3) formatting and printing the edited file.

and print. You have only a typewriter-like terminal with a cassette device plugged into an NSW frontend computer. Note that the scenario using a CRT and line-processor instead would be considerably simpler than this. There are three major sections in this scenario. 1) typing onto the cassette tape and reading it into an NSW file, 2) viewing and editing the file online, 3) formatting and printing the edited file.

210n1

1) Typing onto a cassette tape to read in to an NSW file

210n2

Preliminaries

210n2a

Switch on the typewriter terminal and the cassette device. Place a cassette in the cassette device. Be sure the cassette device is switched to "offline" so it is not talking to the computer. Type the keys on your terminal that cause the cassette tape to rewind and place the cassette device in record mode.

210n2a1

Type in the report

210n2b

Type the title of the report followed by a Carriage-Return (<CR>) and two Line Feeds (<LF> or <CTRL-J>). Do not bother with centering any titles. This can be done automatically later.

210n2b1

Type a lowercase d followed by a space and then "Section I". The d followed by a space indicates that section I is to be located "down" under the title in the outline of the report. Type a <CR> and two <LF>s.

210n2b2

Type another d space followed by the first paragraph of Section I.

210n2b3

End every line with a <CR> and one <LF>.

210n2b4

End every paragraph and title with a <CR> and two <LF>s.

210n2b5

The lower case d space is not placed in front of the next paragraph because this and the following paragraphs in Section-I are at the same level in the outline of the report.

210n2b6

After ending the final paragraph in Section-I, type a

oldMessages

lowercase u followed by a space and then "Section II".
The u space indicates that Section II is located "up" at
the same level as Section I in the outline of the report.

210n2b7

Type another d space and the first paragraph in section
II.

210n2b8

One d space is typed before each sub-heading and the
first sub-paragraph after a heading. As many lower-case
u's are entered as is necessary followed by a space to
indicate the desired level of the next paragraph or
heading.

210n2b9

This process is continued until the entire report has
been entered. <CTRL-Z> is typed to indicate the end of
the report.

210n2b10

Backspacing to correct errors while you type

210n2c

A cassette device usually has special keys you can hit to
back space any number of characters, words, and up to the
end of the last line. These edits are made on the
cassette. In addition, you can type in any number or
combination of < to backspace characters, > to backspace
words, and ~ to backspace lines. These latter characters
will be interpreted and the edits made when the
information on the cassette is made into an NSW file of
use-type NLS in the next step.

210n2c1

Creating a NSW File From a cassette Tape

210n2d

switch the cassette machine off of record, switch it
online so it can talk to the NSW. Login to the NSW. You
are automatically placed in your "login tool" which is the
NLS editor.

210n2d1

Type gc. The words "Goto C: Cassette (tool) OK:" are
echoed. You hit Carriage Return (<CR>) which means "OK".
"CASS C:" is typed telling you that you have indeed gone
to the Cassette reading tool and it is ready for you to
specify a command-word. You type rd.

210n2d2

"Read C: Document (into file) T:" is echoed and you type
the name of the report "july-report" followed by <CR>.
This command creates an NSW file of use-type NLS. It
looks for two carriage returns to specify the end of a
paragraph or heading.

210n2d3

"Rewind tape? Y/N" appears and you type y for "yes". The

oldmessages

tape then rewinds and the report is read into an NSW file. When it is finished reading the report, "(More?) y/N:" is echoed. You answer n for "No". 210n2d4

Finally the terminal will type "CASS C:" indicating that the Cassette tool has finished reading the report into an NSW file and is ready for the next command. Type q <CR>. This returns you to the NLS editor. 210n2d5

2) Viewing and editing the file online

You have an NSW file named july-report which has been freshly input. You wish to proof-read it. You are logged into the NSW NLS editing tool. "EDIT C:" has been typed at your terminal indicating it is ready to receive NLS editing commands. 210n3

Type lfju<ESC><CR>. "Load C: File T: JULY-REPORT," is echoed on your terminal. The characters "JULY-REPORT" are also echoed on a separate line indicating that you have been placed at the beginning of the report. 210n3a

Type cq<CR>. "Output C: Quickprint OK/C:" is echoed. A copy of the report is printed on the local hardcopy printer specified in your profile. The report has a number at the bottom right of each paragraph and heading uniquely representing its position in the outline. Each paragraph is single spaced. There is one blank line separating each paragraph and title. These "viewspecs" are your default specified in your profile. 210n3b

While proof-reading the printed copy, you notice the same word is misspelled almost everywhere it occurs in the paper. 210n3c

Type gwb0<CR>. "Substitute C: Word (in) OPT/C: Branch (at) A: 0" is echoed. Then in response to prompting from the command, you type the correct spelling followed by the incorrect spelling. When you are done, the words "25 substitutions made" are typed at your terminal. 210n3d

Further proofing reveals that the first paragraph in Section II (2A) should be moved after the last paragraph in Section I (1E). 210n3e

You type ms2a<CR>1d<CR><CR>. "Move C: Statement (from) 2a (to follow) 1d L: OK:" is echoed and you are ready for a new command. 210n3f

Noticing the word "can" is typed twice in a row in the paragraph in section III marked 3B, you type dw3b "can"<CR><CR>. "Delete C: Word (at) A: 3b "can" OK:" is

oldmessages

echoed. When "EDIT C:" comes back indicating it is ready for a new command, you type the back-slash key \ and immediately, the paragraph you just edited is typed on your terminal. The word is gone.

210n3g

When you have completed all of the edits, you are ready to format the paper. For further information on NLS editing, see the TNLS-8 primer 23911, the NLS-8 Command Summary 23912, and the NLS-8 Glossary.

210n3h

3) Formatting and printing the edited file
You have loaded an NSW file name july-report which you wish to format and print on your local line-printer.

210n4

Type gf<CR>if<CR>3<CR>.

210n4a

```
EDIT C: Goto C: Format OK:
FORM C: Insert C: Format (in file at) A: (using format #)
3
```

210n4a1

is seen at your terminal followed by
"(Title:)" You type July Report<CR>
"(Author) Ident(s):)" you type the NSW identifiers of the authors.

210n4b

The Format tool then adds codes to the file to make the file conform to format number 3 which is the desired format for reports. It does such things as centering headings, adjusting margins, fixing type-font and size, and adding the title page. When "FORM C:" appears, you type q<CR> for "Quit OK:" and "EDIT: C:" is typed at your terminal.

210n4c

You type op<CR>. "Output C: Printer OK/C:" is echoed on your terminal and a formatted copy of the report is printed at your local line-printer.

210n4d

THE HELP DESCRIPTION FILE

211

Background

211a

Most of the following background information is from 24485 "Some NSW Frontend Issues..." by Charles Irby 13-NOV-74 and 24534 "A Scenario of an NSW Session" by Charles Irby 17-NOV-74.

211a1

Typing the HELP button or using the Help command available for all tools can provide you, the user, with an English description from the current tool's Help description file(s) and place you in a repeating Help command. This will be accomplished by providing a separate function, capable of

interacting with the user (via the Help command grammar in the Frontend) and using structured description files provided along with the tool grammar. This help function will not run in the satellite machine but will be invoked by the satellite whenever the user asks for semantic help with a tool. The help function will be provided with the name of the help description file(s) for the tool the user was using and a representation of the user's command state at the time he requested help. (Once a connection has been established to the help function for a user, the connection will probably be maintained until the user terminates the session.)

211a2

It is expected that the command language designers will provide the description files. It is expected that there will be one description file for the NSW as a whole, describing global concepts, organization, purpose of the NSW. This description file will be available at all times to the user. In addition, we may wish to produce a description file that is a high-level guide or "yellow pages" to all the tools accessible through NSW. At any time the Universal description file(s) as well as the description file(s) for the tool currently being used are available.

211a3

SRI has not been funded to write and maintain the NSW description file(s) and we know of no one else who has been. There seems to be a hole here.

211a4

For first-year NSW, this help function is simply a set of calls on the NLS backend, with the description files being NLS structured files (this approach is now being used within NLS).

211a5

If the user requests semantic help with a tool the Frontend automatically starts the help function (which is probably loaded as needed rather than at Frontend startup time) and passes it information on the user's parse state, the name of the help description file(s) for this tool, the name of the NSW help description file, and the user-id so it can get at the user-profile. The user may interact with the help command for a while and then resume using the original tool. If he requests help again for the same tool, he merely switches to the help function which receives new parsestate info but otherwise preserves the state from the last interaction with this user.

211a6

The Help Command

211b

The following description of the Help command is adopted from the one in the NLS-8 description file.

211b1

oldmessages

HELP=button: <CTRL-Q>

Typing the HELP button (<CTRL-Q>) at any point in a command provides a description about what you were doing and places you in the Help command which allows you to ask for more information and the meanings of terms.

211b2

Help TYPEIN/OK:

The Command "Help" provides the most complete information about a tool. After you type in any term and hit the Command Accept key (CA, <CTRL-D>), you will see the description. The Help command will be ready for another TYPEIN. TYPEIN any term you wish or the number of a "menu" followed by CA. Any time after the first description prints, you can type < followed by Y (for yes) to see the previous view indicated or n (for no) to choose a view before that. Hit the Command Delete key (CD, <CTRL-X>) to end the Help command. Capitalization does not matter when typing words in the Help command.

211b3

menu:

A numbered list of related subjects that may follow an explanation in the Help command. Typing a number followed by CA will show the explanation named. This list is called a menu.

211b3a

going-up (for advanced users): "

If you use " instead of <, you will go "up" instead "back". Going up lets you "see your surroundings." Because of the "random access" nature of Help, it is sometimes the same but can be quite different from going back. This is just a convenience, it is not necessary for using the Help command.

211b3b

A Description

211c

A description consists of an NLS statement containing a short paragraph. The first word of a paragraph can be made the "name" of that paragraph and is the term defined by that paragraph. Users of the Help command can get any description simply by typing the term. Provisions exist for using multiple words to specify duplicate terms within the same description file.

211c1

Menued paragraphs are numbered sub-paragraphs classified by the term in the paragraph under which they are located in the outline or tree-structure of the file. Only the first line of menued items appear until they have been requested by typing the corresponding "menu number".

211c2

A paragraph may consist of a term, some optional supporting words, and a pointer or "link" to another paragraph in the

current description file or any NLS file. If descriptions are written properly, you can avoid much redundancy by linking from one concept to another. The description file containing links takes on the qualities of a network. If it is well structured, it becomes a hierarchical network.

211c3

Structuring a Description File

211d

Depending on the tool, description file structure will vary. At the minimum, there must be a description of the tool in general terms. A list of descriptions of the commands available in the tool with names the same as each command word must exist in order for the HELP button to find and display them. These are placed under the general tool description in the file structure. Commands with a tree structure of alternative command words may need a corresponding tree structure in the description file describing the alternatives.

211d1

Usually, there are a few command functions which occur in many commands. These may be given names and described in only one place. In addition, step-by-step scenarios of how to do specific tasks that can be accomplished with the tool may be provided. These are written in words the user can understand which interface the user to confusing or cryptic commands. Besides pointing or "linking" to the desired commands, these "How to" descriptions can be structured to present any special terms the user needs to learn in the most effective way.

211d2

If "How to" descriptions are provided, they are usually listed in an appropriate order terminated by the branch containing all of the command descriptions. This "command description branch" starts with a statement named "commands" which appears as the last menu when reading the general, top-level description of the tool.

211d3

The NSW description File(s)

211e

The NSW description file(s) will contain descriptions of all of the commands in the Works Manager (WM), and the Front End (FE), the NSW-EXEC and Universal commands. Some subset of these commands will be "universal" commands available to all tools that are integrated into the NSW.

211e1

In addition, any high-level concepts and definitions of terms necessary to use the WM, the FE, and the NSW in general should be available here. This can include general descriptions of tools or, to avoid duplication, links to tool description files. The various tools can be placed under subject headings and indexes to the terms used in the description files of each

oldmessages

tool can be provided thus making up the "yellow pages" of the NSW. Such links to description files can be followed using the Help command if the access controls allow it. In the future, it may be desirable due to the simplicity of the Help command to actually startup a tool in this manner.

211e2

We know of no one funded to write any of the NSW description file(s).

211e3

Helpd: Proposed Help Description File Development Tool

211f

We recommend that in the second year of NSW a Help description file development tool be built. The purpose of this tool would be to help create, maintain and publish a tool's description file. The tool would not only prompt a tool builder for commands and Help descriptions, but would also perform verification of the links and structure in his Help data bases.

211f1

IMPORTANT AREAS FOR DISCUSSION

212

FILENAME

212a

The NSW filenameing convention used by the NSW Works Manager (WM) will differ in significant ways from both TENEX and current NLS filenameing conventions. One of the ARC goals is to ensure a consistent user-interaction across tools integrated into the NSW. This means the same convention should be used for naming files in all NSW tools. In keeping with this philosophy, the NLS-9 filenameing convention should match the convention used by the WM. As NSW users, front-end builders, and tool-integrators we want the filename syntax to be the easiest to type and point to, the most flexible in use, the fastest to parse, and the least offensive to look at.

212a1

Speed of parsing a filename is a major point of difference between NSW and the current NLS. We do not want to burden the NSW with the current baroque NLS-8 link parser. Delimiters around the filename and a place for an infile-address within those delimiters, on the other hand, are two features potentially valuable to any tool and should be carried over from the current NLS-8 into NLS-9. Such a delimited "address" or "path-name" containing a filename, infile-address, or both imbedded in text is called a "link". A third field of a link, the viewspecs, have been treated in discussions about this as a part of the infile-address only.

212a2

Delimiters around the filename are needed for ease of pointing to a filename imbedded in text. In general, as the detail or number of selections increases, the effort necessary to select

oldmessages

increases geometrically. The easiest way to specify something is to name what type it is (e.g. a link) using the appropriate command and then make one specification near enough to the item in front or in back of it to distinguish it from others of it's kind and have the command find it and grab it. In order to do this, the item must be enclosed in "enclosing" delimiters which are available on all terminals. In addition, the delimiters must not be common characters that might be usefull in a filename or outside a filename. Since parentheses are frequently used for parenthetical expressions, and square- and squigly-brackets are not on all terminals, that leaves only angle-brackets. We therefore recommend that angle-brackets be the NSW filename or link delimiter. It turns out that this is also an acceptable delimiter for current NLS links.

212a3

The infile-address needs to be within the same delimiters as the filename because it is an integral part of the entire path-name or address of which the filename may be only the beginning. Tool builders that allow an infile-address will want to use the same delimiters for links that do not happen to go across files. A single reserved separator character is necessary to distinguish a filename field preceeding an infile-address field so that each field may contain the maximum range of characters. The separator should be easy to type because unlike the delimiters for a link, the separator may be frequently typed by the user as free text in a command. The only easily typed punctuation characters are period, comma, slash, and semi-colon with period and comma probably the easiest. Our experience with NLS has shown that comma works very well. For maximum compatability and minimum conversion hassle we recommend that comma be the separator character.

212a4

For speed and accuracy of parsing, we do not want to allow the delimiters inside the delimiters and we do not want to allow the separating character in the filename or infile-address fields.

212a5

```
filename = ['<'] filename [, infile-address] ['>']
filename and infile-address do not include '<', '>', ',',
```

212a5a

Note: We should point out that when a user types a link or filename he need not type the angle brackets as the Frontend will provide these for him.

212a5b

JBP's description of Bob Millstein's syntax for NSW filenames 25205 looks like it would fit our needs described above. One character substitution and the addition of the possibility of delimiters also containing infile-addresses would be necessary.

oldmessages

We request that comma not be used anywhere in the filename. Charles points out that there should be no reason why fields in a filename can't be separated by a simple space rather than a somewhat more ugly punctuation character. For something that is the least offensive to look at, this would be desirable. 212a6

One unanswered question is "What does the link <abc> point to -- a filename or an infile-address?" It is clear that <abc,> always points to a filename and <,> always points to an infile-address because filenames always precede the infile-address. 212a7

The current default in NLS is for a link containing no comma to be taken as an infile-address. In the initial NSW, it may be that a link containing only a filename will be more frequent than a link containing only an infile-address and we should therefore switch defaults. 212a7a

In links, this would require a comma at the beginning of every infile-address but not at the end of a filename with no infile-address. 212a7b

The INLS user using an infile-address to specify locations in editing commands will not want to place a comma in front of every address. A special function would be written to not require it at that point so that infile-address specification would be the same as NLS-8. This would mean the user must always after a filename when prompted by A: but need not place a comma when using a "file" command (such as Load File) or in links. 212a7c

A link to filename abc may look like <abc> but if viewspecs vspc are specified, it must look like <abc, !vspc>. 212a7d

A fancy infile-address parser would be necessary to allow commas in content searches, otherwise characters preceding the comma would be mistaken for a filename. If ' or " are allowed in filenames, searches for commas may be unparseable. 212a7e

The infile-address should allow constructs such as "...." and 'char so that content addressing may include the literal characters ", " and ">". 212a7f

Samples of links containing only an infile address are <,> and <,>. Those containing only viewspecs would look like <,>. 212a7g

oldmessages

The question of whether or not ARC should recommend deviating from its current default has not been decided. 212a7h

USER PROFILE 212b

This section outlines the current design of "User profiles" as used by both the Front End and the NLS tools within the NSW environment. The Works Manager functions needed to support this design are also detailed. 212b1

Overview 212b2

An NSW user wants to have control over some of the parameters which control the interaction between himself and the NSW system. The FE must have access to a file, or a data store which defines the user's interaction parameters. 212b2a

The first question to be decided is whether a "user profile" is bound to an individual, or to an individual, project pair, that is to an account. It seems more consistent with the overall goals of the NSW to have at least part of the "user profile" bound to an individual, regardless of which project he is currently working on. We envision the FE making use of such an "individual profile" to control the interaction between the Command Language Interpreter (CLI) and the individual. This includes such things as command recognition mode, prompting mode, and the Verboseness to be used. 212b2b

Elements in a user's profile which describe his access rights, however must clearly be based on the account, that is on the user-project pair. We are assuming that the WM will provide both a grammar and its supporting packages to maintain these data bases. We would like the FE to be able to read a part of the account profile data maintained by the WM at login time. This allows the FE to provide some useful functions for the user. For example suppose that at login time the FE hands the WM the user name and project identifier and receives in return a list of the tools that the user can use. This enables the FE to provide a reasonable reply when the user types "RUN (tool) ?". The FE responds with the list of tools that are available to the user. Another example might be a data element called entry tool. If the WM can provide the FE with this data element for a user-project pair the FE can place the user directly into this tool after login. 212b2c

In addition each NSW tool may require it's own elements of user profile data which are completely independent of the FE

and WM. NLS for example contains the address of a commands branch to be processed upon entry to NLS, and a link file to be used to resolve external names in a jump command. 212b2d

It seems unreasonable to require the WM to maintain any tool dependent user profiles, or to even know of their existence. It should clearly be the burden of the tool manufacturer to maintain any tool dependent user profile for his tool. This can be done by either including the appropriate profile modifying commands in his tool, or by providing a separate tool which maintains the user profile. Note that even though the WM is not directly involved in this maintenance the actual user profile data base has to be a NSW file, that is known to the WM in order to provide host independence to the tool. 212b2e

Recommendation 212b3

The NSW FE will make use of two profile data bases. One is called the "individual" profile and the other is the "tool" profile. ARC will provide the grammar and the backend process to maintain a users individual profile. We request that the WM makes primitives available to the FE read the elements of the tool profile from the WM's account profile. The following is a list of the data elements which we think would be good candidates for elements in the FE tool profile. 212b3a

List of "approved tools" 212b3a1

Entry tool 212b3a2

In this model the WM has the following responsibilities concerning user profiles. 212b3b

The works manager will provide a grammar and supporting process which maintains the account profile for each user, project pair. It is probable that use of this facility will be restricted to project leaders. 212b3b1

Primitives will be made available to the FE for reading agreed parts of this account profile, namely the tool profile. 212b3b2

In NSW the NLS tool will keep its own user profile (individual profile) for each user. The grammar will contain the proper commands for modification of the data elements. These commands will be supported by a package in the NLS Back End. 212b3c

oldmessages

To implement a single user profile for an individual it is necessary that the Works Manager provide a unique identifier for each NSW individual. A later section will discuss the need for, and possible designs of such a unique identifier. Basically what is required is a WM primitive which will take as arguments a user name and project name and return a unique identifier for this individual. Note that the process which maintains the FE's individual profile also requires this primitive.

212b3d

Requested WM primitives :

212b3e

available tools:

212b3e1

availtools(username,project => toollist, entrytool)

212b3e1a

This primitive will be called by the FE to build a tool profile for this user, for this session.

212b3e1b

Argument / result types

212b3e1c

username = CHARSTR

212b3e1c1

project = CHARSTR

212b3e1c2

toollist = LIST (%toolnames% (simplename, systemname),...)

212b3e1c3

entrytool = INTEGER/EMPTY

212b3e1c4

unique user identifier:

212b3e2

uniqueid(username,project => userid)

212b3e2a

This primitive is called by the tool which maintains the users individual profile, and also by the FE to get a handle on this individual profile. Some tools may also use this primitive.

212b3e2b

Argument / result types

212b3e2c

username = CHARSTR

212b3e2c1

Project = CHARSTR

212b3e2c2

userid = LIST (INTEGER,CHRSTR)

212b3e2c3

IDENT SYSTEM

212c

oldMessages

The NSW needs to be able to deliver mail for an individual to a single mail box and to know the type of delivery the individual would like, i.e., an NLS-JOURNAL citation or a 'SNDMSG' sequential file. 212c1

In addition to mail delivery we should anticipate the need for NSW directories and 'phone' books. 212c2

The NLS editing tool needs an identifier for an individual. We presently have available 21 bits that can be translated to a displayable, meaningful, character string to use in statement signatures (simple audit trails). 212c3

In the current NLS we provide the necessary information in a special file that contains the following information. 212c4

Individuals 212c4a

Information needed for mail delivery 212c4a1

Name: two fields, lastname, first and middle
 This allows us to deal with split names like van Kamp.
 Ident : a 4 character alpha numeric identifier or
 nickname
 Organization (see below)
 Hardcopy mail address
 Network mail address: host name
 Delivery mode: Hardcopy / Network sequential /
 Network NLS 212c4a1a

Additional Information for Directories (Phone Books, etc.) 212c4a2

Phones
 Groups: Idents of all the groups the person belongs
 to Function
 Capabilities
 Secondary organization
 Comments
 Subcollections: Used for indexing 212c4a2a

Groups 212c4b

Information needed for mail delivery 212c4b1

Name
 Ident
 Membership: The Idents of all members
 Hardcopy mail address
 Network mail address

oldmessages

Delivery Coordinator	212c4b1a
Additional Information for Directories (Phone Books, etc.)	212c4b2
Function Comments	212c4b2a
Organizations(Projects)	212c4c
Information needed for mail delivery	212c4c1
Name	
Ident	
Membership	
Groups	
Coordinator	
Hardcopy mail address	
Network mail address	
Delivery	212c4c1a
Additional Information for Directories (Phone Books, etc.)	212c4c2
Type of organization	
Phone	
Comments	212c4c2a

The 4 character ident has not been fully satisfactory as duplications occur frequently, requiring idents such as RLB2. However, our present file format limits us to 21 bits for the identifier. We suggest using a 21 bit permanent number that can be translated to a character string to use both in statement signatures and as a query argument, 212c5

By permanent we mean that the number, sequentially assigned shall never be reused, 212c6

In addition to the number each record should contain a permanent ident (nickname), limited to, say 50 (upper case ?) printing characters. Each individual would choose his own ident, 212c7

Consideration should be given to other information which might be useful, 212c8

It is particularly important that a super fast search across this file be possible, 212c9

In addition to providing the mail tool with its needs, the

oldmessages

database should be queryable by people. Minimal query arguments should include ident (nickname) and last name. 212c10

We can see three possible ways of dealing with this for the first year of NSW. These are 212c11

Find a way to get BBN TIPSER Database right for NSW needs 212c11a

Include all the needed information in the Works Manager's data base. 212c11b

During the first year use the NLS ident system for mailing. The main problem with this is the 4 character limit on nicknames. 212c11c

More Questions: 212c11d

What does the Works Manager know about real people? 212c11d1

How does a tool ask the WM for information about people? 212c11d2

What does the WM return in response to an inquiry. 212c11d3

Who maintains the data base? i.e. who can enter, and validate the information in the file. We see this as a big, on-going problem area. 212c11d4

213

4-FEB-75 13:27:28,1656
 Net mail from site CCA-TENEX rcvd at 4-FEB-75 13:27:22
 Date: 4 FEB 1975 1626-EST
 From: DEE at CCA
 Subject: RFC 671
 To: HOST-HOST-PROTOCOL-PEOPLE:, SCHANTZ at BBN
 cc: DEE

214

RICK:
 THANKS FOR YOUR REPLY. I HAD SEEN RFC 671 AND HAVE NOW REREAD IT (THE TCP SPECIFICATION REFERENCE TO YOU HAD SOUNDED LIKE YOU HAD WRITTEN SOMETHING SPECIFIC TO INTERNET RECONNECT). RFC 671 SEEMS LIKE A GOOD FLESHING OUT OF THE TELNET RECONNECT PROTOCOL. I CERTAINLY AGREE THAT A RECONNECT FEATURE SHOULD BE IN THE HOST-HOST LEVEL PROTOCOL, POSSIBLY ALONG SOMEWHAT SIMILAR LINES, THERE SHOULD BE AN OPTIONAL "ALTERNATE ROUTING" FEATURE WHERE A HOST COULD SPECIFY THAT IF A CONNECTION TO IT GOES DEAD, THE OTHER END SHOULD TRY TO RECONNECT (ICP?) TO ANOTHER HOST&SOCKET WHICH MIGHT REALLY BE THE SAME MACHINE THROUGH A DIFFERENT NET CONNECTION OR, MORE LIKELY,

oldmessages

AN ENTRY TO A SIMILAR SERVICE IN SUCH A WAY THAT THE USER WOULD GET A MESSAGE THAT THINGS HAD BEEN "RESET" BUT WOULD STILL BE IN THE SAME ENVIRONMENT. (THIS COULD BE DONE ABOVE THE HOST-HOST LEVEL BUT, PARTICULARLY IF IT IS USED TO SWITCH BETWEEN REDUNDANT PHYSICAL CONNECTIONS, IT WOULD BE NICE IF IT COULD BE AS TRANSPARENT AS POSSIBLE.)

YOU SAY YOU THINK IT QUESTIONABLE WHETHER MOST SYSTEMS WILL ALLOW A USER MULTIPLE TELNET CONNECTIONS. SINCE, IN MY LIMITED EXPERIENCE, I HAVE NOT ENCOUNTERED A SYSTEM THAT RESTRICTS OR ALLOCATES NETWORK CONNECTIONS BETWEEN USERS, I WAS WONDERING WHAT PROMPTED YOU TO SAY THAT.

I MUST SAY, IT IS DIPLOMATIC OF YOU TO REFER TO THE PECULIARITIES OF TENEX YOU HAD TO OVERCOME AS FEATURES.
SINCERELY, DONALD EASTLAKE (DEE@CCA)

4-FEB-75 14:36:57,8785

Date: 4 FEB 1975 1436-PST

From: IRBY

Subject: Some Possible NSW tool interaction

To: watson, POSTEL

215

The following (Journal # 25120) are brief notes regarding tool interaction through the FE. Although some readers may find the implementation notes too technical, the examples and general discussion should be of interest.

216

The NSW can provide for significant tool interaction, driven by the user, by providing some fairly simple facilities in the FE, WM, and tools which wish to allow such interaction. We feel that this can be done in such a way that the WM can insure system integrity and provide access controls and such that neither tools nor their grammars need change to allow new tools to interact with each other.

216a

Perhaps the best way to communicate this facility is to present a few concrete examples.

216b

Example 1: Editor -- mail sender interaction

216b1

Let us assume that there exists two tools, one called EDITOR and one called SENDMAIL, with the obvious functions. Let us first consider a user sitting at a display terminal using the EDITOR to prepare a memo he wishes to send to some of his associates. He could prepare the memo, which could be just part of a larger file that he is editing, and create a file containing only the memo and give this file a temporary name. He could then run the SENDMAIL tool, supplying it the name of his temporary memo file.

216b1a

A simpler alternative is for the user to simply slue to the SENDMAIL tool and as input to the SENDMAIL command he could simply point to the portion of the EDITOR file he wishes to send.

216b1b

Example 2: mail sender == Editor interaction

216b2

This involves the same tools as just described. The user types a lengthy message to the SENDMAIL tool and then wants to edit it before sending it. Again there could be a command in the SENDMAIL tool which causes it to create a file which can then be input to the EDITOR tool and Example 1 can be repeated.

216b2a

Again, the alternative allows the user to slue to the EDITOR tool and insert the text of the message into his file somewhere, edit it, and slue back to SENDMAIL and respecify the source of the message as in the second alternative in example 1.

216b2b

Example 3: Editor == compiler interaction

216b3

In this example, the user is editing source code (the current edited state of the source code is known only to the editor) and wishes to compile some part or all of it. Again, he could create a file with that code in it and pass that file to the compiler. However, he could also just slue to the desired compiler tool and point to the desired text in the editor window and have it compiled.

216b3a

How to accomplish the slueing tool interaction

216c

One thing that must be considered if we allow the slue interaction is that the WM maintain control of the situation. Thus, for first year NSW I propose the following implementation:

216c1

The CLI provides a CML rule called SOURCE which is made up of the declared source rules of each of the user's currently active tools. The command language designer would, where appropriate, allow the user to specify one of the dynamic set of currently available sources for a command.

216c1a

When the user selects something of type TYPE (which is meaningful to TOOL-A) by pointing to TOOL-A's window or by typing its address (perhaps with TOOL-A's name appended to the front of the address) as an argument to a command to TOOL-B, then the CLI calls a standard function in TOOL-A which returns the name of a new file which contains the

oldmessages

desired data object. This file name is then supplied as the desired argument to the execution function in TOOL=B. TOOL=B then calls the WM to open the file and read out the data structure. If the use-type of the file does not match the file type supplied with the openfile request, then an appropriate conversion is invoked.

216c1b

In subsequent development of the NSW it would be desirable for the tools to send PCP data structure to each other (perhaps using co-routines) rather than incurring the expense of creating and deleting files. However, for the interim, we can probably afford this inefficiency.

216c1c

For the case of users at typewriter terminals, the normal way in which they specify locations of actual parameters by typing something (which I call an ADDRESS) could be expanded so that the address could contain a syntactically unique way of specifying the active tool toward which it is directed. This facility is also available for users at displays, since what they want may not be displayed on the screen currently. In the case of a display user, he might be able to point to the desired tool by use of an active tools status window displayed whenever the user has more than one active tool.

216d

Implementation notes:

217

Add the builtin SOURCE to CML as the name of a rule of currently possible source command words.

217a

Allow SSEL, DSEL, and LSEL to deduce the target tool from a selection type and be able to invoke a standard function in a tool to produce the desired file when necessary.

217b

Allow incremental help if SOURCE is an alternative, such that current tool alternatives are shown separately from others.

217c

Define the standard function in tool processes to call in order to create the result file.

217d

CRTNSWFILE(type, designator -> filename)

217d1

type = INTEGER
designator = ANY
filename = CHARSTR

217d1a

CRTNSWFILE requires the following facilities from the WM:

217d1b

1) The procedure UNGNSWFN(number -> filenamelist)

217d1b1

oldmessages

which will yield a list of NUMBER unique NSW file names. 217d1b1a

2) An additional parameter in the CREATE-FILE procedure to specify that the file is to be TEMPORARY (will be automatically deleted at the end of the session). 217d1b2

It should be noted that these are the only changes required in the WM. Also, the CRTNSWFILE procedure is the only additional requirement on tool components to allow all of this to work. 217d1c

TYPE is a source type known to the CRTNSWFILE being called, DESIGNATOR is a data structure that CRTNSWFILE understands and when combined with TYPE specifies the desired data structure. 217d1d

For example, DESIGNATOR might be an ADDRESS string or a (WINDOW, STRING, CHARACTER-COUNT) triple that defines some image that the tool placed on the user's screen. 217d1d1

Add a parse function NOTINRULE which will succeed only if the specified command word is NOT one of the alternatives in a specified rule (see example below). 217e

Add a CML declaration for the rule that defines the universal sources for this grammar (this will get linked to the dispatch record). 217f

DECLARE SOURCES ,ID; %name of a rule of command words% 217f1

This would allow the following CML for the NLS copy command 217g

"COPY" 217g1

stype = SOURCE 217g1a

% user will pick one of the currently available source command words. This is a function of his active tools % 217g1a1

<"from"> source = SSEL(stype) 217g1b

% user selects a source for the copy == SSEL would have to be able to tell stype was from another tool and invoke the CRTNSWFILE procedure in the correct tool process if it is not the current tool % 217g1b1

<"to follow"> dtype = stype %initialize dtype% 217g1c

oldmessages

```

[ (notinrule(stype, mytypes) stype = # "FILENAME" /
OPTION) dtype = mytypes]                                217g1c1

%if the source type (stype) was not one of this tool's
source types as represented by the rule MYTYPES, or if
the user types the OPTION character, then the user
will specify a destination type (dtype).%                217g1c1a

dest = DSEL(dtype) %get the destination selection%       217g1d

CONFIRM %get a final confirmation%                        217g1e

xcopy(stype, source, dtype, dest);                        217g1f

%call the XCOPY procedure in the tool process to carry
out the command%                                         217g1f1

```

```

4-FEB-75 15:15:50,5387
Net mail from site SRI-ARC rcvd at 4-FEB-75 15:15:45
Date: 4 FEB 1975 1515-PST
From: IRBY at SRI-ARC
Subject: User Programs in the National software works
To: NSW-DISTRIBUTION:

```

218

The following memo (Journal # 25294) addresses the issue of user programs in the NSW environment. For the purpose of this memo I have considered user programs to be in two classes: 1) those that do not get input from the user and 2) those that do. The first class can be handled entirely by the tool and have no bearing on the NSW except that they may live in NSW files. Non-interactive TECO macros, NLS content analysis, sequence generator, sort key and other non-interactive user programs fit into this class. I will not discuss this class further unless someone raises issues with respect to it.

219

Note: tools like RD, which are separate save files of TECO preloaded with macros are considered separate tools and are not treated here.

219a

The second class consists of slightly odd NSW tools. They are tools in the sense that they have grammars and supporting pcp processes, help data bases, and access restrictions. The odd thing about these tools is that the support process is not created when the tool is run, but rather it already exists and all that is needed is that perhaps new packages should be opened in the process. Please note that this requires that the set of packages in a process must be allowed to change dynamically.

220

oldmessages

To make this all a bit more real to the reader who may be unfamiliar with such user programs, I present a scenario of what must happen when a user runs such a user-program. I should point out that this is a facility now provided by NLS-8. It is widely used and affords advanced users a means of extending the capabilities of tools available to them. The access controls that must be brought to bear upon users and developers of such user programs should be openly acknowledge, discussed, and decided. However, we should allow them since they provide a powerful facility for the user and are easily constructed.

221

On to our scenario (Please note that an example using TECO and loading TECO macros would have served as well as the NLS example that follows except that TECO is a non-integrated tool and thus introduces complications that are not germane to this issue.):

222

The user of the NLS editor decides to run a user program written by an associate which interacts with the user to determine formatting information that conforms to the conventions established for his project. He gives a command to the editor to load the program named proj.formats. This is the name of an NSW file containing the relocatable binary program written to execute within the user-program environment of the nls editor. The editor fetches the file from the WM and link-loads it into the user-program buffer. In addition, a new package named projformats is added to the pcp dispatch tables, thus making some procedures in the user-program callable through pcp.

222a

Please note that it is very important that this program run within the environment provided by the nls-editor since this provides the writer of such a program with high level editing primitives and other facilities. This reduces the development time of such new tools by several orders of magnitude without penalizing them in terms of execution time!

222a1

The user then gives the "run tool formats" command to the NSW. "formats" is the user's simple name for the tool. Its more complicated system name is read from the user's tool list and passed to the WM, which returns the grammar for the tool. Now the FE inspects the grammar to determine which processes to create in support of this tool. It finds that it must be the existing "nlsbe" process and that it is to open the package "projformats", which it does.

222b

The user now gives commands to this tool which causes it to insert the proper format controls into the file he is currently editing. When the user is done with the formats tool, he commands the NSW to terminate it for him. The FE closes the packages it opened for

oldmessages

the tool, but does not ask the WM to delete the process since it existed prior to the tool's invocation. The user may now resume the editor and ask it to delete the program proj,formats if he wishes to reclaim space in his user-program buffer.

222c

Note: It would be much nicer if the user could treat this like any other tool (and not have to instruct the editor to load and delete the program) with only the requirement that the editor must be active while running the formats tool. It may be possible to do this through CML initialization rules which would call procedures in the nlsbe process (known through a process declaration) to load the needed user-program file and open the package. Similarly, a termination rule could cause the program to be deleted from the program buffer. This has the disadvantage that if the user reuses the user program, the program must be reloaded. The termination rule could ask the user if he wanted the program deleted before doing so, however,

222c1

7-FEB-75 10:13:27,1181
 Net mail from site BBN-TENEXA rcvd at 7-FEB-75 10:13:21
 Date: 7 FEB 1975 1245-EST
 From: BURCHFIEL at BBN-TENEXA
 subject: Network mail protocols
 To: NORTON at SRI-ARC
 cc: MESSAGE-SERVICE-COMMITTEE:, PETERS at SRI-ARC,
 cc: HOPPER at SRI-ARC, WATSON at SRI-ARC, WHITE at SRI-ARC, cc:
 POSTEL at SRI-ARC

223

Jim,
 Dick Watson has assured me that you will be fixing up NIC mail soon to conform to ARPANET standard protocols. He suggested that I describe your current violations of protocol for clarity:

224

1. Messages and citations from the NIC have no header at all. RFC #561 specifies that "TO:", "FROM:" and "DATE:" items are required, followed by a blank line (CRLF CRLF) to delimit end of header.

225

2. The FTP MAIL command requires that everything be sent as lines delimited by CRLF. The lines are interpreted by the receiver to find header items, end of header, and end of message. The standard line buffer is 132 characters, so you should not send more than 132 characters without a CRLF delimiter.

226

I hope these suggestions prove helpful. I would appreciate it if you would acknowledge receipt of this message.

227

oldmessages

Thanks,
Jerry

10-FEB-75 10:28:50,468
Net mail from site BBN-TENEX rcvd at 10-FEB-75 10:28:42
Date: 10 FEB 1975 1327-EST
From: MCKENZIE at BBN-TENEX
Subject: Protocols
To: postel at SRI-ARC
cc: mckenzie

228

Jon,
The NTIS accession number for the latest version of BBN Report No.
1822 is:
ADA002751
(Note that the number is now an "ADA" number rather than an "AD"
number)

229

Would you ask Jake if she has received the NTIS number for the
"Protocols Notebook" yet?

Regards,
Alex

230

JBP 10-FEB-75 21:46 25336

oldmessages

(J25336) 10-FEB-75 21:46;;; Title: Author(s): Jonathan B.
Postel/JBP; Distribution: /JBP([INFO=ONLY]); Sub-Collections:
SRI-ARC; Clerk: JBP; Origin: < POSTEL, OLDMESSAGES,NLS;2, >,
10-FEB-75 21:43 JBP ;;;####;

old messages

14-JAN-75 15:23:26,84
 Date: 14 JAN 1975 1523-PST
 From: POSTEL
 Subject: test
 To: postel

1

 15-JAN-75 14:02:32,851
 Date: 15 JAN 1975 1402-PST
 From: POSTEL
 Subject: RFCs
 To: Schantz at BBN
 cc: postel

2

Rick:
 I have now (at long last) copied the RFCs 671 & 672 to Office-1 to live in directory <Netinfo> with other recent RFCs. The pathnames for these is of the form [Office-1]<NETINFO>RFCxxx.TXT where xxx is the rfc number.

3

Have you received any comment on the reconnection suggestions that would indicate any opposition to replacing the current telnet option with your proposal? I still urge that the <IAC><SE> acknowledgement be replaced by <IAC><SUB><RECONNECT><OK><IAC><SE>. In the case that your proposal does replace the existing telnet option we will need a new document for the protocol notebook, are you prepared to create such a document? I am willing to assist to the extent of editorial suggestions etc.?

4

--Jon.

 15-JAN-75 16:04:08,8709
 Date: 15 JAN 1975 1604-PST
 From: POSTEL
 Subject: Mail Protocol
 To: AV at MIT-DMS, Burchfiel at BBN, Watson at SRI-ARC,
 To: Oestreicher at ISIB
 cc: postel

5

Dick has been letting me see some of the recent notes on mail system proposals and one note or another suggested that the current transmission protocol limited the number of recipients of a message at a host to one. This is not the case, and for your reference I include the current protocol definition which clearly indicates that each message may be addressed to a list of users at the host it is transmitted to.

Mail Protocol Jon Postel 4 December 1974

6

Mail Protocol

6a

old messages

Introduction

7

This document describes the existing mail sending protocols. The mail sending protocol is a subset of the File Transfer protocol, consisting of two additional commands to the set of commands described in the specification of the File Transfer protocol.

7a

Old FTP

7a1

A. McKenzie "File Transfer protocol," RFC 454, NIC 14333, 16-Feb-73.

7a1a

New FTP

7a2

N. Neigus "File Transfer Protocol," RFC 542, NIC 17759, 12-Jul-73.

7a2a

J. Postel "Revised FTP Reply Codes," RFC 640, NIC 30843, 5-Jun-74.

7a2b

Commands

8

Mail File (MLFL)

8a

The intent of this command is to enable a user site to mail data (in form of a file) to another user at the server site. It should be noted that the files to be mailed are transmitted via the data connection in ASCII or EBCDIC type. (It is the user's responsibility to ensure that the type is correct.) These files should be appended to the destination user's mail by the server in accordance with serving HOST mail conventions. The mail may be marked as sent from the particular using HOST and the user specified by the *USER* command. The argument field may contain one or more system or NIC idents (it is recommended that multiple idents be allowed so the same mail can easily be sent to several users), or it may be empty. If the argument field is empty or blank (one or more spaces), then the mail is destined for a printer or other designated place for site mail.

8a1

A NIC ident refers to the standard identification described in the NIC directory of Network Participants. A serving host may keep a table mapping NIC idents into system idents, although NIC idents are not required in the implementation. A system ident is the user's normal identification at the serving HOST.

8a2

Mail Protocol Jon Postel 4 December 1974

8a2a

The use of system idents would allow a network user to send

old messages

mail to other users who do not have NIC identification but whose system ident is known,

8a3

Mail (MAIL)

8b

This command allows a user to send mail that is NOT in a file over the TELNET connection. The argument field may contain one or more system or NIC idents, or it may be empty. The idents are defined as above for the MLFL command. After the "Mail" command is received, the server is to treat the following lines as text of the mail sent by the user. The mail text is to be terminated by a line containing only a single period, that is, the character sequence ".CRLF" in a new line. It is suggested that a modest volume of mail service should be free; i.e., it may be entered before a USER command.

8b1

Reply Codes

9

The MAIL and MLFL commands have the same reply codes as the Append (APPE) command, with the addition of the Reply code for MAIL stating that mail is expected over the Telnet connection.

9a

Old FTP

9a1

350 - Enter mail, terminate with <CR><LF>.<CR><LF>

9a1a

New FTP

9a2

354 - Start mail input, end with <CR><Lf>.<CR><Lf>

9a2a

Syntax

10

It is strongly urged that for consistency in the handling of mail at the various hosts that all mail sending subsystems or programs use these standard syntax convention for the text of the mail. This will help a great deal in allowing a user or program to intelligently process incoming mail.

10a

The text of the mail, whether transmitted over the FTP Telnet connection (via the MAIL command) or over the separate data connection (via the MLFL command), is governed by the syntax below:

10a1

1

10a1a

Mail Protocol Jon Postel 4 December 1974

10a1a1

Example:

10a1b

old messages

From: White at SRI-ARC
 Date: 24 JUL 1973 1527-PDT
 Subject: Multi-Site Journal Meeting Announcement
 NIC: 17996

10a1b1

At 10 AM Wednesday 25-JULY there will be a meeting to discuss a Multi-Site Journal₁ in the context of the Utility. Y'all be here.

10a1b2

Formal Syntax:

10a1c

```

<mailtext> ::= <header> <CRLF> <message>
<header> ::= <headeritem> ! <headeritem> <header>
<headeritem> ::= <item> <CRLF>
<item> ::= <authoritem> ! <dateitem> !
<subjectitem> ! <miscitem>
<authoritem> ::= FROM: <SP> <user> <SP> AT <SP> <host>
<dateitem> ::= DATE: <SP> <date> <SP> <time> - <zone>
<subjectitem> ::= SUBJECT: <SP> <line>
<miscitem> ::= <keyword> : <SP> <line>
<date> ::= <vdate> ! <tdate>
<vdate> ::= <dayofmonth> <SP> <vmonth> <SP> <vyear>
<tdate> ::= <tmonth> / <dayofmonth> / <tyear>
<dayofmonth> ::= one or two decimal digits
<vmonth> ::= JAN ! FEB ! MAR ! APR ! MAY ! JUN ! JUL
! AUG ! SEP ! OCT ! NOV ! DEC <tmonth> ::= one or
two decimal digits
<vyear> ::= four decimal digits
<tyear> ::= two decimal digits
<zone> ::= EST ! EDT ! CST ! CDT ! MST ! MDT ! PST
! PDT ! GMT ! GDT
<time> ::= four decimal digits
<user> ::= <word>
<host> ::= a standard host name
<message> ::= <line> <CRLF> ! <line> <CRLF> <message>
<keyword> ::= <word>
<line> ::= a string containing any of the 128
ASCII
characters except CR and LF
<word> ::= a string containing any of the 128
ASCII
characters except CR, LF, and SP <CRLF> ::= CR LF
<SP> ::= space

```

10a1c1

2

10a1c1a

Mail Protocol Jon Postel 4 December 1974

10a1c1a1

please note the following:

10a1d

old messages

(1) <authoritem>, <dateitem>, and <subjectitem> may each appear at most once in <header>; <miscitem> may occur any number of times. The order of <authoritem>, <dateitem>, and <subjectitem> is insignificant, but they must proceed all occurrences of <miscitem>.

(2) The case (upper or lower) of keywords -- specifically, 'FROM', 'DATE', 'SUBJECT', 'AT', <host>, <zone>, <vmonth> and <keyword> -- is insignificant. Although 'FROM', for example, appears in upper-case in the formal syntax above, in the header of an actual message it may appear as 'From' (as in the example), or 'from', or 'FrOm', etc.

(3) NO attempt has been made to legislate the format of <user>, except to exclude spaces from it.

(4) The time has no internal punctuation.

(5) No provision is made for multiple authors.

10ald1

3

15-JAN-75 17:14:03,1278

Net mail from site SRI-ARC rcvd at 15-JAN-75 17:13:58

Date: 15 JAN 1975 1713-PST

From: POSTEL at SRI-ARC

Subject: NEW NSW & PCP DOCUMENTS

To: NSW-DISTRIBUTION:

11

There are three new documents of interest to NSW and PCP workers:

12

1) NSWSTRUC -- Defines the process structure of NSW,

13

2) NTP -- NSW Tool Package which contains NSW-specific procedures and data stores required of a process for use as a tool within the NSW,

14

3) PCPV2CHANGES -- documents the divergence of the implementation from the version 2 documentation. This is a dynamic document,

15

The documents are available online at SRI-ARC in the directory <NLS> as text files. They may be pulled from ARC using FTP by supplying the username ANONYMOUS and password GUEST. The pathnames are:

[SRI-ARC]<NLS>NSWSTRUC.TXT

[SRI-ARC]<NLS>NTP.TXT

[SRI-ARC]<NLS>PCPV2CHANGES.TXT

16

We will be sending these out in hardcopy in the next week or two,

17

We also would like to offer our assistance in understanding these and the other documents and concepts in the NSW and PCP designs. If you would like to discuss any of these topics please call or sndmsg Jon Postel at (415) 326-6200 x3718 or POSTEL at SRI-ARC,

18

old messages

--jon,

18-JAN-75 23:59:29,780
 Net mail from site ISIB rcvd at 18-JAN-75 23:59:27
 Date: 18 JAN 1975 2359-PST
 From: COHEN at USC-ISIB
 Subject: NVP.
 To: POSTEL at SRI-ARC, POSTEL at ISI
 cc: COHEN

19

Jon,

20

here are some words re NVP, you might want to include under
 "recent developments" for NVP :

21

AN INITIAL VERSION OF NVP WAS IMPLEMENTED FIRST FOR REAL-TIME VOICE
 EXPERIMENTS BETWEEN ISI AND LINCOLN LABORATORY, ON AUGUST 1974. A
 MORE EXPANDED VERSION IS IN OPERATION SINCE DECEMBER 1974, FOR
 REAL-TIME VOICE COMMUNICATION (BETWEEN LINCOLN AND CHI, AT SANTA
 BARBARA).

NVP USES BOTH TYPE-0 AND TYPE-3 MESSAGES, AND ALLOWS INCREASED
 BANDWIDTH AND DECREASED DELAYS AT THE POSSIBLE COST OF RELIABILITY.

22

cheers,
 Danny.

22a

P.S. my address is at isiB, not isi. thanks.

23

20-JAN-75 07:33:59,800
 Net mail from site BBN-TENEXA rcvd at 20-JAN-75 07:33:55
 Date: 20 JAN 1975 1032-EST
 From: SCHANTZ at BBN-TENEXA
 Subject: RFC 671
 To: Postel at SRI-ARC
 cc: Schantz

24

Jon:

I have received no objections to the reconnection proposal (other
 than your suggested acknowledgement change). On the other hand, I
 haven't heard anything from most network sites. I assume no comment
 is synonymous with acquiescence. I would gladly volunteer to prepare a
 new option definition document. It would probably consist of a
 revision of the existing document more than a complete rewrite.

25

Shifting gears now, I am beginning devote my attentions to BBN's NSW
 project commitments, and will be going over your documents this week.
 I'm sure I'll have some questions/comments on them soon. --Rick

old messages

20-JAN-75 10:24:42,20602

Net mail from site SRI-ARC rcvd at 20-JAN-75 10:24:06

Date: 20 JAN 1975 1024-PST

From: POSTEL at SRI-ARC

Subject: Batch Job Models

To: NSW-DISTRIBUTION:

26

< POSTEL, BATCH-JOB-MODEL,NLS;6, >, 17-JAN-75 15:24 JBP ;;;;

27

Bill:

Here is commented version of your message on batch jobs. Following these comments is a description of my model for batch jobs in the NSW. The main differences are in the break down of functions to particular processes (wm, fe, grammar, tool, etc.), and in which processes touch which kinds of files.

--jon,

28

Comments on your message:

29

Date: 12 JAN 1975 1136-PDT

From: CARLSON at OFFICE-1

Subject: batch tools

29a

< CARLSON, BATCH-TOOLS,NLS;2, >, 12-JAN-75 11:26 WEC ;;;;

29b

I have a simplified model of batch tools which I use to make decision,

29c

%% How does this model compare with the model presented in the documents RJE-MODEL, and BJP by Postel and the notes by Warshall and Millstein ? %%

29c1

%% What decisions ? %%

29c2

%% It would be very helpful to have your comments keyed to the previously distributed documents. %%

29c3

Please evaluate the model and, by 16 Jan 75, send a message indicating agreement or identify pitfalls in the model by describing scenarios where it fails, and propose SIMPLE revisions which resolve the pitfalls

29d

%% Should this suspend progress on the implementation of NSW ? %%

29d1

A batch job cannot communicate with the user during execution,

29e

%% Is this a definition or an attribute of batch jobs shared by other types of jobs ? %%

29e1

old messages

%% Millstein defined the terms BATCH, DETACHED, AND INTERACTIVE in a useful way, lets use his definitions. %% 29e2

Background jobs on Multics or other time-sharing systems qualify as batch jobs. 29f

%% Does "background" include TENEX Detatched Jobs ? %% 29f1

The following classes of batch jobs are of interest: 29g

Predefined NSW Tools: allow a user talking to the Works Manager to say the logical equivalent of "execute TESTDATA using CRITERIA as input and producing MONTHLY as output." CRITERIA and MONTHLY are NSW files. Optionally, the user might specify a host, ie "execute TESTDATA at UCLA91". 29g1

%% "predefined" is a new term to me perhaps a further explanation would be helpful. I take it to mean that it is a program that has been made known to the Works Manager as a tool and has a grammar. %% 29gia

%% Which 360 should we be getting up to speed on NSW/PCP -- RAND or UCLA ? %% 29gib

The WM will know whether the TBH requires all files to be resident before a batch job is submitted, or if it supports delayed staging of files. If files must be prestaged, the WM will move or create the files and remember the local names. 29gic

%% Perhaps the works manager dosent need to know this but the batch job package can take care of fetching the required files. %% 29gic1

%% The idea of prestaging vs delayed staging of files is what distinguishes BATCH and DETACHED tools in Millstein's document, lets use one set of definitions. %% 29gic2

The WM will know the local name of the tool. It will send a message to the TBH of the form "run Local-Tool-Name on Local-File-1, Local-File-2, NSW-File-3 producing Local-File-4 and NSW-File-5 using TEXT-ARG-1,TEXT-ARG-2." 29gid

%% This assumes that it is easy to distinguish local (to what) filenames from NSW filenames -- i for one don't buy that assumption. Although i do agree that the probability of confusion can be greatly reduced by a sutiable prefix name for all NSW file names. %% 29gid1

%% BY now everyone should think in terms of Procedure

old messages

Call Protocol, The procedure call your "message" maps into is defined in the Batch Job Package (BJP) and is named CRTJOB, 29g1d2

CRTJOB (infiles, outfiles -> jobid) 29g1d2a

The files in the lists infiles and outfiles are filenames that can be handled by file packages, the batch job package calls on a file package either in the same TBH or another TBH to get the files for input or store the result files, %% 29g1d3

If the TBH does not support delayed staging, then of course there will be no NSW files in the list, Note that since this message is in an NSW format, we should easily be able to mark local file names, NSW file names, and textual arguments, 29g1e

%% By "in NSW format" do you mean it is a PCP Call ? %% 29g1e1

One implementation (not only one) would have the local tool name be a text file or catalogued procedure, The Foreman component in the TBH would ask the WORKS MANAGER for a correct local name corresponding to each NSW Filename (if there is delayed staging of files). The local filenames and the textual arguments would be substituted into the control file, which would be given to the standard scheduler to be executed at its convenience, The only uses I have thought of for textual arguments thus far are run time parameters like core size, time limit, priority, etc, 29g1f

%% What is the "Foreman component" ? Perhaps this is the role of the Batch Job Package ? %% 29g1f1

%% The textual arguments you suggest are already handled in every case we know of by parameters in the control file required by the batch processing facility, why should this aspect of host specific job control be replicated in the general purpose batch job package ? %% 29g1f2

%% These "textual arguments" could be accepted from the user by the grammar driven front end, which calls on a simple procedure to edit the control card file by substituting the arguments for place holders, %% 29g1f3

The TBH must provide the WM with a job ID, The WM must be able to get job status information for a given JOBID, 29g1g

old messages

%% See the CRTJOB and STSJOB procedures specified in the
Batch Job Package, %% 29g1g1

The TBH must signal the WM whenever a job terminates. 29g1h

%% An interesting point. To do this the Works Manager must
provide a procedure that a batch job package may call
when a job terminates. %% 29g1h1

RESPONSIBILITIES 29g1i

COMPASS- define language for invoking tools(the WM
command language), provide tool for defining other tools
to the WM (CML is part of it, but I don't think all of
it), Provide a document telling how to define tools. It
must identify options with regard to numbers and
attributes of input & output files, checking of textual
arguments, optional files, warranties, etc. 29g1i1

TBH Installer- provide a mechanism for accepting WM
messages and invoking tools, 29g1i2

%% Shouldn't "a mechanism for accepting WM messages"
be a "mechanism for accepting and making PCP Calls".
%% 29g1i2a

Create ident/jobid/account card with info sent by WM, 29g1i3

%% This card is generally the first card in the
control card file which is required by the batch
processing facility. This info should be sent in the
control file which is one of the infiles in the CRTJOB
call to the batch job package, %% 29g1i3a

Provide for status probing, signal WM when tools
complete, 29g1i4

%% See the batch job package %% 29g1i4a

Provide a reasonable way to send output reports onto the
ARPANET, 29g1i5

%% I think this is a call for a reformatting program
to make line printer oriented output presentable on
display and teletype terminals. %% 29g1i5a

Provide a document telling how to install additional
tools on that machine. 29g1i6

old messages

General Issue: How does the WM know how much space to allocate for output files? COMPASS to take responsibility for formulating and documenting some reasonable answer. 29g1i7

%% HOW does anybody know ? %% 29g1i7a

Sequences of NSW Batch Tools: One can envision jobs consisting of several "standard" NSW batch tools to be run in succession on the same TBH. On many hosts, the scheduling algorithm will make it advantageous to have the sequence lumped into a multi-activity job. Yet the WM should know when each activity completes, and have some options with regard to file disposition and conditional tool invocation, passing files between activities may also necessitate control stream changes. 29g2

%% Why should the works manager notice the jobstep completion for multistep one host jobs ? It may be very difficult to get access to this information in any case. %% 29g2a

Responsibilities: UCLA should take the lead in resolving these issues, with inputs from COMPASS and all TBH installers. 29g2b

"Perfect" Batch Control Streams: contain only local file names. We want to discourage these in the NSW, but must provide the capability so users don't have to leave the NSW just to type in a few simple control cards and run a batch job on their own machine. All the TBH must do is append the ident/jobid/account into to the control stream and retrieve status and output. 29g3

%% It would be easy for a NSW user to create a file (either with a special tool or with any text editor) that contained control cards and file names specific to a particular batch processing facility. %% 29g3a

Responsibilities: 29g3b

COMPASS: WM must accept a command like "run file at place", move the file, signal TBH to invoke it 29g3b1

%% By "file" are you now referring to a control file ? %% 29g3b1a

TBH Installer: responsible for start-up, status and output reporting. 29g3b2

Batch Control Streams Containing NSW Filenames: 29g4

old messages

The user builds a job control stream ready to run, except he wants to refer to files by NSW names. In general case, would also want to be able to defer file movement(not this year). Solution to delayed staging of files should use same TBH features as for predefined NSW Tools.

29g5

Responsibility

29g5a

SRI: build an interactive tool which works on typewriter terminals as well as displays and replaces NSW file names with LOCAL names. Eventually, will instead simply identify some of the names as NSW names and will also be able to handle priority etc. After the substitutions are complete, the tool will invoke the WM to initiate the job

29g5a1

%% There could easily be a tool that assisted users in replacing NSW filenames by filenames local to a particular batch processing facility, this would be useful in preparing the control files for a program developed in the NSW to be turned over for use outside the NSW. %%

29g5a1a

%% This aside on typewriter terminals and display terminals is out of place and shows a lack of conviction that the front end will provide means to use a range of terminal classes to use the same tools. %%

29g5a1b

COMPASS and TBH Installers are responsible for providing the same capabilities as for "perfect" batch control streams and (eventually) as for NSW defined tools.

29g5a2

%% The user wants a nsw-wide control file that is like the existing host specific control files but allows each job step to be executed on a different host. The user can construct such a file with any text editor or perhaps a special control file construction tool. When the user wants to have this control file "executed" a tool is called upon to translate (by calling on the works manager) the nsw filenames to file package file names and to call the appropriate batch job packages for each job step. %%

29g6

29h

Description of my model:

30

Here is a scenario of use of a batch tool which is an elaboration of the discussion contained in the RJE-MODEL document.

30a

old messages

Note that there are two case for batch jobs in the NSW: one is the traditional batch processing facility which normally expects as its primary input a control card file; the other is an interactive time sharing system which allows input to come from a file instead of interactively from a user at a terminal.

30a1

MODEL

30b

First we discuss the entities involved in the process of composing a batch job, having it run, and examining the results.

30b1

The principal entity is a batch processing facility. This is expected to be an existing hardware & software unit that will be only minimally changed to interface to the NSW.

30b1a

Examples of batch job processing facilities are the B4700 and the IBM 360.

30b1a1

Another type of batch job capability is is the TENEX runfil or the Multics execom facility.

30b1a2

The NSW talks to the batch processing facility via a Procedure package called the Batch Job Package (BJP).

30b1b

The batch job package in a sense referees the flow of information between its PCP callers and the batch processing facility. For example the batch job package collects all the input files that are resident on other hosts before turning the job over to the batch processing facility, and the batch job package may distribute the result files to other hosts when the job is completed by the batch processing facility.

30b1b1

The Batch Job Package interacts with File Packages (FP) to effect the movement of files to and from the Batch Processing Facility.

30b1c

The call on the batch job package to get a job submitted to a batch processing facility is:

30b1c1

CRTJOB (infiles, outfiles -> jobid)

30b1c1a

The files referenced in infiles and outfiles are named so that the batch job package can get them from and put them into the directories owned by NSW at various hosts and manipulated by file packages. Thus these files are named by "file-package-filenames".

30b1c2

old messages

The user sees only NSW-filenames so there must be a language/grammar that controls the users interaction which results in the generation of a create job call on a batch job package. This processing for the user must include the mediation of the NSW-filenames the user supplies into the file-package-filenames included in the create job call.

30b1c3

The files themselves are created and examined using the text editors (e.g. NLS) available in the NSW.

30b1d

Some files that are included in a create job call may be standard library files and from the users point of view part of the system. The user may not even be aware of their existence since their names could be supplied by the grammar internally.

30b1d1

The input files are probably in most cases job control files in a particular batch processing facilities specific job control language. There might be grammars/tools to aid the user in constructing such control files for specific batch processing facilities and applications programs.

30b1d2

A scenario for a user creating, submitting, retrieving, and examining a batch job follows:

30b2

The user interacts with the front end. The front end contains a command language interpreter that is driven by a grammar. The particular grammar in use for this user at any time depends on which tool the user is accessing.

30b2a

The user interacts with an editing tool to create a source program and to concatenate it with a standard file of job control information particular to the Batch Processing Facility to which it will be submitted. The concatenation is accomplished using regular editing commands (not batch specific commands).

30b2b

The user then interacts with the Works Manager and the Batch Job Package mediated by a grammar to submit the file he has created. The grammar and the Batch Job package will require enough information from the user that the Batch Job Package can retrieve the input files from file packages, and store the output files. The Batch Job package will return an identifier for this job which can be used to request status information at a later time.

30b2c

Some of the information needed to run a batch job could

be in a standard file that the user always appends his file to, OR this type of information could be in a separate file that is included by the grammar in the create job call automatically, and the Grammar could call on a function to edit a standard file to contain user and run specific parameters such as user-name, priority, run-time-limit.

30b2c1

When the job has been processed the user may use an editing tool to examine the output file. Note that the output files have been stored as specified in File Packages and are thus accessible to tools as permitted by the Works manager.

30b2d

It may be necessary to construct special tools to reformat the output of other tools for presentation on the users terminal.

30b2d1

In particular the tools which were designed to output to line printers will produce output difficult to view adequately on narrower display and teletype terminals.

30b2dia

A discussion of a batch program as a tool.

30b3

An applications program which lives on a batch processing facility can be made into a tool in the NSW such that the users of it as a tool do not need to know the control language of the facility where it lives. To do this the tool installer must create a control card file and a Grammar which are stored in the Works Manager under the toolname assigned to this program.

30b3a

When the user accesses the tool the front end gets the grammar from the works manager and follows it to collect the parameters from the user. Once all the arguments are collected the front end (or the works manager) can call the batch job package. Note that one of the arguments is the name of the control card file. This argument may be built in to the grammar or supplied by the works manager.

30b3b

A discussion of multi-host batch jobs.

30b4

Suppose a user wanted to run a series of batch jobs steps where each step was to be carried out on a different host. It is not difficult to envision a NSW-batch-control-language in which one could say things like:

30b4a

"If the previous job step was successful then use its output file WALDO appended to control file DOITTOIT as

old messages

card input to the batch processing facility ABC and call the printer output file GEORGE".

30b4a1

This requires a tool to "execute" files of this NSW=batch-control-languauge to be written.

30b4b

20-JAN-75 11:25:46,312
Date: 20 JAN 1975 1125-PST
From: POSTEL
Subject: Reconnection
To: Schantz at BBN
cc: postel

31

Rick:
ok, go ahead on a revised reconnection option document for the protocol notebook following the standard format, when you have a draft ready ill review it for any holes or glitches.
--jon,

20-JAN-75 13:13:27,2014
Net mail from site OFFICE-1 rcvd at 20-JAN-75 13:13:22
Date: 20 JAN 1975 1313-PDT
From: WINGFIELD at OFFICE-1
subject: NSW meeting
to: crocker at 226, balzer at 226, holg at 226, carlson at ISI, to: lloyd at ISI, baggiano at ISI, mayhen at ISI, crain at ISI, To: waal at SRI-ARC, postel at SRI-ARC, watson at SRI-ARC, To: warshall at SRI-ARC, millstein at SRI-ARC, To: irby at SRI-ARC, triolo at SRI-ARC, schaffner at SRI-ARC, To: schantz at BBN, burchfiel at BBN, thomas at BBN, To: braden at CCN, pogram at MIT-MULTICS, wingfield at OFFICE-1, to: stone at OFFICE-1, lawrence at OFFICE-1, uhlig at OFFICE-1, to: weeks at OFFICE-1, riddle at OFFICE-1

32

We should be at the halfway point in the development of the basic hardware/software packages required by the NSW. In order to insure that the requirements of the Data Systems Design Center are implemented by 1 July, Crain and I would like to schedule a meeting of the steering committee and principal investigators sometime next week.
The agenda will essentially cover an indepth review of how the various components of the NSW will interact to implement certain DSDC scenarios. For efficiency, I would like to minimize the number of persons present to include only one (1) person from the following organizations:
SRI - postel/white/watson
ADR - triolo/waal
MCA - warshall/millstein

old messages

RADC = wingfield
 ARPA = carlson
 ISI = crocker/balzer
 SAI = douglas
 AFSDSC = crain
 AFDSC = lloyd
 BBN = burchfiel

33

The meeting will be two days sometime next week [or else the second week in Feb], at a location on the east coast. Limited TDY funds for government organizations make the east coast a better choice. Please indicate who will be coming and which days are best. Unfortunately, the success of such a large project as the NSW may be determined by the operational status on 1 July. It behooves us to address these short term goals now.

Thanks,
 Mike

20-JAN-75 14:06:37,3499

Net mail from site OFFICE-1 rcvd at 20-JAN-75 14:06:34

Date: 20 JAN 1975 1406-PDT

From: CRAIN at OFFICE-1

subject: MEETING to discuss people-process-process interactions to:
 NSW-DISTRIBUTION:

34

< CRAIN, MEETING=MSG,NLS;5, >, 20-JAN-75 13:55 LAC ;;;;

35

1 Greetings

36

2 we should be at the halfway point in the development of the basic hardware/software packages required by the NSW. In order to insure that the requirements of the Data Systems Design Center are implemented by 1 July, Crain and I would like to schedule a meeting of the steering committee and principal investigators sometime next week. Unfortunately, the success of such a large project as the NSW may be determined by the operational status on 1 July. It behooves us to address these short term goals now. The purpose of the meeting is:

37

2A determine exactly what will be available on 1 Jul, and make sure everyone is in phase on this; and

37a

2B develop scenarios for the process-process and process-user interactions for each procedure available to the user on 1 Jul. We mean to concentrate on content (information required to be passed) and stay away, as much as possible, from form (syntax/format of info exchanged).

37b

3 The agenda will essentially cover an indepth review of how the

old messages

various components of the NSW will interact to implement certain DSDC scenarios, Among the Items we wish to address are:	38
3A Login and logout sequence	38a
3B Invoking, using, and leaving TELNET/ELF Tool	38b
3C Creating a Batch Job	38c
3D Calling, using, and leaving NLS	38d
3E Calling for proofs, then publication to COM/Hardcopy	38e
3F Explicit (user directed) movement of files, into, out of, and within NSW.	38f
3G Help features.	38g
3H Invoking a TBH (TENEX, Multics, ?OS360/370)	38h
3I Escaping to the WM and returning to a tool.	38i
3J passing messages in NSW (not NLS Journal or Netmail)	38j
3K Reading/sending Journal and Network Mail	38k
3LThere may be others, please consider...	38l
4 The meeting will be two days sometime next week [or else the second week in Feb], at a location on the east coast. Limited TDY funds for government organizations make the east coast a better choice. Bill Carlson suggested Boston as the meeting place, but I (crain) would prefer Princeton (at ADR), as they have not yet had the privelege(?) of hosting such a session. The tentative date we suggest is 28 and 29 Jan. We hope to get everything done in a day and a half, but don't plan anything critical for the rest of the second day so we can run over if necessary.	39
5 We are requesting, to keep the group managable and efficient, only one (1) representative from each group:	40
5A ARPA [Carlson, Crocker, or Balzer]	40a
5B ADR [Tricolo or Waal]	40b
5C SAI [Douglass or Hamrick]	40c
5D RADC [Wingfield]	40d

old messages

- 5E MCA [Warshall or Milstein] 40e
- 5F SRI-protocols [White or Postel] 40f
- 5G SRI-NLS/FE [Watson or?] 40g
- 5H BBN [Burchfiel or?] 40h
- 5I AFDSC [Lloyd] 40i
- 5J AFDSDC [Crain] 40j
- 5K *Please note; those are exclusive 'or's. If we have too big a group, we won't get anything done. 40k
- 6 We would like to have the date and location firm NLT Thursday afternoon, so please comment ASAP on: 41
 - 6A Can you attend? 41a
 - 6B any problems with the date or location(Princeton), (ADR has veto power- There's always Montgomery... 41b
 - 6C Who will attend from each group? 41c
- 7 Thanks, Mike and Larry 42

 20-JAN-75 17:47:41,6132
 Net mail from site USC-ISI rcvd at 20-JAN-75 17:47:35
 Date: 20 JAN 1975 1746-PST
 From: POSTEL at USC-ISI
 Subject: Traffic Graphs
 To: TRAFFIC-GRAPH-DISTRIBUTION: 43

Here are the ARPANET Traffic Graphs updated to include December 1974 with the data provided by Alex McKenzie of BBN. 44

TOTAL INTERNODE TRAFFIC
 PACKETS PER MONTH (MILLIONS)

Sep71	1.5	*
Oct71	3.0	*
Nov71	3.5	*
Dec71	3.3	*
Jan72	5.3	**
Feb72	6.5	***
Mar72	6.7	***
Apr72	10.1	*****
May72	15.2	*****

old messages

Jun72	24.2	*****
Jul72	15.0	*****
Aug72	21.0	*****
Sep72	24.0	*****
Oct72	40.0	*****
Nov72	25.0	*****
Dec72	28.0	*****
Jan73	45.0	*****
Feb73	41.0	*****
Mar73	56.0	*****
Apr73	67.0	*****
May73	72.0	*****
Jun73	70.0	*****
Jul73	83.0	*****
Aug73	99.0	*****
Sep73	86.7	*****
Oct73	93.5	*****
Nov73	85.3	*****
Dec73	73.8	*****
Jan74	91.9	*****
Feb74	79.9	*****
Mar74	102.9	*****
Apr74	100.0	*****
May74	104.3	*****
Jun74	90.6	*****
JUL74	115.2	*****
***** AUG74		
116.4	*****	*****
SEP74	85.8	*****
OCT74	113.3	*****
***** NOV74		
105.2	*****	***** DEC74
115.7	*****	*****

44a

TOTAL INTERNODE TRAFFIC
AVERAGE PACKETS PER DAY (MILLIONS)

Sep71	0.1	*
Oct71	0.1	*
Nov71	0.1	*
Dec71	0.1	*
Jan72	0.2	**
Feb72	0.2	***
Mar72	0.2	***
Apr72	0.4	*****
May72	0.5	*****
Jun72	0.8	*****
Jul72	0.5	*****
Aug72	0.7	*****
Sep72	0.8	*****

old messages

Oct72	1.3	*****
Nov72	1.2	*****
Dec72	1.1	*****
Jan73	1.4	*****
Feb73	1.6	*****
Mar73	1.9	*****
Apr73	2.4	*****
May73	2.3	*****
Jun73	2.3	*****
Jul73	2.7	*****
Aug73	3.2	*****
Sep73	2.9	*****
Oct73	3.0	*****
Nov73	2.8	*****
Dec73	2.4	*****
Jan74	2.9	*****
Feb74	3.0	*****
Mar74	3.3	*****
Apr74	3.3	*****
May74	3.4	*****
Jun74	3.1	*****
3.8	*****	JUL74
AUG74	3.8	*****
3.3	*****	SEP74
3.8	*****	OCT74
3.8	*****	NOV74
3.7	*****	DEC74

44b

TOTAL INTERNODE TRAFFIC
 AVERAGE PACKETS PER NODE=DAY (THOUSANDS)

Sep71	2.9	*
Oct71	5.3	**
Nov71	6.5	***
Dec71	5.7	**
Jan72	9.1	*****
Feb72	12.1	*****
Mar72	11.6	*****
Apr72	14.8	*****
May72	20.2	*****
Jun72	28.3	*****
Ju172	17.0	*****
Aug72	23.0	*****
Sep72	27.0	*****
Oct72	43.0	*****
Nov72	37.0	*****
Dec72	34.0	*****
Jan73	41.0	*****
Feb73	45.0	*****

old messages

```

Mar73  54.0 *****
Apr73  66.0 *****
May73  64.0 *****
Jun73  64.0 *****
Jul73  72.0 *****
Aug73  86.0 *****
***** Sep73
73.8 ***** Oct73
73.8 ***** Nov73
64.7 *****
Dec73  52.9 *****
Jan74  65.8 *****
Feb74  68.3 *****
Mar74  72.8 *****
Apr74  72.4 *****
May74  73.2 *****
Jun74  67.9 *****
JUL74  83.5 *****
***** AUG74
79.1 ***** SEP74
68.5 *****
OCT74  75.6 *****
NOV74  72.8 *****
DEC74  72.6 *****

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44c

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-----
21-JAN-75 06:33:09,1611
Net mail from site USC-ISI recvd at 21-JAN-75 06:33:05
Date: 21 JAN 1975 0626-PST
From: CARLSON at USC-ISI
Subject: NSW MEETING
To: CROCKER at ISIB, BALZER at ISIB, POSTEL at SRI-ARC,
To: CARLSON at ISI, LLOYD at ISI, BAGGIANO at ISI, MAYHAN at ISI,
To: CRAIN at ISI, WATSON at SRI-ARC, WARSHALL at SRI-ARC,
To: MILLSTEIN at SRI-ARC, WHITE at SRI-ARC, IRBY at SRI-ARC, To:
STONE at OFFICE-1, WINGFIELD at OFFICE-1,
To: RIDDLE at OFFICE-1, WEEKS at OFFICE-1,
To: LAWRENCE at OFFICE-1, UHLIG at OFFICE-1, JACOBS at BBN, To:
BURCHFIEL at BBN, THOMAS at BBN, SCHANTZ at BBN,
To: WAAL at SRI-ARC, TRIOLO at SRI-ARC, SCHAFFNER at SRI-ARC, To:
HOLG at ISIB, BRADEN at CCN, POGAN at MIT-MULTICS

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45

THANKS TO LARRY AND MIKE FOR ORGANIZING THE MEETING.

46

I WANT TO REEMPHASIZE THE LIMITED FOCUS; THE OBJECTIVE IS TO
 GUARANTEE THAT ALL PIECES OF THE 1 JULY DEMONSTRATION SYSTEM
 ARE BEING BUILT AND THAT WE HAVE A COMMON UNDERSTANDING OF
 WHAT THE RESULT WILL LOOK LIKE.

47

old messages

I THINK NEXT WEEK IS TOO EARLY TO HAVE THE MEETING. FOR ONE THING, I CANNOT AFFORD THE TIME BEFORE 1 FEB. A MORE SUBSTANTIVE COMMENT IS THAT THE SCENARIOS TO BE DISCUSSED SHOULD BE DISTRIBUTED IN ADVANCE OF THE MEETING AND A FIRST PASS ANALYSIS DONE BY TELEPHONE. TWO DAYS WILL NOT BE ENOUGH TO DO IT ALL, AND WE CANNOT AFFORD TO BREAK UP WITHOUT COMPLETING THE JOB,

48

IN LARRY'S NOTE ABOUT THE MEETING, THERE WAS A LIST OF ACTIVITIES TO BE PERFORMED IN JULY. THOSE NEED TO BE FLESHED OUT IN GREATER DETAIL.

49

THE FIRST TWO WEEKS IN FEB ARE BOTH OK WITH ME EXCEPT FOR 11FEB,

50

THANKS,
BILL

51

21-JAN-75 12:29:08,1412
Net mail from site BBN-TENEX rcvd at 21-JAN-75 12:29:00
Date: 21 JAN 1975 1520-EST
From: MCKENZIE at BBN-TENEX
Subject: RFC 662
To: Kanodia at MIT-MULTICS
cc: Pogran at MIT-MULTICS, pogran,CompNet at MIT-MULTICS,
cc: walden, mcquillan, mckenzie, postel at SRI-ARC

52

Raj,

I have just gotten around to reading RFC #662. In response to your statements in the second paragraph of the section labeled "PROBLEM", namely "the protocol does not specify any way to recover from transmission errors that occur while more than one RPNM is pending on the same connection", I would like to call RFC's 533 and 534 to your attention. If the "protocol" referred to in the quotation above is the Host/IMP protocol then your statement is incorrect. Of course, if you refer to the Host/Host protocol then you are correct. However, I believe it would be possible for you to program Multics to use the features described in RFC's 533 and 534 EVEN IF NO OTHER HOST IMPLEMENTED THE CHANGE. I believe you could then get higher bandwidth sending TO any Host (provided sufficient buffer allocation was made available); of course you could only CORRECT errors when sending to a Host which also implemented the change (you would have to abort the transfer and start over if errors were detected in sending to Hosts which were not known to have implemented the change).

Regards,

Alex McKenzie

21-JAN-75 17:07:48,5675
Net mail from site SRI-ARC rcvd at 21-JAN-75 17:07:43
Date: 21 JAN 1975 1707-PST

old messages

From: POSTEL at SRI-ARC
 Subject: Terminal, Tools and the NVTP in NSW
 To: NSW-DISTRIBUTION:

53

Bill:

In response to your message of 12-JAN-75 and our subsequent telephone conversations on the role of Telnet in the connection of user's terminals to old programs being used as tools I have prepared the following note. --jon.

< POSTEL, NVTP-COMMENTS,NLS;8, >, 21-JAN-75 16:42 JBP ;;;;

54

This is an attempt to clarify the role of the Network Virtual Terminal Package (NVTP) in interfacing "Old Programs" to the National Software Works (NSW). The discussion here assumes that the reader is familiar with the Procedure Call Protocol (PCP) and the Telnet protocol.

55

The NSW is composed of two principal entities and a group of auxiliary entities. The principals are a Works Manager (WM) and a Front END (FE). The auxiliaries are called Tool Bearing Hosts (TBHs).

56

The WM and the FE always communicate with each other and with the TBHs using PCP. This is a simplifying principle that allows for a cleaner and quicker implementation of the WM and the FE.

57

(We note that at times the same machine that supports the FE may be used in a non-NSW context to communicate with other machines, including those that support the WM or those that are also TBHs, using other protocols. This does not alter our basic simplifying principle since those other communications protocols and programs are completely independent of the NSW.)

57a

The active agent in the FE that carries out the users requests as interpreted using the grammar and the user profile is the Command Language Interpreter (CLI).

58

The TBHs support applications programs (e.g. text editors, compilers, reformatters, ...) called tools. These tools are or will be constructed with the NSW in mind, and will expect to communicate via PCP. Other applications programs, here called "Old Programs", were constructed to communicate only with a controlling teletype. The Telnet protocol has been designed and implemented such that a remote user's terminal can appear to be the controlling teletype when the remote user utilizes a "user Telnet" process to communicate via the network with a "server Telnet" process that directly controls the application program.

59

To interface such Old Programs into the NSW a NVTP has been designed to act as a converter between PCP and Telnet protocol. There are two

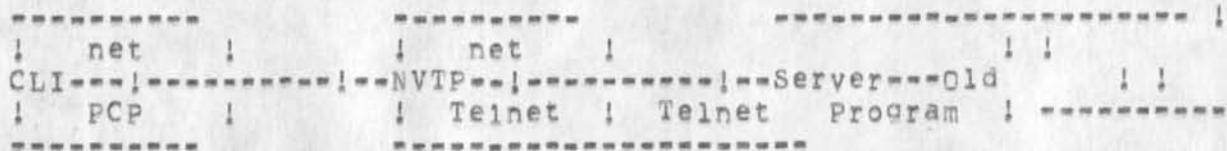
old messages

cases to be distinguished: first the case where the NVTP is in a third host, and second where the NVTP is directly controlling the Old Program, Note that in either case from the point of view of the WM and the FE the NVTP is the tool.

60

Case 1

61



61a

Notes:

61b

CLI only does PCP calls,

61b1

NVTP merely copies data,

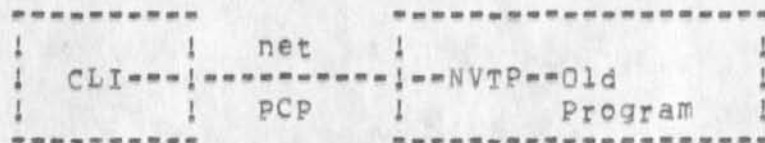
61b2

Server Telnet acts as controlling teletype to Old Program,

61b3

Case 2

62



62a

Notes:

62b

CLI only does PCP calls,

62b1

NVTP acts as controlling teletype to Old Program,

62b2

NVTP is a SMALL extension of Server Telnet program,

62b3

In the NSW environment the control features of telnet are generally unnecessary since these functions are performed by the FE,

63

Most of Telnet's control options are for controlling aspects of the users interaction that can be specified by a grammar or user profile. The difference is that in Telnet the parameters are dynamically controlled and transmitted between the user and server for each use of a program; in the NSW case these parameters are incorporated in the grammar and are therefore relatively static, but they are not renegotiated with each use of the tool and thus there is less network traffic. A user should be able to change

old messages

aspects of the interaction by commands to the FE which do not require network traffic,

63a

For example the most powerful Telnet Option == Remote Controlled Transmission and Echoing (RCTE) == is completely replaced by a grammar tailored to the serving host and tool. And the strategy of dynamic control used in RCTE requires substantially more network traffic than is necessary in the NSW case.

63a1

An alternative communication strategy for Old programs has been suggested that would have the FE communicate with the Old Program using Telnet protocol.

64

The WM is the only NSW process that initiates tool processes and the WM always communicates using PCP. It would be quite awkward to have the tool process initiated using PCP and subsequently communicate using Telnet protocol. The Telnet protocol does have a reconnection option (there are no known implementations of this feature), so that (in theory) control of a process created by a Telnet initiation by the WM could be switched to the FE, such a procedure requires both the WM and the FE to treat Old Programs differently than new tools, and requires both the WM and the FE to implement both PCP and Telnet protocol.

64a

 22-JAN-75 06:00:58,1281
 Net mail from site BBN-TENEXA rcvd at 22-JAN-75 06:00:55
 Date: 22 JAN 1975 0900-EST
 From: BTHOMAS at BBN-TENEXA
 Subject: NSW-DISTRIBUTION LIST
 To: POSTEL at ARC

65

JON,
 I HAVE RECEIVED 2 COPIES OF YOUR LAST TWO NSW MESSAGES.
 PLEASE CHECK YOUR DISTRIBUTION LIST. NOTE THAT MESSAGES
 FOR THOMAS@BBN ARE NOW FORWARDED TO BTHOMAS@BBN.

66

ALSO, FOR YOUR INFORMATION, AN IMPLEMENTATION OF THE TELNET
 RECONNECTON PROTOCOL HAS BEEN TESTED FOR TENEX
 WITHIN CONTEXT OF RSEXEC - SEE RFC #671 BY SCHANTZ,

67

ALSO, I JUST READ YOUR NOTE ON NVTP-COMMENTS. THE COMMENTS WERE
 ABOUT WHAT WE EXPECTED THE NSW "SOLUTION" TO THE OLD PROGRAM PROBLEM
 TO BE. I PERSONALLY BELIEVE THAT NSW IS MAKING A SERIOUS MISTAKE BY
 NOT DIRECTLY SUPPORTING "ORDINARY" NETWORK CONNECTIONS AND "ORDINARY"
 TELNET CONNECTIONS IN ADDITION TO THE "LOGICAL" AND "PHYSICAL"
 CHANNELS DESCRIBED IN JIM'S PCP DOCUMENTS.
 IN THE OLD PROGRAM CASE IT APPEARS THAT THE PCP REGIMEN

old messages

IS FORCING AN INEFFICIENT IMPLEMENTATION BY, FOR EXAMPLE, FORCING TWO
 TERMINAL I/O WAKEUPS RATHER THAN ONE. THIS COULD BE CORRECTED BY
 ADMITTING THE NOTION OF ORDINARY CONNECTIONS AND TELNET CONNECTIONS
 TO PCP - I BELIEVE THIS COULD BE DONE IN A WAY THAT DOES NOT
 SERIOUSLY COMPROMISE THE PCP DESIGN PHILOSOPHY,

68

BOB

22-JAN-75 08:50:47,237

Net mail from site USC-ISI rcvd at 22-JAN-75 08:50:44

Date: 22 JAN 1975 0848-PST

From: CARLSON at USC-ISI

Subject: TERMINALS,TOOLS,NVTP IN NSW

To: POSTEL at SRI-ARC

cc: WATSON at SRI-ARC

69

THANKS FOR THE PAPER JON,

70

22-JAN-75 09:06:58,1827

Date: 22 JAN 1975 0906-PST

From: WHITE

Subject: Answers to PCP Questions

To: mandell at IsIB

cc: postel

71

Dick--

72

1) MY current intention is to abort (return type PERMANENT and
 subtype ABORTED) a procedure call request when all processors are in
 use. There are a couple of other possibilities, one or more of which
 may prove desirable:

73

The process could, as you suggest, queue the request until a
 processor becomes available. Clearly there's some limit to the
 buffering capacity of the process, so queuing probably just delays
 the inevitable,

73a

The process could abort the request and promise to notify the
 calling process (with a new type of message) when a processor
 becomes available, and force him to reissue the request at that
 time,

73b

We could add an argument to the CALPRO procedure which lets the
 caller decide how this situation is to be handled,

73c

Suggestions? Preferences?

73d

2) The user descriptor is assumed by the PCP code to be addressed by

old messages

the external symbol "USRDSC". The loader resolves the reference at load time. The system descriptor is known to the applications code by a similar mechanism.

74

3) I'm behind schedule on implementation, and am now shooting to have PCP running and NLS using it by the end of FEB.

75

4) BUPRSM is indeed missing from the bundle descriptor. Thanks. Assume that it follows BUPDSP.

76

New (even readable) hardcopy documentation went out to you in the mail yesterday. Among it is a document called PCPV2CHANGES whose on-line version will be regularly updated and will contain bug fixes, design changes and additions, clarifications, etc. Once we have a running implementation, I will merge this file with the Version 2 documents to generate Version 3.

77

--Jim

77a

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-----
22-JAN-75 10:56:25,707
Net mail from site BBN-TENEX rcvd at 22-JAN-75 10:56:21
Date: 22 JAN 1975 1357-EST
From: MCKENZIE at BBN-TENEX
subject: RFC's
To: postel at SRI-ARC
cc: mckenzie
```

78

Jon,
Since my inundation with papers starting in about November, my filing system hasn't been perfect, and things may have gotten lost. The last RFC I received was numbered 674 (Postel & White). Working backward, there are the following "missing" RFC's:

```
#673
#670
#668
#665
#664
#648-#650
#646
#641
#639
```

Do you know if any of these numbers correspond to documents which were actually written? If any do, would you mind telling me the source of the document, so that I can try to get a copy?

Thanks,
Alex

```
-----
22-JAN-75 11:18:10,857
```


old messages

Date: 22 JAN 1975 1118-PST
 From: POSTEL
 Subject: NSW interface to old programs
 To: Thomas at BBN
 cc: Postel, White

79

Bob:

In principle the NVTP should sit in the same place in the processing of the data as Server Telnet. (See my case 2.) When this is true there should be no difference in the number of wake-ups (or any other measure) between the NSW and non-NSW cases. The reason for the difference you correctly point out is that in TENEX the Server Telnet has been pushed into the monitor. It could be that the NVTP is eventually pushed into the monitor too (or instead). But we do not advocate that approach. We believe that new tools (that know PCP) which are constructed for and fully integrated into the NSW will be so much more attractive to users that the use of old programs will become insignificant.

--jon,

22-JAN-75 14:16:38,509
 Date: 22 JAN 1975 1416-PST
 From: POSTEL
 Subject: RFCs
 To: McKenzie at BBN
 cc: postel

80

Alex:

Your list of missing RFCs is exactly right, none of the numbers you mention is assigned to an actual document. There are some additional numbers assigned: 675 is Cerfs TCP Spec (ask Cerf for hardcopy), 676 is no document, 677 is assigned to Paul Johnson at BBN but I haven't received a document yet, and 678 is by me on File Formats and is online at Office-1 as <NETINFO>RFC678.TXT

--jon,

81

22-JAN-75 15:08:26,755
 Date: 22 JAN 1975 1508-PST
 From: WHITE
 Subject: A Suggestion for Handling Processor Assignment
 To: mandell at ISIB
 cc: postel

82

I suggest the following:

83

- 1) implement (some reasonable amount of) queuing in the CF,
- 2) add a BOCLEAN argument to the CALPRO procedure by which the

83a

old messages

caller can either take advantage of or ignore the CF's queuing ability.

83b

3) add an INTEGER priority argument to the CALPRO procedure, allow the applications code (by way of the USRDSC) to specify USPRCT priorities (one for each processor), and then assign a procedure call request to a processor only if the request's priority is greater than or equal to that of the processor.

83c

What sayest thou?

84

--Jim

84a

 22-JAN-75 17:36:24,1261
 Net mail from site ISIB rcvd at 22-JAN-75 17:36:17
 Date: 22 JAN 1975 1736-PST
 From: MANDELL at USC-ISIB
 subject: response to priority proposal
 To: James E. White:
 cc: postel at ARC

85

My first reactions to the use of priority numbers for processors and calls is that it looks like a good idea. Perhaps, the amount of buffering required in the call queues can be suggested by the processes that create logical channels. The number of queue spaces could be arbitrated between the processes at each end of the channel. I think that the use of priority numbers for processor allocation is cleaner than my suggestion of allowing a user routine to handle queuing. Our application can probably benefit by the ability to reserve some processors for high priority calls. Your proposal also allows all processors or most processors to have the same priority. In order to avoid deadlocks, it is probably necessary to select candidates for assignment to processors in a priority order. This can be done by priority ordering of the call queue or by some other equivalent means. In our application it would be convenient to be able to change the priority of processors from time to time to adjust to load conditions.

 22-JAN-75 17:37:00,1264
 Net mail from site ISIB rcvd at 22-JAN-75 17:36:53
 Date: 22 JAN 1975 1730-PST
 From: MANDELL at USC-ISIB
 Subject: Response to processor priority
 To: James E. White:
 cc: POSTEL at ARC

86

old messages

My first reactions to the use of priority numbers for processors and calls is that it looks like a good idea. Perhaps, the amount of buffering required in the call queues can be suggested by the processes that create logical channels. The number of queue spaces could be arbitrated between the processes at each end of the channel.

I think that the use of priority numbers for processor allocation is cleaner than my suggestion of allowing a user routine to handle queuing.

Our application can probably benefit by the ability to reserve some processors for high priority calls. Your proposal also allows all processors or most processors to have the same priority. In order to avoid deadlocks, it is probably necessary to select candidates for assignment to processors in a priority order. This can be done by priority ordering of the call queue or by some other equivalent means. In our application it would be convenient to be able to change the priority of processors from time to time to adjust to load conditions.

87

22-JAN-75 18:32:41,233
 Net mail from site BBN-TENEX rcvd at 22-JAN-75 18:32:39
 Date: 22 JAN 1975 2123=EST
 From: WALDEN at BBN-TENEX
 Subject: book chapter
 To: postel at SRI-ARC
 cc: Walden

88

how is book chapter on protocols coming?
 dave

22-JAN-75 20:19:30,5961
 Net mail from site OFFICE-1 rcvd at 22-JAN-75 20:19:22
 Date: 22 JAN 1975 1851=PDT
 From: CRAIN at OFFICE-1
 subject: more on meeting
 To: nsw=all:

89

< CRAIN, MSG-MEETING,NLS;5, >, 22-JAN-75 18:13 LAC ;;;;

90

Hello, again;

There seems to be considerable (and I must admit well founded) objections to having the meeting next week. However, it is imperative that we hold it as soon as possible, so we get the important issues it will address resolved. Therefore, let's move it back a week, to Wed-Fri, 5-7 Feb. I feel that we must make time to attend, and that that date is probably the latest one reasonable. It should also fit better into the schedules of those who have already responded, particularly Watson, who plans to be in Boston the 4th already. You

old messages

might also notice that the length has been extended to three days, at the request of Bill, who doesn't think we can get everything done in two. Judging by past meetings, he may be right, so let's plan on 2+ days, and reserve Friday if we need it. Pete Waal says that he will be happy to host it, and we have no other major objections yet voiced, so let's set Princeton as the place. Pete: We would appreciate directions, and the name of one good motel (for everyone else) and one cheap one (for a certain poor Lt.) when you get a chance.

i

91

In response to some "Comments on Scenarios for Meeting" by Bill:
2

92

1. BY CREATING BATCH JOB, I ASSUME YOUU MEAN B4700 BATCH JOB?
2A

92a

I mean B4700 batch jobs, but I suspect AFDC would read that to mean 360 or Multics Batch jobs. This brings up an interesting question: do we let users of a TBH such as a 360 or Multics use the operating system's facilities to create batch jobs directly, or do we require them to invoke a separate batch tool? The former seems like it would be difficult to recover the accounting information, but the latter involves trapping any commands the user might try which would create a batch job, as well as building an additional tool.
2A1

92a1

2. ARE WE GOING TO CALL/USE/LEAVE NLS, OR IS THERE GOING TO BE AN NLS EDITOR, AN NLS PUBLICATION SYSTEM, AN L10 COMPILE/DEBUG SYSTEM (OF COURSE WITH SLEWING AMONG TOOLS PER IRBY'S RECENT NOTE)
2B

92b

conceptually, I prefer separate tools, but practically, I am worried about implementing them in time. I must have missed the referenced note from Irby- Charles; could you point me at a copy? 2B1 3. WHAT EXPLICIT MOVEMENT OF FILES WITHIN NSW DO YOU WANT, THE ONLY CASE I AM AWARE OF IS FOR LOWER COST STORAGE.
2C

92b1

I thought that movement of files to the Batch TBH would be necessary in the 1 Jul system. (correct me if I'm Wrong.) I think that implies Explicit movement.
2C1

92b2

4. MIT AND UCLA ARE JUST STARTING TO GET INVOLVED IN THE NSW, AND THEY HAVE NOT YET COMMITTED TO A DATE FOR TBH IMPLEMENTATIONS ON MULTICS OR THE 360,
2D

92c

old messages

The Multics, and to some extent the 360, were mentioned for DSC. Jim Lloyd: what is your feeling on this?
2D1

92c1

5. THE MESSAGE THING WORRIES ME. THE STATEMENT OF THE SCENARIO IMPLIES I MUST NOW LEARN NSW MAIL AS WELL AS SNDMSG AND JOURNAL.
2E

92d

Steve Warshall mentioned this facility at a previous meeting, so I'll drop it in his lap. I tend to agree that it is definitely Undesirable to have message systems start proliferating like coathangers in a dark closet.
2E1

92d1

6. I WISH THERE WAS ONE PROGRAM ON THE B4700 WE COULD INSTALL AS A REAL NSW TOOL. IT SHOULD BE A BATCH PROGRAM. BY REAL TOOL, I MEAN THAT I WANT TO INVOKE IT AND RETRIEVE THE RESULTS WITHOUT EVER SEEING B4700 JOB CONTROL.
2F

92e

One candidate for such a role I have been considering is a program our Support branch developed. Called %-EXECUTE, it takes a COBOL source deck, instruments it, compiles it, then executes it to see if your test data has exercised all possible control paths. If this sounds like a reasonable choice to all of you, I'll see what we can do about getting it installed as a batch tool on the B4700.
2F1

92e1

To Bill, especially, but others might take note also: I would appreciate you using the Distribution List feature whenever possible. ISI-KA users can use <nsw>all, Distribution-list, pi,D., and Steering. Office one users have <crain>NSW-ALL., NSW-PI., and NSW-Steering. I think there are also lists available at SRI-ARC, under similar names. The reason for this request is very simply that it seems about a quarter of my mailbox is filled with lists of addressees. If you have a spare minute, please review the respective "ALL" file at your site, and let me know if any names are "ALL" file at your site, and let me know if any names should be added. This is basically a 'shotgun' file, and anyone interested in the project should be included.
3

93

so much for the work. Now for a little frivolity: For those of you who are secret Batman Freaks, or who just like bad puns and veiled references, may I commend to your reading the works of one of my distinguished fellow inmates here at GAFS (Gunter Air Force something, for you troupes who dont understand Military talk). See [ISI=ka]<NSW>Capt.ARPA;6.
4

94

old messages

Thanks for your attention, and I'll see you all a week from
Wednesday, 5 95

/Larry e 95a
5A

----- 96

23-JAN-75 15:02:49,590
Net mail from site USC-ISIA rcvd at 23-JAN-75 15:02:48
Date: 23 JAN 1975 1458-PST
From: CARLSON at USC-ISI
Subject: 360 NCP
To: POSTEL at SRI-ARC
cc: CARLSON 97

NOWHERE IN THE ARPA OFFICE IS A COPY OF THE PAPER YOU DID AT MITRE ON
NETWORK NCP. I DESPERATELY NEED TO KNOW HOW BIG THE NCPS
ARE AT UCLA AND AT SANTA BARBARA. DO YOU HAVE A COPY OF YOUR
PAPER? ALSO, DOES IT GIVE ANY INFO ABOUT THEIR TELE HANDLER AND HOW
IT IS INTERFACED TO TELNET? ARE FTP DONE THROUGH THE TELE HANDLER, OR
DOES IT GO MORE DIRECTLY TO THE FILE SYSTEM, HOW ABOUT RJE? 98

THANKS,
BILL 99

23-JAN-75 16:13:28,1302
Net mail from site USC-ISIA rcvd at 23-JAN-75 16:13:23
Date: 23 JAN 1975 1603-PST
From: DCROCKER at USC-ISI
Subject: Protocol information file
To: Postel at ARC 100

Hi, Jon, How's tricks? 101

A small suggestion for the Protocol information file:
Use numbering to help the user parse segments of the
document. Because most of the statements are only one line
long and there is a great deal of indentation
variation, it is sometimes difficult to scan for
a specific section. 102

Additions/corrections: 103

1. You were second author of RFC 539 (Thoughts on White's Mail
protocol). 104

2. MY RFC 577 isn't on the list, for Proposed Mail, It is

old messages

a very short note and may not have said enough to be worth including, but,,,
105

3. The people and documents referring to CCN's RJS are all CCN people. There have been several implementations of User processes (e.g., the Harslem/Fagan one that I modified). Might be worth listing them. Harslem issued RFC 307 on his initial version. The document on my mods to the program is a NUTS note (!).
106

4. Oestreicher (at ISIB) has issued an addendum to RFC 561, with some additional mail header fields. It was a small-distribution document, but he may be interested in making it an RFC.
107

Any exciting happening?
108

Hello to Joanne, Dave,

109

23-JAN-75 20:50:09,1369
Net mail from site SRI-AI rcvd at 23-JAN-75 20:50:07
Date: 23 JAN 1975 2051-PST
From: LYNCH at SRI-AI
Subject: NEED FOR A GIVER OF NAMES
To: POSTEL at ARC, WHITE at ARC
110

I AM READING YOUR RECENT TOMES (AND GETTING AN EDUCATION, THANKS) AND I KEEP SEEING A COMMON PROBLEM CROP UP -- THAT IS THE ONE OF "UNIQUE" NAMES FOR THINGS. IS IT TOO MUCH TO ASK THAT THERE BE A UNIVERSAL NAME GIVER IMPLANTED IN THE SCHEME? OBVIOUSLY A SIMPLE "ADD ONE AND HAND IT TO HIM" PROCESS EXISTING IN HEAVEN OR SOMEWHERE WOULD DO THE TRICK. SUCH A SIMPLE SOLUTION, THAT I SUPPOSE IT CAN'T WORK. REALLY, THOUGHT IT IS A TERRIBLE PROBLEM AS THINGS START TO GROW IN THE WORLD, BUT PHYSICISTS ABSOLUTELY REFUSE TO WORK WITHOUT CERTAIN INSTRUMENTS AND I THINK THAT NAME MANIPULATORS OUGHT TO ADOPT THE SAME STANCE. IS ALL THIS SILLY? CAN YOU IMAGINE A PROCESS SOMEWHERE THAT YOU SEND A "STRING OF WHATEVER GIBBERISH YOU DESIRE" AND IT SENDS YOU A VIRGIN "NAME" (NUMBER) THAT YOU CAN USE FOREVER AND BE ASSURED THAT NO ONE ELSE WILL EVER GET TO CREATE THAT NAME? LAST WEEK AT ARPA LICK WAS ACTUALLY VERY CONCERNED ABOUT WHO GIVES OUT NAMES (FOR USER IDS) AND I THINK THAT IT WOULD BE A HANDY THING IF THERE COULD BE A TECHNICALLY FEASIBLE WAY TO ESTABLISH SUCH A GENERATOR OF NAMES FOR PROCESSES THAT HAD TO HAVE UNIQUENESS FOR ITS NAMES.

OH WELL,
DAN

24-JAN-75 08:52:06,1452
Date: 24 JAN 1975 0852-PDT

old messages

From: POSTEL
 Subject: NCPs and Survey
 To: Carlson at ISI
 cc: postel

111

Bill:

I am sending you my last "extra" copy of the report, for future reference the appropriate source of copies is MITRE, the person to contact is Howard Duffield (thats at MITRE Washington),

112

As to the info you requested i think that be "tele handler" you mean local interactive terminal handler, and will try to answer what i know on that assumption,

113

NCP Size these numbers should be taken in perspective, they dont measure the same things in every case in particular across the 12 systems surveyed the size reported varies by more than a decimal order of magnitude. The total size is composed of three factors the code, the tables, and the buffers. The last (buffers) is quite variable and in some cases dynamic so the size given may represent the size in use with a (at the time of the survey) average load. Now the numbers: UCLA = 25K bytes, UCSB= 105K bytes, RAND =47K bytes,

114

The UCLA and UCSB implementations are very different in organization. To my understanding neither interfaces to the local interactive terminal handling code,

115

The other questions you ask take a bit of picture drawing and should really be refered to the appropriate guys at the sites. I did not cover those aspects of the network code in my survey. N.B. the NCP is only a part of the network related code in a host,

116

--jon,

24-JAN-75 09:07:14,783

Date: 24 JAN 1975 0907-PDT

From: WATSON

Subject: critical questions still open

To: irby, michael, maynard, postel, white, martin, lehtman, To: belleville, andrews, victor

cc: watson

117

The file (nls=sources,nls=questions) contains critical unanswered questions. Please read, will assume that CHI and EKM are responsible for getting them answered by next thurs at latest. I do not see how we can freeze the split desing until they are answered. We need to decide what is importnat and must be thre by July and what can be pushed to after July. We must aim to be integrating the system by April, NLS Frontend and hopefully WM if we really hope to be up in

old messages

July. Our reputation depends on this. If there is any slack anywhere lets pick it up. Thanks Dick -----

24-JAN-75 09:34:28,876

Date: 24 JAN 1975 0934-PDT

From: WATSON

Subject: attendance at next NSW meeting

To: carlson at ISI, crain at ISI

cc: postel, irby

118

Jon Postel and I will definitely be there. Since this meeting is crucial in the sense that this is basically the last chance to get any unanswered questions answered Charles maybe should also go although he just recently had a fairly serious hand accident and it may not be possible for him to travel extensively at this time. We are preparing scenarios and questions will send a suggested agenda from our point of view next week. Bill should I still plan to come down to DC to talk with Russell, If so I would like it to be on Monday or Fri of that week. I basically object to three day meetings. If they are organized properly two should be enough. I didn't like the last one much as it was not very productive. Dick -----

24-JAN-75 10:38:43,1128

Net mail from site USC-ISIA rcvd at 24-JAN-75 10:38:39

Date: 24 JAN 1975 1033-PST

From: DCROCKER at USC-ISI

Subject: Telnet Option sub-acknowledgement

To: Schantz at BBNA

cc: Postel at ARC, DCROCKER

119

Rick -- I, also, like the idea of a uniform handling of parameter acknowledgement. I wish I could think of an approach that appealed to me.

120

<IAC><SB><OPTION><OK><AIC><SE> is fraught with problems, since each option deals with the first byte after <option> is different ways. I don't believe it will be possible to get agreement on its handling. That leads me to wonder about putting the <OK> (and, by implication, <NOT-OK>) on the other side. That is (brace yourself, Jon): <IAC><ACK/NAK><SB><OPTION><IAC><SE>. This has many problems, but may work. In fact, the SB and SE parts may not be necessary, depending upon how self-identifying the Ack needs to be. (Will an option, at any point in time, be awaiting at most one ack?).

121

A larger, and uglier, problem with this approach is the part of the subnegotiation would now take place "outside" of the SB/SE parentheses.

122

Yuch.

123

old messages

Dave,

124

24-JAN-75 14:20:30,276
 Date: 24 JAN 1975 1420-PDT
 From: FEINLER
 subject: visit from Craig Fields
 To: postel

125

Craig Fields will be at the Institute next Friday for a 'general friendly visit'. Just thought I would pass on the info. Don't know time or particular occasion.

126

Jake

24-JAN-75 16:28:47,2347
 Net mail from site MIT-MULTICS rcvd at 24-JAN-75 16:28:04
 From: Kanodia.CompNet at MIT-Multics
 Date: 01/24/75 1926-est
 subject: RFC 662

127

Alex:

128

In response to your remarks on RFC 662, I would like to offer the following comments:

129

1 - The complete sentence that you refer to (and the one preceding it reads as follows:

130

An old version of the IMP-to-Host protocol requires that a host may not transmit another message on a network connection unless a Request-for-Next-Message (RFNM) has been received in response to the previous message. Even though this restriction has now been relaxed, the protocol does not specify any way to recover from transmission errors that occur while more than one RFNM is pending on the same connection.

130a

I believe that the terms "network connection" and "connection" are crucial in these sentences. At one time the IMP-to-Host protocol recognized the concept of a network connection in terms of links. In as much as the IMP-to-Host protocol no longer recognizes the concept of links, it is certainly ambiguous to state that "the protocol does not specify any way to recover from transmission errors on the same connection." It is up to the Host-to-Host protocol to specify recovery procedures; it may use the IMP-to-Host protocol features of message-id and "incomplete Transmission Message". I am sorry for this inadvertent ambiguity/error.

131

old messages

2 - Your conclusion that features described in RFCs 533 and 534 could be used to improve bandwidth, even if no other host implements these features, is partly incorrect. Consider a Host A which uses message sequence numbers while sending messages to a host B which does not use message sequence numbers and can not detect the loss of messages. It is quite possible that B will receive a sequence of messages with a hole in it (undetected by B), and take some disastrous action (unimplied by A) even before A could abort the connection.

132

3 - I have tried to deal with some of these problems in my RFC 663 and, as pointed out in the same RFC, the proposed recovery protocol uses the ideas developed in RFC 534.

133

- Raj

134

copy to: walden, mcquillan at bbn-tenex
 copy to: postel at sri-arc
 copy to: pogram, clark at mit-multics
 24-JAN-75 18:17:03,894
 Net mail from site SRI-AI rcvd at 24-JAN-75 18:17:01
 Date: 24 JAN 1975 17:16-PST
 From: LYNCH at SRI-AI
 Subject: PCP
 To: white at ARC, postel at ARC

135

Hey guys,
 I have finally absorbed the first pass at your stuff and have one huge worry. It appears to me that you are moving "system programming" considerations UP to the user programmer instead of DOWN from him. I got seduced into thinking what you were saying was good stuff until I realized that it was my kind of daily consumption you were formalizing. Maybe I am on the wrong track, but aren't we (the cs world) supposed to be making the world better for non-specialists? I probably have missed something in the total scheme, but I do want to chat with you about this to settle my mind and to give you the benefit of my tears about system programming...

Dan

PS As a spec for an operating system it is great.

 25-JAN-75 18:49:37,380
 Date: 25 JAN 1975 18:49-PDT
 From: IRBY
 Subject: nls-questions
 To: watson, MICHAEL, white, postel, MAYNARD, martin, kelley, To:
 andrews, victor, BELLEVILLE, LEHTMAN

136

I have added comments to <nsw-sources, nls-questions,>. I suggest you reread it. -- Charles, p.s. I understand we will meet about

old messages

this on monday, please read before the meeting to save time, -----

27-JAN-75 12:08:26,541
 Net mail from site OFFICE=1 rcvd at 27-JAN-75 12:08:22
 Date: 27 JAN 1975 1111-PST
 From: CRAIN at OFFICE=1
 Subject: NSW Long-range Scenario
 To: NSW-DISTRIBUTION:
 cc: crain

137

Please see [Office=1]<crain>Scenario.txt;1 for a long range view of how I expect the NSW will fit into the working environment of AFDSDC. This should allow you to better see some of the high level scenarios I expect will be supported by NSW (in its 'mature' incarnation), and what I think should be available early in the project.
 /Larry

138

27-JAN-75 13:15:29,207
 Net mail from site USC-ISIA rcvd at 27-JAN-75 13:15:28
 Date: 27 JAN 1975 1308-PST
 From: CARLSON at USC-ISI
 Subject: MITRE REPORT
 To: POSTEL at SRI-ARC

139

CAME IN TODAYS MAIL
 THANKS,
 BILL

140

27-JAN-75 14:27:37,424
 Date: 27 JAN 1975 1427-PDT
 From: POSTEL
 Subject: Reconnection Protocol
 To: Dcrocke at ISI
 cc: Schantz at BBN, postel

141

Dave:
 My comment on your suggestions==ODG!

142

Rick and I have previously discussed the inclusion of the option name and an "OK" byte in the acknowledgement. I feel that it is a satisfactory situation. Your idea to put the ACK outside the SB...SE phrase is unacceptable.
 --Jon,

143

 28-JAN-75 11:38:25,7296
 Date: 28 JAN 1975 1138-PST
 From: WHITE

old messages

Subject: Answers to PCP Questions

To: mandell at ISIB

cc: postal 144

Dick== 145

Processor Priority 146

I prefer at the moment, I think, to let your suggestions for dynamically variable processor priority, and call-queue depth assignment via IT_pPRCS, sit in my post-implementation queue. Although I can see the possibility of their utility, they tend to make processors much fancier than I intended, and I don't think I'm willing to commit to that yet. I'd rather wait until we have some experience with a running NSW system first.

146a

Inter-Entity Synchronization 147

The event and signal subroutines defined in PCPTNXINT are indeed for intra-process synchronization (between CF=PF and PF=PF),

147a

The lock procedures defined in PMP, however, are provided for INTER-process as well as intra-process synchronization. A data store is locked by a particular processor within a particular process. Thus locking a data store for write prevents read/write attempts by other processors within the locker's process, and other processes within the tree.

147b

We may want to add a BOOLEAN argument to LCKDATA to allow locking by an entire process with free access by ALL processors, not just one,

147b1

The lack of consistency you see between the methods by which SYLOCK and LCKDATA report the successful setting of the lock disappears if you take a larger view. In BOTH cases an event is signalled if you decide to wait. In one case, the event is specified as an argument to SYLOCK; in the other, it's specified as an argument to the CALPRO procedure by which you invoked LCKDATA.

147c

It is indeed the responsibility of PKDSMN to check the lock associated with the data store to be manipulated. The system code can't possibly do it, since it knows absolutely nothing about the data stores within a user package (not even whether one of a particular name exists). I will state that fact explicitly in Version 3,

147d

A user package presumably maintains a control block that contains such things as the name and current value of each data

old messages

store within the package. This control block must also contain a lock for each data store. 147d1

I also need to define a new USS that LCKDATA can call to lock/unlock a data store or at least hand me the address of the ECB associated with it. 147d2

Temporary Data Stores 148

Temporary data stores, since they are contained within PSP, are implemented entirely by PSP. 148a

Temporary data stores were intended for use in conjunction with CALPRO's argument- and result-list masks, providing a place where a caller could temporarily save the results of one procedure and then use them as arguments to a subsequent procedure. Furthermore, their use was only thought practical when the intermediate results were fairly large, in which case efficiencies would probably result from not having to ship them back to the caller and later to the (new) callee. None of this is meant to suggest that any other use ISI may see is necessarily unreasonable, but rather just to provide some background. 148b

Consistent with the above, a temporary data store is "known" only to the process containing the procedure that made the call to CRTTMP which created it. That fact allows, for example, two inferiors of some process P to each independently create a temp with name "TEMP" without running into a name conflict, which is just what one wants PROVIDED the intended application is as suggested above. 148c

The word "known" refers to who PCP will permit to reference an entity, whether it be a procedure, data store, process, etc.; rather than what portions of the user code happen to be aware that the entity has been created. 148c1

If one section of user code creates a temp whose name is chosen at random at run-time, then of course that temp is not "known" (in a DIFFERENT sense of the word, one which I never use) to other sections of the code until its name is communicated to them. However, from PCP's standpoint, the temp is known (i.e., addressable) from anywhere within the process. 148c2

From your questions, I gather you want to use temps just like one uses builtin data stores, i.e. You want them to be addressable by any process that has a PH for the process that contains the temp. We could, of course, add a BOOLEAN argument to CRTTMP, which specifies the scope of the data store you wish to create. Is there a reason that you can't simply build in the data stores you

old messages

need at compile time, rather than defining them as temps at run time? 148d

I strongly resist your desire to give user code control of temps by means other than RDDATA/WRDATA. I think you need to use standard data stores, over which you already have complete control. 148e

It turns out, now that I think of it, that since you DO have complete control of the data stores in your own package, you CAN define any additional ones you need at run-time (i.e. you can implement temporary data stores in packages other than PSP). Such data stores would, however, violate the definition given in the PCP document (i.e. data stores exist throughout the life of a process). If you decide you want to do this, I would like to know about it; it may be entirely reasonable. 148f

PSI System 149

The details of system-code PSI usage aren't entirely worked out yet, but I will if possible use just one channel. I expect my usage of the PSI system to be confined mainly to implementation of SYLOCK and SYUNLK. 149a

I may need to provide some SSS's by which user code can manipulate the PSI system. I can't, short of using the JSYS trap mechanism, PREVENT their doing so directly. 149b

Processor Composition 150

Each PF will in fact contain a shared copy of the same SAV file, and thus will contain the same packages (procedures and data stores) as every other PF. Doing otherwise seems a bad idea and would be difficult to implement. 150a

I cringe at the thought of building an entire "system" as a single process. A process is a COMPONENT of a system, and a system of any size will consist of SEVERAL processes. It seems unnecessary (at least at this point) to develop disciplines for solving the address-space-size problem within a single process, when one of the powerful things about PCP is that it permits you to solve that problem by partitioning the system into SEVERAL processes. 150b

New Arguments in RSMPRO 151

The new arguments supplied to a previously-called procedure via RSMPRO bear no necessary relationship, either in number, form, or content, to the original arguments supplied via CALPRO. 151a

old messages

The arguments supplied via CALPRO are available to the caller until he makes a permanent return, while those supplied via RSMPRO are available only until he makes his next temporary return (or of course a permanent one).

151b

--Jim

29-JAN-75 12:05:22,3013

Net mail from site OFFICE-1 rcVd at 29-JAN-75 12:05:13

Date: 29 JAN 1975 1159-PST

From: WINGFIELD at OFFICE-1

subject: NSW meeting agenda

To: NSW steering committee;

152

The following are agendas for the two NSW meetings next week.

153

1. Boston meeting

153a

date

153a1

5,6 Feb.

153a1a

Agenda

153a2

Wed morn: COMPASS, BBN, SRI, Carlson, (MIT) discuss TENEX TBH questions,

153a2a

Wed aft: COMPASS, BBN, SRI meet to discuss SRI proposed WM issues:

153a2b

1. userid system

153a2b1

2. mail ident

153a2b2

Thurs morn: COMPASS, SRI, MIT discussions to be announced,

153a2c

2. Princeton meeting

153b

date

153b1

6,7 Feb.

153b1a

Agenda

153b2

Thurs morn at 0900: SAI, Triolo, Muntz, Crain, and Wingfield meet to discuss B4700 interface hardware/software, user interaction and scenarios, Crain will discuss the scenarios that are expected to be implemented by 1 July,

153b2a

old messages

RJE= In this scenario the user sits down at a terminal, wakes up the WM (or FE?) and engages NLS to create three files: a JCL file, a COBOL source file, and a data file. He then specifies that the three files be sent to the B4700 for submission as a remote job entry. Upon completion of the job, the user is notified (if still on-line) or a message is sent to him if off-line. The user then peruses his output file for errors.

153b2a1

TIP= The user requests NSW to go into TIP mode. NSW provides a TIP-like service for general network access. (The actual user interactions can follow TIP, ELF, or TENEX/TELNET patterns). The user requests a connection to a NON-NSW host, does some work at that site, then closes that connection, and exits from the TIP mode.

153b2a2

File Transfer= The user specifies that an NSW file be moved to storage at the B4700 site.

153b2a3

Tool invocation on B4700= There is a tool which checks whether all logical paths are exercised by the input data by imbedding in the source language counters and traps at branch points before compilation. The user specifies that this tool be run against his COBOL source file to produce another COBOL source file which is then sent to RJE.

153b2a4

Thurs aft: Discussion of the B4700 NSW software requirements, the PDP-11 DEC IMP-11a interface driver software. A discussion of the responsibilities of ADR in regards to implementation of the TBH software will also occur.

153b2b

Fri morn: SRI and Carlson will join us in discussions of how the front-end software interacts with the TBH software. Any problems brought up the previous day in regards to the ADR software will be discussed.

153b2c

154

 29-JAN-75 12:50:47,286
 Net mail from site OFFICE-1 rcvd at 29-JAN-75 12:50:44
 Date: 29 JAN 1975 1231-PST
 From: WINGFIELD at OFFICE-1
 Subject: changes
 To: NSW steering committee:, NSW PI's and others:

155

Let me know if there are any changes to the NSW meeting agendas I just sent out.

old messages

Mike

156

29-JAN-75 18:33:31,698

Net mail from site SRI-ARC rcvd at 29-JAN-75 18:33:29

Date: 29 JAN 1975 1833-PST

From: POStEL at SRI-ARC

Subject: NSW protocols

To: NSW-DISTRIBUTION:

157

There is now available a document that describes changes to the NSW Protocols set of documents. This is a dynamic document that will evolve as the implementations emerge and it will be the basis for an eventual Version 3 of the documents. The new document is available on line at SRI-ARC in three forms:

158

for NLS viewing <POSTEL>NSWV2CHANGES,NLS

159

for printing at ARC <NSW-SOURCES>NSWV2CHANGES,PRT

160

for copying over the net <NLS>NSWV2CHANGES,TXT

161

note that this is a companion to the PCPV2CHANGES document.

--jon

30-JAN-75 08:06:29,1822

Net mail from site MIT-MULTICS rcvd at 30-JAN-75 08:06:15

From: Pogran,CompNet at MIT-Multics

Date: 01/30/75 1020-est

subject: suggestions for improving NSW protocol document format

162

To: Jon Postel

Copy to: Jim White, Raj Kanodia, Bill Carlson, Steve Warshall,

Dick Watson

163

Jon,

164

As you know, we have been looking at various NSW documents here. Our secretary has lamented the lack of organization or cataloging of these documents. And so have we. For example, consider that each of the Version 2 protocol documents contains, on its cover page, a reference to the "procedure call Protocol (PCP -- 24459)".

On none of these documents is the document's OWN NIC # to be found on the cover page! (This is true even of the PCP document which is referenced by NIC # on the cover page of every other NSW Protocol document.) Furthermore, it would be nice if the page headers inside the document, instead of giving the NLS user's name and date (the first of which is useless for external distribution), gave the package abbreviation and the document's NIC # also.

165

old messages

Thus, I would like to see in the upper right-hand corner of the cover page of each of the documents two lines: one with the package abbreviation and one with the NIC #. On the header line of each inside page I would like to see the same two pieces of information.

166

There is a further problem with the cataloging of "documents" distributed solely as Network mail. There is no way to reference these except by the sender's name and the date (unfortunately), perhaps as NSW work begins to shape up, people could spend a little more time in document preparation before distributing them via Network mail, and take a moment to get a NIC # to put on the document.

167

Hope these comments are helpful,
See you next week?!

168

Ken
28-JAN-75 14:48:04,832
Date: 28 JAN 1975 1448-PST
From: POSTEL
Subject: NSW Meeting
To: Watson
cc: irby, postel

169

I had a call from Carlson this morning. He is contemplating re-organizing the meeting, and after I talked with him about our concerns on mail, idents, file names, he was even more sure that a restructuring of the mtg would be helpful. The plan at the end of our phone conversation was:
wed am: SRI & MCA & MIT people meet at MCA to discuss NSW in general
bring MIT up to speed

170

WED pm: SRI & MCA & BBN & Carlson meet at MCA to discuss Tenex as
TBH (MIT people may stay to observe)

171

THURS: SRI & MCA & BBN(?) & Carlson meet in Boston (MCA?) to
discuss MAIL, IDENTs, Filenames.

172

THURS ADR & Crain meet at Princeton to discuss B4700 interface.
(should SRI person be there ?)

173

FRI: ???

174

--jon,

31-JAN-75 09:38:47,1744
Date: 31 JAN 1975 0938-PST
From: WHITE

old messages

Subject: Document Identification

To: pogram at MULTICS

cc: postel, watson, warshall, carlson at ISI, kanodia at MULTICS

175

Ken--

176

Thanks for your comments re documentation identification. Each document in both the original and the more recent bound PCP and NSW document collections, as well as the three individual documents sent by mail a week ago have the author's ident, the date, and NIC catalog number on every page, including the title page. This information is "stamped" on each page automatically by our Journal as a byproduct of recording the document.

177

As you point out, however, the ON-LINE versions of some of these same documents do NOT have that stamp. The lack of header information there resulted from our efforts to make the documentation suitable for printing on remote line printers. In addition to stamping each page, the Journal stamps each statement's number in the right margin. The resulting increase in line length normally causes each line to be folded by remote systems. We have since learned how to alter the margins before journalization so that documents can have both stamps and still be presentable to remote users. For the several documents you mention, however, we chose to forgo the header information rather than modify, rejournalize, and have new catalog numbers assigned to them all.

178

We've been trying fairly hard to provide reasonable documentation, but we still have some things to learn. We'll try harder with Version 3. Addition of the document name to the header information on each page is a good idea that we'll incorporate in future material.

179

Thanks for the suggestions. --Jim

179a

 31-JAN-75 09:48:13,601
 Date: 31 JAN 1975 0948-PST
 From: WATSON
 Subject: scenario documetation
 To: irby, michael, postel

180

There are a number of scenarios in prepartation that need to be assembled together and shipped out to the NSW world as background for next weeks meetings. They should go out late today or monday by noon. Jon's are basically noops but should go out, Charles is reworking his from meeting, Elizabeth is reworking a couple rom meeting and others I have not yet seen I think. Would appreciate it if Elizabeth would take on job of getting them all together and shipped out. Thanks Dick -----

old messages

31-JAN-75 10:48:32,758
 Net mail from site MIT-MULTICS rcvd at 31-JAN-75 10:48:24
 From: Pogran,CompNet at MIT-Multics
 Date: 01/31/75 1349=est
 Subject: NSW Document Collections 181

To: Jim White
 Copy to: Jon Postel, Dick Watson, Bill Carlson, Steve Warshall,
 Raj Kanodia 182

Jim, 183

Say, are we supposed to be getting documentation by U.S. mail? If so,
 is anyone here on that distribution list? I personally don't recall
 ever having seen NSW documentation here which was distributed via
 U.S. mail! 184

And what is this mention of "bound PCP and NSW document collections"?
 Again, all we have is loose stuff pulled over the Net.
 Are we missing something? 185

Is anyone maintaining a running catalog/index of NSW documentation?
 Our secretary has been clamoring for same, 186

Ken
 31-JAN-75 13:52:45,557
 Net mail from site MIT-MULTICS rcvd at 31-JAN-75 13:52:37
 From: Pogran,CompNet at MIT-Multics
 Date: 01/31/75 1653=est
 Subject: Bound volumes of protocol documents 187

To: Jim White
 Copy to: Jon Postel, Dick Watson, Bill Carlson, Steve Warshall,
 Raj Kanodia 188

Jim, 189

Raj Kanodia just informed me that he did receive the bound volumes of
 protocol documents but squirreled them away because they were totally
 unreadable. And indeed they were, so that clears up the mystery of
 the bound volumes -- but is there a mailing list we should be on? 190

Ken
 3-FEB-75 07:02:43,450
 Net mail from site CCA-TENEX rcvd at 3-FEB-75 07:02:40
 Date: 3 FEB 1975 1002=EST
 From: JF at CCA
 Subject: DFTP AVAILABLE AT SRI=APC & ISI

old messages

To: POSTEL at ARC
cc: DALE 191

AS YOU MAY KNOW, DFTP HAS BEEN INSTALLED IN <SUBSYS> AT ARC. IT ALSO EXISTS, WITH TWO OTHER PROGRAMS THAT TALK TO THE DATACOMPUTER, RDC & SMART, IN THE <CCA> DIRECTORY AT ISI. MEMOS ACCOMPANY DFTP & RDC IN <CCA>; ALL OF THIS SHOULD BE GENERALLY ACCESSIBLE.

3-FEB-75 07:31:55,548
Net mail from site MIT=MULTICS rcvd at 3-FEB-75 07:31:48
From: Pogran.CompNet at MIT=Multics
Date: 02/03/75 1032=est
Subject: Bound NSW Documents 192

To: Jon Postel
Copy to: Jim White, Dave Clark, Raj Kanodia 193

Jon, 194

The bound documents popped out of Dave Clark's in-basket Friday. Apparently there was no cover letter with them, and Dave had no idea that HE had been sent THE copy for our group. In fact, he had no idea why he should have been so blessed, but ... 195

Well, it looks like we now have good-quality documentation. 196

Ken
3-FEB-75 08:36:20,405
Date: 3 FEB 1975 0836=PST
From: WHITE
Subject: PCP Documentation for VLDB Committee
To: balzer at ISIB
cc: watson, postel, carlson at ISI, fields at ISI,
cc: crocker at ISIB 197

Bob-- I put hardcopy in the mail today to Gains, Skinner, and Srinivasan. Benoit and Goldberg were already on the distribution list and the most recent documents have already been sent to them.
--Jim

3-FEB-75 11:14:20,586
Date: 3 FEB 1975 1114=PST
From: WHITE
Subject: PCP User-System Interface
To: mandell at ISIB
cc: Postel 198

old messages

Dick--

199

1) The parameter list does indeed contain the address of the result list in (PCPTNXINT,6a3b3). Sorry,

200

2) The parameter list lifetime you suggest is exactly what I had in mind. Just one of the myriad details missing from the documentation. I appreciate all the feedback; Version 3 may even turn out to be self-consistent.

201

3) [SRI=ARC]<NLS>PCPV2CHANGES.TXT has been updated. You may want to suck over a fresh copy.

202

--Jim

202a

3-FEB-75 11:52:15,1909

Date: 3 FEB 1975 1152-PST

From: IRBY

Subject: talk with millstein

To: watson, postel

203

just had a phone conversasion with bob millstein;

1) he does not want to write up the "white box" descriptions at all except to tell us about the ones we say we need. He says writing is physically difficult for him. I asked why not use a secretary, he mumbled something. I agreed to write a memo describing what we need to know as a guide to what he must provide. This should be raised as an issue at meeting. I think it can work by just having them provide what we need but there may be some differences in our world models that we cant see because they have never written down their model of what we would do for fe and tools.

204

2) he wanted to know if he should call a fixed routine in fe when handed a file name that was ambiguous. I told him I could imagine cases where the tool created the file name and going straight to the user would not allow the tool to react to the problem. I thought a help return was better way to handle the problem.

205

3) he had a different model of tool interaction that required thatt the grammars for the tools be changed to allow them to interact. this would clearly work but forces changes in grammars each time you want two tools to interact that didnt previously.

206

4) the matter of use-types and file conversions came up. he seemed quite fuzzy on the subject and talked about usetypes as though they were inconsequential. I suggested they were attributes of the file and foormed the bases for invoking conversuion routines when needed.

old messages

we assume they are providing the facility to do the conversion and that we will provide conversion routines for nls files. 207

In general I felt discouraged by the call. They feel like they are way behind to me and I fear they will not be able to provide what we need to make the NSW work by July. 208

-- Charles.

3-FEB-75 23:41:46,67007

Net mail from site SRI=ARC rcvd at 3-FEB-75 23:40:59

Date: 3 FEB 1975 2250-PST

From: MICHAEL at SRI=ARC

Subject: Scenarios, help, problems: NSW Meeting

To: NSW=DISTRIBUTION: 209

SCENARIOS 210

The following scenarios are in response to Larry Crain's memo announcing the Feb NSW review meeting. We have numbered the points we are addressing according to the numbers in Larry's original memo. 210a

3A) LOGIN AND LOGOUT 210b

This hasn't changed enough from CHI's earlier scenario (JOURNAL # 24534) to warrant much discussion. When a user types some character on an unused terminal, the FE collects project, username and password and calls login procedure in WM [We would write actual call here but don't have WM documentation]. The WM returns user-id, user profile for FE-interaction, and list of tools available to this user. User is then talking to NSW-EXEC grammar with commands to manipulate whole files, perform terminal-specific operations, get accounting information, logout, etc. In addition the user always has available (while running any integrated tool) the universal commands to run tools, terminate tools, get semantic help with tools or the NSW as a whole. The number of commands in the universal set should be kept small to avoid undue restrictions on other tool command languages. 210b1

[Since FE has list of allowed tools, must it get permission from the WM before allowing user to run a tool?] 210b1a

3B) INVOKING, USING, AND LEAVING THE TELNET-ELF TOOL 210c

a) using ELF outside NSW 210c1

There will probably be a command in the NSW-EXEC that allows

old messages

the user to leave the NSW FE and use the normal ELF exec. Once this is done, the user is on his own until he returns to the NSW FE,

210c1a

The user will not be able to reference NSW files by their NSW names. He will not be able to talk to the WM or NSW tools,

210c1a1

b) using a non-integrated tool

210c2

The NSW will allow users to use tools that are not fully integrated into the NSW. These tools will be accessed either a) through a common tool grammar that knows nothing of the behavior or intended function of the tool or b) through a tool grammar that has been tailored somewhat for that tool,

210c2a

In case (a) the user will type characters or strings to the tool and it will respond, with the FE doing all or no echoing. This will be much like operating a full-duplex or half-duplex character-at-a-time or a line-at-a-time terminal. There will be no commands given to the tool in the normal NSW sense of command words and parameters. The user will be able to get very little help from the FE for this type of tool since it has only one command which is just the collection of a literal string from the user, but he will have the universal commands available to him by typing an escape character. There will also be a command in the NSW-EXEC to allow the user to change his escape character. Please note that while running such a character-at-a-time tool, the normal characters for <back-space-character>, <back-space-word>, <help>, etc, will not have their normal NSW function but will transmit that character to the un-integrated tool. Note also, that for line-at-a-time tools, the writer of the grammar may specify whether or not to send a carriage-return linefeed at the end of each string,

210c2b

In case (b) above, the tool grammar will contain commands tailored to the function of the tool and will appear to be more like an integrated tool,

210c2c

In both of these cases the NVT package will be used to drive the actual tool through telnet. The only difference is in the commands that are available to the user. In both cases the user may reference NSW files and may slue to other tools from the un-integrated one (see CHI's memo on tool interaction, 25120),

210c2d

old messages

The use of file names requires that the tool's attempt to access the file be trapped and that the file be moved to the local host by the WM.

210c2d1

3C) CREATING BATCH JOB

210d

This is covered in the NSWV2CHANGES file under the RJE-MODEL section.

210d1

3D) CALLING, USING, AND LEAVING NLS

210e

It should be understood that NLS like NSW represents a system for accessing a number of different tools. Thus, within the NSW the various tools contained in NLS will be tools in the NSW. There will be no single NLS tool. There will be an editor, a calculator, a send-mail, a user-profile tool, and perhaps other tools.

210e1

The universal command for running a tool is used to specify the desired tool, say the editor.

210e2

There is a tool naming issue here. We should not, for example, use up all of the obvious good names just because we are adding the first few tools. We propose that the user or his project leader supply the simple name which he will use and that this be translated into a unique system-wide name for the tool. Thus the user may ask to run the "editor" and for him that translates into "NLS-EDITOR." For another user, "editor" might mean some other editor tool.

210e2a

When the user logs into the NSW, the FE fetches from the WM a list of the tools this user is allowed to access. This list could consist of (simple name, system name) pairs.

210e2b

When the user issues the run-tool command he may type ? to find out which tools he may run. When the user specifies which tool is to be run, the FE calls the WM, passing it the (system) name of the tool and gets back the tool-id for this tool [is this necessary?]. If the grammar for the tool is already in the FE, then it is not reloaded. Otherwise, the FE calls the WM with the toolid and gets back the grammar for the tool.

210e3

We could implement this in such a way that the FE keeps track of tools used and does not bother to call the WM if this user has previously in this session run this tool. As mentioned above, we could not bother the WM at all if the tool name is in the list of legal tools for this user. The WM can still stop a user from running a tool on a particular file since all file references must pass through the WM.

210e3a

old messages

The FE then inspects the grammar to determine which pcp process(es) must be created to support this tool. For each such process the WM is called to create it and introduce it to the FE. The FE opens the appropriate packages and allows the user to specify commands to the tool. 210e4

While the tool is being used, various procedures in the processes are called to carry out the semantics of the commands. 210e5

If the tool needs to read or write on a file it calls the WM to get the file. 210e6

While the user is using the tool, he may give a universal command such as run another tool or terminate the current tool. If he elects to run another tool without first terminating the current tool, the FE simply switches grammars and holds any output from the old tool. The user may later terminate the new tool and resume the old tool or he may give the resume command for the old tool without terminating the new tool. This is what is meant by the term "slueing". When this happens, the FE switches back to the original grammar. 210e7

When the user terminates a tool, the WM is called to delete the process(es) that support this tool and the grammar's use count is decreased by one. If the use count is zero, then no user is using that tool and the core occupied by the grammar can be reclaimed if needed. 210e8

3E) CALLING FOR PROOFS, PUBLICATION TO COM 210f

A document has been entered into an NLS file and edited for content, spelling, grammar, etc. 210f1

The document is an Air Force 177 series manual in standard format and is to be produced, using COM, in both hardcopy and microfiche. 210f2

The user logs in to NSW and starts the NLS-Format tool. The Format grammar asks him to specify the name of the file to be formatted, whether it is to be formatted for COM or the line printer, and which of the standard formats to use. 210f3

The Frontend makes an out-of-line call on the Formater backend and the user is free to do other work while the formater inserts output processor directives in the file. 210f4

The user is notified when the process completes. 210f5

old messages

He may now examine the file containing directives, using the NLS-editor or immediately start the Output Processor tool. This tool produces two files: one is a sequential file, formatted for a COM device to do the actual production of the document. The other is a file that serves as a page index both to the sequential COM file and the source file. In addition to pointers to the beginning and end of each page, the file contains the state information necessary to allow the output processor to start processing in the middle of a file. The pointers in this file are used to display formatted pages on the graphics scope and to permit reprocessing of single or groups of pages from the source file.

210f6

Using the NLS-editor tool, the user may display his source file on the alphanumeric display and request the editor to display the COM formatted version on the graphics display.

210f7

Viewing the COM formatted document one page at a time, he may edit both text and directives in the source file. Hard copy proofs of all, or selected pages of the formatted file may be made on the copy printer at the workstation.

210f8

When editing is finished, the user then processes those pages that have changed creating new sequential and pointer files.

210f9

When the output processor produces a satisfactory set of proofs, the works manager is used to transfer the sequential file to a tape at whatever host maintains contact with the COM facility. (Note: this might not be an NSW host.)

210f10

3F) EXPLICIT (USER DIRECTED) FILE MOVEMENT INTO, OUT OF, AND WITHIN NSW

210g

This is accomplished via the NSW-EXEC's rename/copy/delete file commands. For copying files into and out of the NSW, the user must supply the necessary information to allow the file to be properly transferred and use-typed.

210g1

The FE will provide some abbreviations for the local card reader, printer, and tape drive for use in these commands. If the file to be inserted into the NSW file system is online somewhere the user must supply the pathname to the file.

210g1a

We expect that the path names will look just like those used now in FTP. We also expect that MCA will provide procedures (in the WM or in a separate process) that are capable of talking old FTP and NSW file names (this could

old messages

be done using the monitor call trapping mechanism for un-integrated tools),

210g1a1

It should be pointed out that we expect the WM to provide a file-name and file-name-field completion facility to the FE so that the user need only supply part of a file name and request the system to supply the rest for him (ala ESC and "F in TENEX).

210g1b

In addition, we should state that since all tools must be able to refer file references to the WM, we see no value in the FE doing so also. Thus, we are not planning to report file references to the WM except, of course, as arguments to calls on WM procedures to support NSW-EXEC file commands, etc.

210g1c

We would also hope that the WM file system will provide the user with a facility like the MULTICS working directory or the TENEX connected directory. If so, there will be a command in the NSW-EXEC to specify this.

210g1d

3G) HELP FEATURES

210h

This is accomplished via a universal command and keys on the user's terminal.

210h1

Keys:

210h1a

?: The user may type ? whenever specifying a command (except in the middle of literal text, of course). The FE responds with a list of current alternatives.

210h1a1

[We must decide what is meant by ? typed as the first character of a literal. Is the user asking what is wanted next or is the ? part of the literal text he is expected to type? We debated this for a long time for NLS-8 and finally decided to interpret it as a request for help. This occasionally causes a problem but it is easily understood by the user and happens rarely. If we use the other choice, the user will be unable to get help at times. This may be difficult to justify to the user, especially when he has several alternatives, only one of which is a literal.]

210h1a1a

SYNTAX: The user may type this key to learn the full syntax of a command, part of a command, or all commands in a tool.

210h1a2

HELP: The user may type this at any point in specifying a

old messages

command to obtain semantic, functional help with the command, the tool containing the command, or with basic concepts in the NSW as a whole.

210h1a3

This is simply another way of accessing the semantic help facilities as described below.

210h1a3a

Command:

210h1b

The "HELP" command is in the universal commands and is thus available while using any integrated tool. It allows the user to specify a concept or command or a tool, etc. and attempts to provide the user with useful explanations thereof. The data base for this semantic help facility will be structured nls-editor files for first-year NSW. There will be one or more such files associated (by the WM or a declaration in the CML grammar) with each tool plus one or more containing overall NSW concepts, lists of available tools, and guidelines for installing tools and tool help data bases. We are publishing guidelines for building such data bases.

210h1b1

[We should point out that it is not in our charter to supply the part of the data base describing the NSW as a whole, tools available within the NSW, and so forth. We strongly recommend that these exist but it is up to NSW management to charter and fund someone to supply these valuable aids to new users.]

210h1b1a

The Process that interprets the structured data base and presents help to the user will be an instance of the nls-editor process, created at login time by the WM at the FE's request. When the user first requests semantic help this process is called with the name of the data base for the current tool. It obtains this file(s) plus the NSW-help file(s) from the WM and attempts to help the user. On subsequent invocations of the help facility, no new files will have to be obtained from the WM unless the user has switched tools.

210h1b2

Given our current model of how the help facility would work, it would be difficult for a user to find out detailed things about tools other than his current tool. We recommend that only an overview of other tools would be available to him.

210h1b2a

3H) INVOKING A TBH (TENEX, MULTICS, ?S360/370)

2101

old messages

It is difficult for us to write a scenario about this since it violates our model of the NSW. The thing we think is implied here is starting a tool. It might mean starting a tool that is the interactive executive.

210i1

This should be no different than starting any other tool so the scenario should be the same as 3d (Calling using and leaving NLS).

210i2

3I) ESCAPING TO THE WM AND RETURNING TO A TOOL

210j

Escaping to the WM amounts to running the NSW-EXEC (this is done via a universal command or via an escape character). This "tool" is always immediately available (the grammar is always in the satellite machine and the WM process is always available). Once there the user may if he wishes suspend the current tool (in the middle of execution ala control-c in TENEX). We envision a "resume" command to be used to resume such a suspended tool when the user wishes this to happen. If the tool being resumed was not suspended, but rather the user merely slued (via the escape-to-NSW-EXEC key, a "resume", or a "run" command) to another tool and is now sluing back, any output that was waiting for the user from the tool is now presented to him.

210j1

Following is a first pass at the set of universal commands and the commands in the NSW-EXEC:

210j2

universal commands

210j2a

run tool

210j2a1

("GOTO"!L2! (<tool-name>/"ELF"/"NSWEXEC") <confirm>) 210j2a1a

Note: The !L2! is CML notation to indicate that should the user request that frequently used commands be recognized based on their first letter, that this command will not be so recognized. It will require that the user type <space> before the command. This allows tools to have commands that begin with the same letter without causing a problem for such a user. If the user types a "g" in this case, he will get the tools command starting with "g", not the GOTO command,

210j2a1a1

terminate current tool

210j2a2

("QUIT"!L2! <confirm>)

210j2a2a

old messages

logout	210j2a3
("LOGOUT"!L2! <confirm>)	210j2a3a
resume tool	210j2a4
("RESUME"!L2! <tool=instance-name> <confirm>)	210j2a4a
execute command in another active tool	210j2a5
("EXECUTE"!L2! <tool=instance-name> <command>)	210j2a5a
comment	210j2a6
("; " <text> <confirm>)	210j2a6a
semantic help	210j2a7
("HELP" <optional-item-list> <confirm>) or	210j2a7a
Note: The "help" command will be recognized by its first letter for users who are using this type of recognition. This command is likely to be used by new users who may not understand the <space> to get to other commands. The system help facilities should always be readily available.	210j2a7a1
("<help>")	210j2a7b
show current commands	210j2a8
("?")	210j2a8a
show syntax of commands	210j2a9
("<syntax>")	210j2a9a
NSW-EXEC commands	210j2b
rename file	210j2b1
copy file	210j2b2
includes copying files into/out of the NSW.	210j2b2a
delete file	210j2b3
show	210j2b4

old messages

accounting info	210j2b4a
status of active tool(s)	210j2b4b
list of files	210j2b4c
working directory	210j2b4d
escape character	210j2b4e
set	210j2b5
working directory	210j2b5a
escape character	210j2b5b
tty window position and size (display terminal only)	210j2b5c
reset	210j2b6
working directory	210j2b6a
escape character	210j2b6b
tty window position and size (display terminal only)	210j2b6c
start/stop recording session (typescript)	210j2b7
playback session	210j2b8
connect/disconnect terminals	210j2b9
simulate terminal type	210j2b10
scroll back tty window (display only)	210j2b11
3J) PASSING MESSAGES IN NSW (NOT NLS JOURNAL OR NETMAIL)	210K
This will not happen. The only mechanism for user to exchange arbitrary text messages will be a mail tool either based on SNDMSG or the JOURNAL (most likely SNDMSG) with some interaction with a works Manager maintained data base like an "Ident file",	
	210K1
3K) READING/SENDING JOURNAL NETWORK MAIL	210I
sending a Letter Scenario	
You have a CRT and line-processor console hooked up to the NSW, you want to compose and send a letter via U.S. mail to John,	
	210I1

old messages

Type `gs`. The words "Goto (subsystem) Sendmail" appear at the top of your screen in what is called the "command feedback line". you hit the CONFIRM key and type `l` (the letter). 21011a

"Letter (Dear) T:" replaces the "Goto (subsystem) Sendmail" and you type John (the name of your recipient) and then the CONFIRM key. 21011b

"(Body) C:" appears in the command feedback line. 21011c

"C:" is a prompt for a command-word.
To discover what command-words are available, you hit the questionmark key. The screen contains the following words: 21011c1

Current Alternatives are 21011c1a

Branch, Group, File, Plex, Statement, or Text. 21011c1a1

You type `t`. "Text B/T:" is appended to the command feedback line. Type the text of the business letter. The text appears on your video screen as you type it in. Use the key marked `BC` to backspace characters and the key marked `BW` to backspace words. You may type without worrying about the end of the line as new lines start automatically when needed. After you finish typing the paragraph, you hit two carriage returns. Your screen is cleared ready for the next paragraph. When you have finished typing the body of the letter, you hit the CONFIRM key. 21011c2

"(Sincerely?) Y/N:" then appears in the command feedback line. You hit the CONFIRM key which means "Yes". You are sincere. Typing `n` would allow you to specify another closing. 21011d

"(Author ident:) B/T:" appears. You type the author's NSW identifier. If you hit the NULL key, you are assumed to be the author. 21011e

"(To) B/T:" appears. You type in John's name and address. If John had an ident, you could have typed it instead. Multiple mixed idents and addresses are also possible here and in the "Copies to" field which follows. Lists of idents cannot contain carriage returns and addresses must contain at least one carriage return and each address or group of idents must be separated by double carriage returns as was done to terminate paragraphs above. 21011f

old messages

"(Copies to) B/T:" appears. Although a copy will be kept for your records, you are not sending any copies to anyone so you hit the NULL key. 21011g

"(Show Status?) Y/N/P/I:" appears. You type P CONFIRM for "Print" and your letter prints at your local printer along with all of your status information. The letter is formatted containing a letter-head, heading, salutation, body, closing, and tracings. 21011h

"(Send the Mail?) OK/C:" appears. 21011i

You don't want to send it now because you notice a misspelled word in your letter. A questionmark shows you your 21011ii

Current alternatives are:
Delete (this letter)
Modify (the letter)
Sendmail (commands)
OK 21011iii

You type M and CONFIRM. 21011ii

"Modify (the letter) OK:" flashes by and your letter along with all of it's status information in a special, clearly marked form fills your screen. You are placed in an editor with which you can modify the status form. See Modifying a Document in the documentation production section. When you are done modifying, type Q CONFIRM S CONFIRM. 21011j

"Quit OK:" and "Send (the mail) OK:" appear. 21011k

The letter prints at your local printer formatted with the letter-head, heading, salutation, body, closing, and tracings. A separate page with John's address in the middle of the lower half and your address just below the middle against the left margin accompanies the letter. This can be folded in half over the letter page(s), stapled, stamped, and mailed. Or it can be cut out as a label and pasted to a printed stamped envelope. 21011l

If you specify that the letter is to be Archived before you say "Send the mail", a copy of the letter is stored in the computer which you can retrieve by its filename which is its NSW archive number. Also, a reference to the letter is placed in the list of Sendmail items you have authored. 21011m

3L) GRAPHICS USER INTERFACES 210m

old messages

Graphics user interface takes three forms - user command set, virtual graphics interface, and physical graphics interface. The later two forms are further split into two sets, one for the data structure manipulation and the other for the terminal itself.

210m1

USER COMMAND SET

210m2

The user command set is the interface level which is utilized directly to manually create, view, and manipulate the diagrams stored with an NLS file. Generally speaking this interface takes two forms - manipulative commands, and drafting aids.

210m2a

Manipulative Commands

210m2a1

The commands in this class represent those used to create and modify a display. Since these commands are defined by the CML they can be easily tailored to user preference. While the exact command forms have not yet been formulated, this set of commands would include commands to:

210m2a1a

1) create and delete whole diagrams and to move them from one part of a file to another, or from file to file.

210m2a1a1

2) create, delete, and modify the atomic elements of a diagram, such as lines, curves, points, captions and text.

210m2a1a2

3) group collections of these atomic elements into structures for the creation of "templates" which can be stored and recalled; and for general modification of the diagram. For example, flowchart symbols would be constructed from the line and text elements, recalled with additional caption material, and added to the diagram being created.

210m2a1a3

Drafting Aids

210m2a2

Drafting aids include not only commands, but also environmental variables which constrain the cursor, provide scaling information, and aid the user in determining where a line or figure should be placed. For example, one command will set the resolution of the cursor, to effectively place a grid work over the

old messages

screen so that alignment of figures within the drawing
can be accomplished, 210m2a2a

VIRTUAL GRAPHICS INTERFACE 210m3

A virtual graphics interface will be needed to insure upward
compatibility with new graphics hardware (for example the
moderate cost minicomputer based graphics terminal), and to
provide the programmer with a consistent set of primitive
routines on which to base specific graphic user programs, 210m3a

PHYSICAL GRAPHICS INTERFACE 210m4

The virtual graphics interface will call the appropriate set
of routines within the physical graphics interface,
primitive calls in this group will maintain and move around
within the NLS file system storing, modifying and retrieving
graphics data (as do the current text handling routines);
and provide access to the physical graphics hardware (the
routines which actually write on the display). 210m4a

The file system and the atomic elements for graphics are
described in (belleville,nls=file=structure,). 210m4b

The physical terminal primitives for the initial (or
minimum) graphics configuration are: 210m4c

gbegin() open the graphics port and stop tracking the
cursor. 210m4c1

gend() resume cursor tracking. 210m4c2

gclear() clear the screen. 210m4c3

gline(pointer to linework data structure,pointer to
coordinate transformation matrix,pointer to line type
descriptor data structure) draw a line of the type
specified using the given transformation. 210m4c4

gcap(pointer to a text data structure,pointer to a
window,pointer to a transformation for the window,pointer
to a text type (font etc) data structure) place the text
within the window as given. 210m4c5

glexport(coordinate data structure) return the coordinates
of the last cursor coordinate picked by the user at the
terminal, (constrained by existing environment
variables) 210m4c6

old messages

3M) DOCUMENT PRODUCTION SCENARIO

210n

You have a hand-written report with several sections that you wish to input on to a cassette, place into the NSW file system, correct any typographical errors, format adding a title-page, and print. You have only a typewriter-like terminal with a cassette device plugged into an NSW frontend computer. Note that the scenario using a CRT and line-processor instead would be considerably simpler than this. There are three major sections in this scenario, 1) typing onto the cassette tape and reading it into an NSW file, 2) viewing and editing the file online, 3) formatting and printing the edited file,

210n1

1) Typing onto a cassette tape to read in to an NSW file

210n2

Preliminaries

210n2a

Switch on the typewriter terminal and the cassette device. Place a cassette in the cassette device. Be sure the cassette device is switched to "offline" so it is not talking to the computer. Type the keys on your terminal that cause the cassette tape to rewind and place the cassette device in record mode.

210n2a1

Type in the report

210n2b

Type the title of the report followed by a Carriage-Return (<CR>) and two Line Feeds (<LF> or <CTRL-J>). Do not bother with centering any titles. This can be done automatically later.

210n2b1

Type a lowercase d followed by a space and then "Section I". The d followed by a space indicates that Section I is to be located "down" under the title in the outline of the report. Type a <CR> and two <LF>s.

210n2b2

Type another d space followed by the first paragraph of Section I.

210n2b3

End every line with a <CR> and one <LF>.

210n2b4

End every paragraph and title with a <CR> and two <LF>s.

210n2b5

The lower case d space is not placed in front of the next paragraph because this and the following paragraphs in Section-I are at the same level in the outline of the report.

210n2b6

After ending the final paragraph in Section-I, type a

old messages

lowercase u followed by a space and then "Section II".
The u space indicates that Section II is located "up" at
the same level as Section I in the outline of the report.

210n2b7

Type another d space and the first paragraph in section
II.

210n2b8

One d space is typed before each sub-heading and the
first sub-paragraph after a heading. As many lower-case
u's are entered as is necessary followed by a space to
indicate the desired level of the next paragraph or
heading.

210n2b9

This process is continued until the entire report has
been entered. <CTRL-Z> is typed to indicate the end of
the report.

210n2b10

Backspacing to correct errors while you type

210n2c

A cassette device usually has special keys you can hit to
back space any number of characters, words, and up to the
end of the last line. These edits are made on the
cassette. In addition, you can type in any number or
combination of < to backspace characters, > to backspace
words, and ~ to backspace lines. These latter characters
will be interpreted and the edits made when the
information on the cassette is made into an NSW file of
use-type NLS in the next step.

210n2c1

Creating a NSW File From a cassette Tape

210n2d

switch the cassette machine off of record. switch it
online so it can talk to the NSW. Login to the NSW. You
are automatically placed in your "login tool" which is the
NLS editor.

210n2d1

Type gc. The words "Goto C; Cassette (tool) OK:" are
echoed. You hit Carriage Return (<CR>) which means "OK".
"CASS C:" is typed telling you that you have indeed gone
to the Cassette reading tool and it is ready for you to
specify a command-word. You type rd.

210n2d2

"Read C: Document (into file) T:" is echoed and you type
the name of the report "july-report" followed by <CR>.
This command creates an NSW file of use-type NLS. It
looks for two carriage returns to specify the end of a
paragraph or heading.

210n2d3

"Rewind tape? Y/N" appears and you type y for "yes". The

old messages

tape then rewinds and the report is read into an NSW file. When it is finished reading the report, "(More?) Y/N:" is echoed. you answer n for "No". 210n2d4

Finally the terminal will type "CASS C:" indicating that the Cassette tool has finished reading the report into an NSW file and is ready for the next command. Type q <CR>. This returns you to the NLS editor. 210n2d5

2) Viewing and editing the file online

You have an NSW file named july-report which has been freshly input. you wish to proof-read it. You are logged into the NSW NLS editing tool. "EDIT C:" has been typed at your terminal indicating it is ready to receive NLS editing commands. 210n3

Type lfju<ESC><CR>. "Load C: File T: JULY-REPORT," is echoed on your terminal. The characters "JULY-REPORT" are also echoed on a separate line indicating that you have been placed at the beginning of the report. 210n3a

Type cq<CR>. "Output C: Quickprint OK/C:" is echoed. A copy of the report is printed on the local hardcopy printer specified in your profile. The report has a number at the bottom right of each paragraph and heading uniquely representing it's position in the outline. Each paragraph is single spaced. There is one blank line separating each paragraph and title. These "viewspecs" are your default specified in your profile. 210n3b

While proof-reading the printed copy, you notice the same word is misspelled almost everywhere it occurs in the paper. 210n3c

Type swb0<CR>. "Substitute C: Word (in) OPT/C: Branch (at) A: 0" is echoed. Then in response to prompting from the command. You type the correct spelling followed by the incorrect spelling. When you are done, the words "25 substitutions made" are typed at your terminal. 210n3d

Further proofing reveals that the first paragraph in Section II (2A) should be moved after the last paragraph in Section I (1E). 210n3e

You type ms2a<CR>1d<CR><CR>. "Move C: Statement (from) 2a (to follow) 1d L: OK:" is echoed and you are ready for a new command. 210n3f

Noticing the word "can" is typed twice in a row in the paragraph in section III marked 3B, you type dw3b "can"<CR><CR>. "Delete C: Word (at) A: 3b " can" OK:" is

old messages

echoed. When "EDIT C:" comes back indicating it is ready for a new command, you type the back-slash key \ and immediately, the paragraph you just edited is typed on your terminal. The word is gone.

210n3g

When you have completed all of the edits, you are ready to format the paper. For further information on NLS editing, see the TNLS-8 primer 23911, the NLS-8 Command Summary 23912, and the NLS-8 Glossary.

210n3h

3) Formatting and printing the edited file
You have loaded an NSW file name july-report which you wish to format and print on your local line-printer.

210n4

Type qf<CR>if<CR>3<CR>.

210n4a

```
EDIT C: Goto C: Format OK:
FORM C: Insert C: Format (in file at) A: (using format #)
3
```

210n4a1

is seen at your terminal followed by
"(Title:)" you type July Report<CR>
"(Author) Ident(s):)" you type the NSW identifiers of the authors.

210n4b

The Format tool then adds codes to the file to make the file conform to format number 3 which is the desired format for reports. It does such things as centering headings, adjusting margins, fixing type-font and size, and adding the title page. When "FORM C:" appears, you type q<CR> for "Quit OK:" and "EDIT: C:" is typed at your terminal.

210n4c

You type op<CR>. "Output C: Printer OK/C:" is echoed on your terminal and a formatted copy of the report is printed at your local line-printer.

210n4d

THE HELP DESCRIPTION FILE

211

Background

211a

Most of the following background information is from 24485 "Some NSW Frontend Issues..." by Charles Irby 13-NOV-74 and 24534 "A Scenario of an NSW Session" by Charles Irby 17-NOV-74.

211a1

Typing the HELP button or using the Help command available for all tools can provide you, the user, with an English description from the current tool's Help description file(s) and place you in a repeating Help command. This will be accomplished by providing a separate function, capable of

old messages

interacting with the user (via the Help command grammar in the Frontend) and using structured description files provided along with the tool grammar. This help function will not run in the satellite machine but will be invoked by the satellite whenever the user asks for semantic help with a tool. The help function will be provided with the name of the help description file(s) for the tool the user was using and a representation of the user's command state at the time he requested help. (Once a connection has been established to the help function for a user, the connection will probably be maintained until the user terminates the session.)

211a2

It is expected that the command language designers will provide the description files. It is expected that there will be one description file for the NSW as a whole, describing global concepts, organization, purpose of the NSW. This description file will be available at all times to the user. In addition, we may wish to produce a description file that is a high-level guide or "yellow pages" to all the tools accessible through NSW. At any time the Universal description file(s) as well as the description file(s) for the tool currently being used are available.

211a3

SRI has not been funded to write and maintain the NSW description file(s) and we know of no one else who has been. There seems to be a hole here.

211a4

For first-year NSW, this help function is simply a set of calls on the NLS backend, with the description files being NLS structured files (this approach is now being used within NLS).

211a5

If the user requests semantic help with a tool the Frontend automatically starts the help function (which is probably loaded as needed rather than at Frontend startup time) and passes it information on the user's parse state, the name of the help description file(s) for this tool, the name of the NSW help description file, and the user-id so it can get at the user-profile. The user may interact with the help command for a while and then resume using the original tool. If he requests help again for the same tool, he merely switches to the help function which receives new parsestate info but otherwise preserves the state from the last interaction with this user.

211a6

The Help Command

211b

The following description of the Help command is adopted from the one in the NLS-8 description file.

211b1

old messages

HELP=button: <CTRL-Q>

Typing the HELP button (<CTRL-Q>) at any point in a command provides a description about what you were doing and places you in the Help command which allows you to ask for more information and the meanings of terms.

211b2

Help TYPEIN/OK:

The command "Help" provides the most complete information about a tool. After you type in any term and hit the Command Accept key (CA, <CTRL-D>), you will see the description. The Help command will be ready for another TYPEIN. TYPEIN any term you wish or the number of a "menu" followed by CA. Any time after the first description prints, you can type < followed by y (for yes) to see the previous view indicated or n (for no) to choose a view before that. Hit the Command Delete key (CD, <CTRL-X>) to end the Help command. Capitalization does not matter when typing words in the Help command.

211b3

menu:

A numbered list of related subjects that may follow an explanation in the Help command. Typing a number followed by CA will show the explanation named. This list is called a menu.

211b3a

going-up (for advanced users): *

If you use * instead of <, you will go "up" instead "back". Going up lets you "see your surroundings." Because of the "random access" nature of Help, it is sometimes the same but can be quite different from going back. This is just a convenience, it is not necessary for using the Help command.

211b3b

A Description

211c

A description consists of an NLS statement containing a short paragraph. The first word of a paragraph can be made the "name" of that paragraph and is the term defined by that paragraph. Users of the Help command can get any description simply by typing the term. Provisions exist for using multiple words to specify duplicate terms within the same description file.

211c1

Menued paragraphs are numbered sub-paragraphs classified by the term in the paragraph under which they are located in the outline or tree-structure of the file. Only the first line of menued items appear until they have been requested by typing the corresponding "menu number".

211c2

A paragraph may consist of a term, some optional supporting words, and a pointer or "link" to another paragraph in the

old messages

current description file or any NLS file. If descriptions are written properly, you can avoid much redundancy by linking from one concept to another. The description file containing links takes on the qualities of a network. If it is well structured, it becomes a hierarchical network.

211c3

Structuring a Description File

211d

Depending on the tool, description file structure will vary. At the minimum, there must be a description of the tool in general terms. A list of descriptions of the commands available in the tool with names the same as each command word must exist in order for the HELP button to find and display them. These are placed under the general tool description in the file structure. Commands with a tree structure of alternative command words may need a corresponding tree structure in the description file describing the alternatives.

211d1

Usually, there are a few command functions which occur in many commands. These may be given names and described in only one place. In addition, step-by-step scenarios of how to do specific tasks that can be accomplished with the tool may be provided. These are written in words the user can understand which interface the user to confusing or cryptic commands. Besides pointing or "linking" to the desired commands, these "How to" descriptions can be structured to present any special terms the user needs to learn in the most effective way.

211d2

If "How to" descriptions are provided, they are usually listed in an appropriate order terminated by the branch containing all of the command descriptions. This "command description branch" starts with a statement named "commands" which appears as the last menu when reading the general, top-level description of the tool.

211d3

The NSW description File(s)

211e

The NSW description file(s) will contain descriptions of all of the commands in the Works Manager (WM), and the Front End (FE), the NSW-EXEC and Universal commands. Some subset of these commands will be "universal" commands available to all tools that are integrated into the NSW.

211e1

In addition, any high-level concepts and definitions of terms necessary to use the WM, the FE, and the NSW in general should be available here. This can include general descriptions of tools or, to avoid duplication, links to tool description files. The various tools can be placed under subject headings and indexes to the terms used in the description files of each

old messages

tool can be provided thus making up the "yellow pages" of the NSW. Such links to description files can be followed using the Help command if the access controls allow it. In the future, it may be desirable due to the simplicity of the Help command to actually startup a tool in this manner.

211e2

We know of no one funded to write any of the NSW description file(s).

211e3

Helpd: Proposed Help Description File Development Tool

211f

We recommend that in the second year of NSW a Help description file development tool be built. The purpose of this tool would be to help create, maintain and publish a tool's description file. The tool would not only prompt a tool builder for commands and Help descriptions, but would also perform verification of the links and structure in his Help data bases.

211f1

IMPORTANT AREAS FOR DISCUSSION

212

FILENAME

212a

The NSW filenameing convention used by the NSW Works Manager (WM) will differ in significant ways from both TENEX and current NLS filenameing conventions. One of the ARC goals is to ensure a consistent user-interaction across tools integrated into the NSW. This means the same convention should be used for naming files in all NSW tools. In keeping with this philosophy, the NLS-9 filenameing convention should match the convention used by the WM. As NSW users, front-end builders, and tool-integrators we want the filename syntax to be the easiest to type and point to, the most flexible in use, the fastest to parse, and the least offensive to look at.

212a1

Speed of parsing a filename is a major point of difference between NSW and the current NLS. We do not want to burden the NSW with the current baroque NLS-8 link parser. Delimiters around the filename and a place for an infile-address within those delimiters, on the other hand, are two features potentially valuable to any tool and should be carried over from the current NLS-8 into NLS-9. Such a delimited "address" or "path-name" containing a filename, infile-address, or both imbedded in text is called a "link". A third field of a link, the Viewspeccs, have been treated in discussions about this as a part of the infile-address only.

212a2

Delimiters around the filename are needed for ease of pointing to a filename imbedded in text. In general, as the detail or number of selections increases, the effort necessary to select

old messages

increases geometrically. The easiest way to specify something is to name what type it is (e.g. a link) using the appropriate command and then make one specification near enough to the item in front or in back of it to distinguish it from others of its kind and have the command find it and grab it. In order to do this, the item must be enclosed in "enclosing" delimiters which are available on all terminals. In addition, the delimiters must not be common characters that might be useful in a filename or outside a filename. Since parentheses are frequently used for parenthetical expressions, and square- and squigly-brackets are not on all terminals, that leaves only angle-brackets. We therefore recommend that angle-brackets be the NSW filename or link delimiter. It turns out that this is also an acceptable delimiter for current NLS links.

212a3

The infile-address needs to be within the same delimiters as the filename because it is an integral part of the entire path-name or address of which the filename may be only the beginning. Tool builders that allow an infile-address will want to use the same delimiters for links that do not happen to go across files. A single reserved separator character is necessary to distinguish a filename field preceding an infile-address field so that each field may contain the maximum range of characters. The separator should be easy to type because unlike the delimiters for a link, the separator may be frequently typed by the user as free text in a command. The only easily typed punctuation characters are period, comma, slash, and semi-colon with period and comma probably the easiest. Our experience with NLS has shown that comma works very well. For maximum compatibility and minimum conversion hassle we recommend that comma be the separator character.

212a4

For speed and accuracy of parsing, we do not want to allow the delimiters inside the delimiters and we do not want to allow the separating character in the filename or infile-address fields.

212a5

```
filename = ['<'] filename [, infile-address] ['>']
filename and infile-address do not include '<', '>', ',',
```

212a5a

Note: We should point out that when a user types a link or filename he need not type the angle brackets as the Frontend will provide these for him.

212a5b

JBP's description of Bob Millstein's syntax for NSW filenames 25205 looks like it would fit our needs described above. One character substitution and the addition of the possibility of delimiters also containing infile-addresses would be necessary.

old messages

We request that comma not be used anywhere in the filename. Charles points out that there should be no reason why fields in a filename can't be separated by a simple space rather than a somewhat more ugly punctuation character. For something that is the least offensive to look at, this would be desirable.

212a6

One Unanswered question is "What does the link <abc> point to -- a filename or an infile-address?" It is clear that <abc,> always points to a filename and <,> always points to an infile-address because filenames always precede the infile-address.

212a7

The current default in NLS is for a link containing no comma to be taken as an infile-address. In the initial NSW, it may be that a link containing only a filename will be more frequent than a link containing only an infile-address and we should therefore switch defaults.

212a7a

In links, this would require a comma at the beginning of every infile-address but not at the end of a filename with no infile-address.

212a7b

The TNSL user using an infile-address to specify locations in editing commands will not want to place a comma in front of every address. A special function would be written to not require it at that point so that infile-address specification would be the same as NLS-8. This would mean the user must always enter a comma after a filename when prompted by A: but need not place a comma when using a "file" command (such as Load File) or in links.

212a7c

A link to filename abc may look like <abc> but if viewspecs vspc are specified, it must look like <abc, :vspc>.

212a7d

A fancy infile-address parser would be necessary to allow commas in content searches. Otherwise characters preceding the comma would be mistaken for a filename. If ' or " are allowed in filenames, searches for commas may be unparseable.

212a7e

The infile-address should allow constructs such as "...." and <char so that content addressing may include the literal characters "<" and ">".

212a7f

Samples of links containing only an infile address are <,> and <,>. Those containing only viewspecs would look like <,:vspc>.

212a7g

old messages

The question of whether or not ARC should recommend deviating from its current default has not been decided, 212a7h

USER PROFILE 212b

This section outlines the current design of "User profiles" as used by both the Front End and the NLS tools within the NSW environment. The Works Manager functions needed to support this design are also detailed. 212b1

Overview 212b2

An NSW user wants to have control over some of the parameters which control the interaction between himself and the NSW system. The FE must have access to a file, or a data store which defines the user's interaction parameters, 212b2a

The first question to be decided is whether a "user Profile" is bound to an individual, or to an individual, project pair, that is to an account. It seems more consistent with the overall goals of the NSW to have at least part of the "user profile" bound to an individual, regardless of which project he is currently working on. We envision the FE making use of such an "individual profile" to control the interaction between the Command Language Interpreter (CLI) and the individual. This includes such things as command recognition mode, prompting mode, and the Verboseness to be used. 212b2b

Elements in a user's profile which describe his access rights, however must clearly be based on the account, that is on the user-project pair. We are assuming that the WM will provide both a grammar and its supporting packages to maintain these data bases. We would like the FE to be able to read a part of the account profile data maintained by the WM at login time. This allows the FE to provide some useful functions for the user. For example suppose that at login time the FE hands the WM the user name and project identifier and receives in return a list of the tools that the user can use. This enables the FE to provide a reasonable reply when the user types "RUN (tool) ?". The FE responds with the list of tools that are available to the user. Another example might be a data element called entry tool. If the WM can provide the FE with this data element for a user-project pair the FE can place the user directly into this tool after login. 212b2c

In addition each NSW tool may require it's own elements of user profile data which are completely independent of the FE

old messages

and WM. NLS for example contains the address of a commands branch to be processed upon entry to NLS, and a link file to be used to resolve external names in a jump command, 212b2d

It seems unreasonable to require the WM to maintain any tool dependent user profiles, or to even know of their existence. It should clearly be the burden of the tool manufacturer to maintain any tool dependent user profile for his tool. This can be done by either including the appropriate profile modifying commands in his tool, or by providing a separate tool which maintains the user profile. Note that even though the WM is not directly involved in this maintenance the actual user profile data base has to be a NSW file, that is known to the WM in order to provide host independence to the tool. 212b2e

Recommendation 212b3

The NSW FE will make use of two profile data bases. One is called the "individual" profile and the other is the "tool" profile. ARC will provide the grammar and the backend process to maintain a users individual profile. We request that the WM makes primitives available to the FE read the elements of the tool profile from the WM's account profile. The following is a list of the data elements which we think would be good candidates for elements in the FE tool profile. 212b3a

List of "approved tools" 212b3a1

Entry tool 212b3a2

In this model the WM has the following responsibilities concerning user profiles, 212b3b

The works manager will provide a grammar and supporting process which maintains the account profile for each user, project pair. It is probable that use of this facility will be restricted to project leaders. 212b3b1

Primitives will be made available to the FE for reading agreed parts of this account profile, namely the tool profile, 212b3b2

In NSW the NLS tool will keep its own user profile (individual profile) for each user. The grammar will contain the proper commands for modification of the data elements. These commands will be supported by a package in the NLS Back End, 212b3c

old messages

To implement a single user profile for an individual it is necessary that the Works manager provide a unique identifier for each NSW individual. A later section will discuss the need for, and possible designs of such a unique identifier. Basically what is required is a WM primitive which will take as arguments a user name and project name and return a unique identifier for this individual. Note that the process which maintains the FE's individual profile also requires this primitive.

212b3d

Requested WM primitives :

212b3e

available tools:

212b3e1

availtools(username,project => toollist, entrytool)

212b3e1a

This primitive will be called by the FE to build a tool profile for this user, for this session.

212b3e1b

Argument / result types

212b3e1c

username = CHARSTR

212b3e1c1

project = CHARSTR

212b3e1c2

toollist = LIST (%toolnames% (simplename, systemname),...)

212b3e1c3

entrytool = INTEGER/EMPTY

212b3e1c4

unique user identifier:

212b3e2

uniqueid(username,project => userid)

212b3e2a

This primitive is called by the tool which maintains the users individual profile, and also by the FE to get a handle on this individual profile. Some tools may also use this primitive.

212b3e2b

Argument / result types

212b3e2c

username = CHARSTR

212b3e2c1

project = CHARSTR

212b3e2c2

userid = LIST (INTEGER,CHRSTR)

212b3e2c3

IDENT SYSTEM

212c

old messages

The NSW needs to be able to deliver mail for an individual to a single mail box and to know the type of delivery the individual would like, i.e., an NLS-JOURNAL citation or a 'SNDMSG' sequential file. 212c1

In addition to mail delivery we should anticipate the need for NSW directories and 'phone' books. 212c2

The NLS editing tool needs an identifier for an individual. We presently have available 21 bits that can be translated to a displayable, meaningful, character string to use in statement signatures (simple audit trails). 212c3

In the current NLS we provide the necessary information in a special file that contains the following information. 212c4

Individuals 212c4a

Information needed for mail delivery 212c4a1

Name: two fields, lastname, first and middle
 This allows us to deal with split names like van Kamp.
 Ident : a 4 character alpha numeric identifier or
 nickname
 Organization (see below)
 Hardcopy mail address
 Network mail address: host name
 Delivery mode: Hardcopy / Network sequential /
 Network NLS 212c4a1a

Additional Information for Directories (Phone Books, etc.) 212c4a2

phones
 Groups: Idents of all the groups the person belongs
 to Function
 Capabilities
 Secondary organization
 Comments
 Subcollections: Used for indexing 212c4a2a

Groups 212c4b

Information needed for mail delivery 212c4b1

Name
 Ident
 Membership: The Idents of all members
 Hardcopy mail address
 Network mail address

old messages

Delivery Coordinator	212c4b1a
Additional Information for Directories (Phone Books, etc.)	212c4b2
Function Comments	212c4b2a
Organizations(Projects)	212c4c
Information needed for mail delivery	212c4c1
Name	
Ident	
Membership	
Groups	
Coordinator	
Hardcopy mail address	
Network mail address	
Delivery	212c4c1a
Additional Information for Directories (Phone Books, etc.)	212c4c2
Type of organization	
Phone	
Comments	212c4c2a

The 4 character ident has not been fully satisfactory as duplications occur frequently, requiring idents such as RLB2. However, our present file format limits us to 21 bits for the identifier. We suggest using a 21 bit permanent number that can be translated to a character string to use both in statement signatures and as a query argument,

212c5

By permanent we mean that the number, sequentially assigned shall never be reused,

212c6

In addition to the number each record should contain a permanent ident (nickname), limited to, say 50 (upper case ?) printing characters. Each individual would choose his own ident,

212c7

Consideration should be given to other information which might be useful,

212c8

It is particularly important that a super fast search across this file be possible.

212c9

In addition to providing the mail tool with its needs, the

old messages

database should be queryable by people. Minimal query arguments should include ident (nickname) and last name. 212c10

We can see three possible ways of dealing with this for the first year of NSW. These are 212c11

Find a way to get BBN TIPSER Database right for NSW needs 212c11a

Include all the needed information in the Works Manager's data base. 212c11b

During the first year use the NLS ident system for mailing. The main problem with this is the 4 character limit on nicknames. 212c11c

More Questions: 212c11d

What does the Works Manager know about real people? 212c11d1

How does a tool ask the WM for information about people? 212c11d2

What does the WM return in response to an inquiry. 212c11d3

Who maintains the data base? i.e. who can enter, and validate the information in the file. We see this as a big, on-going problem area. 212c11d4

213

4-FEB-75 13:27:28,1656
 Net mail from site CCA-TENEX rcvd at 4-FEB-75 13:27:22
 Date: 4 FEB 1975 1626-EST
 From: DEE at CCA
 subject: RFC 671
 To: HOST-HOST-PROTOCOL-PEOPLE:, SCHANTZ at BBN
 cc: DEE

214

RICK:
 THANKS FOR YOUR REPLY. I HAD SEEN RFC 671 AND HAVE NOW REREAD IT (THE TCP SPECIFICATION REFERENCE TO YOU HAD SOUNDED LIKE YOU HAD WRITTEN SOMETHING SPECIFIC TO INTERNET RECONNECT). RFC 671 SEEMS LIKE A GOOD FLESHING OUT OF THE TELNET RECONNECT PROTOCOL. I CERTAINLY AGREE THAT A RECONNECT FEATURE SHOULD BE IN THE HOST-HOST LEVEL PROTOCOL, POSSIBLY ALONG SOMEWHAT SIMILAR LINES. THERE SHOULD BE AN OPTIONAL "ALTERNATE ROUTING" FEATURE WHERE A HOST COULD SPECIFY THAT IF A CONNECTION TO IT GOES DEAD, THE OTHER END SHOULD TRY TO RECONNECT (ICP?) TO ANOTHER HOST&SOCKET WHICH MIGHT REALLY BE THE SAME MACHINE THROUGH A DIFFERENT NET CONNECTION OR, MORE LIKELY,

old messages

AN ENTRY TO A SIMILAR SERVICE IN SUCH A WAY THAT THE USER WOULD GET A MESSAGE THAT THINGS HAD BEEN "RESET" BUT WOULD STILL BE IN THE SAME ENVIRONMENT. (THIS COULD BE DONE ABOVE THE HOST-HOST LEVEL BUT, PARTICULARLY IF IT IS USED TO SWITCH BETWEEN REDUNDANT PHYSICAL CONNECTIONS, IT WOULD BE NICE IF IT COULD BE AS TRANSPARENT AS POSSIBLE.)

YOU SAY YOU THINK IT QUESTIONABLE WHETHER MOST SYSTEMS WILL ALLOW A USER MULTIPLE TELNET CONNECTIONS. SINCE, IN MY LIMITED EXPERIENCE, I HAVE NOT ENCOUNTERED A SYSTEM THAT RESTRICTS OR ALLOCATES NETWORK CONNECTIONS BETWEEN USERS, I WAS WONDERING WHAT PROMPTED YOU TO SAY THAT.

I MUST SAY, IT IS DIPLOMATIC OF YOU TO REFER TO THE PECULIARITIES OF TENEX YOU HAD TO OVERCOME AS FEATURES.
SINCERELY, DONALD EASTLAKE (DEE@CCA)

4-FEB-75 14:36:57,8785

Date: 4 FEB 1975 1436-PST

From: IRBY

Subject: Some Possible NSW tool interaction

To: watson, POSTEL

215

The following (Journal # 25120) are brief notes regarding tool interaction through the FE. Although some readers may find the implementation notes too technical, the examples and general discussion should be of interest.

216

The NSW can provide for significant tool interaction, driven by the user, by providing some fairly simple facilities in the FE, WM, and tools which wish to allow such interaction. We feel that this can be done in such a way that the WM can insure system integrity and provide access controls and such that neither tools nor their grammars need change to allow new tools to interact with each other.

216a

Perhaps the best way to communicate this facility is to present a few concrete examples.

216b

Example 1: Editor -- mail sender interaction

216b1

Let us assume that there exists two tools, one called EDITOR and one called SENDMAIL, with the obvious functions. Let us first consider a user sitting at a display terminal using the EDITOR to prepare a memo he wishes to send to some of his associates. He could prepare the memo, which could be just part of a larger file that he is editing, and create a file containing only the memo and give this file a temporary name. He could then run the SENDMAIL tool, supplying it the name of his temporary memo file.

216b1a

old messages

A simpler alternative is for the user to simply slue to the SENDMAIL tool and as input to the SENDMAIL command he could simply point to the portion of the EDITOR file he wishes to send.

216b1b

Example 2: mail sender == Editor interaction

216b2

This involves the same tools as just described. The user types a lengthy message to the SENDMAIL tool and then wants to edit it before sending it. Again there could be a command in the SENDMAIL tool which causes it to create a file which can then be input to the EDITOR tool and Example 1 can be repeated.

216b2a

Again, the alternative allows the user to slue to the EDITOR tool and insert the text of the message into his file somewhere, edit it, and slue back to SENDMAIL and respecify the source of the message as in the second alternative in example 1.

216b2b

Example 3: Editor == compiler interaction

216b3

In this example, the user is editing source code (the current edited state of the source code is known only to the editor) and wishes to compile some part or all of it. Again, he could create a file with that code in it and pass that file to the compiler. However, he could also just slue to the desired compiler tool and point to the desired text in the editor window and have it compiled.

216b3a

How to accomplish the slueing tool interaction

216c

One thing that must be considered if we allow the slue interaction is that the WM maintain control of the situation. Thus, for first year NSW I propose the following implementation:

216c1

The CLI provides a CML rule called SOURCE which is made up of the declared source rules of each of the user's currently active tools. The command language designer would, where appropriate, allow the user to specify one of the dynamic set of currently available sources for a command.

216c1a

When the user selects something of type TYPE (which is meaningful to TOOL-A) by pointing to TOOL-A's window or by typing its address (perhaps with TOOL-A's name appended to the front of the address) as an argument to a command to TOOL-B, then the CLI calls a standard function in TOOL-A which returns the name of a new file which contains the

old messages

desired data object. This file name is then supplied as the desired argument to the execution function in TOOL-B. TOOL-B then calls the WM to open the file and read out the data structure. If the use-type of the file does not match the file type supplied with the openfile request, then an appropriate conversion is invoked.

216c1b

In subsequent development of the NSW it would be desirable for the tools to send PCP data structure to each other (perhaps using co-routines) rather than incurring the expense of creating and deleting files. However, for the interim, we can probably afford this inefficiency.

216c1c

For the case of users at typewriter terminals, the normal way in which they specify locations of actual parameters by typing something (which I call an ADDRESS) could be expanded so that the address could contain a syntactically unique way of specifying the active tool toward which it is directed. This facility is also available for users at displays, since what they want may not be displayed on the screen currently. In the case of a display user, he might be able to point to the desired tool by use of an active tools status window displayed whenever the user has more than one active tool.

216d

Implementation notes:

217

Add the builtin SOURCE to CML as the name of a rule of currently possible source command words.

217a

Allow SSEL, DSEL, and LSEL to deduce the target tool from a selection type and be able to invoke a standard function in a tool to produce the desired file when necessary.

217b

Allow incremental help if SOURCE is an alternative, such that current tool alternatives are shown separately from others.

217c

Define the standard function in tool processes to call in order to create the result file.

217d

CRTNSWFILE(type, designator => filename)

217d1

type = INTEGER

designator = ANY

filename = CHARSTR

217d1a

CRTNSWFILE requires the following facilities from the WM:

217d1b

1) The procedure UNQNSWFN(number => filenamelist)

217d1b1

old messages

which will yield a list of NUMBER unique NSW file names, 217d1b1a

2) An additional parameter in the CREATE=FILE procedure to specify that the file is to be TEMPORARY (will be automatically deleted at the end of the session). 217d1b2

It should be noted that these are the only changes required in the WM. Also, the CRTNSWFILE procedure is the only additional requirement on tool components to allow all of this to work. 217d1c

TYPE is a source type known to the CRTNSWFILE being called. DESIGNATOR is a data structure that CRTNSWFILE understands and when combined with TYPE specifies the desired data structure. 217d1d

For example, DESIGNATOR might be an ADDRESS string or a (WINDOW, STRING, CHARACTER-COUNT) triple that defines some image that the tool placed on the user's screen. 217d1d1

Add a parse function NOTINRULE which will succeed only if the specified command word is NOT one of the alternatives in a specified rule (see example below). 217e

Add a CML declaration for the rule that defines the universal sources for this grammar (this will get linked to the dispatch record). 217f

DECLARE SOURCES ,ID; %name of a rule of command words% 217f1

This would allow the following CML for the NLS copy command 217g

"COPY" 217g1

sttype = SOURCE 217g1a

% user will pick one of the currently available source command words. This is a function of his active tools % 217g1a1

<"from"> source = SSEL(sttype) 217g1b

% user selects a source for the copy == SSEL would have to be able to tell sttype was from another tool and invoke the CRTNSWFILE procedure in the correct tool process if it is not the current tool % 217g1b1

<"to follow"> dtype = sttype %initialize dtype% 217g1c

old messages

```
[ (notinrule(stype, mytypes) stype = #"FILENAME" /
OPTION) dtype = mytypes]                                217g1c1

%if the source type (stype) was not one of this tool's
source types as represented by the rule MYTYPES, or if
the user types the OPTION character, then the user
will specify a destination type (dtype).%                217g1c1a

dest = DSEL(dtype) %get the destination selection%       217g1d

CONFIRM %get a final confirmation%                        217g1e

xcopy(stype, source, dtype, dest);                        217g1f

%call the XCOPY procedure in the tool Process to carry
out the command%                                         217g1f1
```

```
4-FEB-75 15:15:50,5387
Net mail from site SRI-ARC rcvd at 4-FEB-75 15:15:45
Date: 4 FEB 1975 1515-PST
From: IRBY at SRI-ARC
subject: User Programs in the National software Works
To: NSW-DISTRIBUTION:
```

218

The following memo (Journal # 25294) addresses the issue of user programs in the NSW environment. For the purpose of this memo I have considered user programs to be in two classes: 1) those that do not get input from the user and 2) those that do. The first class can be handled entirely by the tool and have no bearing on the NSW except that they may live in NSW files. Non-interactive TECO macros, NLS content analysis, sequence generator, sort key and other non-interactive user programs fit into this class. I will not discuss this class further unless someone raises issues with respect to it.

219

Note: tools like RD, which are separate save files of TECO preloaded with macros are considered separate tools and are not treated here.

219a

The second class consists of slightly odd NSW tools. They are tools in the sense that they have grammars and supporting pcp processes, help data bases, and access restrictions. The odd thing about these tools is that the support process is not created when the tool is run, but rather it already exists and all that is needed is that perhaps new packages should be opened in the process. Please note that this requires that the set of packages in a process must be allowed to change dynamically.

220

old messages

To make this all a bit more real to the reader who may be unfamiliar with such user programs, I present a scenario of what must happen when a user runs such a user-program. I should point out that this is a facility now provided by NLS-8. It is widely used and affords advanced users a means of extending the capabilities of tools available to them. The access controls that must be brought to bear upon users and developers of such user programs should be openly acknowledge, discussed, and decided. However, we should allow them since they provide a powerful facility for the user and are easily constructed.

221

On to our scenario (Please note that an example using TECO and loading TECO macros would have served as well as the NLS example that follows except that TECO is a non-integrated tool and thus introduces complications that are not germane to this issue.):

222

The user of the NLS editor decides to run a user program written by an associate which interacts with the user to determine formatting information that conforms to the conventions established for his project. He gives a command to the editor to load the program named projformats. This is the name of an NSW file containing the relocatable binary program written to execute within the user-program environment of the nls editor. The editor fetches the file from the WM and link-loads it into the user-program buffer. In addition, a new package named projformats is added to the pcp dispatch tables, thus making some procedures in the user-program callable through pcp.

222a

Please note that it is very important that this program run within the environment provided by the nls-editor since this provides the writer of such a program with high level editing primitives and other facilities. This reduces the development time of such new tools by several orders of magnitude without penalizing them in terms of execution time!

222a1

The user then gives the "run tool formats" command to the NSW. "formats" is the user's simple name for the tool. Its more complicated system name is read from the user's tool list and passed to the WM, which returns the grammar for the tool. Now the FE inspects the grammar to determine which processes to create in support of this tool. It finds that it must be the existing "nlsbe" process and that it is to open the package "projformats", which it does.

222b

The user now gives commands to this tool which causes it to insert the proper format controls into the file he is currently editing. When the user is done with the formats tool, he commands the NSW to terminate it for him. The FE closes the packages it opened for

old messages

the tool, but does not ask the WM to delete the process since it existed prior to the tool's invocation. The user may now resume the editor and ask it to delete the program proj.formats if he wishes to reclaim space in his user-program buffer.

222c

Note: It would be much nicer if the user could treat this like any other tool (and not have to instruct the editor to load and delete the program) with only the requirement that the editor must be active while running the formats tool. It may be possible to do this through CML initialization rules which would call procedures in the nlsbe process (known through a process declaration) to load the needed user-program file and open the package. Similarly, a termination rule could cause the program to be deleted from the program buffer. This has the disadvantage that if the user reuses the user program, the program must be reloaded. The termination rule could ask the user if he wanted the program deleted before doing so, however.

222c1

7-FEB-75 10:13:27,1181
 Net mail from site BBN-TENEXA rcvd at 7-FEB-75 10:13:21
 Date: 7 FEB 1975 1245-EST
 From: BURCHFIEL at BBN-TENEXA
 Subject: Network mail protocols
 To: NORTON at SRI-ARC
 cc: MESSAGE-SERVICE-COMMITTEE:, PETERS at SRI-ARC,
 cc: HOPPER at SRI-ARC, WATSON at SRI-ARC, WHITE at SRI-ARC, cc:
 POSTEL at SRI-ARC

223

Jim,
 Dick Watson has assured me that you will be fixing up NIC mail soon to conform to ARPANET standard protocols. He suggested that I describe your current violations of protocol for clarity:

224

1. Messages and citations from the NIC have no header at all. RFC #561 specifies that "TO:", "FROM:" and "DATE:" items are required, followed by a blank line (CRLF) to delimit end of header.

225

2. The FTP MAIL command requires that everything be sent as lines delimited by CRLF. The lines are interpreted by the receiver to find header items, end of header, and end of message. The standard line buffer is 132 characters, so you should not send more than 132 characters without a CRLF delimiter.

226

I hope these suggestions prove helpful. I would appreciate it if you would acknowledge receipt of this message.

227

old messages

Thanks,
Jerry

10-FEB-75 10:28:50,468
Net mail from site BBN-TENEX rcvd at 10-FEB-75 10:28:42
Date: 10 FEB 1975 1327-EST
From: MCKENZIE at BBN-TENEX
Subject: Protocols
To: postel at SRI-ARC
cc: mckenzie

228

Jon,
The NTIS accession number for the latest version of BBN Report No.
1822 is:
ADA002751
(Note that the number is now an "ADA" number rather than an "AD"
number)

229

Would you ask Jake if she has received the NTIS number for the
"Protocols Notebook" yet?

Regards,
Alex

230

JBP 10-FEB-75 21:55 25337

old messages

(J25337) 10-FEB-75 21:55;;; Title: Author(s): Jonathan B.
Postel/JBP; Distribution: /JBP([INFO-ONLY]); Sub-Collections:
SRI-ARC; Clerk: JBP; Origin: < POSTEL, OLDMESSAGES,NLS;2, >,
10-FEB-75 21:43 JBP :;;;####;

JAKE 11-FEB-75 01:39 25338

User names for BBN

I talked to Ted Strollo at BBN today and he would like to have a list of SRI people that will be using BBN after March 1. Jake

1

JAKE 11-FEB-75 01:39 25338

User names for BBN

(J25338) 11-FEB-75 01:39;;; Title: Author(s): Elizabeth J. (Jake)
Feinler/JAKE; Distribution: /RWW([ACTION]) MEH([ACTION]) JCN([ACTION]) ; Sub-Collections: SRI-ARC; Clerk: JAKE;

Party

My roommate and I are throwing a party on saturday, Feb. 22 at 6 Roosevelt Circle. It's a BYOB, starting about 8 pm (with a midnight buffet). Dates, husbands, wives included, of course. See me for a map to find the place (it's not easy in those circles).

1

KJM 11-FEB-75 09:02 25359

Party

(J25359) 11-FEB-75 09:02;;; Title: Author(s): Karolyn J.
Martin/KJM; Distribution: /SRI-ARC([ACTION]); Sub=Collections:
SRI-ARC; Clerk: KJM;

Note concerning ARC's NSW commitments

Dick: This is a quiet request. I have become increasingly concerned about the NSW deadlines and ARC's commitments relative to them; this is to ask you formally to do an evaluation of these items within the next week. My intuition says that it is relatively likely that to be professional in our support role, and to be fair to our staff and to ARC's goals, we may have to insist on a re-casting of targets and expectations in the NSW program. Extending the scope and depth of deliverables is something that an evolving program must be able to do with its contractors, but the contractors must have balancing prerogatives in being able to negotiate reasonable extensions in cost and time.

1

I feel that in the Program's planning there has been an understandable lack of understanding for the range and depth of the problems that actually would be involved, as well as for the potentials of finding payoff to NSW's basic goals. We have provided the Program with a singular resource (staff, experience, techniques, commitment, tool system), and it is clear to me that they are getting extremely good value.

2

It is to our best interests to do an exceptional job for them -- it is not to our or their best interests to see over-commitment or unrealistic expectations work to the Program's detriment.

3

The evaluation I am asking you to make should result in three things, for our internal use:

4

a) A statement as to what targets and expectations would really be best for NSW,

4a

b) A statement as to what targets and expectations can be met by ARC within a recommended (by you) mix of effort that provides both for NSW work and for such as possible new-market exploration, proposal writing, and new-staff acquisition and training. This may be in a form of target stages toward which we can just do a "best effort", and an estimate of the manpower and dollars that are available.

4b

c) A draft communique to Bill Carlson and the NSW Planning Committee stating the conditions on targets and expectations that we must ask for in view of our position on the above two things. [This might be a null statement if by some chance it is felt the situation is best left alone.]

4c

Basically I want to see that at least the key parties come to terms within a common "view of reality". I very much have the feeling now that there are dangerous disparities in that view among such parties as General Robbins, Colonel McBovern, Licklider, Carlson, Crain, you, different members of your staff, the RADC contingent, MCA, and ADR.

Note concerning ARC's NSW commitments

I want either: to learn explicitly that my feeling isn't based upon a situation that warrants any overt action on our part; or else to see that appropriate action is taken.

5

DCE 11-FEB-75 10:01 25360

Note concerning ARC's NSW commitments

(J25360) 11-FEB-75 10:01;;; Title: Author(s): Douglas C.
Engelbart/DCE; Distribution: /RWW([ACTION]) ; Sub-Collections:
SRI-ARC; Clerk: DCE;

DIA's contest entry (worthless commnd)

Execute (command in) Current Subsystem

1

DIA 11-FEB-75 10:10 25361

DIA's contest entry (worthless commnd)

(J25361) 11-FEB-75 10:10;;; Title: Author(s): Don I. Andrews/DIA;
Distribution: /DVN([ACTION]) POOH([ACTION]) ; Sub=Collections:
SRI=ARC; Clerk: DIA;

some questions about the TENEX/ELF OSI Implementation

Some questions about the OSI:

1

For each local file, the OSI keeps track of the use-type. Is it satisfactory to have the use-type stored ONLY as the filename extension field? If not, should the OSI FORCE the extension field to reflect the use-type when it creates a local file?

1a

Plan: If a OSI routine cannot perform its duty because of faulty parameters or a related problem, it will FAIL return with a string explaining the problem. If it gets an error return from the system doing what it seems reasonable, it will (1) ABORT (2) NOTE and give FAIL return (which?). Success will result in success return with parameters as specified. Is that satisfactory? Better ideas?

1b

Has anyone planned how we will do PSI's under ELF?

1c

Should we conform to special OSI-routine naming conventions? That would be ugly but would make it easy to identify OSI calls.

1d

DIA 11-FEB-75 15:24 25362

Some questions about the TENEX/ELF OSI Implementation

(J25362) 11-FEB-75 15:24;;; Title: Author(s): Don I. Andrews/DIA;
Distribution: /NPG([ACTION]) RWW([ACTION]) ; Sub-Collections:
SRI-ARC NPG; Clerk; DIA;

Work Assignments for Tools for NSW and NLS-9.

This list was given to me by Elizabeth and the assignments were determined at the meeting on Monday 2/10. If this information seems correct, I will forward this message to the appropriate people. please let me know who should receive this.

1

POOH 11-FEB-75 16:49 25363

Work Assignments for Tools for NSW and NLS-9.

(J25363) 11-FEB-75 16:49;;; Title: Author(s): Ann Weinberg/POOH;
Distribution: /DVN([INFO-ONLY]) KIRK([INFO-ONLY]) ;
Sub-Collections: SRI-ARC; Clerk: POOH;

More than most useless command

Execute Sendmail Message TYPEIN OK:

(your message is deleted next time you try to go to Sendmail)

1

KIRK 11-FEB-75 21:53 25364

More than most useless command

(J25364) 11-FEB-75 21:53;;; Title: Author(s): Kirk E. Kelley/KIRK;
Distribution: /POOH([ACTION]) ; Sub-Collections: SRI-ARC; Clerk:
KIRK;