DOMAIN/IX Release Notes

Software Release 9.0

Part No. 005492

Revision 01

This document describes the DOMAIN/IX product. It includes an overview of the product, a description of how to install DOMAIN/IX SR9, and a list of known errors and limitations.

The release notes for standard DOMAIN software are located on-line in the system /doc directory. The release notes for optional DOMAIN software will be placed in the /doc directory during the software installation process. Hard-copy Release Notes are also supplied with some software products.

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Chapter 1

SOFTWARE RELEASE 9.0 ENHANCEMENTS

1.1 FEATURES

DOMAIN®/IX™ is a new software product based on the UNIX™ operating system. There are two versions of this product. The sys5 version of DOMAIN/IX is an implementation of UNIX System V Release 2 from AT&T Bell Laboratories. It extends that software by including a set of document production tools that, while part of UNIX System III, have been unbundled from System V. The bsd4.2 version of DOMAIN/IX is an implementation of 4.2 BSD (from the University of California at Berkeley), with the addition of the System V version of the SCCS (Source Code Control System) package. Both versions make full use of the DOMAIN distributed file system, high-speed local area network, and high-resolution bit-mapped displays. You may install either version (or both) at your site.

1.2 ENHANCEMENTS

DOMAIN/IX replaces the SR8 DOMAIN AUX product. It provides numerous enhancements to that product, including:

- support for UNIX System V Release 2 and 4.2 BSD
- 4.2 BSD interprocess communication facilities
- use of variant symbolic links to provide multiple version support and version-switching
- improved support of UNIX access modes
- expanded use of environment variables
- job control in the C Shell
- optional one-program-per-process execution in the C Shell
- support for the -me macro package

- Improved case-sensitivity. Fewer characters need to be escaped. All ASCII printing characters are legal in UNIX component names except slash and null. (An environment variable, NAMECHARS, can be used to preserve special functionality associated with the tilde, grave accent, and backslash.)

CHAPTER 2

INSTALLING DOMAIN/IX

This chapter describes how to install DOMAIN/IX Version 9.0 software on a DOMAIN node or server. This installation, or update, procedure works only if the node or server on which you are installing the software is running the SR9.0 version of the standard DOMAIN software. If the node you plan to update does not meet these conditions, follow the standard SR9.0 update procedures that are described in Chapter 2 of the Standard Software Release Document.

2.1 TERMS

We use the following terms when describing the update procedure:

- "Work node" is the node on which you enter the commands that do the software installation. The work node must be running SR9.0 software.
- "Target node" or target volume is the disked node whose software you are installing or updating. The target node must be running SR9.0 software. The target node and the work node may be the same node.
- "Source node" or "source volume" is a disked node that has been updated with the new software, which you are copying onto the target node. The source node is the node that contains the administrative source area.

2.2 TYPES OF INSTALLATION

There are two types of installations: administrative and user. The administrative install procedure installs a complete DOMAIN/IX file system on a node in the network. This ensures that those files and directories that need specific access rights are set up correctly, and that spool directories and other "public" areas of the file system will only exist in one place. Subsequent user installs allow individuals to mount a subset of the file system on their own nodes. Before any user can run a user install, the administrative install must be complete.

The target node for the administrative installation becomes the source node

for all subsequent user installations. You can only install in user mode across the NET after the administrative install been completed.

2.3 RUNNING THE ADMINISTRATIVE INSTALL

NOTE:

You may purchase either or both versions of DOMAIN/IX software. In these Release Notes, we assume that both versions (sys5 and bsd4.2) are being installed. Various script and program names used here will be different if you are installing only one version. For example, an administrator installing only the sys5 version of DOMAIN/IX will use "acl_sys5" instead of the "acl_both" script described below.

You must run the installation from an AEGIS Shell. Use the following procedure to install DOMAIN/IX software from the distribution media. You normally execute this procedure only once, to create an administrative source area.

NOTE:

Do not delete the /PRESERVE tree that the installation creates, even after you have completed these install procedures. This tree contains essential information for those who will install DOMAIN/IX from the source area. For example, the /PRESERVE tree contains restart capabilities and the list of master links.

1. Use the AEGIS command WORKING_DIRECTORY (WD) to set your work node's working directory to the entry directory of the target node.

   ```
   $ WD //target_node <RETURN>
   ```

2. Insert the media into the drive and enter the RBAK command shown below. If you are using a tape cartridge, use the CT option shown in the example. If you are using a magnetic tape, use the M0 (Mzero) option instead of CT. If you are using a floppy, use the F0 (Fzero) option instead of CT.

   ```
   $ RBAK -DEV CT -F 1 INSTALL -AS INSTALL -L -MS -FORCE -SACL <RETURN>

   $ RBAK -DEV M0 -F 1 INSTALL -AS INSTALL -L -MS -FORCE -SACL <RETURN>

   $ RBAK -DEV F0 -F 1 INSTALL -AS INSTALL -L -MS -FORCE -SACL <RETURN>
   ```

3. When the installation script has been copied to your disk, use the WORKING_DIRECTORY (WD) command to set your work node's working directory to the /INSTALL directory on the target node.

```
$ WD //target_node/INSTALL <RETURN>
```

4. Execute the INSTALL_SYSADMIN program and follow the prompts. The script is interactive. It presents you with options and let you select the one(s) appropriate to the type of installation you're doing. It also lets you restart a partially-completed install.

```
$ INSTALL_SYSADMIN <RETURN>

Software Installation Types are:

      RESTART    --  Restart the DOMAIN/IX software installation.
      DOMAIN_IX  --   Install the DOMAIN/IX software

Please Enter Installation Type:
```

Enter DOMAIN_IX to start the installation or RESTART to restart the installation if a previous attempt to install DOMAIN/IX failed. If you respond RESTART, the program starts at the point of failure. The procedure continues with:

```
**** SYSTEM ADMINISTRATOR ONLY INSTALLATION ****


Please enter the name of the TARGET volume that the software
will be installed on (e.g. '//UPDATE_ME'):

Enter Target Volume or 'quit':
```

The node you specify here will be both the source node for user installs and the place to which links created during user installs will point. Enter the name of the target area and press <RETURN>. The procedure continues with:

```
The DOMAIN/IX Product Types are:

  BSD4.2  --  Berkeley 4.2
  SYS5    --  System 5
  BOTH    --  Berkeley 4.2 and System 5

Please Enter the type you would like to install or 'quit':
```

Enter the type of DOMAIN/IX that you are installing and press <RETURN>. The procedure continues with:

```
You may only have either the BERKELEY 4.2 or SYSTEM 5
version of uucp installed on the source node,
but not both.

Which version of uucp would you like to use ?
Enter 'BSD4.2' or 'SYS5'or 'quit':
```

Enter the version of UUCP that you want to use at your site and press <RETURN>. Note that users of either version of DOMAIN/IX can access whichever UUCP you install. The procedure continues with:

```
Source MEDIA is one of:
      CTAPE   --  SR9 DOMAIN/IX Cartridge Tape
      MTAPE   --  SR9 DOMAIN/IX Magnetic Tape
      FLOPPY  --  SR9 DOMAIN/IX Release Floppies

Enter Source Media or type 'quit':
```

Enter the source media and press <RETURN>. The procedure continues with the following prompts. Answer yes, no or quit to these prompts.

```
Size of manuals for:
  BSD4.2 - 2359 blocks
  SYS5   - 1875 blocks
  BOTH   - 4234 blocks

Do you want the manuals for BOTH installed ?
Enter 'YES' or 'NO'or 'quit':


Size of documents for:
  BSD4.2 - 2483 blocks
  SYS5   - 2483 blocks
  BOTH   - 4966 blocks

Do you want the manuals for BOTH installed ?
Enter 'YES' or 'NO'or 'quit':


Do you want to remain compatible with SR8 AUX software ?
Enter 'YES' or 'NO' or 'quit':
```

If you answered "yes" to the question concerning SR8 compatibility, then a sys3 and a bsd4.1 directory will live under the "source" areas as well. The procedure begins to load the software and displays messages similar to the following:

```
INSTALLING SR9 SOFTWARE ON //target_node.


      ** DOMAIN/IX BERKELEY 4.2/SYSTEM 5 Software Installation **


 INSTALLING THE RELEASE NOTES
     .
     .
     .
 FINISHING INSTALLATION
```

The procedure ends with the following instructions:

As the system adminstrator, you must set up the appropriate registries for your installation. SR9 DOMAIN/IX will not work without these accounts. The file

```
//^target/install/domainix/inst_registry.both
```

contains the following instructions for setting up the required accounts.

DOMAIN/IX requires the following accounts:

```
admin.%.%.%
bin.bin.%.%
bin.mail.%.%
root.bin.%.%
root.staff.%.%
root.sys.%.%
uucp.%.%.%
%.daemon.%.%
```

In order to set up these accounts, follow the procedures described below.

NOTE: You must be logged in as %.sys_admin.%.% to do this procedure.

1. Run the program

```
/install/addroot
```

which adds the person 'root' to the registry.

2. Execute the following edppo commands to add the necessary PERSONs:

```
edppo -a admin
edppo -a bin
edppo -a uucp
```

3. Execute the following edppo commands to add the necessary GROUPs:

```
edppo -a -proj bin
edppo -a -proj daemon
edppo -a -proj mail
edppo -a -proj staff
```

```
edppo -a -proj sys
```

4. Execute the following edacct commands to add the necessary ACCOUNTs

```
edacct -a admin none  none / admin_passwd
edacct -a bin   bin   none / bin_passwd
edacct -a bin   mail  none / mail_passwd
edacct -a root  bin   none / root_passwd
edacct -a root  staff none / root_passwd
edacct -a root  sys   none / root_passwd
edacct -a uucp  none  none /usr/spool/uucppublic uucp_p
```

You may specify a password for each account, as shown above, or leave the password field blank.

5. Once the registries are correctly set up, you should MOVE TO THE TARGET NODE. The remaining steps should be performed at the target node.

6. For information on environment variables that you may need to add to certain DM start-up files, refer to our example file

```
/sys/dm/startup_templates/startup.?*
```

At the very least, you will need to uncomment a line that establishes a default value for the SYSTYPE environment variable. Once the script has been edited, put the relevant lines into `node_data/startup.?*

Now that the start-up files are correctly set up, you must "acl" certain DOMAIN/IX directories and files by following the procedure below.

7. Exit the DM by executing the following command

```
<CMD> EX <RETURN>
```

8. From the boot shell's prompt, restart the DM by typing

```
) go <RETURN>
```

9. Log in as root.%.%.%

10. Update the /etc/passwd and /etc/group files by running:

```
/install/crpasswd
```

which uses information in the network registry.

[NOTE : If you are updating from the SR8 AUX product,

restore existing versions of /etc/group, /etc/passwd, and /etc/passwd.map BEFORE running /install/crpasswd. If the old versions existed on the target node, they can be retrieved by executing the following command lines.

```
cpf target/preserve/aux.sr8/etc/group target/systype/etc -r -l -f
cpf target/preserve/aux.sr8/etc/passwd target/systype/etc -r -l -f
cpf target/preserve/aux.sr8/etc/passwd.map target/systype/etc -r -l -f
```

where "target" represents the target area and "systype" is bsd4.2 or sys5. If the old versions existed on some other node in the network (not the target), copy these files from the old /etc directory to either of the new /etc directories.]

11. In order to make sure the ACL cache is not corrupted run:

```
/install/fix_cache
```

12. Examine the Shell script:

```
/install/acl_both
```

It is configured to set all required ACLs. There are, however, options that may require you to uncomment certain lines in the script. Once the script has been modified as required, you may execute it from any UNIX or AEGIS shell.

DOMAIN/IX Software Installation Complete.

5. Before shutting down the target node, examine the transcript pad for error messages. If any errors occurred during the installation, repeat the installation procedure. If no errors occurred, shut down, reset, and restart the target node.

6. If you are **not** updating from the SR8 AUX product, run the **/etc/cvtumap** program to remap all DOMAIN/IX filenames on the target node.

```
$ /etc/cvtumap -9 -l //target_node/sys5/.../?*
$ /etc/cvtumap -9 -l //target_node/sys3/.../?*
$ /etc/cvtumap -9 -l //target_node/bsd4.2/.../?*
$ /etc/cvtumap -9 -l //target_node/bsd4.1/.../?*
```

If you are updating from SR8 AUX, we recommend that at some agreed-upon date, all users at your site convert to the SR9.0 name-mapping scheme (described in detail in the User's Guide) by running **cvtumap** as described above.

7. Establish the install program as a protected subsystem with the following command:

```
$ init_source
```

During the administrative install, the files

//target_node/preserve/install/domainix_template_sys5

AND/OR

//target_node/preserve/install/domainix_template_bsd4.2

are set up on the target node to provide a record of where all parts of the DOMAIN/IX file system are to be found. For instance, the domainix_template_sys5 file might contain the lines

```
NETWORK CONFIGURATION:  both
BIN: //bs
ETC: //bs
USR/ADM: //bs
USR/BIN: //bs
USR/DOC: //bs
USR/INCLUDE: //bs
USR/LIB: //bs
USR/LIB/UUCP: //bs
USR/PUB:  //bs
USR/SPOOL: //bs
USR/CATMAN: //bs
USR/NEWS: //bs
USR/MAIL:  //bs
SR8: //bs
UUCP:  bsd4.2
#
```

When the user phase of the installation is run, it consults the template file(s) and either copies from or links to these source area directories. For example, /bin is one of those directories that can be either resident or a link on a user's node. If the user decided that /sys5/bin was to reside on the target node (each user is asked this during the installation script), then its contents are copied from //source_node/sys5/bin. If, on the other hand, the user decided that /sys5/bin was to be a link to the source area, then //target_node/sys5/bin will be a link to //source_node/sys5/bin.

Another example is how the /sys5/usr/lib/uucp directory is treated. The user does not get a choice here -- there can be only one /sys5/usr/lib/uucp per network, so every user's node will get a link to //source_node/sys5/usr/lib/uucp.

If after the software is extracted from the source media the administrator decides to alter the place where the software is found, the administrator should only have to update the requisite lines in the template file(s).

It is important that both the ACL (Access Control List) and the date and time of last modification be preserved when files are copied across the network. Install scripts do this automatically, but you must remember to use the **-dtm**

and -sacl options to the AEGIS cpt command if you copy any DOMAIN/IX system files yourself.

NOTE:

Since many DOMAIN/IX programs will not run in the absence of an accessible /etc directory, system administrators may wish to establish an alternate site for /etc that users can link to if the main site fails or needs to be removed from the network. A command line to do this has the following prototype:

```
$ cpt //target_node/etc //alternate_node/etc -pdt -sacl -l
```

Administrators who elect to do this must also be sure to keep the alternate copy of /etc (especially /etc/passwd) up to date.

2.4 RUNNING THE USER INSTALL

You can only install DOMAIN/IX as a user if your system administrator has installed DOMAIN/IX in administrator mode. See the previous section for instructions.

Perform the following steps to install DOMAIN/IX software on a node.

1. Log in to a work node and start an AEGIS Shell on the work node. (This can be the target node.)

2. Set your working directory to //source_volume/INSTALL

   ```
   $ WD //source_volume/INSTALL <RETURN>
   ```

3. Execute the INSTALL Shell script and follow the prompts:

   ```
   $ INSTALL <RETURN>
   ```

   The program prompts you as follows:

   Software Installation Types are:

   ```
   STD        --  Install SR9 standard software
   RESTART    --  Restart the software installation.
   OPT        --  Install optional software (ie. Pascal, Fortran)
   ACL        --  Set acl's for existing software
   CLEANUP    --  Run the Cleanup Procedure for ADD MODE installations
   DOMAIN_IX  --  Install the DOMAIN/IX software
   ```

   Please Enter Installation Type:

   Enter DOMAIN_IX and press <RETURN>. The procedure continues as

follows:

```
You must have sufficient rights to modify system directories on
the target node for the installation procedure to work properly.

You are logged in as:
    person.project.organization.node

Do you have adequate rights ?
Please enter response. (yes or no):
```

You must answer NO and press <RETURN>.

```
Please enter the name of the TARGET volume that the software
will be installed on. (e.g. '//UPDATE_ME'):

Enter Target Volume:
```

Enter the target volume name and press <RETURN>. The procedure continues with the following:

```
The DOMAIN/IX Product Types are:

  BSD4.2  --  Berkeley 4.2
  SYS5    --  System V
  BOTH    --  Berkeley 4.2 and System V

Please Enter the type you would like to install:
```

Enter the DOMAIN/IX product type and press <RETURN>. Note that users will only be able to install the product type(s) that are installed on the source node. For example, you will only be able to install BOTH if the source node has both sys5 and bsd4.2 installed. The procedure continues with the following.

```
  The following SYSTEM V Software may be installed
  either as a local directory or as a link.

  DIRECTORY NAME     BLOCK SIZE     RECOMMENDATION
  ==============     ==========     ==============

   BIN                1490          Local Directory
   USR/ADM            2             Local Directory
   USR/BIN            3060          Local Directory
   USR/CATMAN         1730          Link
   USR/DOC            2120          Link
   USR/INCLUDE        170           Local Directory
   USR/LIB            2200          Local Directory
   USR/PUB            7             Local Directory
   ALL                              All of the above will be LOCAL DIRECTORIES
```

```
   NONE                                All of the above will be LINKS

   Enter the name(s) of ALL software to be installed as LOCAL
   DIRECTORIES.  Use a space as the delimiter between directory
   names.   Enter   HELP   if you are not sure how to respond
   or QUIT to exit the program.

   Please Enter Response:
```

Enter the software to be installed and press <RETURN>. If you have already installed DOMAIN/IX on the target node, you receive the following prompt instead of the previous one.

```
TARGET NODE:              //target_node
DOMAIN/IX PRODUCT TYPE:   type
SYSTEM V SOFTWARE:        software
BERKLEY 4.2 SOFTWARE:     software
SOURCE NODE:              //source_node

Do you want to reuse these parameters ? (yes or no)  yes
```

Respond to this prompt with yes if you want to reuse the parameters, respond with no if you want to select new parameters. The procedure continues with the following.

```
Enter the name of the entry directory from which to copy the
DOMAIN/IX software  (e.g., '//VIVALDI'):
```

Enter the source volume name and press <RETURN>. The source node is the node upon which your system adminstrator created the administrative source area as described in the previous section. The procedure begins to install the software and displays messages similar to the following:

```
  INSTALLING SOFTWARE ON //target_node


  PLEASE WAIT ....


 INSTALLING DOMAIN/IX SOFTWARE
    .       .
    .       .

 CREATING PSEUDO-TTY's


 INSTALLING THE SYS/TCP DIRECTORY
    .       .
    .       .

INSTALLING BERKELEY 4.2 SOFTWARE
```

FINISHING INSTALLATION

If you had AUX on your node before the installation, some messages will appear here that tell you what was saved and where it lives. For example:

```
Your SR8 AUX KEY DEFINITIONS have been saved in: //node/preserve/aux.sr8/aux
Your SR8 AUX USR/NEWS has been saved in: //node/preserve/aux.sr8/usr/news
```

The procedure ends with the following message>

```
DOMAIN/IX SOFTWARE INSTALLATION IS COMPLETE.

It is STRONGLY RECOMMENDED that you make some changes
to your startup files prior to rebooting your node.
Please reference the files in the directory
/sys/dm/startup_templates for more information.
```

4. Shut down and restart the node. After restarting the target node, set your working directory to //target_node/INSTALL and run the FIX_CACHE program as follows:

```
$ WD //target_node/INSTALL <RETURN>
$ FIX_CACHE <RETURN>
```

Refer to the following section for instructions about modifying your start-up files.

2.5 START-UP FILES

Before you can use any UNIX shell, you need to specify the SYSTYPE and (if you are updating from the SR8 AUX product) UNIXNAMES environment variables. In this section, we present a summary of what's required. For more information, see Section 1 of the DOMAIN/IX User's Guide. We also suggest that you examine the template files in /sys/dm/startup_templates. These sample startup files include suggested "env" command lines. Edit the template as necessary, then add the relevant lines into your own `node_data/startup.displaytype file.

The next two subsections describe several of the environment variables in more detail.

2.5.1 Setting UNIXNAMES

In order to establish the mapping rules used by the naming server, the UNIXNAMES environment variable must be set. If there are any files on disks in your network that include the characters

```
! # % & + - ? = ^ *
```

and use the SR8 (AUX) character-mapping rules, you must put the following line in this file:

```
env UNIXNAMES 'sr8'
```

The **cvtumap** program (described earlier in this section) updates files from the old naming rules to the new naming rules. Once all nodes on the network have been updated to the SR9.0 naming rules, you may either remove this line or change it to

```
env UNIXNAMES 'sr9'
```

2.5.2 Setting the SYSTYPE

Once the naming rules have been established, you must specify a SYSTYPE so that variant links may be correctly resolved. We recommend that each node administrator modify the file `node_data/startup.displaytype so that it includes the line

```
env SYSTYPE 'type'
```

where type is either bsd4.2 or sys5 (sys3 or bsd4.1 if you want to run in an SR8 environment). This systype will be used to resolve any references though a systype-variant link before processes are created. If SYSTYPE has not been set, references to /bin, /usr, and /etc can't be resolved.

Once these two environment variables have been specified, you can create UNIX shells that can read SR8 filenames that use mapped characters. At this point, you should consider modifying your user_data/startup_dm.type file and shell start-up files (.cshrc, .login, .profile) as necessary.

2.5.3 Pty's

On each disked node, the installation process creates four **ptys** (pseudo-tty device file pairs) to provide socket connections (e.g., to support **rlogin** access by a remote host). The **ptys** we create are named /dev/ptyp[0-3] and /dev/ttyp[0-3]. Users of diskless nodes (and users of disked nodes who need additional **ptys**) will need to use the **/etc/crpty** command to create the **ptys** they need.

2.5.4 The /etc/rc File

Typically, UNIX systems make use of a shell script called /etc/rc that handles things like starting up daemons at boot time and recovering files lost or damaged in a system crash. The administrative installation process normally establishes a link from /etc/rc to `node_data/etc.rc, and the user install puts a default version of this file in each disked node's `node_data directory.

Owners of diskless nodes will have to do this part of the user install themselves by executing this AEGIS command:

```
$ cpf ///source_node/sys/node_data/etc.rc `node_data/etc.rc -sacl
```

The default version of etc.rc consists of several commented-out lines and, unless you modify it, only initializes the directories /tmp and usr/tmp. Edit it as necessary to enable any other functions you need. Most users will want to have etc.rc run automatically each time their node is rebooted. The example lines below are from the template file supplied in /sys/dm/startup_templates/startup. (Note that the "run_rc" command line must come after the SYSTYPE has been set.)

```
#  If you want this script to be run whenever
#  your node is booted,
#  uncomment the following line
# cps /etc/run_rc
```

Chapter 3

CHANGES TO DOCUMENTATION

3.1 CHANGED REFERENCE MANUAL PAGES

Because we made changes in reference manual pages after the DOMAIN/IX Command Reference and Programmer's Reference manuals were printed, we have prepared a user documentation Update Package for each version of DOMAIN/IX. The DOMAIN/IX Update Package for BSD4.2 (part no. 08015) contains new and changed manual pages, the Berkeley IPC Primer, and the TCP/IP Installation and Configuration Guide for DOMAIN/IX. The DOMAIN/IX Update Package for System V (part no. 08014) contains new and changed manual pages. Where differences exist between the on-line versions of DOMAIN/IX reference manual pages or Release Notes and their updated hard-copy counterparts, the hard-copy is correct.

3.2 INTERPROCESS COMMUNICATION

Important material on the 4.2BSD interprocess communication mechanism (socket calls) was inadvertently omitted from the DOMAIN/IX User's Guide. Source files for this document -- the IPC Primer -- are in /usr/doc/ipc.dir/?.t. We also supply a formatted version as part of the DOMAIN/IX Update Package for BSD4.2.

3.3 THE INPROCESS ENVIRONMENT VARIABLE

In the DOMAIN/IX User's Guide, Section 1, Chapter 1 and Section 2, Chapter 3 should have contained the following additional information about the environment variable INPROCESS.

> INPROCESS can be set as a DM environment variable. (We recommend this if you are going to be accessing DSEE-managed objects from the C Shell.) To set INPROCESS in the DM, put the following line in any DM command file (e.g., `node_data/startup) that is read before the C Shell is started:

```
env INPROCESS 'true'
```

If INPROCESS is set in this way, the C Shell runs as if you had **set INPROCESS** in your .cshrc file.

If an "env INPROCESS" line is not found (or is not set to 'true' or 'TRUE') in a DM start-up file, the process model used by a shell will be determined by the shell variable INPROCESS. The C Shell will, by default, have INPROCESS **unset**. Note that the C Shell does not export INPROCESS to the DM if you set it in .cshrc or .login.

3.4 UUCP

Several important details about **uucp** were omitted and/or garbled in the DOMAIN/IX User's Guide. Please read this section if you are responsible for installing or maintaining a DOMAIN/IX **uucp** site.

The information on direct connections may not have made it sufficiently clear that when the "device:" field of L.sys specifies "DIR" (for a direct connection), the L-devices file should specify which SIO line to use (e.g., "sio1" for connections made via /dev/sio1). As an example, if your site has a direct **uucp** connection at 9600 baud between SIO line 2 of a DOMAIN node a foreign host, L.sys should include a line of the form:

```
hostname Any DIR 9600 sio2 in:--in: uucp word: uucp_password
```

and L-devices should include the following line:

```
DIR sio2 unused 9600 direct
```

In addition to modifying those files **uucp** requires to support connections to other machines, you also need to create or modify various files in the /sys/node_data directory of the node which will be the incoming **uucp** server at your site (the one to which the incoming connection -- hardwired or dial-up -- is made). Any node to which an incoming SIO connection is to be made must be running **siomonit** as a server process. **Siomonit** invokes the **siologin** process whenever someone attempts to connect via the SIO line. To ensure that the **siomonit** process is restarted after the server node has crashed or been shut down, place the following line in that node's `node_data/startup.displaytype file. The example below is from a DN460 node used to receive incoming **uucp** connections via SIO line 1.

```
# from `node_data/startup.191
# uucp incoming (listener) node only
#
# start the siomonit process to watch the sio line
cps /sys/siologin/siomonit `node_data/siomonit_file -n siomonit
```

Then create the file `node_data/siomonit_file and place this line in it (again, the example is for a connection to SIO line 1):

```
-repeat /dev/siol -dialin -n siol /com/sh -startup
```

Siologin runs the /com/sh script `node_data/siologin/startup_sio.sh every time it starts up, passing it the number of the SIO line as the first argument. This script resets the characteristics of SIO lines 1 and 2 to certain defaults. Most uucp sites will require some editing of this file, as show in the example below.

```
#! /com/sh
# This file is run as a shell script when siologin starts a new login
# process on an sio line.  The line number is provided as the first argument.
#

# Force-unlock the line.
#
ulkob /dev/sio^1 -f

# Set the speed and other line-dependent settings.
#
if eqs ^1 1 then
# default version commented out
#  tctl -line ^1 -default -speed 1200 -dcd_enable -insync -nosync
# uucp incoming dialup server should use this line instead
    tctl -line ^1 -speed 1200 -bpc 8 -nosync -noinsync

endif
if eqs ^1 2 then
# default version commented out
#  tctl -line ^1 -default -speed 9600 -dcd_enable -insync -nosync
# uucp incoming direct connect server should use this line instead
    tctl -line ^1 -speed 9600 -bpc 8 -nosync -noinsync

endif
```

This example sets up line 1 to handle incoming uucp dial-up at 1200 baud and line 2 to handle incoming uucp direct connections at 9600 baud. Be sure to add the #! /com/sh line at the top.

You must also make sure the file /usr/spool/uucppublic/user_data/sh/startup exists, and that it contains the lines:

```
# /usr/spool/uucppublic/user_data/sh/startup
/usr/lib/uucp/uucico.real
logout
```

The installation procedure sets HOME for user "uucp" to /usr/spool/uucppublic.

3.5 SENDMAIL CONFIGURATION FILES

Users of **sendmail** should be aware that we have included three example configuration files in this release. They are

/bsd4.2/usr/lib/uucpproto.cf
/bsd4.2/usr/lib/arpaproto.cf
/bsd4.2/usr/lib/sendmail.cf

These files are extensively commented and may work as is for many sites.

3.6 KEY DEFINITIONS

The DOMAIN/IX User's Guide incorrectly refers to a file of key definitions called /sys/node_data/att_keys. The correct name for this file is /sys/node_data/sys5_keys.

3.7 MAPPED FILENAMES

In order for a program to have access to the mapped versions of filenames that use mapped characters, the following conditions have to be true.

- The program must access the file using UNIX calls (e.g. **open, close**) and
- the program must be running in a UNIX shell or have set the UNIX process environment flag PM_$UNIX_ENV.

Programs that access files using the AEGIS calls STREAM_$* will not see mapped filenames, nor will UNIX programs (ones that that use **open**, etc., but do not set PM_$UNIX_ENV) when they are run in an AEGIS Shell.

You should also be aware that, since there is currently no way to pass mapped script names to a UNIX shell script invoked in an AEGIS Shell, you cannot execute a UNIX shell scripts whose name begins with a mapped character (e.g., Scriptname, which maps to :scriptname) from an AEGIS Shell.

3.8 VER

When you use the **ver** command with a single argument of either "sys5" or "bsd4.2," you simply change the value of SYSTYPE. If you execute the command

```
# ver sys5
```

in a bsd4.2 Bourne Shell, it is equivalent to saying

```
# SYSTYPE=sys5
```

All other variables (e.g., PATH) will be unchanged.

3.9 THE /TMP DIRECTORY

One of the less obvious side effects of having each node's /tmp directory be a link to `node_data/tmp is that the following two command lines executed on node //foo both list the contents of //foo's `node_data/tmp directory:

```
% ls /tmp
cattoc          ipc.out         tocl43
% ls //bar/tmp
cattoc          ipc.out         tocl43
%
```

To list the contents of //bar/tmp, you need to be a little more explicit:

```
% ls //bar/sys/node_data/tmp
dirs  ln
%
```

3.10 TROFFING -MM DOCUMENTS UNDER BSD4.2 DOMAIN/IX

Because of a bug in the bsd4.2 version of **troff**, it won't format documents that use **-mm** macros. This means that you will not be able to **troff** the DOMAIN/IX User's Guide or DOMAIN/IX Text Processing Guide at your site unless you have the sys5 version of DOMAIN/IX.

3.11 REPORTING SYSTEM TIME

Because the DOMAIN/IX kernel does not keep separate statistics on time spent in the kernel versus time spent in user space, all DOMAIN/IX commands and calls that report on "system time" and "user time" consumed by a process include system time under user time and report the system time as zero. User time, in these cases, is equivalent to CPU time.

3.12 CRONTAB

If you want a per-node crontab file, create a link from /usr/lib/crontab to `node_data/crontab as shown below.

```
$ crl /usr/lib/crontab `node_data/crontab
```

3.13 PROGRAMS THAT USE TERMCAP

Programs that use libtermcap.a or libcurses.a must be rebound with the new versions of these libraries.

3.14 TABS

Commands that control tab expansion on terminals (e.g., **tset**(1)) have no effect on DM windows. If you want the DM to expand tabs as they are expanded by other UNIX systems, execute the DM command **ts** (tab set) as shown here:

```
Command: ts 9 -r
```

The effect of this tab setting becomes apparent only when you refresh the display:

```
Command: rs
```

Users of terminals should also be aware that the DOMAIN serial line driver does not expand tabs.

Chapter 4

BUGS AND BUG FIXES

4.1 BUG FIXES SINCE SR8.1

The following bugs in the AUX SR8.1 release have been fixed in DOMAIN/IX for SR9.0.

- A bug that caused programs using a **fork()/exec()** combination to fail when running on diskless nodes has been fixed. Typical failure modes included **make** scripts failing (termination code 11), **spell** failing, and other intermittent failures of commands.

- A bug that caused nulls to be interspersed with data being sent through a pipe has been fixed.

- Bugs in **SCCS** commands have been fixed. A "get s.foo" correctly creates "foo" with read-only permissions, **get** no longer hangs if executed following an error, S.files are created read-only, and lockfiles are removed following an error.

- Several users reported C Shell problems that were related to the fact that AUX SR8.1 supplied a 3.0 BSD C Shell but documented a 4.1 BSD C Shell. We have also fixed problems with the path and PATH variables, and problems encountered when invoking C Shell scripts that begin:

  ```
  #! /bin/csh
  ```

  DOMAIN/IX bsd4.2 supplies the 4.2 BSD C Shell and the correct documentation.

- The commands **rm**, **rmdir**, and **mv** can now remove a name when the associated object does not exist.

- To prevent problems that occur when more than one process tries to access the same temporary file, we now link /tmp, /usr/tmp, and /usr/preserve through the `node_data directory.

- **Uucp** and related programs can now **setuid** to "uucp."

- At SR9.0, DOMAIN include files (in /sys/ins) won't make **lint** produce error messages. In addition, all /com/cc directives are implemented in **lint**.

- Errors in **fseek**(3) have been fixed.

- **Kill** -9 now kills UNIX shells.

- The C Shell now tracks changes of directory in $cwd.

- Commands with `cmd` (active functions) in them now work correctly.

- We now fully support the **-me** macros in the 4.2bsd environment.

- The **who** command no longer lists sys_person as the user on a node at which no one is logged in.

- The /etc/group and /etc/passwd files now put the full name first in the GCOS field.

- The **newgrp** command no longer causes the Bourne Shell to abort.

- The **ln** command correctly creates links without requiring write permission to the directory by everyone.

- The **stty, gtty,** and **ioctl** commands no longer have problems setting parity, bits-per-character, and the interrupt character. This in turn fixed a bug that caused **more**(1) to incorrectly set parity on an SIO line.

- Named pipes are now correctly drained on close.

- **Malloc** and **free** now account for space usage correctly and don't create overlapping blocks.

- We now support cartridge tape via the special files in /dev/rct? and /dev/rmt/c*.

- At SR9.0, DOMAIN/IX correctly implements UNIX actions for creation and deletion of files within a directory based on the permissions associated with that directory.

- **Chmod**(2) does not hang if the file `node_data/acl_cache exists.

- **Tar** now works correctly when trying to tar files whose pathnames have soft links in them. **Tar** also now sets the type of obj (object) files correctly upon restoration.

- The **rename** system call and command now work correctly when the source file cannot be unlinked.

- The **fork**(2) call on diskless nodes sometimes produced nonfunctional processes. This has been corrected.

4.2 BUGS IN BSD4.2 UNIX FIXED IN DOMAIN/IX

Several bugs in BSD4.2 UNIX have been fixed in the bsd4.2 version of DOMAIN/IX, including:

troff

A bug that caused bsd4.2 **troff** to fail if given more than one **-m** switch on the command line has been fixed in the DOMAIN/IX implementation.

ls -R

A bug that could cause **ls -R** to fail with an access violation has been fixed.

4.3 KNOWN LIMITATIONS AT SR9.0

DOMAIN/IX SR9.0 has the following known limitations and restrictions:

Arguments Passed to Subshells

Attempts to pass arguments to a subshell (e.g., one invoked to handle a shell script) fail if the invoking shell is **/com/sh** or **/bin/sh**. In a **/com/sh** or **/bin/sh** script, the command line

```
#! /bin/sh -n
```

invokes **/bin/sh** with no arguments.

crypt(1)

We no longer supply any version of **crypt**. Files encrypted with the SR8 AUX version of **crypt** must be decrypted before you install DOMAIN/IX.

C Programs without main ()

Whether or not you invoke it with the **-r** option, **/bin/ld**(1) will silently do nothing if you compile and load a program with no main () routine.

Typed Files

Programs that need to open a file (e.g., **tar**, **cat**, **cmp**) fail if the file is not type uasc (unstructured ascii) or type obj (object). Note that while files of other types are present in the file system, they cannot normally be created by DOMAIN/IX programs.

Files Created with the DM Editor

The DM editor ignores the current **umask** value when assigning rights to a file it creates. Instead, it uses the default file ACL. If the default file ACL does not specify an owner, ownership is assigned to "root" even though it is possible for anyone to use **chown**(1) to change the owner of such files.

bsd4.2 **troff**

The bsd4.2 version of **troff** has problems -- not limited to the DOMAIN/IX implementation -- with the "new" version of **-ms** as well as with the **-mm** macros. Known problems include failure to correctly format .NH output (**-ms**) and prepending a string of zeros to page numbers in **-mm** files.

Suspending a Log-in C Shell

If you suspend a log-in C Shell (one whose "parent" is the DM), you will not be able to unsuspend it unless you send it a continue signal from another process. This signal can be generated by entering a **"kill -cont"** line in another UNIX Shell or by using the DM command **"dq -c 12002b"** (mapped to ^j by bsd4.2_keys).

eqn | tbl | nroff Output

When viewed in a DM read window, files processed with **tbl** and/or **neqn** and **nroff** sometimes include control characters that are displayed as triangles. In some cases (notably when the file includes equations), piping the formatted files through **colcrt**(1) mitigates this problem, although **colcrt** has the side effect of printing underscores one line below the characters they should be underlining.

Loss of rights in subshells

Changes of environment in subprocesses (i.e., shells) started by children of the DM are not communicated to the DM itself. For example, changes to the of working directory (using **cd**) in a forked subshell will not be recognized by the DM. If you start a subshell, then change directories, you will need to give the DM the full pathname of any file you want it to access in the subshell's working directory. If you have to **su** or **login** to obtain rights to edit a file, you must use **ed**, **ex**, or **vi** (rather than the DM editor) to do the editing.

Locked Files

Programs that attempt to open locked files will sometimes return the message "Text file busy".

Ps and Changed Arguments

Even though a program may change its arguments in place, **ps** always shows the arguments with which the program was invoked.

Job Control in Remote Processes

If you create a C Shell as a remote process (using **crp**), you will not have access to any of the job control features, regardless of the setting of INPROCESS.

BL10 Beta Test Version of **ar**(1)

Because of differences between the BL10 beta and final versions of **ar**(1), files archived using the BL10 version are not readable by the released version.

Magtape

Magtape special files cannot be opened for read/write when the tape is not at load point. Magtape does not always get rewound when a tape operation is terminated with a quit fault.

/dev/tty

DOMAIN/IX does not include a /dev/tty. Calls to open /dev/tty normally open the standard input/output of the pad in which a process runs. The files /dev/tty? are equivalent to /dev/sio?.

FIOCLEX

We do not support file locking via the **ioctl**(2) parameter FIOCLEX.

Fork(2) and mailbox server

You cannot fork a process that is acting as a mailbox server.

Libdbm(3)

Only one program at a time can have write access to a **libdbm**(3) database.

Who(1)

Who does not list users logged in via an SIO line.

DISK FULL and END OF TAPE errors

User programs cannot catch DISK FULL and END OF TAPE errors.

Quitting **more**(1)

Because of a limitation in the DOMAIN SIO driver, you cannot quit **more** when running over an SIO line.

!{Mv(1)

If you execute **mv** on an SR9 node to rename a file on an SR8 disk, the file will be cataloged under both names with a reference count of two.

Lint(1)

System V 'lint' returns the spurious error message "variable number of parms" when examining a program that uses **std_$call**.

INPROCESS unset

When the C Shell variable "INPROCESS" is UNSET (the default condition), the following limitations apply:

- The **/com/tb** command always returns the message "no traceback available".

- Libraries loaded with the **inlib** command are not available to programs running in an environment where INPROCESS is UNSET.

- The **/com/las** command will only list the address space occupied by itself.

- The **/com/lopstr** command shows only those streams that the C Shell has open.

- The **/com/wd** command does not work. (Rather, it works but it has a null effect, because it doesn't set the C Shell's working directory, only its own.)

4.4 KNOWN BUGS AT SR9.0

- DOMAIN/IX does not always handle errnos returned by math library routines (3m) correctly.

- If you use **chmod**(1) to change the access mode of a file, it also changes the "last time accessed" associated with that file.

- The super-user can execute files that do not have execute permission for anyone.

- Shell scripts can't be run with **setuid**.

- You cannot open a named pipe for both reading and writing.

- /sys5/bin/rsh incorrectly inherits the PATH of the process from which it is started, rather than getting the PATH from .profile or, if there is no .profile, limiting the path to /bin and /usr/bin. Note that /bin/start_rsh works correctly.

- AEGIS programs don't listen for SIGPIPE. If you kill a UNIX program that is reading a pipe written to by an AEGIS program, the message

  (vfmt) Error writing to stream 1, status 5130005.

  is displayed until the writer is finished.

- If you access **telnet** (bsd4.2 only) via an SIO line, the SIO driver sometimes echoes superfluous characters to the terminal screen. These characters are not transmitted.

- The C Shell runs inhibited when it is doing I/O redirection for in-process execution.

- The sys5 version of **su**(1) doesn't set SID text.

- Jobs started by **atrun** will be run again if they have not completed by the next time **atrun** is invoked.

- **csplit**(1) does not split files into equal-length segments when invoked with a line of the form:

  csplit file prefix number_of_parts

- During installation, the file sys/node_data/acl_cache may become corrupted and need to be replaced with an empty file.

- The bsd4.2 program **rlogin** may hang if you send it multiple interrupts.

- The C Shell may not wake up after foregrounding a process that has been stopped to allow background I/O.

- Null 'while' loops in both Bourne and C Shells may be unquittable.

- The bsd4.2 programs **indexbib** and **lookbib** do not work.

- The bsd4.2 program **htable**(8) reports incorrect line numbers on syntax error.

- The - option to **su**(1) does not work.

- **Diff**(1) does not work on DSEE (DOMAIN Software Engineering Environment) files.

- When using the **-s** option to **ln**(1), you must always specify the link text in lowercase, even when referencing an uppercase environment variable.

- Attempts to use **tty**(1) on a pty return the incorrect message "not a tty".

- Attempts to run the sys5 version of **make**(1) in a bsd4.2 C Shell, using the **ver**(1) command (e.g., **% ver sys5 make** or **%ver sys5; make**), fail.

- Calls to **srand48()** may fail with an access violation.

- **Nm**(1) does not understand **ar**(1) files.

- You cannot create through a link. The command sequence **% /com/crl foo bar ;date >foo** generates the message "foo: cannot create" unless

bar is given as subdir/bar, in which case the date is written to subdir/foo.