Read Me Before Updating the Software Bundle

HP 9000 Series 300

HEWLETT PACKARD

HP Part No. 98594-90617
Printed in USA Sept 1989

E0989

HP Computer Museum
www.hpmuseum.net

For research and education purposes only.

Contents

Read Me Before Updating the Software Bundle

Please Start Here

This document applies to the product you purchased (for example, installing a software bundle, updating AXE, updating PE) for the 7.0 release of the HP-UX operating system. The document has the following purposes:

- Introduce your product.
- Identify things you must accommodate before you begin an update.
- Provide information related to an update that helps you use the *Installing HP-UX* manual or the chapter on updating HP-UX that appears in the *HP-UX System Administration Tasks* manual.
- Identify things you should accommodate after an update to ensure the proper operation of your product.
- Discuss miscellaneous items you may need to consider, depending on your situation.

Contents of Your Product

This box contains the software and documentation for the 7.0 release of the HP-UX Updating Software Bundle product. The bundled product contains the Application Execution Environment (AXE), the Programming Environment (PE), the NS-ARPA Services/300, and the Network File System (NFS).

Please take time to verify the contents against the package contents list. If your product does not have these components, see your HP representative to obtain the correct product.

Do These Things Before You Update the Software Bundle

This section describes things you should do or account for before you begin an update.

Backup Any Existing System

Because you have release 6.5 of HP-UX, backup any files you cannot afford to lose before you begin the update. For example, backup directories for users, applications, environments, tools, utilities, and languages that you suspect may not be on your update media. While an update attempts to preserve special and customized files, you should backup your system to ensure not losing files.

X11 Window System Space Requirements

The 7.0 release of HP-UX includes three window systems: X11, X10, and Windows/9000. Loading the filesets for all three window systems requires approximately 24 Mbytes of disk space in addition to the space required for your other software. Determine your total disk space requirements and be sure your disk can accommodate the requirement before you begin an installation or update.

HP Windows/9000 Users

If you use HP Windows/9000, set up the keyboard and mouse as follows:

- Connect the keyboard directly to the computer.
- Connect the mouse directly to the keyboard.

Changes to /usr/include/utmp.h

The header file `/usr/include/utmp.h` was changed for POSIX conformance. A new type named `pid_t` was introduced at release 7.0. Previously, process ids (pids) were of type short. Beginning with 7.0, the kernel will treat pids as type long (that is, `pid_t` is set to type long in `/usr/include/sys/types.h`).

Although pids are now treated as longs, the value of `MAXPID`, which is 30000, will not changed in the near future. Since the type `pid_t` was introduced, the 7.0 release introduces this change to the utmp structure defined in `<utmp.h>`. Specifically, the field named `ut_pid` is type `pid_t`. The new `ut_host[]` field is a 16-byte array of type `char`, which now corresponds to BSD. It is used to maintain the name of the remote host from which a user is logged into the local host. A spare field named `ut_spare` of type unsigned long was added for future expandability.

Because the `ut_pid` field has been changed from a short to a long, any program that attempts to read from or write to the `/etc/utmp`, `/etc/wtmp`, or `/etc/btmp` files may not work properly.

Some of the early versions of the HP's XWindow environment, in which HP-UX and X Windows were pre-configured onto the system, were designed to use the utmp structure on HP-UX 6.5. The X Windows version of `login` on these early versions of the XWindows environment will not work correctly after an update to 7.0, because `xlogin` relies on the utmp structure.

To determine if you will have a problem, execute:

```
what /usr/bin/X11/xlogin
```

This return a string such as:

```
xlogin.c        1.3     08/16/89 13:54:33
```

Observe the string, and if your version of **xlogin** is older than the example (1.3), obtain a new copy of **xlogin** from your SE before you update to the 7.0 release. If you do not do this, you must change **/etc/inittab** so it does not start the XWindows environment after the update.

SNALink Users

This information affects the SNALink product. It does not affect any other SNA products.

If you install the 7.0 release of HP-UX, you can ignore this situation.

If your standalone or gateway system has SNALink, you must remove references to the SNALink driver from your configuration description file (probably `/etc/conf/dfile`) before you build a system kernel. An update will fail if you do not remove the driver.

To do this work, proceed as follows:

1. Execute:

   ```
   /etc/sna/Remove/Remove_snalink
   ```

2. Just in case, make a backup copy of your configuration description file by executing:

   ```
   cp /etc/conf/dfile /etc/conf/old_dfile
   ```

3. Edit `/etc/conf/dfile` by removing the line containing `snalink`.
4. Perform the update. Read all other information in this document before you do this. Later, after the update, come back to this section and complete the following steps.
5. Install the SNALink version 7.0 product. Use the directions provided in the *HP-UX SNALink and Gateway/SNALink Manager's Reference Manual.*
6. After the installation, convert your existing SNALink configuration file (`sna_cfg`) to the 7.0 format by executing the following shell script. The *SNA 7.0 Read-Me-First* document explains how to run the script.

   ```
   /etc/sna/sna_conv
   ```

NFS-mounted File Systems

In an NFS server/client situation in which HP-UX file systems are distributed across systems and accessed remotely, you update the server's system before you update the client's system.

During the update process, if the update process tries to update a file across an NFS mount, the write attempt fails and sends a message to the logfile (`/tmp/update.log`). You can ignore the message because the remote file system is not changed and the update process continues without interruption. This notice applies only to the system files that may be updated. The user files on NFS-mounted file systems are not affected by the update process.

Before Updating - Systems with X.25/9000

If you have X.25/9000 installed on a system running Release 6.5 software, perform the following steps *before* you update to 7.0:

1. At the HP-UX prompt, execute:

   ```
   mv /etc/netlinkrc /etc/netlinkrc.x25
   ```

   If you run the 7.0 update program without performing this step, the system may panic when rebooted.

2. Run the update program to load the new 7.0 operating system. This is explained later in "Do These Things During the Update".

3. Later, if you receive X.25/9000 on a separate tape, run the update program again to load X.25/9000 as soon as possible after updating to the 7.0 operating system. *Do not* attempt to run the old version of X.25 on Release 7.0 software. When you finish this update, install the X.25/9000 package. See *Installing and Administering X.25/9000* for information on running `x25install`.

   Do not attempt to use X.25/9000 on an updated system until you have run x25install.

Do These Things During the Update

To update your Software Bundle, use the following procedure, noting that you may need to read other files or documents:

1. Read this entire document, and any other READMEs you may have, before you begin the update.
2. When you have performed all prerequisite tasks (according to your system and situation), install your system for the 7.0 release as follows. Prerequisite tasks include testing all hardware and making sure you have sufficient disk space to hold the Software Bundle product.
   a. Login as the root user and get the system into the single-user state (run `/etc/shutdown 0`).
   b. Work through the chapter named "Updating HP-UX" in the *HP-UX System Administration Tasks* manual.
3. Once your system has been updated, perform any necessary tasks to get the system running as required. The *HP-UX System Administration Tasks Manual* and the *HP-UX System Administration Concepts Manual* have information about this. You may also need to use documentation for networking, system security, windowing, and so on. The *Finding HP-UX Information* manual has information about the entire HP-UX documentation set.

Do These Things After You Update the Software Bundle

Read the Release Notes File

The 7.0 release has a directory named `/etc/newconfig`. This directory contains a file named `ReleaseNotes`, which discusses new features, changes from the 6.5 release, and other user information. With the 7.0 release, the `ReleaseNotes` file replaces the files that were previously contained in the `/etc/newconfig/Update_info` directory.

You should read this file after you do an update and before you use the 7.0 release.

Configuring a LAN Card That Has Not Been Used

If your kernel has networking, but your LAN card has not been initialized, work through the following steps:

1. To determine if you have a LAN interface that has not been used, execute:

```
/etc/ifconfig lan0
```

You can get feedback as follows:

a. If the message says **system feature not installed**, your kernel does not have networking. You need to work through the previous section.

b. If the message contains **inet** 0.0.0.0, your LAN card has never been used. You need to configure a new LAN interface, beginning at Step 2.

c. If the message says you have no such interface, you need to configure a new LAN card. You can use SAM to do this. Go back to the Main Menu and work down as implied by the menus.

2. If you have not done so, log in as the root user.

3. Execute:

```
/usr/bin/sam
```

4. From the SAM Main Menu, select **Networks/Communications->**.

5. You should get **LAN Card Configuration->**. If you get a menu that contains **Configure a New LAN Card->**, see the previous section called "A Newly Installed System With Networking".

The procedure continues on the next page.

6. Before you configure the LAN card, you must set the current interface to a non-zero address. The example assumes you have one LAN card. If you already have a working LAN card (or cards), use the appropriate entry (for example, `lan1` for a second card, `lan2` for a third LAN card). To do this work, press the `Shell` softkey, wait for a shell prompt, and execute:

   ```
   /etc/ifconfig lan0 1.0.0.0
   ```

7. Return to SAM by typing `exit`
8. Back in SAM, select `LAN Card Configuration->`.
9. Select `View/Modify a LAN Card's Configuration...`
10. If you have one LAN card, you get `lan0` as the LAN card to view/modify. If you have more than one LAN card, use `Help` and choose the interface to modify (the one used earlier for `/etc/ifconfig`).

    The IP address field appears as `1.0.0.0`. Replace this value with the value for your system (for example, something like `15.15.232.31`). Fill in other fields as appropriate.
11. When you are ready, press `Perform Task`
12. At this point, you should have a functioning LAN card.

Set the DISPLAY Variable

On a system without networking, set the `DISPLAY` variable in your environment before you use the X11 window system. For Bourne and Korn shell users, include the following lines in your `.profile` file:

```
DISPLAY=local:0
export DISPLAY
```

For C shell users, include the following line in your `.csh.login` file:

```
setenv DISPLAY local:0
```

Modifications for the DOS Coprocessor 2.0

The X11 font directory structure has changed for 7.0. To make the DOS Coprocessor work with the new structure, your system administrator will have to follow these steps as super user:

1. Move the DOS Coprocessor fonts under the `/usr/lib/X11/fonts/misc` directory by executing the following commands:

   ```
   mv /usr/lib/X11/fonts/xd12x20.scf  /usr/lib/X11/fonts/misc/.
   mv /usr/lib/X11/fonts/xd6x15.scf /usr/lib/X11/fonts/misc/.
   mv /usr/lib/X11/fonts/xd6x8.scf /usr/lib/X11/fonts/misc/.
   mv /usr/lib/X11/fonts/xd8x16.scf /usr/lib/X11/fonts/misc/.
   ```

2. Edit `/usr/lib/X11/fonts/misc/fonts.dir` by adding the following lines at the end of the file:

   ```
   xd12x20.scf xd12x20
   xd6x15.scf xd6x15
   ```

```
xd6x8.scf xd6x8
xd8x16.scf xd8x16
```

3. Rehash the table of allowed fonts by executing the following command:

```
xset fp rehash
```

4. Configure the XFONT by specifying one font without using the .scf suffix. Edit the dos.config file that your are using. This can be:

   a. /usr/lib/dos/dos.cnf,

   b. the file pointed to by $DOSCONFIG, or

   c. the $HOME/.dosrc file.

   In one of these files, make sure that one font is specified as follows:

```
XFONT           xd12x20          # xd6x15 xd6x8 xd8x16
```

Increasing Shared Memory between Starbase Applications and an X11 Server

The Graphics Resource Manager (GRM) handles various resources that need to be shared between Starbase applications and an X11 server. These shared resources include:

- fonts
- color maps
- cursors
- backing store (window retain space) for Starbase clients

If a particular configuration requires many large fonts or large numbers of any of the above resources, the shared memory segment the GRM uses may need to be enlarged. If a memory shortage occurs, an error message is issued, stating that a resource request has failed due to a lack of memory.

To increase the amount of shared memory, you must set the WSHMSPC and the GRM_SIZE environment variables. These variables must be set correctly in the shell used to invoke X11 Windows. It is a good idea to place them in the shell login file.

These environment variables must be set *before* the grmd process and the X11 Window System start executing (that is, while no X11 servers or Starbase applications are running). To ensure that these processes are not running, examine the output of the ps -ef command for the presence of a grmd process.

By default, the Series 300 GRM will allocate 2 Megabytes if it is started by a Starbase graphics program and 4.5 Megabytes if started by the X11 server.

To increase the shared memory size to 6 Megabytes, set the WSHMSPC and the GRM_SIZE environment variables as follows:

For the Bourne or Korn Shells, enter:

```
WSHMSPC=0x600000; export WSHMSPC
GRM_SIZE=600000; export GRM_SIZE
```

For the C Shell, enter:

```
setenv WSHMSPC   0x600000
```

```
setenv GRM_SIZE  600000
```

Note the lack of a prefix for the GRM_SIZE value. It is always assumed to be in hexadecimal.

The Following Items May Relate to Your Situation

The X11 Window System

If you have an HP 98720 monitor and run X11 windows, set up the Xn.devices file to tell XWindows what device file to use.

The following items discuss things you may need to accommodate.

xwcreate/gwind

In X11 for HP-UX 6.5, the **gwind** daemon can manage multiple windows on multiple screens. This capability is broken in HP-UX 7.0 X11 because an enhancement was added to ensure that each **xwcreate** window displays the same type of arrow as appears for a Starbase program running on the ITE.

The 7.0 **gwind** daemon creates an arrow only for the first window generated by a call to **xwcreate**. Then **gwind** attempts to share with all subsequently created windows. On windows that reside on the same display combination as the first window, this condition generates a non-fatal X protocol error when **gwind** attempts to register the arrow for windows on other screens. The condition has other non-fatal consequences, and in any case, the workaround is to use the **-wmdir** option in **xwcreate** to force a new **gwind** for each unique combination of displays.

libX11

X11 clients that reference the Xlib procedure named XGetMotionEvents(), need the following lines as part of the C source code.

```
#include <X11/Xmd.h>

int cvtINT16ToInt(val)
    int val;
 {
    return(cvtINT16toInt(val)) ;
 }
```

Using X11 and X10 Windows on a System

If your system has the X11 and X10 window systems, you should control the paths you use so the correct window system starts up. The hpterm for X10 is in /usr/bin and the hpterm for X11 is in /usr/bin/X11. Therefore, work as follows:

- If you want X11, make /usr/bin/X11 a value in your PATH variable in your local login script and place this value ahead of /usr/bin.
- If you want X10, make /usr/bin a value in your PATH variable in your local login script and place this value ahead of /usr/bin/X11 (if you include this value).

- If you start X11 or X10 remotely, you can avoid problems by using an absolute pathname (for example, `/usr/bin/X11/hpterm` to get an X11 window).

The System Administration Manager

The 7.0 release contains a System Administration Manager (SAM). HP recommends using SAM for system administration whenever possible and working manually when SAM does not perform a task. The capability of `/usr/bin/sam` exceeds the capability of `/etc/reconfig`, which existed on releases prior to 7.0. Therefore, HP-UX no longer contains `/etc/reconfig`. A file named `/etc/newconfig/Update_info/reconfig_sam` explains the differences.

The New ELM Mailer

A new ELM Mailer has a screen-oriented interface that conforms to RFC-822 electronic mail header protocol.

Conformance to Standards

The 7.0 release conforms to POSIX IEEE 1003.1 and X/Open branding. Examine any information about this in the release notes. Also, read the *HP-UX POSIX Conformance Document.*

The default job control facilities in 7.0 conform to POSIX 10003.1.

Integration of Series 300 and Series 800 Computers

HP has made a significant effort to integrate Series 300 and Series 800 systems. For example, a Series 300 computer can be a client in an HP-UX heterogeneous cluster.

Some documents such as the *HP-UX System Administration Concepts Manual* apply to both series, and some documents such as the *HP-UX System Administration Tasks Manual* apply to a specific series. For example, if you have a Series 300 computer, you need the *HP-UX System Administration Tasks* manual for HP 9000, Series 300.

Compatibility Between the 6.5 and 7.0 Releases

The `/etc/utmp`, `/etc/wtmp`, and `/etc/btmp` files have a different format in the 7.0 release than they had in previous releases. They may not be compatible with certain software (for example, the 6.5 release and the X11 window system).

If this condition affects any of your programs, you must recompile the existing programs against the 7.0 header file named `/usr/include/utmp.h`. Private data files that conform to the 6.5 format need to be converted to the new `utmp` format as defined in the header.

Job Control

The job control features can induce conditions that make HP-UX unstable if you use the Korn or C shells. To avoid this, the root user (the superuser) should use the Bourne shell (`/bin/sh`). Also, you should shut down the system from a Bourne shell.

The `ReleaseNotes` file in `/etc/newconfig` has more information.

Note This When You Run /etc/shutdown

Running `/etc/shutdown` may display this message:

```
Cannot find HOME variable
```

The `/etc/init` command does not initialize this shell environment variable. Getting the messages does not adversely affect the shutdown process.

Saving Space on Standalone Systems

The AXE part of your product contains several preconfigured kernels. After an installation or update, if you have a standalone configuration (no networking and no relationships to HP-UX clusters) and you want to free up some disk space, you can safely remove files from the `/etc/conf` directory as follows:

- If you have a multi-user license (16- or 32-user AXE), removing the following files saves about 4 Mbytes.

```
cnode.hp-ux.m
cnode.nfs.m
cnode.cdnfs.m
cnode.cdfs.m
```

- If you have a 2-user license, removing the following files saves about 4 Mbytes.

```
cnode.hp-ux.2
cnode.nfs.2
cnode.cdnfs.2
cnode.cdfs.2
```

X11 Windows: server

The HP-UX 7.0 X11 server does *not* support `SaveUnders` even though *DoesSaveUnders()* and *XDoesSaveUnders()* both indicate that it does.

Ksh Interaction with Background Jobs

If you alias a `ksh` built in command to a function that uses command substitution with a non-builtin command, there is interaction with background jobs. Here is an example of an alias that causes this situation to occur:

```
$ alias cd=newcd
#  alias cd (a builtin) to function
$ function newcd
 {
     \cd /tmp
```

```
    x='/bin/echo foo'
# command substitution of non-builtin
 }
```

Here, the function *newcd* substitutes a non-builtin command (`/bin/echo`). If you put a job in the background, and then immediately issue the `cd` command, `cd` hangs until the background job finishes. Here is an example of when this situation occurs:

```
$ sleep 120 [1] 8377
$ cd
```

The prompt will not return until the `sleep` command finishes because the command is waiting for the background job to complete and it is also waiting for the expected `/bin/echo` to complete. This occurs only if there are no intervening non-builtin commands issued between putting a job in the background and issuing the alias. For example:

```
$ sleep 120 [1] 9876
$ pwd  # execute a ksh builtin
/users/pbm
$ cd   # cd hangs
```

If,however, you enter an intervening non-builtin command, `cd` completes normally.

```
$ sleep 120 [1] 9876
$ /bin/true # execute a non-builtin
$ cd   # cd completes normally
```

Workaround

Make sure that functions you alias to `ksh` builtin commands (for example, `kill`, `cd`, `echo`, `umask`, and so on) do not contain command substitution (nor should functions called by the function aliased to the builtin).

If you have this situation, make sure you do not issue the function *immediately* after putting a process in the background. If there is an intervening non-builtin command, the problem will not occur.

Native Language Support Default LANG Value

The default LANG variable in 7.0 HP-UX has changed from "n-computer" to "C". If you wish to use the default computer language of "C," make sure the LANG variable is *not* set in the login scripts, such as `.profile` or `.cshrc`.

If the LANG environment variable is set to an invalid value, all NS logging entries will say `UNKNOWN MESSAGES`.

Enabling Auditing in HP-UX Clusters

The following discussion applies only if you enable auditing on an HP-UX cluster.

If you enable auditing on an HP-UX cluster, the program `/etc/tsconvert`, normally executed by *sam*(1M), has a flaw that affects heterogeneous and homogeneous clusters.

The flaw appears when `at` and `cron` jobs execute. For all clients of the cluster, none of these jobs execute, and users are informed (via mail) that their `at` or `cron` job did not run because their job did not have a valid audit ID.

The /etc/tsconvert program takes the following actions:

- Creates a new file, /.secure/etc/passwd. The line entries in this file have the following form:

  ```
  user:password:aid:flag
  ```

  The contents of the fields user and password are taken from the /etc/passwd file, and an aid (audit ID) is automatically assigned to the user. The audit flag is set to 1 by default.
- Removes passwords from /etc/passwd, replacing them with asterisks.
- Creates two new directories, .ataids and .cronaids in /usr/spool/cron
- For each at and cron job, creates a file having the same name as the job; the contents of the file are the submitters' audit IDs.

The /usr/spool/cron directory is a CDF, but tsconvert does not recognize this fact. Thus, only the server's at and cron jobs get properly converted (not the clients). As mentioned earlier, this results in the jobs being ignored and mail being sent to the submitters saying their jobs were not run.

Here is a workaround. *After* you have converted to a trusted system from *sam*(1M), run tsconvert using the -p option. For each client on the cluster, as root, run tsconvert by entering:

```
/etc/tsconvert -p
```

The /etc/tsconvert program will not run to completion if you have not first converted to a trusted system. The -p option specifies that tsconvert is to not convert the password file (as this has already been done).

Quietjet Plus Printer Configuration

You need to configure the Quietjet Plus Printer to return the correct ID byte. The printer manual for the Quietjet Plus erroneously indicates that switches B2 and B3 should be configured B2 Up and B3 Down. They should both be configured down.

Using the m4 Command

The m4 command has moved from /bin to /usr/bin. The /bin/as command has an m option that pre-processes input assembler files with m4 before assembling. The /bin/as command, however, still looks for m4 in /bin instead of /usr/bin. Therefore, if you use the m option to /bin/as, either:

1. link /usr/bin/m4 to /bin/m4; or
2. move /usr/bin/m4 to /bin/m4.

Fast Alpha and Font Manager (FA/FM) Libraries

Fast Alpha and Font Manager (FA/FM) are two libraries (`libfa.a` and `libfontm.a`) and related files which allow Starbase programs to write raster text on bit-mapped displays.

The `FAFM_MIN` fileset contains a set of raster font files for use by programs compiled with the FA/FM libraries.

The `FAFM_SUPL` fileset contains the two libraries, plus include files, man pages, and demo-program source code.

FA/FM may be used with any of the Starbase raster display drivers (`libdd98550.a`, etc). It may also be used with `libddsox11.a`, but in this case you must take the special actions described below.

Note If the hp98720w driver is used in raw Starbase mode, as opposed to in a Windows/9000 environment, FA/FM clipping should not be turned off. The `hp98720w` driver is primarily a Windows/9000 driver.

Using FA/FM with the sox11 Driver

In 7.0, the X11 server no longer accesses fonts by file name; they are now accessed by a "font name" which is not directly related to the file name. This change was made to conform to MIT release 3 of the X11 server. Programs that use `libfa.a` or `libfontm.a` with `libddsox11.a` will not work with 7.0 servers unless you perform the steps listed below. Execute these steps on the X11 server machine(s):

1. Log in as the root user.
2. If you have not updated your system to include the `FAFM_MIN`, `X11_SERV` and other X11 filesets, do this now. See the "Updating HP-UX" chapter in the *HP-UX System Administration Tasks* manual.
3. Make a new directory as shown below:

   ```
   mkdir /usr/lib/raster/sox11
   ```

4. Edit an `fonts.alias` file in the `/usr/lib/raster/sox11` directory so it has the following lines:

   ```
   "FILE_NAME_ALIASES"
   /usr/lib/raster/10x20/SNF/kana.8K.scf ulr10x20k
   /usr/lib/raster/10x20/SNF/kana.8K ulr10x20k
   /usr/lib/raster/10x20/kana.8K  ulr10x20k
   /usr/lib/raster/10x20/SNF/lp.8U.scf ulr10x20
   /usr/lib/raster/10x20/SNF/lp.8U  ulr10x20
   /usr/lib/raster/10x20/lp.8U  ulr10x20
   /usr/lib/raster/10x20/SNF/lp.b.8U.scf ulr10x20b
   /usr/lib/raster/10x20/SNF/lp.b.8U ulr10x20b
   /usr/lib/raster/10x20/lp.b.8U  ulr10x20b
   /usr/lib/raster/12x20/SNF/cour.0U.scf ulr12x20c
   /usr/lib/raster/12x20/SNF/cour.0U ulr12x20c
   /usr/lib/raster/12x20/cour.0U  ulr12x20c
   /usr/lib/raster/12x20/SNF/cour.b.0U.scf ulr12x20cb
   /usr/lib/raster/12x20/SNF/cour.b.0U ulr12x20cb
   ```

```
/usr/lib/raster/12x20/cour.b.0U  ulr12x20cb
/usr/lib/raster/18x30/SNF/math.0M.scf ulr18x30m
/usr/lib/raster/18x30/SNF/math.0M ulr18x30m
/usr/lib/raster/18x30/math.0M  ulr18x30m
/usr/lib/raster/18x30/SNF/pica.8U.scf ulr18x30p
/usr/lib/raster/18x30/SNF/pica.8U ulr18x30p
/usr/lib/raster/18x30/pica.8U  ulr18x30p
/usr/lib/raster/6x8/SNF/lp.8U.scf ulr6x8
/usr/lib/raster/6x8/SNF/lp.8U  ulr6x8
/usr/lib/raster/6x8/lp.8U  ulr6x8
/usr/lib/raster/6x8/SNF/lp.b.8I.scf ulr6x8b
/usr/lib/raster/6x8/SNF/lp.b.8I  ulr6x8b
/usr/lib/raster/6x8/lp.b.8I  ulr6x8b
/usr/lib/raster/6x8/SNF/math.8M.scf ulr6x8m
/usr/lib/raster/6x8/SNF/math.8M  ulr6x8m
/usr/lib/raster/6x8/math.8M  ulr6x8m
/usr/lib/raster/7x10/SNF/lp.8U.scf ulr7x10
/usr/lib/raster/7x10/SNF/lp.8U  ulr7x10
/usr/lib/raster/7x10/lp.8U  ulr7x10
/usr/lib/raster/8x16/SNF/kana.8K.scf ulr8x16k
/usr/lib/raster/8x16/SNF/kana.8K ulr8x16k
/usr/lib/raster/8x16/kana.8K  ulr8x16k
/usr/lib/raster/8x16/SNF/linedraw.0L.sc ulr8x16l
/usr/lib/raster/8x16/SNF/linedraw.0L ulr8x16l
/usr/lib/raster/8x16/linedraw.0L ulr8x16l
/usr/lib/raster/8x16/SNF/lp.8U.scf ulr8x16
/usr/lib/raster/8x16/SNF/lp.8U  ulr8x16
/usr/lib/raster/8x16/lp.8U  ulr8x16
/usr/lib/raster/8x16/SNF/lp.b.8U.scf ulr8x16b
/usr/lib/raster/8x16/SNF/lp.b.8U ulr8x16b
/usr/lib/raster/8x16/lp.b.8U  ulr8x16b
/usr/lib/raster/8x16/SNF/lp.i.8U.scf ulr8x16i
/usr/lib/raster/8x16/SNF/lp.i.8U ulr8x16i
/usr/lib/raster/8x16/lp.i.8U  ulr8x16i
/usr/lib/raster/8x16/SNF/math.0M.scf ulr8x16m
/usr/lib/raster/8x16/SNF/math.0M ulr8x16m
/usr/lib/raster/8x16/math.0M  ulr8x16m
/usr/lib/raster/L6x15/SNF/lp.8U.scf ulrL8x15
/usr/lib/raster/L6x15/SNF/lp.8U  ulrL8x15
/usr/lib/raster/L6x15/lp.8U  ulrL8x15
/usr/lib/raster/dflt/a/h/SNF/katakana.scf ulrdahk
/usr/lib/raster/dflt/a/h/SNF/katakana  ulrdahk
/usr/lib/raster/dflt/a/h/katakana  ulrdahk
/usr/lib/raster/dflt/a/l/SNF/katakana.scf ulrdalk
/usr/lib/raster/dflt/a/l/SNF/katakana  ulrdalk
/usr/lib/raster/dflt/a/l/katakana  ulrdalk
/usr/lib/raster/dflt/a/v/SNF/katakana.scf ulrdavk
/usr/lib/raster/dflt/a/v/SNF/katakana  ulrdavk
/usr/lib/raster/dflt/a/v/katakana  ulrdavk
/usr/lib/raster/dflt/b/h/SNF/katakana.scf ulrdbhk
/usr/lib/raster/dflt/b/h/SNF/katakana  ulrdbhk
```

```
/usr/lib/raster/dflt/b/h/katakana  ulrdbhk
/usr/lib/raster/dflt/b/l/SNF/katakana.scf ulrdblk
/usr/lib/raster/dflt/b/l/SNF/katakana  ulrdblk
/usr/lib/raster/dflt/b/l/katakana  ulrdblk
/usr/lib/raster/dflt/b/v/SNF/katakana.scf ulrdbvk
/usr/lib/raster/dflt/b/v/SNF/katakana  ulrdbvk
/usr/lib/raster/dflt/b/v/katakana  ulrdbvk
```

5. Edit a `fonts.dir` file in the `/usr/lib/raster/sox11` directory so it has the following lines:

```
24
ulr10x20.scf        ulr10x20
ulr10x20b.scf       ulr10x20b
ulr10x20k.scf       ulr10x20k
ulr12x20c.scf       ulr12x20c
ulr12x20cb.scf      ulr12x20cb
ulr18x30m.scf       ulr18x30m
ulr18x30p.scf       ulr18x30p
ulr6x8.scf          ulr6x8
ulr6x8b.scf         ulr6x8b
ulr6x8m.scf         ulr6x8m
ulr7x10.scf         ulr7x10
ulr8x16.scf         ulr8x16
ulr8x16b.scf        ulr8x16b
ulr8x16i.scf        ulr8x16i
ulr8x16k.scf        ulr8x16k
ulr8x16l.scf        ulr8x16l
ulr8x16m.scf        ulr8x16m
ulrL8x15.scf        ulrl8x15
ulrdahk.scf         ulrdahk
ulrdalk.scf         ulrdalk
ulrdavk.scf         ulrdavk
ulrdbhk.scf         ulrdbhk
ulrdblk.scf         ulrdblk
ulrdbvk.scf         ulrdbvk
```

6. Set file owners and permissions as follows:

```
chmod 555 /usr/lib/raster/sox11
chmod 444 /usr/lib/raster/sox11/*
chown bin /usr/lib/raster/sox11 /usr/lib/raster/sox11/*
chgrp bin /usr/lib/raster/sox11 /usr/lib/raster/sox11/*
```

7. Edit a `links` file in `/tmp` so it has the following lines:

```
/usr/lib/raster/10x20/SNF/kana.8K.scf ulr10x20k.scf
/usr/lib/raster/10x20/SNF/lp.8U.scf ulr10x20.scf
/usr/lib/raster/10x20/SNF/lp.b.8U.scf ulr10x20b.scf
/usr/lib/raster/12x20/SNF/cour.0U.scf ulr12x20c.scf
/usr/lib/raster/12x20/SNF/cour.b.0U.scf ulr12x20cb.scf
/usr/lib/raster/18x30/SNF/math.0M.scf ulr18x30m.scf
/usr/lib/raster/18x30/SNF/pica.8U.scf ulr18x30p.scf
/usr/lib/raster/6x8/SNF/lp.8U.scf ulr6x8.scf
```

```
/usr/lib/raster/6x8/SNF/lp.b.8I.scf ulr6x8b.scf
/usr/lib/raster/6x8/SNF/math.8M.scf ulr6x8m.scf
/usr/lib/raster/7x10/SNF/lp.8U.scf ulr7x10.scf
/usr/lib/raster/8x16/SNF/kana.8K.scf ulr8x16k.scf
/usr/lib/raster/8x16/SNF/linedraw.0L.sc ulr8x16l.scf
/usr/lib/raster/8x16/SNF/lp.8U.scf ulr8x16.scf
/usr/lib/raster/8x16/SNF/lp.b.8U.scf ulr8x16b.scf
/usr/lib/raster/8x16/SNF/lp.i.8U.scf ulr8x16i.scf
/usr/lib/raster/8x16/SNF/math.0M.scf ulr8x16m.scf
/usr/lib/raster/L6x15/SNF/lp.8U.scf ulrL8x15.scf
/usr/lib/raster/dflt/a/h/SNF/katakana.scf ulrdahk.scf
/usr/lib/raster/dflt/a/l/SNF/katakana.scf ulrdalk.scf
/usr/lib/raster/dflt/a/v/SNF/katakana.scf ulrdavk.scf
/usr/lib/raster/dflt/b/h/SNF/katakana.scf ulrdbhk.scf
/usr/lib/raster/dflt/b/l/SNF/katakana.scf ulrdblk.scf
/usr/lib/raster/dflt/b/v/SNF/katakana.scf ulrdbvk.scf
```

8. Create links in the `/usr/lib/raster/sox11` directory as follows:

```
cd /usr/lib/raster/sox11
xargs </tmp/links -n2 ln -s
```

9. Locate the `.x11start` file used to start up the server (this will be in the home directory of the user who starts the server). Add the following line to the `.x11start` file at the beginning of the section where clients are started:

```
xset +fp /usr/lib/raster/sox11
```

Note the following things:

- The "ulr ... " links are created to make font aliasing possible. Users are not encouraged to refer to them directly.
- It is not strictly necessary to modify the `.x11start` file. You just need to execute the xset ... command on the server before running the sox11 application, in order to tell the server where to find the fonts.

Mediainit Situation

At release 7.0 mediainit(1M) is no longer a setuid root command. This may pose some problems for generic users hoping to initialize floppy disks. The workaround for this problem is to execute the following commands as root.

```
chown root /usr/bin/mediainit
chmod 4555 /usr/bin/mediainit
```

Dynamic Swap

You cannot reserve space to be used for dynamic swap. The mechanisms that apparently allow you to do this (the `min` parameter to `swapon`; the corresponding field in `/etc/checklist`; and the corresponding field in the **Add Dynamic Swap** screen in SAM) have been disabled in the case of dynamic swap. You will not get an error message if you use any of these mechanisms to reserve dynamic swap space; they simply will not take effect.

The above applies to dynamic swap only. Static swap works as it always did.

If dynamic swap is enabled, HP-UX allocates space from the specified file system in increments whose size is determined by the `dmmax` and `dmmin` parameters.

Symbolic Links on a Cluster Server

During the conversion process of a standalone system to a cluster server, SAM creates a symbolic link from `/hpux+/<server_name` to `hpux+/localroot`. You should *not* remove this link, because autoboot needs it.

Auditing With RFA in a Cluster

When you run RFA (Remote File Access) in a cluster, auditing is automatically turned off. This is to prevent the LAN from becoming overloaded to the point where some of the clients could "hang".

Real-Time Priority in Clusters

Do not run any processes at real-time priority in a cluster. If you do, you may cause one or more of the clients to panic. (Real-time priority is any priority less than 128.)

Starbase Programs and Memory Resources

Starbase programs, under certain conditions, do not release memory resources, causing your system to gradually run out of memory. This situation occurs because in some cases the programs do not de-allocate system semaphores and shared memory at the time the graphics device is closed. To avoid this problem, periodically use the *ipcs*(1) and *ipcrm*(1) commands to verify and if necessary, free up memory resources. See the *HP-UX Reference* manual.

The Starbase CGM Driver

If you develop Starbase programs or applications that run on Starbase, the Starbase CGM (Computer Graphics Metafile) driver has a problem with the Starbase `move2d` and `draw2d` routines. After a `move2d` call, the next `draw2d` call is lost. You have two workarounds for this problem:

1. After every `move2d` call, insert a `draw2d` call that draws to the same point you just moved to. This NOP `draw2d` will be thrown away and subsequent `draw2d` commands will be executed correctly.
2. Use the Starbase routine `polyline` to implement line drawing instead of the `move2d` and `draw2d` calls.

Updating the /usr/lib/tztab File

When you update to 7.0, you receive a new `tztab` file in the `/etc/newconfig` directory. Incorporate any changes you made in your old `usr/lib/tztab` file into this new `tztab` file. Then, replace your old `/usr/lib/tztab` file with the new `tztab` file.

The `/usr/lib/tztab` file specifies when daylight savings time should begin and end on a per/year basis (since the authorities change their minds from time to time as to when the changes should occur). The new `tztab` file shipped with 7.0 extends the times for the European time zones through the year 2038 (previous versions end in 1989). The new file is also reorganized to improve performance and contains a few changes required for POSIX.1 compliance.

Using SAM to Configure NS Services

On a system that has no `net` directory, use the following menu items to configure NS Services, starting from the Main Menu of SAM:

1. `Networks/Communications->`
2. `NS (Network Services) Configuration->`
3. `Add Connectivity to a Remote System`

If you try to add a remote system such as `abcdef`, you get the following message:

```
SAM System Error: No such file or directory (2).
Please call your Hewlett Packard representative.
```

When you press the space bar, the form remains as it was with the name `abcdef` as you entered it in the `Name of remote system` field. The `/net` directory is created, but its mode is unpredictable. The unpredictable mode can prevent non-root users from using the *netunam*(1) command with network special files created in `/net` In addition, the network special file for `abcdef` exists under `/net`, but it is empty. Consequently, it will not work for a *netunam*(1) command by root or non-root users.

When Can This Defect Occur?

System	Can appear on both 300s and 800s.
Condition	Occurs only when the `/net` does not exist.
Frequency	Occurs only once. After you create `/net`, the defect does not recur.

Workaround

In SAM, while you are on the same form, press `Perform Task` a second time once the error message goes away. The network special file is created properly. To allow non-root users to access the network special files that are created under `/net` exit SAM (or use the `Shell` softkey), and run the following command:

```
chmod 755 /net
```

As an alternative, you can create `/net` as the root user prior to using SAM and everything will work correctly.

```
mkdir /net
```

```
chmod 755 /net
```

Change in the xmfonts.c Program

You must edit a change in the `xmfonts.c` program because of a change in the structure of the X11 font directories. Proceed as follows:

1. Copy the file named `xmfonts.c` from `/usr/contrib/Xm` to your home directory.
2. Edit the file, looking for the line:

   ```
   #define FONT_DIR_NAME "/usr/lib/X11/fonts"
   ```

   Change the line to read:

   ```
   #define FONT_DIR_NAME "/usr/lib/X11/fonts/misc"
   ```

3. Compile the edited program in accordance with the directions in Chapter 1 of the *HP/OSF Motif Programmer's Guide.*

Errata

Correction to setuid(2) man-page

On the man-page of *setuid*(2), the following description for `setgid` is incorrect:

> If the **euid** is not zero, but the **rgid** or **sgid** is equal to **gid**, and the calling process is a member of a group that has PRIV_SETRUGID privilege (see *privgrp*(4)), **setgid** sets the **egid** to **gid**; the **rgid** and **sgid** remain unchanged.
>
> If the **euid** is not zero, but the **gid** is equal to the **egid**, **setgid** sets the **rgid** to **gid**; the **egid** and **sgid** remain unchanged.

The corrected version of this section is:

> If the **euid** is not zero, but the argument **gid** is equal to the **rgid** or the **sgid**, **setgid** sets the **egid** to **gid**; the **rgid** and **sgid** remain unchanged.
>
> If the **euid** is not zero, but the argument **gid** is equal to the **egid**, and the calling process is a member of a group that has the the PRIV_SETRUGID privilege (see *privgrp*(4)), **setgid** sets the **rgid** to **gid**; the **egid** and **sgid** remain unchanged.

Correction to signal(5) man-page

In the *signal*(5) man-page, in the DESCRIPTION section under H for `SIG_DFL`, the following paragraph is incorrect:

> When a process whose parent is the initialization process (see *init*(1M)) stops as the result of receiving the SIGTSTP, SIGTTIN, or SIGTTOU signal, the process terminates because the SIGKILL signal is sent to the stopped process.

Here is the corrected version:

> When a process that is in an orphaned process group (see *glossary*(9)) receives the SIGTSTP, SIGTTIN, or SIGTTOU signal, the process is not stopped, because a process in an orphaned process group is not allowed to stop. Instead a SIGHUP signal is sent to the process. The SIGTSTP, SIGTTIN, or SIGTTOU is discarded.

X11 Manuals

The *Starbase Programming with X11* manual (98592-90000), which came out with the 6.5 release, was not updated for the 7.0 release. Instead, the information in this manual was integrated into the other 7.0 manuals, including the *Starbase Device Driver's Library* manual and *Starbase Graphics Techniques.* If you find any differences between the information in *Starbase Programming with X11* and the 7.0 release or newer manuals, assume the newest version is the most correct.

Incomplete HP/OSF Motif Man Pages

The following man pages are incomplete when displayed on-line using the `man` command. Refer to the *HP/OSF Motif Programmer's Reference* manual to get correct and complete information.

Application	Composite
Contstraint	Core
Object	OverrideShe
RectObj	Shell
TopLevelShe	TransientSh
VendorShell	WMShell
XmBulletinB	XmArrowButton (XmArrowButA)
XmCommand	XmArrowButtonGadget (XmArrowButB)
XmDialogShe	XmCascadeButton (XmCascadeBA)
XmDrawingAr	XmCascadeButtonGadget (XmCascadeBB)
XmDrawnButt	XmFileSelectionBox (XmFileSeleA)
XmForm	XmFrame
XmGadget	XmInstallIm

XmLabel	XmLabelGadg
XmList	XmMainWindow (XmMainWindA)
XmManager	XmMenuShell
XmPanedWind	XmMessageBox (XmMessageBA)
XmPrimitive	XmPushButton (XmPushButtA)
XmRowColumn	XmPushButtonGadget (XmPushButtB)
XmScale	XmScrollBar (XmScrollBaA)
XmText	XmScrolledWindow (XmScrolledA)
XmUninstall	XmSelectionBox (XmSelectioA)
XmUpdateDis	XmSeparator (XmSeparatoA)
XmSeparatorGadget (XmSeparatoB)	XmToggleButton (XmToggleBuA)
XmToggleButtonGadget (XmToggleBuB)	

Error Message Reported from catman

Ignore the following message if *catman*(1M) reports:

```
stdin: not in compressed format
```

This message is caused by non-compressed format files.

Fileset Sizes and Dependencies for 7.0

The following table shows the filesets, sizes, and dependencies for the 7.0 release of HP-UX. **Size** means number of 512-byte blocks. The three columns on the right (Name, Size, and Partition) show the dependent filesets for the fileset shown on the left (Fileset). The table continues for several pages.

			Dependencies		
Fileset	Size	Partition	Name	Size	Partition
ACCOUNTNG	1520	OS_ADMIN	KERN_SUPL	7264	OS_CMDS
ALLBASE1	10720	DATABASE	N_COMPUTE	640	NLS
ARPA	4544	NETWORKING	LANLINK	5456	NETWORKING
CE_UTIL	1344	DIAGS	AGP_DGL	3840	GRAPHICS
			AGRM	100	WINDOWS
			C_MIN	1936	PROG_LAN
			C_SUPL	2912	PROG_LANG
			FAFM_MIN	480	GRAPHICS
			KERN_SUPL	7264	OS_CMDS
			PROG_MIN	1248	PROG_LANG
			PROG_SUPL	5360	OS_CMDS
			STAR_MIN	5884	GRAPHICS
C_MIN	1936	PROG_LANG	PROG_MIN	1248	PROG_LANG
C_SUPL	2912	PROG_LANG	C_MIN	1936	PROG_LANG
			KERN_SUPL	7264	OS_CMDS
			PROG_MIN	1248	PROG_LANG
			PROG_SUPL	5360	OS_CMDS
DGL_SKEL	1392	GRAPHICS	C_MIN	1936	PROG_LANG
			KERN_SUPL	7264	OS_CMDS
			PROG_MIN	1248	PROG_LANG

DIAGNOSTC	6512	DIAGS	AGRM	100	WINDOWS
			FAFM_MIN	480	GRAPHICS
			STAR_MIN	5884	GRAPHICS
DISKLESS	624	OS_KERNEL	ARPA	4544	NETWORKING
			LANLINK	5456	NETWORKING
FAFM_MIN	480	GRAPHICS	AGRM	100	WINDOWS
			STAR_MIN	5884	GRAPHICS
FORTRAN	3072	PROG_LANG	FTN_LIBS	576	PROG_LANG
HPGKS	1568	GRAPHICS	AGRM	100	WINDOWS
			C_MIN	1936	PROG_LANG
			C_SUPL	2912	PROG_LANG
			FAFM_MIN	480	GRAPHICS
			KERN_SUPL	7264	OS_CMDS
			PROG_MIN	1248	PROG_LANG
			PROG_SUPL	5360	OS_CMDS
			STAR_MIN	5884	GRAPHICS
KERN_BLD	9472	OS_KERNEL	02_USER	7344	OS_KERNEL
			MULT_USER	8416	OS_KERNEL
NFS_RUN	6784	NETWORKING	LANLINK	5456	NETWORKING
			TEXT_READ	144	OS_DOC
NJWSERV	2000	NLIO	AGRM	100	WINDOWS
			FAFM_MIN	480	GRAPHICS
			KFA_FM	1056	NLIO
			NLIO_JPN	3008	NLIO
			NLIO_MIN	1104	NLIO
			STAR_MIN	5884	GRAPHICS
			WIN_RUN	2640	WINDOWS
NLIO_CHS	496	NLIO	NLIO_MIN	1104	NLIO

NLIO_CHT	1344	NLIO	NLIO_MIN	1104	NLIO
N1IO_JPN	3008	NLIO	NLIO_MIN	1104	NLIO
NLIO_KOR	256	NLIO	NLIO_MIN	1104	NLIO
NLX10_CHS	1952	NLIO	NLIO_CHS	496	NLIO
			NLIO_MIN	1104	NLIO
			NLX10_SUB	34	NLIO
NLX10_CHT	3872	NLIO	NLIO_CHT	1344	NLIO
			NLIO_MIN	1104	NLIO
			NLX10_SUB	34	NLIO
NLX10_JPN	1776	NLIO	NLIO_JPN	3008	NLIO
			NLIO_MIN	1104	NLIO
			NLX10_SUB	34	NLIO
NLX10_KOR	2176	NLIO	NLIO_KOR	256	NLIO
			NLIO_MIN	1104	NLIO
			NLX10_SUB	34	NLIO
NLX11_CHS	3088	NLIO	NLIO_CHS	496	NLIO
			NLIO_MIN	1104	NLIO
			NLX11_SUB	122	NLIO
NLX11_CHT	6192	NLIO	NLIO_CHT	1344	NLIO
			NLIO_MIN	1104	NLIO
			NLX11_SUB	122	NLIO
NLX11_JPN	5152	NLIO	NLIO_JPN	3008	NLIO
			NLIO_MIN	1104	NLIO
			NLX11_SUB	122	NLIO
NLX11_KOR	3344	NLIO	NLIO_KOR	256	NLIO
			NLIO_MIN	1104	NLIO
			NLX11_SUB	122	NLIO

NS_SERV	896	NETWORKING	LANLINK	5456	NETWORKING
PASCAL	1104	PROG_LANG	C_MIN	1936	PROG_LANG
			TEXT_READ	144	OS_DOC
			TEXT_SUPL	1696	OS_DOC
			KERN_SUPL	7264	OS_CMDS
			TEXT_FMT	1120	OS_DOC
			PROG_MIN	1248	PROG_LANG
			PROG_SUPL	5360	OS_CMDS
			LANG_MIN	32	PROG_LANG
			PAS_LIBS	688	PROG_LANG
PROG_SUPL	5360	OS_CMDS	KERN_SUPL	7264	OS_CMDS
SBDL_BLD	464	GRAPHICS	AGRM	100	WINDOWS
			C_MIN	1936	PROG_LANG
			C_SUPL	2912	PROG_LANG
			FAFM_MIN	480	GRAPHICS
			KERN_SUPL	7264	OS_CMDS
			PROG_MIN	1248	PROG_LANG
			PROG_SUPL	5360	OS_CMDS
			STAR_MIN	5884	GRAPHICS
			STAR_BLD	6192	GRAPHICS
SBDL_DEMO	960	GRAPHICS	AGRM	100	WINDOWS
			C_MIN	1936	PROG_LANG
			C_SUPL	2912	PROG_LANG
			FAFM_MIN	480	GRAPHICS
			KERN_SUPL	7264	OS_CMDS
			PROG_MIN	1248	PROG_LANG
			PROG_SUPL	5360	OS_CMDS
			STAR_MIN	5884	GRAPHICS
			STAR_BLD	6192	GRAPHICS
			SBDL_BLD	464	GRAPHICS

STAR_BLD	6192	GRAPHICS	AGRM	100	WINDOWS
			C_MIN	1936	PROG_LANG
			C_SUPL	2912	PROG_LANG
			FAFM_MIN	480	GRAPHICS
			KERN_SUPL	7264	OS_CMDS
			PROG_MIN	1248	PROG_LANG
			PROG_SUPL	5360	OS_CMDS
			STAR_MIN	5884	GRAPHICS
STAR_DEMO	2336	GRAPHICS	AGRM	100	WINDOWS
			C_MIN	1936	PROG_LANG
			C_SUPL	2912	PROG_LANG
			FAFM_MIN	480	GRAPHICS
			KERN_SUPL	7264	OS_CMDS
			PROG_MIN	1248	PROG_LANG
			PROG_SUPL	5360	OS_CMDS
			STAR_MIN	5884	GRAPHICS
			STAR_BLD	6192	GRAPHICS
STAR_MIN	5984	GRAPHICS	AGRM	100	WINDOWS
			FAFM_MIN	480	GRAPHICS
TEXT_READ	144	OS_DOC	TEXT_FMT	1120	OS_DOC
TEXT_SUPL	1696	OS_DOC	TEXT_FMT	1120	OS_DOC
			TEXT_READ	144	OS_DOC
UX_CORE	18800	OS_KERNEL	TEXT_FMT	1120	OS_DOC
			TEXT_READ	144	OS_DOC
			TOOL	1968	OS_CMDS

WIN_BLD	256	WINDOWS	AGRM	100	WINDOWS
			FAFM_MIN	480	GRAPHICS
			STAR_MIN	5884	GRAPHICS
			WIN_RUN	2640	WINDOWS
WIN_DEMO	816	WINDOWS	AGRM	100	WINDOWS
			C_MIN	1936	PROG_LANG
			C_SUPL	2912	PROG_LANG
			FAFM_MIN	480	GRAPHICS
			FAFM_SUPL	7264	OS_CMDS
			KERN_SUPL	7264	OS_CMDS
			PROG_MIN	1248	PROG_LANG
			PROG_SUPL	5360	OS_CMDS
			STAR_MIN	5884	GRAPHICS
			STAR_BLD	6192	GRAPHIC
			TEXT_READ	144	OS_DOC
			TEXT_SUPL	1696	OS_DOC
			TEXT_FMT	1120	OS_DOC
			WIN_RUN	2640	WINDOWS
			WIN_BLD	256	WINDOWS
WIN_MAN	640	WINDOWS	KERN_SUPL	7264	OS_CMDS
WIN_RUN	2640	WINDOWS	AGRM	100	WINDOWS
			FAFM_MIN	480	GRAPHICS
			STAR_MIN	5884	GRAPHICS
X11_RUN	8544	WINDOWS	X11_MIN	3072	WINDOWS
X11_SERV	3040	WINDOWS	AGRM	100	WINDOWS
			X11_MIN	3072	WINDOWS
X25_COM	2384	NETWORKING	LAN_MAN	640	NETWORKING
			NS_MAN	74	NETWORKING