Exemplar S-Class Software
SPP-UX V5.0FT Distribution Notice

Document No. 710-031230-015
October 1996
SPP-UX V5.0FT and optional products

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Overview

This notice describes the October 1996 Exemplar S-Class Software SPP-UX V5.0FT Release. Please refer to this document before reporting problems; your questions may be answered here.

Requirements

Hardware requirements

This Exemplar Software Distribution can be used on S-Class machines only. The machine must be previously loaded with the 5.0 Scratch Install Distribution. The release is specifically NOT upgradeable from SPP-UX 4.2 and can not be down graded from the 5.0 level.

You can install this Exemplar Software Distribution on the following hardware platforms:

- Convex Exemplar S-Class systems

A test station must be connected to the DaRT (diagnostic) bus of each hypernode of the Exemplar system through the test station's `lan1` Ethernet port.

Software requirements

This software distribution has the following software prerequisite:

- The SPP-UX operating system must be at version 5.0 of the SPP-UX Scratch Install as delivered from Hewlett Packard Convex Division manufacturing before upgrading to V5.0FTor any later release.

The prerequisite must be installed before installing this software distribution. Contact the Convex TAC if the prerequisite has not been installed on your system.

Contents

Table 1 and Table 2 list the Exemplar software products in this Exemplar Software Distribution. The version of each product and comments for the product are shown.

Table 1 lists products installed on the Exemplar test station. All products must be installed

Table 1 Exemplar test station software products (required)

Product	Version	Part Number	Disk Space Used
1-1-installsw	7.3.1	760-005715-005	56K
1-CERS	3.0	081-014315-003	8M
1-ExDiags	1.0	760-006315-000	32M
1-PDC_ENTRY	3.0	710-024015-000	27M
1-OBP	3.0	710-023815-000	52K
1-SPP-UX_ts	5.0	710-024515-000	7M

Table 2 lists the Exemplar software products in this Exemplar Software Distribution.

Table 2 Exemplar software products

Product	Version	Part Number	Disk Space Used
SPP-UX	5.0	710-024615-000	1K
C-ANSI-C	CXD-1.00.00Beta	720-005815-000	14M
C-Plus-Plus	CXD-10.23.02Beta	720-003915-003	2M
CXdb	3.9.1	710-018515-012	30M
CXpa	3.9.1	710-018415-013	8M
CXtrace	2.3.1	710-018915-003	11M
FORTRAN	CXD-1.00.00Beta	720-005615-000	18M
FORTRAN90	1.0	720-005415-000	20M
MLIB	4.0.0.1	770-004115-007	26M
HP-MPI_SPP-UX	1.1.Beta	770-006315-000	6M
NQS	2.3	770-004415-006	3M
HP-PVM_Exemplar	3.3.11.Beta	770-004015-013	10M
SPP-UX_env	5.0	710-024415-000	17M
SPP-UX_ls	1.2	710-022715-002	1M
SPP-UX_mk	5.0	710-024215-000	30M
SPP-UX_mpi	1.1.Beta	770-006215-000	5K
SPP-UX_server	5.0	710-024315-000	28M
SPP-UX_libc	5.0	710-023915-000	10M
SX	1.0	710-006415-000	50M

Underlined products are bundled with product SPP-UX

Exemplar System Software descriptions

SPP-UX - A bundle that is used to install all required SPP-UX core products.

C-ANSI-C - HP bundled C compiler and ANSI compatible compiler.

C-Plus-Plus - HP C++ compiler.

CXdb - The Convex Symbolic Debugger.

CXpa - The Convex Performance Analyzer.

CXtrace - Graphical trace tool for PVM/MPI applications.

FORTRAN - HP Fortran 77 compiler.

FORTRAN90 - HP Fortran 90 compiler.

MLIB - Mathematical libraries.

HP-MPI_SPP-UX - MPI message passing software.

NQS - Batch queue utility.

HP-PVM_Exemplar - PVM message passing software.

SPP-UX_env - Convex SPP systems software environment.

SPP-UX_libc - Libraries, include files, and compiler support.

SPP-UX_ls - Convex flexlm license server.

SPP-UX_mk - Convex SPP Operating System Microkernel.

SPP-UX_mpi - OS bundled portion of the MPI optional product.

SPP-UX_server - Convex SPP Operating System Server.

SX - System Exerciser, a generic test driver used for stress testing Exemplar S-Class SPP Systems. SX has an interactive GUI interface.

Software Installation Instructions

Your installation kit consists of the following materials:

- One Exemplar Software DAT cartridge.
- *SPP-UX V5.0FT Release Notice.*

After you install the products, on-line versions of release notices for each product listed in Table 1 will be located in /usr/share/doc.

Contact the HP/CXD TAC if your installation kit is incomplete.

This section contains instructions for installing this Exemplar Software Distribution. Installation consists of the following three phases:

1. Installing SPP-UX and Exemplar layered software.
2. Installing test station software.
3. Loading Exemplar firmware.

You must perform these steps in the order presented.

Installing SPP-UX and Exemplar layered software.

This section describes the procedures for installing the SPP-UX operating system and layered software only.

The SPP-UX V5.0 Scratch Install or greater must be installed prior to starting this installation.

NOTE: All shell paths in /etc/passwd must be updated to reflect the 10.0 file system layout. Change all occurrences of /bin/<shell> to /usr/bin/<shell> so that the reference in /etc/shells will allow network utilities (e.g. ftp) to function correctly.

This procedure installs the latest version of SPP-UX on node 0 of your Exemplar system. Insert the Exemplar Software DAT cartridge containing SPP-UX V5.0FT into the DAT drive on node 0. This is not the same DAT drive that is connected to the test station.

Before you begin, please read the "Software licenses" section on page 14. Get your flexlm license keys before you begin this installation process; you have received a hard copy with this distribution. An on-line version is available on the Convex WWW server. If you are a registered user of our Customer Web Server, you may obtain an electronic copy of your license keys from the server. This page (including registration instructions) can be reached at http://www.convex.com:90. If you do not have access to the HP net, contact the TAC for an electronic version.

Step 1 Start the `swagentd` daemon if it is not already running. Enter the following command in the Exemplar System console window to start the daemon:

```
/usr/sbin/swagentd
```

Step 2 Use the `swinstall` command to install SPP-UX from the Exemplar Software DAT cartridge. Enter the following command:

```
/usr/sbin/swinstall -x rpc_timeout=9 -x reinstall=true -x allow_downdate=true -x
allow_multiple_versions=true -x mount_all_filesystems=false -s /dev/rmt/0m SPP-UX
```

This takes approximately 20 minutes to complete.

The SPP-UX bundle has been structured to include only the following products:

SPP-UX_env

SPP-UX_ls

SPP-UX_libc

SPP-UX_mk

SPP-UX_mpi

SPP-UX_server

This was done so that only those products deemed necessary would be loaded on the customer system using the SPP-UX bundle. All other products need to be loaded individually. The installation procedure is the same as above, with the exception that individual products are called out instead of SPP-UX. Be sure to pay attention to spelling and case. You can get individual product names from the above table "Exemplar software products" section on page 4.

Make sure the tape is rewound by entering the following command:

```
mt -t /dev/rmt/0m rew
```

Step 3 Use the swinstall command to install optional products from the Exemplar Software DAT cartridge. The following command is an example, where SPP-UX has been replaced with a list of products:

```
/usr/sbin/swinstall -x rpc_timeout=9 -x reinstall=true -x allow_downdate=true -x
allow_multiple_versions=true -x mount_all_filesystems=false -s /dev/rmt/0m C-ANSI-C
C-Plus-Plus CXdb CXpa CXtrace FORTRAN FORTRAN90 MLIB HP-MPI_SPP-UX NQS HP-PVM_Exemplar
```

Step 4 See the Release Notes for each layered product, rel notes may contain information about how to set user's PATH and MANPATH variables so as to have access to the newly installed product.

Installing test station software.

This procedure installs the new software on your Exemplar test station.

Step 1 Shut down SPP-UX on all nodes. From the Exemplar system console window for node 0, enter the following command:

```
# /usr/sbin/shutdown -h now
```

Step 2 Log in to the test station as `root` and bring the test station to single-user mode with the following command:

```
# /etc/shutdown now
```

Insert the Exemplar Software DAT cartridge containing SPP-UX V5.0FT into the DAT drive on the test station. If /etc/installsw does not exist, perform the following:

```
# cd /
# tar -xw 1-1-installsw
# mv 1-1-installsw/Installsw/etc/installsw /etc/installsw
# rm -rf 1-1-installsw
```

Step 3 Using the `installsw` program, install the test station software products. Enter the following command:

```
/etc/installsw -n
```

`installsw` displays a list of products on the DAT tape. Select all of the products listed below (as shown in Table 1), and press **Enter** to install the products:

1-Cers

1-ExDiags

1-PDC_ENTRY

1-OBP

1-SPP-UX_ts

This takes approximately 20 minutes to complete.

Step 4 Verify that **/spp** is present in the **/etc/exports** file.

Step 5 Reboot the test station using the **`/etc/reboot`** command, and log in as `sppuser`.

Firmware

To load Exemplar firmware on the SPP2000 you will need to be at the OBP prompt in the console window. To upgrade OBP and PDC_ENTRY you will along with the other firmware you will first need to edit the file in /spp/scripts called dl-diags.fth on the test station. Delete the backslash and the extra space on the last two lines of this file. It should look like the following after the edit:

```
fwcp 15.99.111.99:/spp/firmware/post.fw POST
fwcp 15.99.111.99:/spp/firmware/test_controller.fw TC
fwcp 15.99.111.99:/spp/firmware/arch3000.fw ARCH3000
fwcp 15.99.111.99:/spp/firmware/cpu3000.fw CPU3000
fwcp 15.99.111.99:/spp/firmware/intra3000.fw INTRA3000
\ fwcpp 15.99.111.99:/spp/firmware/inter3000.fw INTER3000
fwcp 15.99.111.99:/spp/firmware/io3000.fw IO3000
fwcp 15.99.111.99:/spp/firmware/mem3000.fw MEM3000
fwcp 15.99.111.99:/spp/firmware/uscsi.fw USCSI
fwcp 15.99.111.99:/spp/unsupported/rdr_dumper.fw RDR_DUMPER
\ fwcp 15.99.111.99:/spp/firmware/texBoot.fw
fwcp 15.99.111.99:/spp/firmware/entry.pdc /flash@0,0
fwcp 15.99.111.99:/spp/firmware/obp.pdc OBP
```

If you do not want to upgrade OBP and PDC_ENTRY the file does not need to be modified.

Loading Exemplar firmware.

This procedure loads the new firmware from the Exemplar test station to the Exemplar system.

Step 1 From the sppuser window start the console by entering the command:

sppuser > **/spp/scripts/sppconsole -F**

Step 2 If no OBP prompt appears, issue the following command from an sppuser window:

sppuser > **do_reset**

NOTE: Be patient the do_reset will take 3-4 minutes to complete.

Step 3 If you still do not have an obp prompt type the following sequence of keys in the sppconsole window:

<control>*e c d* (that's control-e followed by "c", then "d")

<control>*e c o*

<control>*e c f*

Step 4 From the OBP prompt enter the following command to download Exemplar firmware from the test station to the node:

[0:2] ok **source**
/core@f0,f0000000/lan@0,d30000;15.99.111.99:/spp/scripts/dl-diags.fth

NOTE: After all of the firmware has been downloaded a fault will occur that can be ignored. It should look like the following:

```
Data TLB miss fault/dpage fault
Using sppux boot-mode.
[0:2] debug
```

If the you have problems with the firmware download, use the printenv command from OBP and make sure the following parameters are set correctly.

```
Parameter             Correct setting


dns-ip#               15.99.111.99      (this is set the same as the t/s)

obp-ip#               15.99.111.150

ts-ip#                15.99.111.99

system-mac-address    0:a0:d9:0:ad:b4    (the ad:b4 portion is the
                                          least significant 2 bytes
                                          of your enrb serial number
                                          in hexadecimal)
```

Make any necessary corrections and retry the source command. If you still cannot upgrade the firmware, contact the HP/CXD TAC.

Step 5 At the debug prompt enter a reset:

[0:2] debug **reset**

Step 6 Once the obp prompt reappears, use the following command to verify the firmware upgrade:

[0:2] ok **lifls /flash@1,0**

```
volume FLASH1 data size 8064 directory size 8 96/10/09 21:58:42
filename    type      start      size   implement   created/modified
====================================================================
PDCBOOT     -12800       64        320          0  96/10/09 21:58:43
POST        -12802      384        512          0  96/10/15 00:45:07
CPU3000     -12802      896        496          0  96/10/15 00:45:16
RDR_DUMPER  -12802     1392         16          0  96/10/15 00:45:34
USCSI           -2     1408         96          0  96/10/15 00:45:31
PAD             -2     1504        416          0  96/10/09 21:58:48
OBP             -2     1920       3072          0  96/10/15 18:44:01
TC          -12802     4992        512          0  96/10/15 00:45:11
MEM3000     -12802     5504        512          0  96/10/15 18:41:54
ARCH3000    -12802     6016        384          0  96/10/15 00:45:13
INTRA3000   -12802     6400        256          0  96/10/15 00:45:21
INTER3000   -12802     6656        512          0  96/10/09 21:58:54
IO3000      -12802     7168        896          0  96/10/15 00:45:26
```

NOTE: The time on the right will not coincide with the actual time. It is Coordinated Universal Time (UTC)time. However you should be able to see that the POST, CPU3000, RDR_DUMPER, USCSI, OBP, TC, MEM3000, ARCH3000, INTRA3000, and IO3000 firmware was updated at about the same time. PDCBOOT, INTER3000, and PAD are NOT updated with this release.

Device Mappings

On the 5.0 release, mapping of devices in OBP is not yet supported. The Operating System will map the devices for you. For tape devices it takes the scsi id of the device and uses that as it's logical label. If you have a DAT drive that is at scsi id 0x0 then it would be DAT unit 0. Below is the message you see when booting:

```
[+0 72000001 002aac14 0:2] Using target id as logical label
[+0 72000001 002aac9c 0:2] scsi tape: 0:0:0:0 attached and mapped as DAT unit 0
```

Keep this in mind if you have more than one tape device!

For ethernet network devices, the OS will map the first ethernet interface it probes as le0, the second that it probes as le1, and so on.

For fddi network devices the OS will map the first fddi interface it probes as fddi0,i the second that it probes as fddi1, and so on.

Booting the System

The following procedure will show you how to set your boot parameters in OBP and boot the Exemplar System. In the I/O layout section following, there is some information that will be useful in helping you determine what your parameters should be set to.

Step 1 From the OBP prompt check your boot-device with the following command:

[0:0] ok **printenv boot-device**

Parameter Name: boot-device

Current Value:

/pci@fe,10000/qlisp@0,0/sd@2,0:a

Default Value:

/pci@fe,10000/qlisp@0,0/sd@2,0:a

Step 2 If the boot-device paramter is not correct, use the setenv command to correct it, otherwise proceed to step 3..

[0:0] ok **setenv boot-device /pci@fe,210000/qlisp@1000,0/sd@2,0:**

NOTE: This would change the boot-device to partition a, disk at scsi id 0x2, epic 4, slot 18

Step 3 Verify that the controller for your boot-device is fcode enabled.

```
[0:0] ok printenv pci[4]-fcode-enable
Parameter Name:  pci[4]-fcode-enable
Current Value:
2
Default Value:
```

NOTE: The example above is examining the settings for epic 4. In this case slot 18 would be fcode enabled.

Step 4 If the fcode enable is not correct, use the setenv command to correct it. Otherwise, proceed to Step 5.

[0:0] ok **setenv pci[0]-fcode-enable 0**

NOTE: The example above would fcode enable the controller on epic 0 slot 0. The accepted values for each epic (or pci bus) are 0,1, and 2 for the 3 slots on each epic. You can enable multiple slots on the epic by putting a comma in between the slot numbers.

[0:0] ok **setenv pci[0]-fcode-enable 0,1,2**

To clear the parameter use the following command:

[0:0] ok **set-default pci[0]-fcode-enable**

Step 5 Check the boot-directory parameter and make sure that it is set to/stand/spp3. If it is not, correct it with the set-default command.

[0:0] ok **printenv boot-directory**

```
Parameter Name:  boot-directory
Current Value:
/stand/spp3/old
Default Value:
/stand/spp3
```

[0:0] ok **set-default boot-directory**

Step 6 Once your parameters are set, boot the Exemplar System.

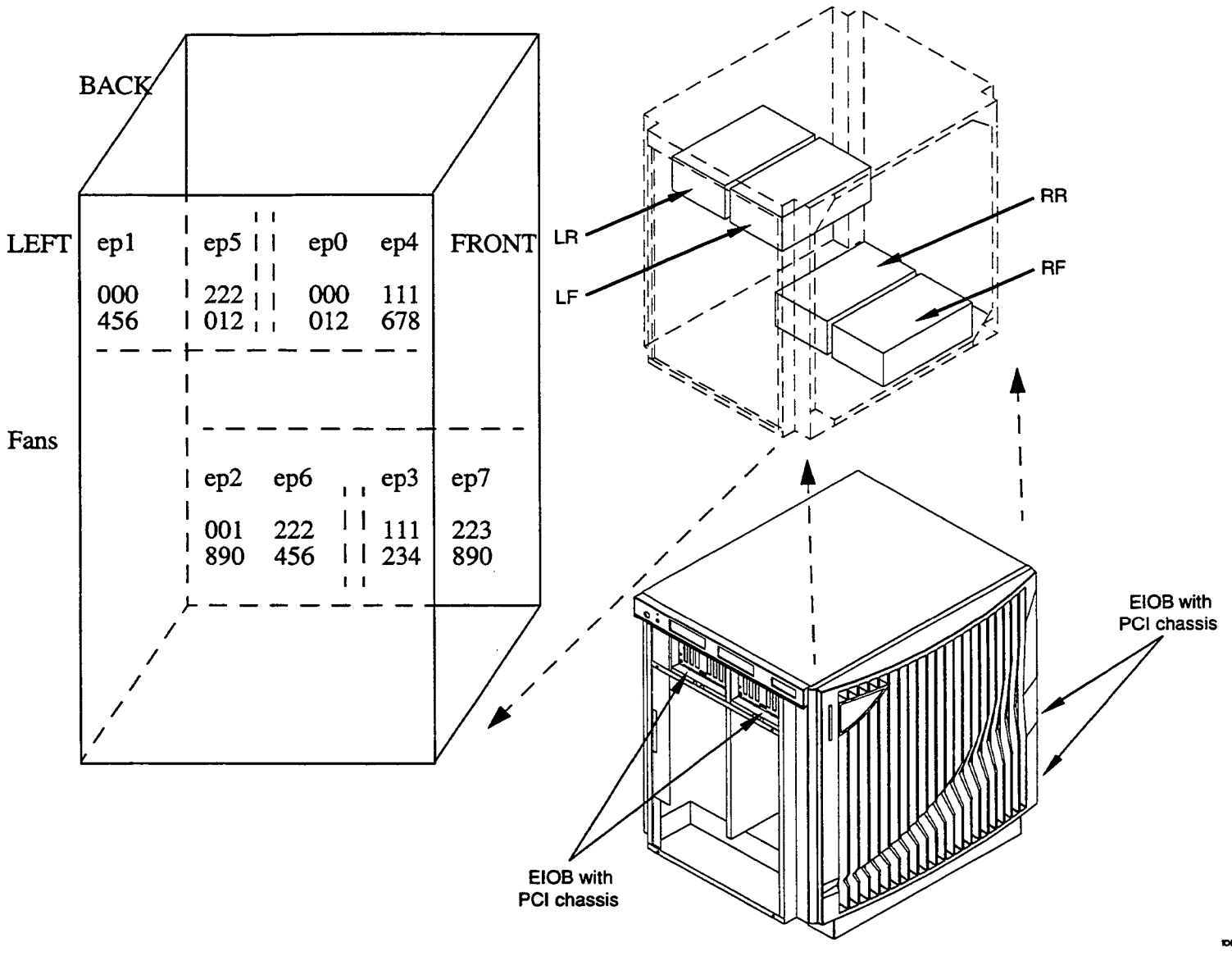
[0:0] ok **boot**

```
Device          :/pci@fe,210000/qlisp@1000,0/sd@2,0:a
Directory       :/stand/spp3
File            :mach
Arguments       :No arguments.

QLogic ISP1040 firmware version 2.10 loaded and executing.
Loading         : /stand/spp3/tunables . 3824 bytes loaded.
Loading         : /stand/spp3/server ..............
                      .
                      .
                      .
```

I/O Layout

NOTE: epic numbering used here is based upon pac numbering (i.e. ep1 is on pac1). It is also the csr address ordering.



Csr addresses/OBP names to OS/physical locations

```
ep0     /pci@fe,10000
ep1     /pci@fe,90000
ep2     /pci@fe,110000
ep3     /pci@fe,190000
ep4     /pci@fe,210000
ep5     /pci@fe,290000
ep6     /pci@fe,310000
ep7     /pci@fe,390000
```

TPCI card mappings

- epic was designed for 4 pci devices per epic/pci bus hence the 4 slot numbers per epic even though in this generation of machine there is only physically room for 3.
- single function devices show up on the pci bus configuration space every 0x800 bytes. Since there are only 3 per pci bus in our system they show up as 0x0, 0x800, 0x1000. e.g.

```
epic 4, first pci slot
   OR
   /pci@fe,210000/qlisp0,0
   OR
   (4:16)

epic 4, second pci slot
   OR
   /pci@fe,210000/qlisp800,0
   OR
   (4:17)

epic 4, third pci slot
   OR
   /pci@fe,210000/qlisp@1000,0
   OR
   (4:18)

   There is no fourth slot
```

- In general, pci cards will have a name which is constructed from "pci" and the vendor and device id's assigned to them by the PCI consortium. Our devices are:

```
DEC FDDI    : vendor=0x1011, device=0xf:      /pci@fe,210000/pci1011,f@0,0
DEC ETHER   : vendor=0x1011, device=0x9:      /pci@fe,210000/pci1011,9@0,0
QLOGIC SCSI: vendor=0x1077  device=0x1020:   /pci@fe,210000/pci1077,1020@0,0
```

Running processes in a GSM subcomplex

Once you have loaded a GSM subcomplex configuration file, inform users to run all of their processes in this subcomplex. Users can automatically run all their processes in the `user` subcomplex by adding the following line at the bottom of their .cshrc or .profile file:

```
exec mpa -sc user
```

Alternatively, users can create a `user` subcomplex shell by entering one of the following commands from a command line:

```
exec mpa -sc user /usr/bin/sh
```

```
exec mpa -sc user /usr/bin/csh
```

See the `mpa(1)` and `scm(1M)` man pages for more information about using subcomplexes.

Software licenses

The licensing information you need is available to you in two places:

- A hardcopy paper is bundled with your distribution tape.
- An on-line version is available on the CXD WWW server. If you are a registered user of our Customer Web Server, you may obtain an electronic copy of your license keys from the server. This page (including registration instructions) can be reached at **http://www.convex.com:90**. If you do not have access to the HP net, contact the TAC for an electronic version.

Activating software licensing

To activate the license for an Exemplar software product, edit the file /usr/local/flexlm/licenses/convex.dat. Add the license key to this file on a new line, after the SERVER statement and the DAEMON statement. Each license key consists of two lines with a continuation symbol (\) at the end of the first line. The license key is similar to:

```
FEATURE sppux convex_ls 99.990 1-jan-2099 0 1234567890ABCDEF123\
VENDOR_STRING=UIDS=0;PART=710-008990-005 HOSTID=1000b ck=82
```

Configuring the FLEXlm license manager

SPP-UX V5.0FT includes the FLEXlm license manager `SPP-UX_ls`. To configure the license manager for your Exemplar system, perform the following steps:

Step 1 Place the license keys furnished for your site into /usr/local/flexlm/licenses/convex.dat.

Step 2 Start the license daemon (`/usr/local/flexlm/lmgrd`). Enter:

```
/usr/local/flexlm/rc.convex.flex
```

Informing users about software licensing

Since licensing is a new feature for HP/CXD software products, you should inform your users what to do if they are denied access to a licensed product. The following paragraph is an example of a message you can send to your users.

"This Hewlett Packard software product is controlled by a software license manager. If the license server does not allow you to use a licensed software product, or if the license server is not working, the operating system prints an error message with the following format:

"`Unable to obtain license for` *product*: *reason*

"When you see a message with this format, copy the entire message text and send it to your system administrator."

Getting assistance

If you have questions about this distribution, contact the HP/CXD Technical Assistance Center (TAC). To contact the TAC, use one of the following phone numbers:

- Within the continental U.S., call 1(800)952-0379.
- From Canada, call 1 (800) 345-2384

- All other locations, contact the nearest HP/CXD office.

The TAC recommends using the `contact` utility to report a hardware, software, or documentation problem. Refer to the contact(1) man page for complete details.