Installing SoftBench

Manufacturing Part Number: B6454-97011
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Printing History

Table 1

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September 1999	B6454-93002 Revised for SoftBench 6.50. Cfront-based C++ compiler is no longer provided.	Edition 1
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This printing date and part number indicate the current edition. The printing date changes when a new edition is printed.

Problem Reporting

If you have any problems with the software or documentation, please contact your local Hewlett-Packard Sales Office or Customer Service Center.

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1 Preparing for Your Installation

This manual describes how to install and configure SoftBench 6.X products. You need superuser (root) access for most of the tasks in this manual.

Checklists are provided to help you perform your installation tasks. Checklist A (Table 1-1) helps you prepare for your installation and helps you choose the appropriate checklist for the remainder of your installation tasks.

Installation Checklist

Make a copy of Checklist A so you do not need to turn back as you follow the instructions in this chapter. Check off each step as you complete it.

Table 1-1 Checklist A

New Installation of SoftBench	Refer To
❑ 1. Choose which products to install.	page 11
2. Choose software servers (for the products you are installing): ❑ SoftBench execution host ❑ SoftBench CM server	page 13
❑ 3. Check your system prerequisites.	page 15
❑ 4. Enter CD installation codeword (HP-UX Application CD only).	page 17
❑ 5. Choose your installation checklist.	page 18

Choose Which Products to Install

If you do not have SoftBench 6.X installed, you need to choose which type of SoftBench to install. SoftBench is available for C and C++. (Limited support is also provided for FORTRAN).

In most cases, you should not choose more than one type of SoftBench. For example, if some users on the system want to use C and others want to use C++ and others want to use both, you can install C++ SoftBench on the system. You can also customize each user's configuration to enable only the programming languages that are needed (to reduce the number of licenses you need to buy).

Note to SoftBench 5.X Users

If you have SoftBench 5.X installed on your system, here are some key changes in SoftBench 6.X that may affect your system:

- COBOL SoftBench is no longer supported. If you install SoftBench 6.X, **COBOL SoftBench will be removed** from your system.
- SoftBench CM is now bundled with SoftBench. You can still use SoftBench CM PC-Client, but you need at least one copy of SoftBench to get the SoftBench CM server software.
- SoftBench CodeAdvisor is bundled with C++ SoftBench. It is not a separate product.
- SoftBench SDK is bundled with C++ SoftBench. It is not a separate product.
- SoftBench Program Editor is no longer supported.

  The primary SoftBench editor is now an integration of the Xemacs editor.

  SoftBench Program Editor is no longer supported, but it is delivered under the `/opt/softbench/contrib` directory. It does not support the new project features of SoftBench. More information can be found in `/opt/softbench/contrib/doc/README.softeditsrv`.

- SoftRCS is no longer provided.

  The RCS integration with SoftBench is no longer provided. SoftBench now provides SoftBench CM instead. You can also use a third party Configuration Management integration, or you can create your own RCS integration using SoftBench SDK.

- SoftBench 6.X does not read `softinit` files.

  If you have customized your local or system `softinit` file to add tools to your SoftBench environment, refer to the *Customizing SoftBench* section in SoftBench online help for information about how to add tools to SoftBench 6.X.

Changes in SoftBench 6.30

SoftBench 6.30 included the following additional changes:

- Network licensing is no longer required or provided.
- The *SoftBench Solutions* CD is no longer provided.

Changes in SoftBench 6.50

SoftBench 6.50 included the following additional changes:

- The cfront-based C++ compiler is no longer provided.

Choose Your Software Servers

This section is intended to help you choose where to install SoftBench and where to set up a SoftBench CM server.

SoftBench CM requires a CM server system to manage its archive files. If you have more than one system in a network, you can choose to have your SoftBench CM server reside on a different system than where SoftBench is installed.

Choosing Your SoftBench Execution Host

A system on which SoftBench is installed and executes is called a SoftBench execution host. It is recommended that you install SoftBench on a standalone workstation with a local display.

Make a list of the systems you have chosen as SoftBench execution hosts. Check "SoftBench Execution Host" and continue with Checklist A.

You may later customize SoftBench to use a network-distributed configuration. This is discussed in Chapter 6, “Setting Up Network-Distributed Operation,” on page 45.

Choosing Your SoftBench CM Server

A SoftBench CM server system will contain the SoftBench CM archive files. When choosing a server system, consider the following:

- Keep the number of SoftBench CM servers to a minimum. Each server requires additional system administration in maintaining the SoftBench CM archives. Generally, all archive files for a project should be stored on the same server system. It is recommended that each project's archive files be stored on no more than three server systems; a single server is preferred.
- A fast system that is lightly loaded provides better performance than a heavily loaded system. See “Check Your System Prerequisites” on page 15 for more information.
- The server can be located anywhere on the network. However, network performance usually dictates that archive files be stored close to where they are most often accessed.

Make a list of the systems you have chosen to be SoftBench CM servers.

You may later customize SoftBench CM servers to limit network access by clients. This is described in “Controlling Access and Security in SoftBench” on page 56.

Check Your System Prerequisites

Before installing SoftBench products, you need to check that your system(s) meet all of the necessary prerequisites. Refer to Appendix A, “Prerequisite Details,” on page 59 for further information.

Check the *SoftBench Release Notes* document for any requirements that are not listed in this manual.

Computer: HP 9000 Workstation or Server, HP-PA 1.1 or higher

Operating System: HP-UX 10.20 or 11.0

Required Patches: Refer to the *SoftBench Release Notes* or to the URL:

`http://devresource.hp.com/softbench/`

for the latest list of required patches.

Network: LAN/9000, ARPA, NFS

RAM: 128 Mb or more

Swap Space: 256 Mb or more

Display: High-resolution (1024×768, or greater), bit-mapped. Monochrome is not supported.

X Server: X11R6 server

X Libraries: Motif 1.2.6 or later

Window Manager: Common Desktop Environment (CDE), or VUE Window Manager (HP-UX 10.20 only)

Other: SoftBench is not supported on a diskless cluster.

SoftBench requires a file system that allows long filenames.

Disk Space: The following disk space values are for the SoftBench products *with* compilers.

Table 1-2 Disk Space Requirements for SoftBench

SoftBench Product	Disk Space Required	
	On HP-UX 10.20	On HP-UX 11.0
C SoftBench	286 Mbytes	210 Mbytes
C++ SoftBench	322 Mbytes	261 Mbytes
SoftBench CM server only [a]	60 MBytes (plus space for archive files)	

a. SoftBench CM is included with SoftBench. The SoftBench CM server may be installed separately. The SoftBench CM server does not require compilers.

Table 1-3 Disk Space Requirements for Compilers

Compiler Product	Disk Space Required	
	On HP-UX 10.20	On HP-UX 11.0
C Compiler (includes HP C/ANSI C Developer's Bundle)	152 Mbytes	68 Mbytes
HP aC++ Compiler	77 Mbytes	95 Mbytes

Enter CD Installation Codeword

This step is needed only if you are installing SoftBench from an *HP-UX Application* CD. Skip this step if you are installing from a software depot.

SoftBench requires a codeword to allow you to install SoftBench from the CD. The codeword is shipped with your *HP-UX Application* CD on a certificate entitled *Codeword For Updating Software*.

To use the codeword, edit the file `/etc/update.lib/codeword` on each system where you plan to install SoftBench and enter the codeword into that file. Make sure that you have:

- copied the codeword correctly
- not entered any extra lines, spaces, or other characters
- not mistaken any `1` (one) characters for any `l` (el) characters
- not mistaken any `0` (zero) characters for any `O` (uppercase oh) characters

If you are installing SoftBench on more than one system, you can avoid entering the codeword on every system by using a netdist server or a software depot. Refer to the *swcopy(1M)* reference page for information on creating a software depot.

Choose Your Installation Checklist

Use Table 1-4 to choose the installation checklist you need to complete for your configuration.

Make a copy of the checklist you choose, and check off each task in the checklist as you complete it.

Table 1-4 Choosing Your Installation Checklist for SoftBench

For This Configuration	Use This Checklist
New Installation of SoftBench. You are installing SoftBench on one or more systems where it has not been installed previously.	B
Upgrading from SoftBench 5.X or later. You have SoftBench 5.X installed on a system running HP-UX 10.20 or later, and you want to upgrade to SoftBench 6.X.	C
Installing SoftBench CM server without SoftBench. You are installing the SoftBench CM server on a system where SoftBench will not be installed.	D

Installation Checklists

Use Table 1-4 to choose a checklist. Make a copy of the checklist you choose, and check off each task as you complete it.

Table 1-5 Checklist B

New Installation of SoftBench	Refer To
❑ 1. Install SoftBench	page 21
❑ 2. Install Required Patches	page 26
❑ 3. Configure SoftBench	page 29
❑ 4. Verify the Installation	page 33

Table 1-6 Checklist C

Upgrading SoftBench	Refer To
❑ 1. Install SoftBench	page 21
❑ 2. Install Required Patches	page 26
❑ 3. Verify the Installation	page 33

Table 1-7 Checklist D

Installing SoftBench CM Server Without SoftBench	Refer To
❑ 1. Install SoftBench CM Server	page 21
❑ 2. Install Required Patches	page 26
❑ 3. Configure SoftBench CM Server	page 37
❑ 4. Verify SoftBench CM Server	page 41

2 Installing SoftBench

The instructions that follow describe the steps to install SoftBench from a CD ROM onto a single system.

If you want to install SoftBench on more than one system, you may want to use a software depot. Refer to *swcopy(1M)* for information on setting up a software depot.

For an overview of Software Distributor commands, see *sd(5)*.

Warning

If you are using COBOL SoftBench 5.X and you install SoftBench 6.X, COBOL SoftBench will be **removed** from your system.

Loading the SoftBench Software

1. Become the root user on the target (destination) system.
2. If you are installing SoftBench from an *HP-UX Application* CD, a codeword is required to copy the software from the CD. This is *not* required if you are installing from a software depot.

   Refer to “Enter CD Installation Codeword” on page 17 for instructions.
3. Mount the SoftBench CD. You can mount the disk with *sam(1M)* or *mount(1M)*.
4. Execute `swinstall`.
5. Depending on the version of swinstall you are using, you may need to select a target system before you can view and mark the software bundles to be installed.

   If the Target Selection window appears, use the following steps to select a target:

   a. In the Target Selection window, select the line with your hostname.

   b. Use the menu "`Actions:Mark for Install`" to mark the target.

   c. Use the menu "`Actions:Show Software for Selection...`" to bring up the Software Selections window.
6. From the Software Selection window in `swinstall`, select a bundle you want to install, and then use the menu "`Actions:Mark For Install`" to mark the bundle. Table 2-1 lists the names of product bundles you may choose.

Table 2-1 SD Bundle Names of SoftBench Products

Product to Be Installed	HP 9000 Workstation SD Bundle	HP 9000 Server SD Bundle
C SoftBench	B6449EB	B6445EB
Japanese C SoftBench	B6450EB	B6446EB

Table 2-1 SD Bundle Names of SoftBench Products

Product to Be Installed	HP 9000 Workstation SD Bundle	HP 9000 Server SD Bundle
C++ SoftBench	B6451EB	B6447EB
Japanese C++ SoftBench	B6452EB	B6448EB
SoftBench CM server only	To install the SoftBench CM server without SoftBench, use the instructions in "Selecting the SoftBench CM Server Without SoftBench" on page 24.	

7. Once you have marked the bundle you wish to install, proceed with the analysis phase of swinstall. Choose the menu "`Actions:Install`" or "`Actions:Run This Job`", depending on which menu is available in the version of swinstall you are using. (You should see one or the other menu — but not both.)

   For more detailed instructions, refer to the online help in swinstall.

8. Click **Logfile** to check the logfile after the analysis phase is complete, Correct any errors before clicking **OK** to continue with the installation. Check the logfile again after the installation is complete.

   If errors occur, refer to "Correcting Installation Problems" on page 25 for more information.

9. Exit swinstall.

Selecting the SoftBench CM Server Without SoftBench

If Your System Has a Previous Version of SoftBench

If your system has a previous version of SoftBench, *do not install the SoftBench CM server without SoftBench*. If you have SoftBench 5.X installed on your system, you can do one of the following:

- Install SoftBench 6.X rather than just the SoftBench CM server software. SoftBench includes the SoftBench CM server software.

or

- Use `swremove` to remove SoftBench 5.X before installing the SoftBench CM server without SoftBench.

Selecting the SoftBench CM Server

To select the SoftBench CM server software without SoftBench:

- Open the C SoftBench bundle listed in Table 2-1. You can open the bundle by double-clicking on the bundle or by selecting the bundle and using the "`Actions:Open Item`" menu. *Do not mark the bundle for install.*
- Select the "`SB-CM`" product and use the "`Actions:Mark For Install`" menu to mark the fileset for install. You may need to use the scroll bar to see this product in the list.

You have marked the SoftBench CM server for installation. Continue with the swinstall process to load the software. For more detailed instructions, return to the section “Loading the SoftBench Software” on page 22 and proceed with the step where the bundles have been marked.

Correcting Installation Problems

Problems with NIS

SoftBench requires that an entry be added to the `/etc/services` file. This is normally done for you when SoftBench is installed.

If your `/etc/services` file is managed via the Network Information Service (NIS), an error message will appear in the install log file. If this is the case, you need to manually add the following SoftBench entries to the services file on the NIS master system:

```
spc          6111/tcp          # Sub-process control
softcm         6110/tcp          # SoftBench CM
```

If you are installing only the SoftBench CM server on a system with NIS, you need to create the following entry in the NIS master map for `/etc/services`:

```
softcm         6110/tcp          # SoftBench CM
```

Other SoftBench Installation Problems

The SoftBench installation performs a number of automated customizations for you. These include:

- The entry “spc” is added to the `/etc/inetd.conf` file. Entries for `spc` and `mserve` are added to the `/var/adm/inetd.sec` file. Refer to “Controlling Access and Security in SoftBench” on page 56 for information on customizing the `inetd.sec` file.
- An entry for “softcm” is added to the `/etc/inittab` file. This entry is described in “Adding a SoftBench CM entry to /etc/inittab” on page 39.

If one of the installation logfiles indicates a problem during installation, you may need to perform one or more of these steps manually.

Install Required Patches

Some SoftBench products require patches to function correctly. You need to install any required patches before you can use the product.

Patch information is available in the following locations:

- The latest patch information is available from the World Wide Web. Visit the URL:

  `http://devresource.hp.com/softbench`

  Check the website to see if new patches are required. You can download new patches from the website.
- The SoftBench Release Notes contains a list of required patches.
- You can also get patch information from the file:

  `/opt/softbench/README`

  which is installed on your system when you install SoftBench or the SoftBench CM server. This information may be older than the other sources in this list.

Checking the Patches

To check the patches on your system, run the command:

`/opt/softbench/sbin/checkpatch`

This script verifies that patches required by SoftBench 6.X are present on the system. If any patches are missing, an ERROR is reported.

After Installing SoftBench

Once the products have loaded successfully, you can unmount the CD.

Refer to Chapter 3, “Configuring SoftBench,” on page 29 for instructions on configuring the SoftBench products you have installed.

3 Configuring SoftBench

This chapter describes configuration tasks required to run SoftBench.

You may choose whether to perform the SoftBench configuration tasks for each user or to inform the users of the configuration steps that they each need to do before they run SoftBench.

Required Configuration Tasks for SoftBench

Setting the PATH Environment Variable

The directory /opt/softbench/bin *must* appear *before* the required /bin and /usr/bin and /usr/ccs/bin directory paths in each SoftBench user's PATH.

/usr/bin/X11 must also appear somewhere in the PATH.

Table 3-1 SD Bundle Names of SoftBench Products

Shell	Examples for Setting PATH

sh, ksh	Edit your $HOME/.profile, and locate the line that looks like this:
	`PATH=/bin:/usr/bin:$PATH:.`
	Add the following SoftBench-related paths to the *beginning* of the list:
	`/opt/softbench/bin:/usr/bin/X11:`
	Your modified PATH would look something like:
	`PATH=/opt/softbench/bin:/usr/bin/X11:/bin:/usr/bin:$PATH:.`

csh	Edit your $HOME/.login, and locate the line that looks like this:
	`set path=(/bin /usr/bin . )`
	Add the following SoftBench-related directory paths to the *beginning* of the path:
	`/opt/softbench/bin /usr/bin/X11`
	Your modified PATH would look something like:
	`set path=(/opt/softbench/bin /usr/bin/X11 /bin /usr/bin . )`

Common Desktop Environment (CDE) does not automatically read your `.profile` or `.login` file (unless you have configured it to do so). Refer to `$HOME/.dtprofile` for more information.

You need to log out and log in before changes to the `.profile` or `.login` file become effective.

For the Latest Configuration Information

The *SoftBench Release Notes* contain information on other configuration steps that may be required for SoftBench to run correctly.

The `/opt/softbench/README` file has additional information about the current release of the product.

The very latest configuration information is available via the URL:

`http://devresource.hp.com/softbench`

4 Verifying SoftBench Installation and Configuration

This chapter provides information on how to verify that SoftBench is ready to use.

Verifying SoftBench Operation

To verify that SoftBench operates correctly, do the following:

1. For each SoftBench user, log in as that user.
2. Start one of the window managers supported by SoftBench.
3. Start SoftBench by typing `softbench` in a terminal window.

If SoftBench reports PATH problems, refer to “Required Configuration Tasks for SoftBench” on page 30 for information on how to set your PATH for SoftBench. If the SoftBench Toolbar does not appear or if there are other problems, see “Correcting SoftBench Startup Problems” on page 34.

For more information on using SoftBench, refer to the *SoftBench User's Guide* or the SoftBench online help.

Correcting SoftBench Startup Problems

Here are several possible problems that can occur when starting up SoftBench, along with appropriate remedies.

Table 4-1 Troubleshooting SoftBench

Problem	Possible Causes and Solutions

SoftBench main window does not appear on the screen.	• Patches required by SoftBench may be missing.
	To check the patches on your system, run the command:
	`/opt/softbench/sbin/checkpatch`
	If `checkpatch` reports missing patches, refer to “Install Required Patches” on page 26 for more information.
	• `PATH` may not be set properly. Refer to “Required Configuration Tasks for SoftBench” on page 30 for information on how to set your `PATH` for SoftBench.
	• The `DISPLAY` environment variable may not be set properly. See "Defining Your Display" in *Using the X Window System*.
	• You may not have enough swap space. See the section “Check Your System Prerequisites” on page 15.
	• SoftBench may be unable to open a subprocess control (spc) channel. Check the log files:
	`/var/adm/sw/swagent.log`
	`/var/adm/sw/swinstall.log`
	for problems updating `/etc/inetd.conf`, `/etc/inetd.sec`, or `/etc/services`.

Table 4-1 Troubleshooting SoftBench

Problem	Possible Causes and Solutions
SoftBench applications appear on the screen, but colors appear incorrect.	• You may be using a schemes file from SoftBench 5.X. In SoftBench 6.X, you should be letting CDE manage your colors. If a *Scheme resource is set, delete it. • The color map may be full; SoftBench automatically switched to a white-on-black color scheme. Free allocated color cells and restart SoftBench for proper color operation (for example, reduce the number of colors used in your X resources file or kill other applications that use multiple colors). See "Defining Your Display" in *Using the X Window System* for a description of how colors are set via X resources. • R and B color cables may be missing or crossed on the display. Correct the cabling.
SoftBench fonts and geometry appear much too large or too small for the screen being used.	• You may be using a schemes file from SoftBench 5.X. If a *Scheme resource is set, delete it. • Check that the X server is configured correctly with respect to the screen type, size, and resolution.

5 Configuring the SoftBench CM Server

This chapter describes configuration tasks required to set up a SoftBench CM server.

Configuring SoftBench CM

You must complete the following steps before SoftBench CM will work on your server:

1. Create a user called `softcm`.
2. Add an entry for the SoftBench CM server to the `/etc/inittab` file.
3. Start the SoftBench CM server.

Creating the softcm User

The SoftBench CM server program always runs as the user `softcm`, and all files managed by SoftBench CM are owned by `softcm`.

To create the `softcm` user, add an entry to the `/etc/passwd` file that looks something like this:

```
softcm:*:10000:10000:SoftBench CM:/:/bin/sync
```

- You can use any UserID and GroupID numbers that do not conflict with other users in the `/etc/passwd` file. This example uses the number `10000` for both the UserID and GroupID. You can use this example for your entry in your `/etc/passwd` file as long as there are no other UserIDs using `10000`.
- Since you never need to log in as user `softcm`, the home directory of `/` and shell `/bin/sync` are appropriate for this user entry.

If you are using NIS (Network Information Services, also referred to as "Yellow Pages"), make sure that the `softcm` entry is in your NIS master `/etc/passwd` map.

If you use a unique GroupID, add it to the `/etc/group` or NIS master group file. For example, a group entry might be:

```
softcm:*:10000:softcm
```

Adding a SoftBench CM entry to /etc/inittab

During installation, a line similar to the following should have been added to your `/etc/inittab` file:

```
#sbcm:23456a:once:/opt/softbench/sbin/cmserver 'LANG=C' 'TZ=MST7MDT'
```

This entry is used to automatically start the SoftBench CM server each time your system reboots. Make the following changes to the line:

1. Uncomment the entry by removing the # character at the beginning of the line.
2. Change the LANG value to be appropriate for your geographical location. Use the following values for Japanese environments:

   `ja_JP.SJIS` *for SJIS encoding*

   `ja_JP.eucJP` *for EUC encoding*
3. Change the TZ value to be appropriate for your time zone. (For more information about the TZ value, see the *date(1)* reference page.)

Starting the SoftBench CM Server

The `softcm` entry in `/etc/inittab` starts the SoftBench CM server each time your system is rebooted. You can also start the SoftBench CM server manually. Use the following instructions to start the SoftBench CM server initially so that you can see that the server has been installed and configured correctly:

1. Log in as `root`.
2. Execute the server program:

   ```
   /opt/softbench/sbin/cmserver
   ```

Note: SoftBench CM is installed in `/opt/softbench` for all platforms.

Once started successfully, `cmserver` disassociates itself from the connecting terminal window (`tty`) and becomes a background process. It also changes itself to be owned by `softcm`.

Initialization errors are printed to standard error. After initialization, all messages are printed to the file `/var/opt/softbench/cm/msglog`. Check this log for any errors, correct them, then restart the server.

Assuming the startup of `cmserver` was successful, the `msglog` file contains entries confirming that the `cm.mapping` and `cm.permission` files were found and read correctly.

Verifying the SoftBench CM Server

Once SoftBench CM has been installed on the server and client systems, and the server program (`cmserver`) has been started on the server(s), the following test will determine whether your installation of SoftBench CM is successful.

Execute the following command on the SoftBench CM server system and on each of the client systems:

```
/opt/softbench/bin/fls  -h server_host -dlX /TestArchive
```

The options mean the following:

Table 5-1 Options Used With fls Command To Verify Installation

Option	Description
`-h` *`server_host`*	Specify the hostname of the server system here.
`-d`	Causes only the name of directories to be listed, not their contents.
`l`	The letter l causes the resulting listing to be in long format, giving mode, locks, size in bytes, and the last time the file (directory) was modified.
`X`	Lists the names in expanded form.
`/TestArchive`	The name of the archive directory.

This test verifies that the archive server can be reached from a client. It should show the archive directory `/TestArchive`, which was physically placed in `/var/tmp` on the SoftBench CM server system during the installation process. You should see output that looks something like:

```
drwxrwxrwx  unlocked  1024   Jan 15  15:33  /TestArchive
```

Correcting SoftBench CM Startup Problems

You may see the following errors when you verify access to the archive directory `/TestArchive`:

- `fls: no permission for operation on archive item /TestArchive`

  This means that the cm.permission or the inetd.sec files (both on the SoftBench CM server system) may have been modified since the installation.

- `fls: archive file '/TestArchive' not found`

  This may mean that the cm.mapping file has been modified on the SoftBench CM server system since the installation, or that the /var/tmp directory on the server has been deleted.

- `fls: cannot connect to` *server_host* `(Connection refused).`

  There is no SoftBench CM server running on *server_host*.

- `ERROR: Cannot find address for` *server_host*`.`

  server_host may not be a valid hostname.

Additional SoftBench CM Configuration

After you start the SoftBench CM server, you will probably want to customize your configuration management environment (such as specifying the access rights for each user and where archive files are stored). See Appendix C, “Customizing SoftBench CM Configuration,” on page 69 for details.

6 Setting Up Network-Distributed Operation

This chapter describes how to customize SoftBench to be distributed over a network. This includes:

- Displaying a remote SoftBench session locally
- Using SoftBench with remote data
- Setting the execution host in a SoftBench tool
- Starting SoftBench tools on a remote host
- Controlling access and security in SoftBench

Displaying a Remote SoftBench Session Locally

This section describes the requirements to run SoftBench on a remote system and display it on your local system:

- Remote SoftBench is supported with the following local window managers:
  - — VUE window manager (HP-UX 10.20 only)
  - — CDE window manager
- The system where SoftBench is running needs access to the display server. See *xhost(1)* for more information.
- SoftBench fonts must be available on both the system where SoftBench is running and the system where SoftBench is displayed. They can be either installed locally or from a font server. For more information, see Appendix D, “Using SoftBench on X Terminals and PC X Servers,” on page 83.
- If you want to use SoftBench on a supported X-terminal, SoftBench needs to be installed and run on the X-terminal server system. For more information, see Appendix D, “Using SoftBench on X Terminals and PC X Servers,” on page 83.
- You can also display SoftBench on a PC system, using PC X server software such as *Exceed*®. For more information, refer to Appendix D, “Using SoftBench on X Terminals and PC X Servers,” on page 83.

See the section "Running SoftBench on a Remote System" in the "Using SoftBench" chapter of the *SoftBench User's Guide* for instructions to run SoftBench on a remote system and display it on a local system.

Using SoftBench with Remote Data

You can use SoftBench with data on a file system that is NFS-mounted or automountable from another system. The mount point can be anywhere you choose. Check the following list to see if you need to do any special setup to access your remote data with SoftBench:

- If you are using the automounter to mount remote file systems, you may want to set up the automounter with the `-hosts` special map. If you choose a mount point other than `/net` or `/nfs`, you need to create an `AUTOMOUNT_PREFIXES` entry in the `wusr.conf` file. For more information, see *wusr.conf(4)* and *automount(1M)*.
- The remote file system needs to be exported appropriately. See *exportfs(1M)* for more information.
- User and group ID numbers should match on all systems involved (to avoid permission problems). If you want to run a SoftBench process remotely, user and group ID numbers *must* match.
- **If you are using SoftBench Debugger** and the executable that you are debugging resides on a remote NFS file system (with respect to the execution host), the file system must be mounted with the "nointr" option set. See *mount(1M)* for details on this option.

Setting the Execution Host in a SoftBench Tool

SoftBench Builder and SoftBench Debugger allow you to specify an **Execution Host** for subprocesses started by that tool. For example in SoftBench Builder, you can specify that the build program (such as `make`) be executed on another system by setting the compile host to that system name. SoftBench Builder is run on the same system as SoftBench, but `make` would run on the specified compile host.

Before you can set the execution host in a SoftBench tool, you need to set up the following:

- SoftBench should be installed on both systems.
- Both systems need write access to a common directory for SoftBench Subprocess Control (SPC) validation. The default location is /var/tmp on the remote system. During authentication, the SPC process creates a temporary file in that directory to verify the user's identity on both systems.

  Refer to “The SPC Authentication Directory” on page 50 for more information about this directory.
- Data required by the tool must be mounted or automountable on both systems. This may include:

  — data directories to be accessed by SoftBench

  — users' home directories

  — the SPC authentication directory

  — system `include` directories

  See “Using SoftBench with Remote Data” on page 47 for more information.
- User and group ID numbers must match on all systems involved.
- Depending on the tool, special configuration may be required. See the sections that follow for tool-specific requirements.

See “Customizing Subprocess Control” on page 50 for more information on how SoftBench sets up a remote process.

Compile Host Requirements for SoftBench Builder

In addition to the general requirements in “Setting the Execution Host in a SoftBench Tool” on page 48, you need to set up the following before you can use a remote compile host from SoftBench Builder:

- The directory where SoftBench was installed on the remote compile host needs to be accessible through NFS from the host where SoftBench is running.
- Include directories on the remote system need to be NFS-mounted or automountable (for error browsing).
- To set the SoftBench Builder remote compile host in a network of heterogeneous systems, make sure your login shell's PATH is defined to contain a mixture of the PATH variables required on the types of systems you want to access.

Execution Host Requirements for SoftBench Debugger

You can use the "**O**ptions:Debug **H**ost…" menu to specify that DDE and the program being debugged should run on a different execution host than the one running the "softdebug" program.

The current working directory should be a directory path that works on both systems. For example, if your home directory is under /home on one system and under /users on the other, you may need to change your local workspace root in the project.

If the executable that you are debugging resides on a remote NFS file system (with respect to the execution host), the file system must be mounted with the "nointr" option set. See *mount(1M)* for details on this option.

Be careful when debugging across heterogeneous systems and architectures. Object files and executables may not be compatible in this case.

See “Setting the Execution Host in a SoftBench Tool” on page 48 for general requirements for setting the debug host.

Customizing Subprocess Control

Whenever SoftBench starts a process (either local or remote), it uses the Subprocess Control (SPC) service. This section describes how you can customize SPC behavior.

The SPC Authentication Directory

SoftBench uses the SPC to start a SoftBench tool on a remote system. Before you can use a remote SoftBench tool, access must be authenticated. During authentication, the SPC server on the remote execution host creates a temporary file in a directory to verify the user's identity on both systems.

Requirements for the SPC Authentication Directory

In order for authentication to succeed:

- The authentication directory must exist.
- Both the local and the remote system must have read/write access to the authentication directory.
- The directory must allow read/write access by any SoftBench user.
- The directory may be local on one system, but must be mounted on the other. It may be mounted on both.

  This may be a hard mount, or the mount may occur automatically through the `-hosts` automounter map.
- Operation of the validation directory is unreliable if it is mounted through an automounter map other than `-hosts`.

Changing the Authentication Directory

The default SPC authentication directory is `/var/tmp` on the remote execution host. An alternate location can be defined.

The default location may not always be practical. For example, you may not be able to export `/var/tmp` with write permission if the parent directories have different access permissions. Another example where access may be restricted is if you are trying to automount the directory via a `-hosts` map and the parent directories are not also exported.

For a system to receive remote execution requests in these cases, the administrator of that system must specify an alternate temporary directory to use. The directory may reside on any system on the network, as long as the requirements listed in “Requirements for the SPC Authentication Directory” on page 50 are met.

Once the alternate location is selected, the full path to the alternate validation directory should be placed in the file:

```
/opt/softbench/config/sharedtmpdir
```

on each system where remote SoftBench tools are to be executed.

Although `/opt/softbench/config/sharedtmpdir` is the *recommended* location for this information, the contents of that file can be overridden by a `sharedtmpdir` file in one of the following alternate locations:

Override sharedtmpdir file on HP-UX 11.0:

```
/etc/opt/softbench/config/sharedtmpdir
```

Override sharedtmpdir files on HP-UX 10.20:

```
/etc/opt/softbench/config/sharedtmpdir
/usr/bms/config/sharedtmpdir
/etc/usr/bms/config/sharedtmpdir
```

Other Authentication Configurations

If you are using remote SoftBench processes between more than two systems, you may want to set up a single authentication directory for a group of systems. The *advantage* of this is

- it may be much simpler to create and export a single authentication directory.

The *disadvantage* of this is

- having a single authentication directory for a large number of may cause a bottleneck that delays remote processes.
- if the system where the directory is located is unavailable, remote SoftBench processes could not be started.

For example, if your team has a single reliable hub system that already provides remotely mountable disks, the shared temporary directory could be placed on that system. Every system used by your team could then share that one directory, minimizing the administration needed to set up each new system.

Customizing Environment Variables for SoftBench

When one of the SoftBench tools needs to control other processes, such as SoftBench Builder running `make`, it can run these processes on a different host. To do this type of remote processing, your access rights are checked on the remote system, and your current environment is transmitted to the remote process.

To check access rights on the remote system:

1. A validation file is created in a directory accessible to both hosts.
2. The user ID of the file owner is obtained and the remote process runs as this user ID.
3. This user ID is used to obtain initial settings for the `HOME` and `SHELL` environment variables for the remote process. See *getpwent(3)* for more information.

When the process is run, the environment of the parent process is modified before it is inherited by the child. For local processes, the following procedure is followed:

1. The contents of the file `/opt/softbench/config/softenv` are read and each variable found in this file is put into the child environment. The variables in this file overwrite existing variables with the same names in the child environment.
2. The environment created by step 1 is further modified by the contents of your `$HOME/.softenv` file. As in step 1, a variable in the `$HOME/.softenv` file overwrites any existing variable of the same name.
3. The environment created by steps 1 and/or 2 is further modified by the contents of your `$HOME/.softenv.`*hostname* file. As in the preceding steps, a variable in the `$HOME/.softenv.`*hostname* file (where *hostname* is the name of the local system) overwrites any existing variable of the same name. This file is especially useful if you have your launch directory mounted on more than one system. You can create `$HOME/.softenv.`*hostname* files to customize the environment variables used by SoftBench on each system.

Using softenv Files with Remote Processes

When SoftBench starts a process on a remote system, customizations to environment variables used by SPC are evaluated in the following order:

1. The environment is modified according to the following files on the local host:
   - `/opt/softbench/config/softenv`
   - `$HOME/.softenv`
   - `$HOME/.softenv.`*local-host* (where *local-host* is the name of the local system)
2. The environment is transferred to the remote host.
3. The environment is modified according to the following files on the remote host:
   - `/opt/softbench/config/softenv`
   - `$HOME/.softenv`
   - `$HOME/.softenv.`*remote-host* (where *remote-host* is the name of the remote system)
4. `DISPLAY` is modified to point to the same display as the invoking tool.

The remote process is then run, inheriting this modified environment.

Creating a Custom softenv File

To specify an environment variable in the `/opt/softbench/config/softenv`, `$HOME/.softenv`, or `$HOME/.softenv.hostname` files, use *varname*=*value*, where *varname* is the name of the environment variable and *value* is the desired value.

The format of a `softenv` file is similar to other shell command files (such as `.login`) with the following exceptions:

- Only environment variable assignments are supported.
- Environment variables in the value part of an assignment are not expanded. For example, if you have a statement such as:

  ```
  PATH=/bin:$PATH
  ```

  The `$PATH` is not expanded when `PATH` is assigned. `softenv` entries strictly redefine environment variables.
- White space can appear in a value without using quoted strings.
- If you place quotes in a value, the quotes are retained in the value of environment variable being set.
- Line continuation (backslash followed by newline) is *not* supported.

Controlling Access and Security in SoftBench

Remote execution of SoftBench Debugger and remote compiles from SoftBench Builder require that the `inetd` process be configured and running on the remote system. The normal installation procedures configure the `inetd` automatically, and the networking services described in the *Installing and Administering LAN/9000* manual are required.

The `inetd.sec` file is described in detail in the *inetd.sec(4)* reference page.

If SoftBench is to be run on a system connected to a network, it should be configured to restrict access to only the work-group that requires SoftBench. This security model is very similar to the X model in which `/etc/X0.hosts` is used to restrict access to the service.

The "`mserve`" (Message Server) and "`spc`" (Sub-Process Control) services, defined by SoftBench, are automatically restricted in `inetd.sec` by the customization script to:

- Host name of the system if it is running standalone.
- Nodes in the cluster if it is a cluster system.

To provide access from systems other than the above, edit the `inetd.sec` file manually. It is advisable to keep the access list down to a minimum, as these services allow access to the system by anyone connecting to the port (just as X11 does).

Example of Controlling Access

For example, on a cluster of three nodes, the `inetd.sec` file contains the following after installation:

```
mserve  allow   hostA hostB hostC
spc     allow   hostA hostB hostC
```

To add a new host, simply append it to the end of the line. To add a complete network, simply include the network or subnet component of the address:

```
mserve  allow   hostA hostB hostC 192.6.36.*
spc     allow   hostA hostB hostC 192.6.36.*
```

If a system attempts to connect to the message server or spc without access permissions, an error message occurs. The error message may indicate a broken connection and may suggest that the `inetd.sec` should be checked. Since there are other reasons why a connection may be broken, SoftBench cannot always identify the cause as a security problem. If the system on which SoftBench is started does not have permission to connect to the message server, `softbench` exits immediately on startup with a broken connection error. Even if `inetd.sec` was correctly configured upon installation, later modifications to the file could generate this problem.

The host on which the environment is first started must always be allowed in `inetd.sec`. If `inetd.sec` is shared via an NFS mount *(not recommended)*, then it would have to include all hosts which need to talk to any message server with access to the shared file. This would not be handled automatically by the installation procedure as it only provides permission to the installing host and cluster.

Note that if the hostname or internet address of the system is changed, the `inetd.sec` file should be checked to make sure it still allows access to the correct systems.

A Prerequisite Details

Prerequisites for SoftBench are described in “Check Your System Prerequisites” on page 15. This appendix provides additional information about the prerequisites.

Swap Space

If not enough swap space is available for SoftBench, processes (including the X server) may abort and data may be lost. Swap space requirements are described in “Check Your System Prerequisites” on page 15.

Refer to *swapinfo(1M)* for information on determining the swap space available.

NLS Filesets

To use non-USASCII data-related features of SoftBench, you must have the NLS-AUX fileset and a language-specific fileset for each language you will be using.

Support for 16-bit character sets also requires the Asian System Environment (ASE).

Kernel Parameters

For initial use of SoftBench, you may not need to change kernel parameters. It is recommended that you *finish* installing and verifying simple SoftBench operation *before* modifying kernel parameters. This is because modifying these parameters necessitates regenerating the kernel, and regenerating the kernel at the same time that you install a product makes troubleshooting problems much more complex.

To avoid exceeding the default limits for certain kernel resources and incurring possible loss of data during heavy SoftBench use, check the recommended values in the following table for configurable kernel parameters. See the *HP 9000 System Administration Tasks* manual for default values and further details.

Table A-1 Recommended Kernel Parameter Values for SoftBench

Parameter	Description	Recommended Value
`maxdsize`	Maximum data segment size.	128 Mb or higher is recommended. `maxdsize` should not exceed available swap space. Setting `maxdsize` equal to RAM is recommended. Default is adequate only for light usage: small programs, one task at a time.
`maxuprc`	Maximum number of processes that a user can run simultaneously.	Default value + 50
`nproc`	Maximum number of processes that can exist on the system simultaneously.	Default value + 30 per concurrent SoftBench user. In addition, the following should be true: `nproc > (maxuprc+30)`

Table A-1 Recommended Kernel Parameter Values for SoftBench

Parameter	Description	Recommended Value
npty	Maximum number of pty devices in the system.	The default value is generally sufficient. Systems running more than 10 sessions of SoftBench simultaneously may need to increase this value.

If you had previously raised the value of any of these parameters because your system was exceeding the original limit, use your current value as the "default value" when you calculate the recommended value.

You can use SAM to determine the values of the parameters in your kernel, and change the values of these parameters as necessary. For more information, see "Reconfiguring the Kernel" in *HP 9000 System Administration Tasks*.

System Type

SoftBench requires an HP 9000 Workstation or Server, HP-PA 1.1 or higher. To determine the version of HP-PA for your system, do the following:

1. Run the command

   `/bin/uname -m`

   to determine your system type.

2. Look up the HP-PA version for your system type by viewing the file

   `/usr/lib/sched.models`

For example, if `uname -m` returns the value `9000/710`, and `/usr/lib/sched.models` has the following entry for `710`:

```
710      1.1a     PA7000
```

then you have an HP 9000/710 Workstation, which is an HP-PA 1.1a system.

B SoftBench Directories

This appendix describes the directories for SoftBench.

SoftBench places most files under `/opt/softbench`. The following table describes the directory structure which SoftBench creates during installation.

SoftBench Directories

Table B-1 SoftBench Directory Description

Subdirectory	Description
app-defaults	Application resources
bin	Executables
charmaps	Bit maps
config	Configurations and default startup files used by SoftBench applications
config.5x	SoftBench 5.X config files that were saved when SoftBench 6.X was installed.
contrib	Contributed software for SoftBench.
dde	SoftBench additions to the Distributed Debugging Environment Debugger
dt	CDE integration files
etc, sbin	Administration commands
examples	Program examples referred to in the printed documentation
fonts	Non-standard font files (also linked into /usr/lib/X11/fonts)
icons	Screen icons
include	Encapsulator include files (also linked into /usr/include)
lbin	Executables used by SoftBench tools
lib	Shared library and archive files for SoftBench
share/man	Online man pages
menus	Menu descriptions for SoftBench tools

Table B-1 SoftBench Directory Description

Subdirectory	Description
`newconfig`	Configuration files for SoftBench customization
`lib/nls/msg`	Native Language Support files
`schemes`	Color and font scheme files
`share`	SoftBench Debugger related files

In addition to the above directories, SoftBench places files in the directories described below.

Table B-2 Additional SoftBench Directories

Directory	Description
`/etc`	Modified `services` and `inetd.conf` files for subprocess control
`/var/adm`	Modified `inetd.sec` to allow permissions for access to SoftBench tools from other systems
`/usr/lib/X11/fonts`	Symbolic links to SoftBench font files
`/usr/include`	Symbolic links to SoftBench include files

The `/etc` directory contains the `services` and `inetd.conf` files, which are modified for sub-process control.

The `/etc/opt/softbench` directory contains any files used by SoftBench but defined by the user or by third-party applications. These files are used for "host-specific" configurations. See the HP-UX operating system's description of file system layout for more information.

SoftBench Directories

C Customizing SoftBench CM Configuration

SoftBench CM lets you customize your configuration management environment at the user, system, or global level.

Modifying the Configuration Files

The following configuration files come with SoftBench CM and are usually maintained by the SoftBench CM administrator. However, each SoftBench CM user can configure the default `.fmrc` file. The server reads and acknowledges modifications to these files every 30 seconds. The system writes a record to the `/var/opt/softbench/cm/msglog` file every time it reads a configuration file.

Table C-1 Server Configuration Files

File Name	Description
`cm.mapping`	Determines where archive files are stored on the server(s).
`cm.permission`	Determines user access rights to the archive files.
`cm.option`	Determines logging and debug levels.
`cm.nameperm`	Determines user modification rights on symbolic names.

The server configuration files can exist in two different directories on your server:

- `/opt/softbench/config` When SoftBench CM is installed on your server, SoftBench CM places the configuration files in this directory. The contents of the files in this directory provide global configuration of your SoftBench CM environment. All machines are configured according to the settings in these files.
- `/etc/opt/softbench/config` To configure a specific system differently from the global configuration, you can copy the configuration files into this directory and make the changes you want. The contents of the files in this directory only affect the system on which they reside.

SoftBench CM looks in both directories for the configuration files, but only uses one. The contents of the files found in the `/etc/opt/softbench/config` directory override the contents of the files found in `/opt/softbench/config` directory. Comment lines in these files

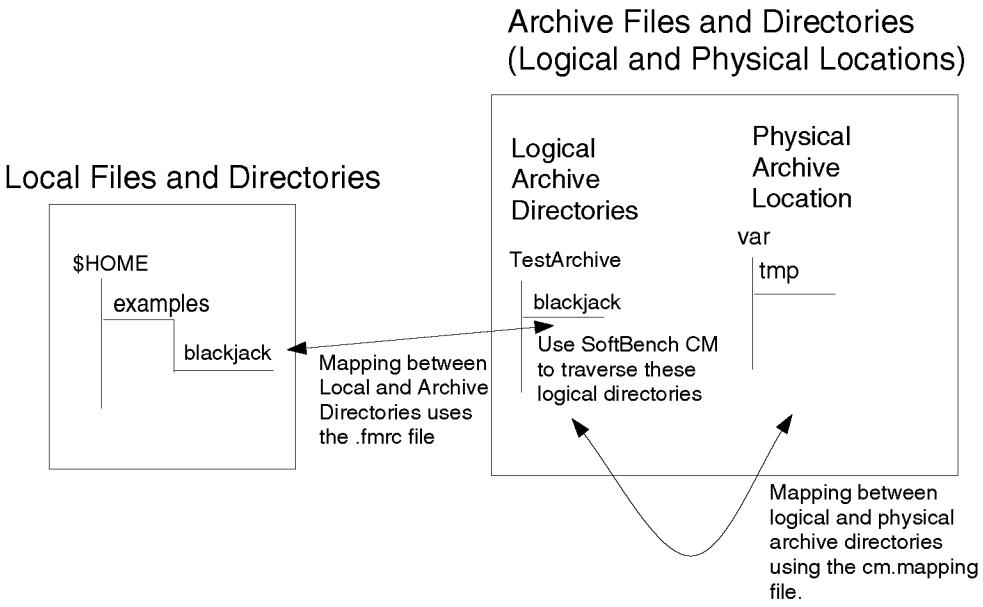
begin with a "#" character.

Configuring Where Archive Files are Stored

The `cm.mapping` file determines where archive files are physically stored on the server. This file is created during installation and contains default entries that *MUST* be modified to map to your archive file structure. Together this file and the mapping file determine the relationship between local files and directories and the logical and physical location of archive files and directories (see Figure C-1).

Each line in this file contains two fields separated by tabs or spaces. The first field is the *`logical`* archive directory prefix. The second field is the corresponding physical directory prefix.

Figure C-1 File Mapping Between Local and Archive Files



The `cm.mapping` file initially contains the following entry for the `/TestArchive` directory:

```
# TestArchive entry
/TestArchive  /var/tmp
```

In this entry, /TestArchive is the logical archive path by which the SoftBench CM client and server communicate, and /var/tmp is the physical path where the example files are stored on the SoftBench CM server.

Every file managed by SoftBench CM should have exactly one logical path name. You should not map multiple, logical archive path names to the same physical file or directory. When creating or updating the cm.mapping file, create the physical directories and set their ownership to softcm. Otherwise, the SoftBench CM server may not be able to access these directories. For example, if you add the following entry to the cm.mapping file:

```
#logical path   physical path
/project_95    /data/project_srcs
```

you would also need to do the following from the command line:

```
mkdir     /data/project_srcs
chown softcm /data/project_srcs
chgrp 10000  /data/project_srcs
chmod 700   /data/project_srcs
```

Change the group id number for the "chgrp" entry above if you used a GroupID number other than "10000" for the softcm entry in the /etc/passwd file.

You can edit the cm.mapping file while the SoftBench CM server is running. The server notices the changes and updates its internal data structures automatically.

Defining User Access to the Server

The `cm.permission` file determines users' access rights to the SoftBench CM archive files. When you make changes to this file, they take effect within 30 seconds of saving the file.

The `cm.permission` file consists of a series of entries. Each entry contains three types of fields terminated by a semicolon, as follows:

```
f1 f2 f3 ... [ f2 f3 ... ] ... ;
```

where f1, f2 and f3 are three distinct types.

- *User@System*
  - — *User* is either * (indicating any user) or a user name.
  - — *System* is a `sh(1)` wild card pattern for a [full domain] machine name, or a machine address or address range in dot notation (see *inetd.sec(4)*).
- Permission symbols (see Table C-2).

  Each option is specified by a lower case letter and each grouping by an upper case letter.
- `/path`.

Table C-2 Options Used in the cm.permission and cm.option Files

Option	Description
a	List the contents of a directory.
b	Show the history of a file.
c	Create a new file.
d	Create a new directory.
e	Rename a directory.
f	Check out a revision.
i	Check in a new revision.
l	Create a lock for later check in.
m	Modify a comment on an existing revision.

Table C-2 Options Used in the cm.permission and cm.option Files

Option	Description
n	Create a new symbolic revision name.
o	Obsolete a revision.
p	Modify the mode of a file.
q	Delete a file and all of its revisions.
s	Change the state of a revision.
t	Change the descriptive text for a file.
u	Delete a lock on a revision.
v	Rename a file.
w	Break a lock which is owned by another.
x	Delete a directory.
y	Move a symbolic revision name.
z	Delete a symbolic revision name.
S	Superaccess: allows all access rights.
R	Read access to archive files. Equivalent to "abf".
M	Modify archive files. Equivalent to "cdilmnptuwx".
D	Delete archive files, revisions and symbolic revision names. Equivalent to "oqz".
A	Administration: Rename files and directories. Modify symbolic revision name values and state values. Equivalent to "ensvy".
0	Set low priority for this entry.
2	Set high priority for this entry.
3	Set highest priority for this entry.
-	Ignored placeholder.

The permission symbols come in three groups:

- lower case letters control access to individual operations
- upper case letters control access to groups of operations
- numbers set relative priorities for the associated entry

  These priorities, coupled with the best match criteria, apply a single set of permissions to a given access.

SoftBench CM normally uses the best matching entry (longest /path prefix match, then most specific user/host match) to determine access rights. However, by specifying priorities, you can use a shorter path for a specific user. For example, in the following entries:

```
*@host R /earth ;
john@host S / ;
jane@host 2S / ;
```

the user "john" has "R" access to `/earth` because `/earth` is more specific than "/" and "S" access to the rest of the archive. The user "jane" has "S" access to the whole archive, including `/earth` because the "2" specifies an increased priority.

The `/opt/softbench/sbin/checkperm -d` command displays the permissions file entries in sorted order. For any given access, the first entry that matches the requesting `user@host` and `/path` determines the access.

Recommended Format for Permissions File

You can order fields within an entry in two formats:

Format 1. Place user field first and permissions field second.

```
user1@host.domain.hp.com
      RM  /project1 /project2
      S    /project3    # system admin
      R    /               # read-only default
      ;
user2@hp*  S    /project1
      RM  /project2 /project3
      ;
```

Format 2. Place path field first and permissions field second.

```
/      R    *@*
      ;
/project1  RM   user1@host* user2@15.1.1-40.* user3@*
      S    user4@host1.domain.hp.com
      ;
/project2  RM   user1@host*
      RMD   user2@host1*
      ;
```

Use the pattern `RMDA` or `-abf-cdilmnptuwx-oqz-esvy` for permissions and replace the disallowed permission bits or groupings with "`-`" characters. This makes it easier to understand which permissions are deleted and given. The permission letters can be in any order.

If the `cm.permission` file is missing, or no match is found, no access is allowed. You should specify a default entry such as:

```
*@15.*     -abf-cdilmnptuwx-oqz-esvy   /
        ;
```

Setting Logging and Debug Options

The `cm.option` file specifies two archive options:

`LogOptions` The recommended (default) setting for logging is to log every modification operation into the `/var/opt/softbench/cm/activityLog` file. The option letters are position independent (see Table C-2).

```
LogOptions:  abf-cdilmnptuwx-oqz-esvy  # Logging options (full list)
LogOptions:  cdilmnptuwx-oqz-esvy  # Logging options (recommended)
```

`Debug` Enables writing of debugging information into the file `/var/opt/softbench/cm/msglog`. Debug levels range from `1` to `5`. Higher numbers result in more output.

```
Debug: 1
```

Use the `cron` utility to trim the log files periodically because the log files have no maximum file length.

Controlling Client Machine Access to the SoftBench CM Server on HP-UX

The `inetd.sec` file determines the list of client machines that have access to the archive server machine.

- If `inetd.sec` is missing or does not contain an entry for `softcm`, all users have access to the archive files, subject to the `cm.permission`. For more information, see “Defining User Access to the Server” on page 73.
- If `inetd.sec` exists, but is inaccessible to the `softcm` user, SoftBench CM denies all access.
- Otherwise, the `softcm` service entry determines access according to the standard `inetd.sec` constructs. (See the *inetd.sec(4)* reference page for more information.)

You can edit the `inetd.sec` file while running the archive server. The server notices the change and updates its internal data structures immediately.

Performing SoftBench CM Administrator Tasks

SoftBench CM requires a few maintenance tasks to ensure a smooth-running configuration management environment.

Migrating Archive Files From RCS

You can import individual RCS files into SoftBench CM using the `-ARCS` option of `fci`. SoftBench CM can also assume management of an existing hierarchy of RCS files.

To migrate archive files from RCS:

1. Edit the `/opt/softbench/config/cm.mapping` or `/etc/softbench/config/cm.mapping` file so that the desired logical path is mapped to the existing directory hierarchy of RCS files.
2. Make certain that all RCS locks in the hierarchy are removed.
3. Change the owner (and group) of all files and directories in the hierarchy to "softcm".

Migrating Archive Files From SCCS

To migrate files from existing SCCS archives to SoftBench CM archives:

1. Create the new SoftBench CM archive hierarchy using the "`futil -M`" command.
2. Use the utility "`sccstorcs`" to convert the SCCS files to GNU RCS format.

   Run `sccstorcs` without any arguments to create the KeyWordEdit script. This script lets you decide which SCCS keywords convert to RCS keyword equivalents. Most users use the default keywords in this script.
3. Run "`sccstorcs s.file`" to convert files in the current directory.
4. Run "`find` *`directory`* `-type f -name 's.*' -print | xargs sccstorcs`" to convert files in a directory hierarchy. (See the *sccstorcs(1)* man page for more information on `sccstorcs`)

5. Run "`fci -ARCS file,v`" to create the initial SoftBench CM archive files.
6. Begin using SoftBench CM for file versioning.

This conversion process preserves the history and contents from the SCCS files.

Modifying the Lockinfo File

The file `/var/opt/softbench/cm/lockinfo` holds all archive file lock information and is created and maintained automatically. The SoftBench CM server accesses this file for all lock or unlock information requests. It is recommend that you *DO NOT* modify this file. If you must modify it, follow these steps:

1. Shut down the SoftBench CM server.

   Failing to shutdown the server could cause data corruption and loss of information.

2. Modify the `lockinfo` file.
3. Run the `fixinfo` program on the `lockinfo` file:

   ```
   cd /var/opt/softbench/cm
   /opt/softbench/sbin/fixinfo lockinfo outOK outBAD
   ```

4. If "`bad = 0`" prints, copy the `outOK` file onto `lockinfo`:

   ```
   cp outOK lockinfo
   ```

5. If there are bad records, edit the `outBAD` file to try to fix the problems.
6. Run `fixinfo` on the fixed file.
7. Concatenate all the "OK" files together and recheck before restarting the SoftBench CM server process.

Creating Archive Backups

SoftBench CM requires no special setup or precautions to backup the SoftBench CM archive files, configuration files, or log files. Follow the normal backup procedures for your SoftBench CM server.

Moving Archive Storage Locations

As a project grows and you add more files to an archive, the archive may exceed the size of the disk. Several options exist for moving archive locations:

To move an entire archive hierarchy to another disk:

1. Stop the `cmserver` process.
2. Copy or move the hierarchy.
3. Modify the `cm.mapping` file to reflect the new physical location.

To move a portion of an archive hierarchy (subhierarchy) to another disk:

1. Stop the `cmserver` process.
2. Copy or move the hierarchy.
3. Modify the `cm.mapping` file to reflect the new physical location.
4. Add a symbolic link or leave an empty directory in the location from which you moved each subhierarchy.

   This lets you browse the parent directory to view the moved subhierarchy.

To move an archive hierarchy to another machine:

1. Stop the `cmserver` process.
2. Copy or move the hierarchy.
3. Modify the `cm.mapping` file to reflect the new physical location.
4. Copy lock information for the portion of the archive hierarchy that you are moving (see “Modifying the Lockinfo File” on page 79).
5. Add a symbolic link or leave an empty directory in the location from which you moved each subhierarchy.
6. Have each user replace or update the usehost line in their mapping file to reflect the move.

   If the global `fmrc` file `/opt/softbench/config/fmrc` is used, then the system administrator can edit its usehost entries for all users. This is usually most practical for sites mounting SoftBench CM from a central server.

All changes should be made such that the logical paths to files are not modified. This way, users are less affected by the move and locks are preserved. Changing the logical hierarchy during a move can cause loss of lock information.

Troubleshooting

SoftBench CM uses archive log files for quick resolution of problems you may encounter.

Using the Archive Status and Error Log

The SoftBench CM server daemon keeps the file `/var/opt/softbench/cm/msglog` open in append mode for writing various status and error messages. Look at this file when unexpected events occur.

Log files can grow without bounds if left unchecked. Use an automated process, such as a `cron` job, to truncate the log files.

Each message in the log files begins with a date stamp. The most common messages include the "Started" and "Terminated" status messages, the configuration file reading messages, and the "Access denied" messages. Some RCS error messages might also show up in the file. These messages are more detailed than the command error messages, so consult the server's `msglog` file if the command error message is not clear.

Using the Archive Activity Log

The `/var/opt/softbench/cm/activityLog` file tracks modifications made to archive files. The SoftBench CM server writes a line for every activity that has been selected for logging in the `cm.option` file. The `activityLog` file can be moved, truncated, or deleted without affecting SoftBench CM. If deleted, the system recreates the file automatically at runtime.

D Using SoftBench on X Terminals and PC X Servers

SoftBench requires a number of special fonts to support all its functions. When you run SoftBench on an HP-UX workstation, your X server finds the necessary fonts under the `/opt/softbench/fonts` directory.

However, if you use an X terminal or PC-based X server software, your display will not find the necessary fonts. SoftBench issues font errors and warnings to notify you of the problem. You can use SoftBench in this state, but some text will not display properly. To achieve the optimal behavior in SoftBench, you must configure your X terminal or PC X server so it can find the fonts.

The steps required are different for each type of X display. These instructions cover only X terminals and the *Reflection® X*, *Exceed®* and PC-Xware® PC X servers.

There are three approaches:

- Configure a font server. The X window system supports a concept called "font servers" that allows X displays to retrieve fonts from a remote system instead of from a local directory. If you set up a font server and configure it to export the fonts found under `/opt/softbench/fonts`, then all X displays can access the SoftBench fonts through the server. See *fs(1M)* for details.

  This approach works for all types of X displays. It can be the least-effort solution, especially if you already use a font server. The only configuration needed on the X displays is to specify the location of the font server.

- Access the font files across the network as if they were installed locally. Most X terminals support remote file access like this. On a PC, you must create a network drive and configure the X server to look for its fonts in the remote directory. This approach works with X terminals and with Reflection X. Exceed and PC-Xware cannot access the Unix-format X fonts directly from an HP-UX system.

- Install customized font files onto the PC. This requires the most configuration effort on each PC, but it may have better performance.

When you have correctly configured your X display using one of the above options, you should not see any font errors when running SoftBench, either in `stdout` or in dialog boxes, with one exception. On all PC X servers, a warning dialog may appear when you first start SoftBench Online Help. This warning can be ignored.

For the latest fonts and font information, refer to the URL:

`http://devresource.hp.com/softbench`

Configuring an X Terminal

Accessing SoftBench fonts on most X terminals is very straightforward. Using a font server is the recommended solution. If that is not an acceptable option, configure the X terminal to retrieve fonts from a remote file system. In addition to the basic X fonts under `/usr/lib/X11/fonts`, you should also retrieve the fonts under `/opt/softbench/fonts`.

See the documentation for your X terminal for details on accessing a font server or remote file systems.

Configuring Reflection X

SoftBench 6.X supports version 6.00 of Reflection X. Other versions have not been tested.

Reflection X can access its fonts from a font server, from a remote file system, or from the PC's local file system. See the Reflection X documentation for details on accessing font servers and modifying the X font search path.

Accessing Fonts on a Remote HP-UX System

To access fonts on a remote file system, you must create a network drive to mount the remote file system on your PC. You may choose to mount only the `/opt/softbench/fonts` directory from the HP-UX system. This allows you to use shorter file paths, and it also minimizes any security concerns of allowing PC users access to the entire HP-UX file system.

After you have created the network drive, you can add the SoftBench font directories to your Reflection X font path. You can do this either by configuring each PC, or by specifying the new font path on HP-UX.

To change the font path on the PC: In addition to any font directories required by your other applications, you should add the following font directories, in this order:

```
E:pcfonts\reflection\iso_8859.1
E:hp_roman8\75dpi
C:\Program Files\Reflection\Fonts\misc
```

This assumes that you have mounted `/opt/softbench/fonts` onto drive `E:`, and that the standard "`Misc`" font directory supplied by Reflection X is installed under "`C:\Program Files\Reflection\Fonts`".

You can add these fonts to your font path using the Reflection X font settings manager.

To change the font path on HP-UX: If you prefer not to modify every PC's configuration, you can add the directories to the X font path on the HP-UX side using the `xset` command:

```
xset +fp E:pcfonts/reflection/iso_8859.1,E:hp_roman8/75dpi
```

(Notice the use of Unix-style "forward slashes" for this command.)

The `xset` command must be executed after you start `mwm` or other window manager.

Each SoftBench user can add this command to his or her X startup script. If you prefer, you could create a SoftBench startup script that adds the font paths and then starts SoftBench. This allows you to handle all X font issues in one location. Be aware that the "`xset +fp`" command *adds* the fonts to the start of the font path. You may want to use the "`xset fp=`" command to avoid adding the fonts to the font path each time the user runs SoftBench in an X session.

When you have added these directories to your font path, you can restart Reflection X to activate the new fonts.

Installing Reflection X Fonts Locally

If you prefer not to access the SoftBench fonts across the network, you can install them onto each PC. Copy the file `/opt/softbench/fonts/pcfonts/reflect.zip` to your PC, and unpack it in the Reflection X root directory, which is normally "`C:\Program Files\Reflection`".

After unpacking the `zip` file, use the Reflection X font settings manager to add these directories to your font path. Assuming the "Font Directory" is set to "`C:\Program Files\Reflection\Fonts`" (or wherever your Reflection X fonts are located), enter these directories in the "Font Path" field:

```
hp_roman8
x11-iso
Misc
```

When you are through, restart Reflection X to activate the new fonts.

Configuring Exceed

SoftBench 6.X supports version 5.1.3.0 of Exceed. Other versions have not been tested.

Exceed can retrieve its fonts from a font server or from locally-installed font files. Exceed cannot use standard Unix-format X fonts, so you cannot access fonts on a remote file system.

See the Exceed documentation for details on accessing a font server or for changing the X font path.

Installing Exceed Fonts Locally

To use locally-installed fonts, copy the file:

`/opt/softbench/fonts/pcfonts/exceed.zip`

to your PC. Unpack it in your Exceed directory, which is usually found under "`C:\Program Files`".

After unpacking the `zip` file, use the XConfig utility to add the following fonts to your font path. (This is called the "Font Database" in Exceed.) The first column is the "font database" name, and the second is the directory location.

```
hp_roman8  C:\Program Files\Exceed.nt\font\hp_roman8\
x11-iso    C:\Program Files\Exceed.nt\font\x11-iso\
misc       C:\Program Files\Exceed.nt\font\misc\
```

(This assumes Exceed is installed under "`C:\Program Files\Exceed.nt`".)

Note that the trailing "`\`" is required! Verify that the three font directories are activated. The `Status` field for these fonts should be "`L P`" or "`K P`". If it is not, select the font and select **Change...** to modify it.

When you are through, restart Exceed to activate the new fonts.

Configuring PC-Xware

SoftBench 6.X supports version 4.08.00 of PC-Xware. Other versions have not been tested.

PC-Xware can retrieve its fonts from a font server or from locally-installed font files. PC-Xware cannot access fonts on an HP-UX system.

PC-Xware uses a Font Path to determine where to find the fonts requested by X applications. The default Font Path for PC-Xware is

```
C:\Program Files\Solstice\Pcx
```

The instructions that follow are for placing the fonts in this default location. If you choose a different location, you can modify the Font Path by choosing “Configure: X Server -> Fonts”.

See the PC-Xware documentation for details on accessing a font server or for changing the X font path.

Configuring PC-Xware to Use a Font Server

To access fonts from a font server, choose “Configure: X Server -> Fonts”.

Select the [Add Font Server] button, and add the font server line to the front of the Font Path. The font server line uses this format:

tcp/hostname:port

Installing PC-Xware Fonts Locally

PC-Xware uses the same *.pcf fonts as those used on UNIX. However, PC-Xware cannot access the fonts across the network. If you prefer not to access the fonts from a font server, you can install the fonts locally onto your PC.

To use locally-installed fonts, copy the file

```
/opt/softbench/fonts/pcfonts/pcxware.zip
```

to your PC. Unpack it at C:\

This assumes that you have PC-Xware installed at

```
C:\Program Files\Solstice\Pcx
```

After unpacking the zip file, bring up the PC-Xware GUI and choose “Configure: X Server -> Fonts”. Add the following font directory names, in this order, to the beginning of the Font Path.

```
softbench
hp_roman8
x11-iso
Misc
```

Other applications may need the other font directories listed in the Font Path, so do not remove them from the path.

When you are through, restart PC-Xware to access the new fonts.

You can verify your font path on the HP-UX system with the HP-UX command:

```
xset -q
```

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