Software Package Builder 2.0 User's Guide

for HP-UX 11i v1, 11i v2, and 11i v3

Edition 2

Manufacturing Part Number: 5991-7462
February 2007

United States

Legal Notices

Warranty

A copy of the specific warranty terms applicable to your Hewlett-Packard product and replacement parts can be obtained from your local Sales and Service Office.

U.S. Government License

Proprietary computer software. Valid license from HP required for possession, use or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

Copyright Notice

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Microsoft, Windows, and Windows NT are U.S. registered trademarks of Microsoft Corporation.

Printed in the US.

Trademark Notices

Intel Itanium® Logo, Intel, Intel Inside and Itanium are trademarks or registered trademarks of Intel Corporation in the US and other countries and are used under license.

Publication History

The manual publication date and part number indicate its current edition. The publication date will change when a new edition is released. The manufacturing part number will change when extensive changes are made.

- *Software Package Builder 2.0 Users Guide for HP-UX 11i v1, 11i v2, and 11i v3:* February 2007, 5991-7462
- *Software Package Builder 2.0 Users Guide for HP-UX 11i v1 and 11i v2:* September 2004, 5990-6771
- *Software Package Builder 1.0 Users Guide for HP-UX 11i v1 and 11i v2:* December 2003, 5187-4494
- *Software Package Builder 1.0 Users Guide for HP-UX 11i v1 and 11i v2:* September 2003, 5187-3646

New editions of this manual will incorporate all material updated since the previous edition. For the latest version, see the Software Package Builder documentation on the Web:

`http://docs.hp.com/`

Please use the following Web form to send us feedback:

`http://docs.hp.com/assistance/feedback.html`

About this Guide

This guide describes installing and getting started with Software Package Builder. It also provides a basic overview of the software packaging process and terminology. It assumes that you are an HP-UX system administrator and familiar with installing and administering software in these environments.

This guide applies to the February 2007 version of Software Package Builder 2.0. If you need additional information for Software Package Builder, visit the product Web site:

http://software.hp.com/products/SPB/

Typographic Conventions

We use the following typographical conventions.

mxtool (4)	HP-UX manual page. *mxtool* is the name and *(4)* is the section. From the command line, you can enter "`man mxtool`" or "`man 4 mxtool`" to view the manpage. See *man* (1).
Book Title	Title of a book. On the Web and on the Instant Information CD, it may be a hot link to the book itself.
`Command`	Command name or qualified command phrase.
`ComputerOut`	Text displayed by the computer.
KeyCap	Name of a keyboard key.
Term	Defined use of an important word or phrase.
`UserInput`	Commands and other text that you type.
`Variable`	Name of a variable that you may replace in a command or function or information in a display that represents several possible values.
`[ ]`	Contents are optional in formats and command descriptions. If the contents are a list separated by |, you must choose one of the items.
`{ }`	Contents are required in formats and command descriptions. If the contents are a list separated by |, you must choose one of the items.
...	Preceding element may be repeated an arbitrary number of times.
|	Separates items in a list of choices.

Contents

1 Introduction to Software Package Builder

The following topics are covered in this chapter:

Software Package Builder Overview

Software Package Builder (SPB) provides a visual method to create and edit software packages using the HP-UX Software Distributor (SD-UX) package format. Once software is packaged, it can easily be transferred to a distribution medium, mass produced, and installed by administrators. The SPB graphical user interface (GUI) provides a window into the software package structure, showing attributes that can be set for each package element. SPB loads packaging policies and validates software package attributes against these policies. The SPB command line interface (CLI) can also perform validation of software package attributes against policies and can be added to an automated process for editing and validation of a PSF.

SPB can assist with the following tasks:

- Creating a product specification file (PSF) to organize files into products, filesets, and optionally, into bundles and subproducts
- Setting attribute values to define software package characteristics such as revision, architecture, file permissions, and dependencies
- Validating the PSF against packaging policies to ensure successful packaging into a software depot with the `swpackage` command
- Editing and validating the PSF automatically as part of a nightly build process using SPB's CLI
- Viewing and editing multiple PSF's
- Viewing and validating depots and copying data from a depot to create a PSF
- Testing or creating a software package by running the `swpackage` command from within the SPB GUI

Software Package Builder offers the following features:

Table 1-1 Features of Software Package Builder

Feature	Description
Graphical User Interface (GUI) for creating PSFs in SD-UX format.	Provides an easy-to-use interface, making the complex task of creating a PSF easier.
Command Line Interface (CLI) for automating nightly changes to packages.	Provides a mechanism for easy automation of PSF edits and validation.
Policy validator for verifying a package's use of legal SD-UX syntax.	Easy to create a valid PSF without in-depth knowledge of all the packaging policies.
Open source software can be packaged in SD-UX format.	Easy to repackage software from various formats into SD-UX, allowing you to manage software with the SD-UX software management toolset.
User-specified rules files.	Allows you to specify the rules file you want to validate your PSF against.
Depot view.	Allows you to view and validate depots and copy information from a depot to create a PSF.
Package software.	Allows you to run the swpackage command from within the SPB GUI to create a software package.

Software Package Builder and HP-UX Software Distributor

It is important to understand the relationship between SPB and SD-UX.

Software Distributor

SD-UX provides a powerful set of tools for centralized HP-UX software management. SD-UX commands are included with the HP-UX operating system and allow you to package software into the SD-UX format, as well as create, distribute, and manage software from software depots.

SD-UX provides utilities to support numerous software package management tasks. Of these, the `swpackage` command creates a software package by combining the files the user wants to deliver (which may include control scripts) and a product specification file (PSF). The software package is then placed in a software depot where it can be distributed to customers and installed using the `swinstall` command.

The SD-UX packaging operations are based on the attribute values set in the PSF. The PSF is a master file that is created for a given software package to define the structure and describe all the characteristics and file mappings. The PSF contains attribute information for all the software elements contained in the package and must adhere to a strict, hierarchical structure and set of packaging policy rules.

Software Package Builder

SPB fits into this process by assisting with the creation and validation of a PSF that the `swpackage` command uses to create the software package. The structure of a software package and its software elements are largely abstract and the packaging policy rules that the software package must adhere to can also be very complex. SPB helps simplify the process of creating a software package by providing a visual method for creating the PSF, its software elements, attributes, and structure, as well as automatically validating the PSF against packaging policy rules. SPB provides a default set of packaging policies that validate your PSF, however, you can also customize your own packaging policies.

System Requirements

The following table identifies the hardware and software requirements for Software Package Builder (SPB).

Table 1-2 SPB Requirements

Operating System	• HP-UX 11i v1 (B.11.11) • HP-UX 11i v2 (B.11.23) • HP-UX 11i v3 (B.11.31)
Software	Java 1.4 runtime environment (JRE) or later
Free Disk Space	• 6 MB minimum in the `/opt` directory • 1 MB minimum recommended for data
RAM	256 MB

For the latest system requirements, go to:

`http://software.hp.com/products/SPB/`

Optimizing Java

To achieve optimal Java performance, run the **HPjconfig** tool to tune the kernel and list any Java-specific patches that are needed.

To access Java configuration information

Step 1. Visit the Web site

```
http://www.hp.com/go/java/
```

Step 2. Locate the section on **HPjconfig** for tuning HP-UX kernel parameters.

Step 3. Install Java-specific patches, as needed.

Getting and Installing SPB

SPB is available as a selectable application with the release of HP-UX 11i v2 (B.11.23) and 11i v1 (B.11.11), and an optional application with the release of 11i v3 (B.11.31). SPB can also be downloaded from the Web.

Download SPB from the following URL:

http://software.hp.com/products/SPB/download.html

SPB is packaged in SD-UX format and can be installed with the `swinstall` command.

For network installation, enter:

swinstall -s *<host>:</path>* SwPkgBuilder

For media installation, enter:

swinstall -s *<media path>*SwPkgBuilder

For depot installation, enter:

swinstall -d SwPkgBuilder @*<host>:</depot path>*

Starting Software Package Builder

To launch SPB from the command line, enter:

/opt/spb/bin/spb

The SPB GUI will launch, and by default the application will use the packaging policy rules file for the HP-UX version you are running on your system.

About the Policy Rules Files

The packaging policy rules file is an Extensible Markup Language (XML) formatted file that describes the legal PSF syntax and any field value constraints for your PSF.

You can use SPB to package software for a range of HP-UX releases, older or newer than the system running SPB. To package software for a newer version of HP-UX, specify the appropriate policy file as a command line argument. To package software for an older release, use the default, since policy files are backward compatible with previous releases. For example, you can use the HP-UX 11i v3 policy file to package software for a system running HP-UX 11i v2, but to package software for an HP-UX 11i v3 system from a system running HP-UX 11i v2, specify the HP-UX 11i v3 policy file via the command line.

The policies supplied with SPB are located in `/opt/spb/data` and are named as follows:

- For HP-UX 11i v3 (B.11.31) - the default policy file is `113XPolicies_SD.xml`
- For HP-UX 11i v2 (B.11.23) - the default policy file is `112XPolicies_SD.xml`
- For HP-UX 11i v1 (B.11.11) - the default policy file is `11XPolicies_SD.xml`

Specifying the Packaging Policy Rules File

Specify a packaging policy rules file other than the default by using the `-r` option from the command line.

To launch SPB and specify the policy rules file, enter:

spb -r /opt/spb/data/*<Myrules.xml>*

NOTE If only a file name is given as the argument, SPB will look in the default policy rules file directory for the specified file. You can also specify an absolute path to the file.

For additional information on this and other SPB command line options, refer to the *spb (1M)* manpage.

2 Software Packaging

If you are new to software packaging, this chapter provides an overview of the software packaging process and basic concepts. If you are already an experienced packager, you may want to use this chapter as a review, or move to Chapter 3, “Software Package Builder Features.”

This chapter covers the following topics:

Software Packaging Overview

Application software is delivered in units called software packages. A software package is a collection of files and directories required to install a software product. Generally, a software package is designed and built by the application developer after completing the development of the application code.

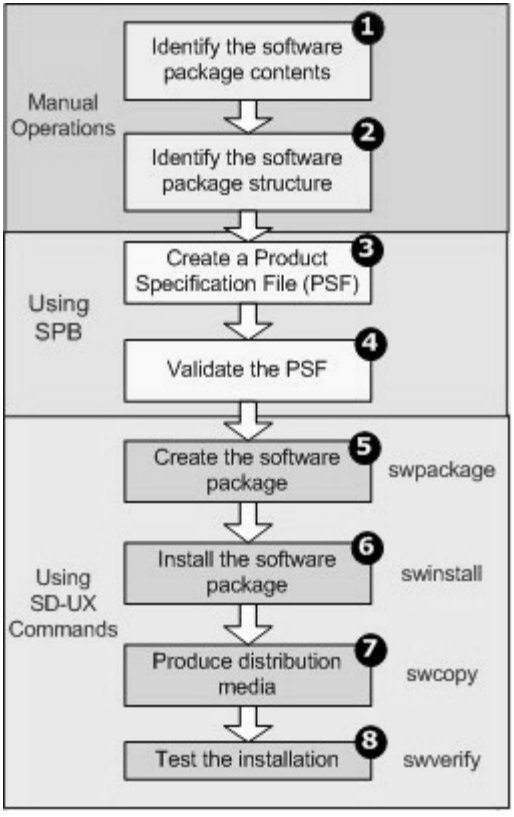
Building a software product into one or more software packages gives you the ability to do the following:

- Transfer the software product to a distribution media
- Produce the software product in mass quantities
- Install the software product on multiple systems

Software Packaging Lifecycle

The software packaging lifecycle is displayed in the figure below.

Figure 2-1 Software Packaging Lifecycle



1. **Identify the software package contents -** Determine what files and directories you want to include in your software package. Your software package can consist of products, filesets, files, and other, optional software elements as discussed in “Software Elements” on page 24.
2. **Identify the software package structure -** Design the software package structure and plan the organization of the source and destination filesystems.

3. **Create a Product Specification File (PSF) -** Use SPB to create a PSF to define the software package. SPB provides a GUI for creating the PSF.
4. **Validate the PSF -** Determine that the PSF is valid prior to creating the software package. SPB uses a packaging policy rules file to validate the PSF.
5. **Create the software package -** Use the SD-UX `swpackage` command to create your software package. This can be done from the SPB GUI or the command line.
6. **Install the software package -** Use the SD-UX `swinstall` command to install the contents of your software package.
7. **Produce distribution media -** Determine the appropriate method of distribution.You can use the SD-UX `swcopy` command to create copies of the package.
8. **Test the installation -** Test the installation of the software package using the SD-UX `swverify` command.

TIP

For detailed information on SD-UX commands, refer to the manpage for individual commands or the *Software Distributor Administration Guide* which can be found at:

`http://www.docs.hp.com/en/SD`

Software Package Structure

A software package is created from a hierarchy of software elements. The hierarchy provides the structure needed by the filesystem to logically identify packaged files. A software package also contains metadata specific to each software element. The metadata is generated by setting attribute values. This is all accomplished through the creation of a PSF which defines the software package.

Once the software package is created, you can create a software depot which acts as a repository for your software products. Software depots can be managed using SD-UX commands.

The packaging process lets you create depots. The PSF is flexible enough to fit many software build requirements and manufacturing process needs.

Before you begin packaging software, ensure the following:

- SPB is installed and configured on the system where you intend to create your software package.
- The software to be packaged is installed on the packaging system, or the necessary files are available remotely.

Organizing Filesystems

One of the first steps in packaging software is determining what files and directories you want included in the software package. The files should follow certain guidelines to support the configuration you want.

As much as is feasible, you should group your source directories and files so they correspond with the filesets and products you are using in the software package. To make the maintenance of your software package easier, when organizing your source and destination filesystems use the following guidelines:

- Create filesets with consistent file access modes (i.e., file permissions).
- Create directories with contents that are directed to the same filesets.

- Group related files in the source filesystem that will directly translate to the destination filesystem.

Software Elements

A software package is created from a hierarchy of software elements, which are structured and defined in a PSF. The SPB-specific software elements are as follows:

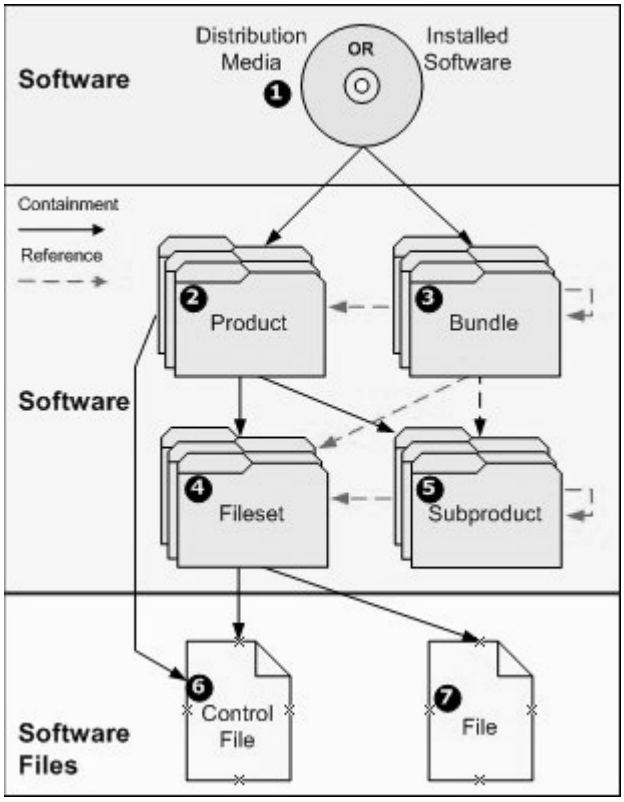
File	A file is the lowest level of software element that can be contained in a software package. Files are grouped together to create filesets.
Fileset	A fileset serves as a container for files, associated file attributes, and separate control scripts. A fileset is comprised of a group of files. Filesets are grouped and contained in products. A fileset can only belong to one product; however, a fileset may be referenced in multiple subproducts within one product. A fileset can also be included in multiple bundles through the product it is contained within. A minimum of one fileset is required for a PSF.
Product	A product is a container for filesets, subproducts, and/or control scripts specific to a software package. Products are collections that form a set of related software. A product can contain one fileset or multiple filesets. Products can contain filesets specific to different versions of the product and different hardware platforms. All these different filesets can be packaged together for distribution. A minimum of one product is required for a PSF.
Subproduct	A subproduct is a reference to groups of related filesets within a product. For example, you might create a subproduct that references a fileset grouping for the entire runtime configuration, manuals, or demonstration versions of the product. It is important to remember that subproducts only reference filesets and do not physically contain the fileset. The use of subproducts is optional and considered an advanced feature.

Bundle	A bundle is a reference to filesets, subproducts and/or products. Bundles may reference collections of filesets that belong to several different products. Creating bundles consisting of multiple filesets allows you to treat several filesets as a single entity. By specifying a bundle, all filesets under the bundle are included in the operation. It is important to remember that bundles only reference filesets, products, and/or subproducts and do not physically contain these software elements. The use of bundles is optional and considered an advanced feature.
Vendor	A vendor is a software element that lets you add additional, detailed information about a PSF.
Category	A category is a software element that can be used as a selection mechanism for a software package. This software element contains additional information about the category. The category information is referred to by the `category_tag` attribute within a product, bundle, subproduct, or fileset.

Software Package Hierarchy

The software package hierarchy provides the structure needed by the filesystem to identify packaged files. Figure 2-2 provides a graphical representation of the hierarchical structure to which a valid PSF must adhere.

Figure 2-2 Software Package Hierarchy



Containment vs. Reference

There are two types of relationships that exist within the hierarchical structure of a software package: **containment** and **reference**. If a software element acts as a container, then the software elements it is comprised of are physically contained. If a software element acts as a reference, then the software elements it is comprised of are virtually contained.

The difference between a containment relationship and a reference relationship can be illustrated by the notion that a bundle can be removed without actually removing the software elements that it references. However, removing a product always removes the filesets it contains, and the files contained in the filesets.

Table 2-1 provides a summary of a software package's structural elements, their functions, and their relationship to other elements. The structural elements are numbered to correspond with Figure 2-2 on page 26:

Table 2-1 Structural Elements: Functions and Relationships

Structural Element	Function	Relationship
Installed Software (1)	A delivered and installed software package.	The installed software is a valid and complete software package.
Product (2)	A collection of related filesets and optionally, subproducts and control scripts.	A product is a **container** for filesets, subproducts, and optionally, control scripts.
Bundle (3)	A collection of related filesets, subproducts, and/or products.	A bundle is a **reference** for groups of filesets, subproducts, or products.
Fileset (4)	A grouping of related files and control scripts.	A fileset is a **container** for files and control scripts. Filesets are **contained** in products.
Subproduct (5)	A grouping of related filesets.	A subproduct is a **reference** for groups of related filesets within a single product.
Control File (6)	A control file performs checks and other tasks in the software package.	Control files (scripts) are **contained** in one or more filesets and/or products.

Table 2-1 Structural Elements: Functions and Relationships (Continued)

Structural Element	Function	Relationship
File (7)	Files serve as the building blocks for a software package.	Files are **contained** in one or more filesets.

Product Specification File

A product specification file (PSF) defines the structure of a software package. The PSF provides a "road map" that identifies the software package according to its attributes, contents, compatibilities, and dependencies. SPB has a GUI that allows you to structure your PSF and define the attributes that apply to it.

The PSF maps files in your source file system area to create the destination filesystem on a customer's system. In addition, the PSF can direct the appropriate installation for the customer by filtering on operating system (OS) and/or machine type attributes that are defined in the PSF.

PSF Requirements and Recommendations

It is required that the PSF contain the following:

- One or more products
- One or more filesets and files for each product

It is recommended that the PSF contain the following:

- Vendor information for individual or groups of products
- The computer(s) and operating system(s) the software product supports
- A description attribute for all software elements contained in the PSF

Attributes

Attributes define the characteristics of the software elements in the software package. For example, the attributes defined for a software package can identify some of the following metadata:

- Where the product is installed;
- What revision of the product is installed;
- What architecture the product supports;
- Who developed the product; and

- What operating system(s) support the product.

Each of the software element classes has its own set of attributes, and each attribute has a value that defines it. Most attributes are optional; however, there are a few required attributes. Assigning valid attributes to software elements provides more control and precision when the software package is installed, updated, and removed. The table below provides a list of attributes that are required for a valid PSF.

Table 2-2 Required Attribute Values

Software Element	Required Attribute
Product	tag
Fileset	tag
Subproduct	tag, contents
Bundle	tag, contents
Vendor	tag
Category	tag

Additional attributes are recommended for creating a more detailed software package. If you use one of the software elements listed in Table 2-3, it is highly recommended to set the following attributes:

Table 2-3 Recommended Attribute Values

Software Element	Recommended Attribute
Product	title, revision
Fileset	title, revision
Subproduct	title
Bundle	title, revision
Vendor	title
Category	title
Corequisites	revision, architecture, vendor
Prerequisites	revision, architecture, vendor

Packaging Policies

Packaging policies are a set of rules that must be consistently followed to create a valid software package. Packaging policies help ensure that the software package you create in SPB is consistently named and structured.

SPB validates your PSF against packaging policies, eliminating the need for you to learn the intricacies of software package structuring. By following a standard set of policies, you will experience fewer problems, problems that can turn into longer test cycles and customer defects. Packaging policies are implemented as Extensible Markup Language (XML) files. The default policies supplied with SPB are located in `/opt/spb/data` and are named as follows:

- For HP-UX 11i v3 (B.11.31) - the default policy file is `113XPolicies_SD.xml`
- For HP-UX 11i v2 (B.11.23) - the default policy file is `112XPolicies_SD.xml`
- For HP-UX 11i v1 (B.11.11) - the default policy file is `11XPolicies_SD.xml`

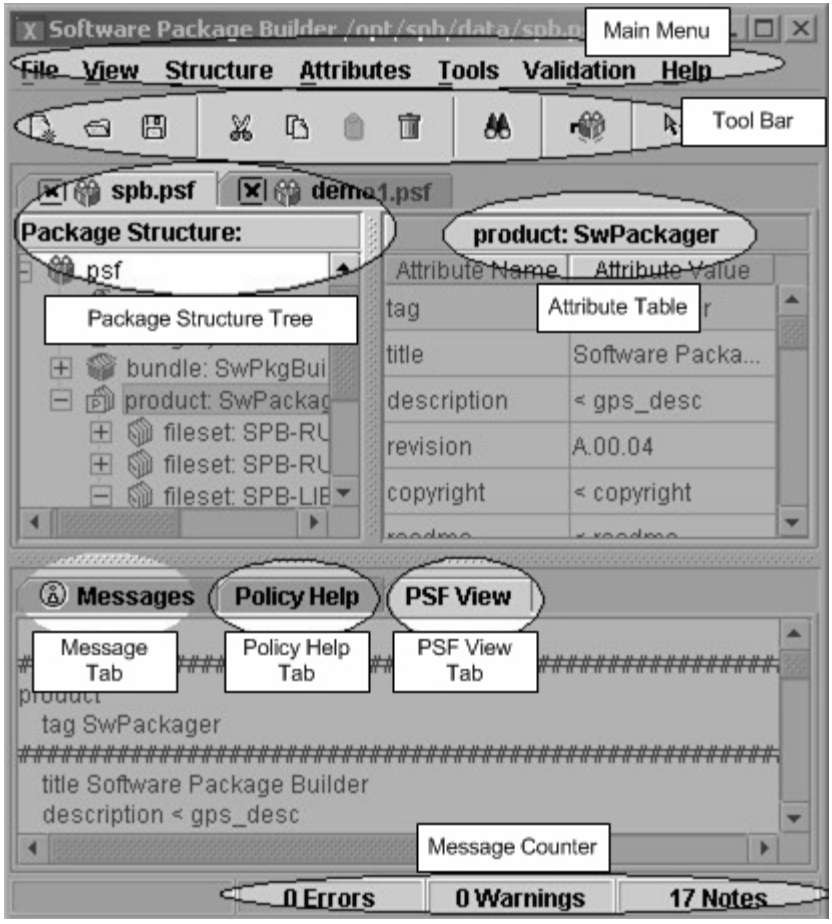
3 Software Package Builder Features

This chapter introduces you to the graphical user interface (GUI) and its features. The following topics are covered in this chapter:

Introduction

The SPB GUI is designed to simplify the process of creating a software package by providing a visual method for creating the PSF, its software elements, attributes, and structure, as well as automating validation of the PSF against packaging policy rules. Figure 3-1 displays the main window in the SPB GUI and the regions it contains.

Figure 3-1 SPB GUI



Screen Regions

The SPB GUI is comprised of the following main screen regions which will be described in detail in the proceeding sections:

Package Structure

The Package Structure displays a navigable hierarchy of the software elements contained in the PSF. From the Package Structure region, you can manage and build your PSF, view attribute information, edit the software package structure, expand and collapse nodes, view detailed information on a software element, and view detailed information on software specification attributes and their status.

- **Display a Software Element Attribute Table -** Select a software element from the Package Structure to display its attribute information in the Attribute Table.
- **Display a Software Specification Attribute Table -** Select a software specification element from the Package Structure to display its attribute information in the Software Specification table.
- **Expand and Collapse Nodes -** Expand or collapse software elements.
- **Follow References -** Follow a reference to the actual software element within the Package Structure and return to the reference of origin.

Depot Region

The depot region displays the properties and the structure of the active depot. Within SPB, the depot is displayed as READ-ONLY. However, you can copy information from the depot and paste it into a PSF. You can also create a PSF from a depot.

Attribute Table

The Attribute Table displays attribute names and values for the software elements contained in the PSF. The Attribute Table displays the associated attribute information for the software element or reference you have selected in the Package Structure.

- **Drop-Down Lists -** For attributes with boolean values, a drop-down list appears when you click in the Attribute Value field.
- **Enumerated Lists -** For SD-UX specific values, an enumerated list appears when you click in the Attribute Value field.
- **Default Values -** SPB provides default attribute values for a select group of attributes.
- **File Browser -** For specifying a file's path and name.

Messages Tab

The Messages tab displays error messages that are generated during validation. The user can filter the validation message display based on the severity of the message. Corresponding information displays in the Policy Help tab to assist you in correcting errors.

- The following three types of messages can be generated:
  - **W (Warning) -** Indicates something unexpected and potentially undesirable occurred. A warning does not prevent an SD session from proceeding.
  - **E (Error) -** Indicates an invalid value provided by the packager which may eventually prevent the product from being packaged correctly
  - **N (Note) -** Indicates an event that is not erroneous, unexpected, or undesirable, but about which the packager should be aware.

- **Select Specific Messages -** By selecting a specific message, the software element associated with the message appears highlighted in the Project Structure tree and the corresponding attribute appears highlighted in the Attribute Table.

Message Counter

A message counter is persistent in the lower, right-hand corner of the SPB main window. The counter displays the active PSF's validation status. The number of errors, warnings, and notes are displayed. The counter refreshes automatically upon data entry, revalidation, etc.

Policy Help Tab

The Policy Help tab displays detailed information on packaging policy rules used to validate your PSF. You can use policy help information to assist in resolving validation errors in your PSF.

- **Display Policy Help for a Specific Attribute -** Select an attribute name from the Attribute Table and policy help information for the selected attribute displays.
- **Display Policy Help for a Validation Error -** Select a validation error and click the Policy Help tab for information to aid in error resolution.
- **Access additional attribute information -** Click the SPB Help link from the Policy Help tab to view additional information from the SPB Help system.

PSF View

The PSF View tab allows you to view portions of the PSF as you build it. The PSF display is read-only text.

Select a software element from the Package Structure for which you are interested in viewing the PSF syntax and select the PSF View tab to display the PSF syntax.

Menus

The following is a brief overview of the menu options provided in the SPB GUI:

- F**ile Menu -** Contains the standard file-related functions.
- **View Menu -** Provides options for changing your view of the Package Structure and filtering on various attributes.
- **Structure Menu -** Contains commands for adding software elements to the Package Structure. This menu provides basic editing functions.
- **Attributes Menu -** Contains commands for adding and editing Vendor Defined Attributes.
- **Tools Menu -** Contains options for building a package.
- **Validation Menu -** Contains options for changing the view of the Messages tab and filtering on the validating message level(s) to display.
- **Help Menu -** Provides access to the help system, tutorial and context-sensitive help.

Tool Bar

The icons displayed in the Toolbar provide shortcuts for some of the most commonly used commands.

Additional Information

For more information about SPB, see the SPB Help system and Quick Start Tutorial. An example of some of the topics available in the online help include:

- Screen Regions
- Dialog Boxes
- Menus
- Accessing Help
- Using the SPB CLI
- Using the SPB GUI

4 Getting Started with Software Package Builder

This chapter provides tasks to introduce you with the features of SPB using the graphical user interface (GUI) and the command line interface (CLI). This chapter covers the following topics:

Getting Started Using the SPB GUI

Get started using SPB by familiarizing yourself with how to create a PSF, add a product and filesets, manage fileset content, validate a PSF, and set attributes.

Creating a New PSF

This procedure walks you through the steps required to create a valid PSF.

To create a PSF

Step 1. Launch the SPB GUI.

```
/opt/spb/bin/spb
```

Step 2. From the main menu, select **File->New PSF**.

Step 3. Select **File->Save As** to name and save the new PSF.

Step 4. Select the new PSF in the Package Structure.
Its associated attributes display in the Attribute table.

NOTE At a minimum, a valid PSF must contain one product, one fileset, and one file.

To create a product and add filesets

Step 1. From the main menu, select **Structure->Add Element(s)->Product**.
The Product dialog box displays.

Step 2. Enter a product name.

Step 3. Select a predefined fileset name by selecting from the list provided
OR
Enter a new name in the Fileset Name field.

Step 4. Click **Add**.

Step 5. To save and exit, click **OK** once all filesets have been added to the product.

Managing Fileset Content

Step 1. From the Package Structure, highlight the fileset to which you want to add files.

Step 2. From the Structure menu, select **Add Element(s)->Files**.
The Manage Fileset Content dialog is displayed.

To create a destination filesystem

Step 1. Click **Add Directory**.
A new directory, titled NewDirectory1, appears in the Destination Filesystem.

Step 2. Double-click on the **NewDirectory1**.
This places you in edit mode.

Step 3. Replace NewDirectory1 by typing your new directory path and press **ENTER**.
The entire path is automatically built for you.

Step 4. Repeat this process until you have created the structure for the destination filesystem.

IMPORTANT A source path must be specified for all directories added to the Destination Filesystem.

To map a file from the source to the destination filesystem

Step 1. From the Destination Filesystem, select the directory into which you want to map files.

Step 2. Navigate the Source Filesystem and locate the appropriate directory path.

Step 3. Select the directory or files you want to add to the Destination Filesystem.

Step 4. Click Add. The directory or file(s) are added to the selected directory in the Destination Filesystem.

Step 5. Repeat this process until you have mapped all the appropriate source files to the Destination Filesystem.

Step 6. From the Destination Filesystem, select the directory you want to map files into.

To set file (or directory) permissions

Step 1. Select the appropriate file (or directory) from the Destination Filesystem.

Step 2. From the File Attributes table (or Directory Attributes table), click in the Mode field.

Step 3. Select the mode appropriate for your file (or directory).

Step 4. Once you have set all desired file permissions, click **OK** to exit and return to the main window.

TIP You can apply a common mode across a select group of files in the File Attributes table by right-clicking in a Mode field and selecting Apply to All.

NOTE SPB by default assigns the file mode access for a destination file or directory by inheriting the setting from the original source. If you wish to accept the default settings, you need not do anything.

Validating a PSF

Within SPB, validation occurs when you:

- Open an existing PSF
- Enter data

The results of the validation process appear on the Messages tab. If the PSF is valid, the message `Validation Status: PSF Passed Validation` appears. If it is invalid, you should debug the PSF as directed by the information provided in the Policy Help tab.

Setting Attributes

Most attributes are optional; however, there are a few required attributes. Setting optional attributes can help to provide more control and precision when the software package is installed, updated, and removed.

You can filter which attributes you want to display in the Attribute Table by selecting to view only the required and currently set attributes.

To filter the attribute display

Step 1. Highlight any software element in the Package Structure.

Step 2. From the View menu, select Show Required or Set Attributes.

Step 3. View how the Attribute Table display has changed.
The required attributes that you may have entered, along with any pre-set, default attribute display.

To set attributes

Step 1. Highlight a software element in the Package Structure.
Its associated Attribute Table displays.

Step 2. In the Attribute Table, click in the desired Attribute Value field and enter valid data.

NOTE At any time, you may select the Policy Help tab to review packaging policy information for the attribute you have currently selected.

Step 3. Press **Enter**.

Step 4. Verify you have entered a valid attribute value by looking in the Messages tab.

Continue this process until you have entered all desired attribute values.

NOTE Remember, you are able to validate your PSF in real-time. Every time you enter new data into the PSF, SPB revalidates the file.

Using the SPB Command Line Interface

From the command line interface, you can perform the following tasks:

- Edit a PSF
- Validate a PSF
- Specify a user-defined packaging policy rules file

Editing from the CLI

You can make edits to a PSF from the command line.

To replace an attribute value for a specified file at the command line, use the following two options in combination:

- The `-f` option specifies the PSF to be edited or validated.
- The `-e` option specifies the attribute value(s) to be replaced in the PSF indicated by the `-f` option.

NOTE The modified PSF is written to `stdout` unless re-directed to a file using the `-o` option.

Example To replace the revision of product `SPBdemo` in the PSF file `/opt/SPB/demo` with revision A.2.0, you would enter the following:

```
spb -f /opt/SPB/demo -e SPBdemo revision A.2.0 -o
SPBdemoRev2.psf
```

Validating from the CLI

To validate a specified file from the command line, use the following two options in combination: The `-f` option specifies the PSF to be edited or validated. The `-V` option validates the PSF indicated by the `-f` option.

- The `-f` option specifies the PSF to be edited or validated.
- The `-V` option validates the PSF indicated by the `-f` option.

Example

To validate the PSF file located in `/opt/SPB/demo/demo1`, you would type the following:

```
spb -f /opt/SPB/demo/demo1 -V
```

Incorporating SPB into Automated Processes

For packagers with automated processes, the build process usually includes generating a PSF. To take advantage of SPB's validation capability, include the SPB validation command after the PSF generation step in the automated process.

Example

To perform validation on the generated PSF, invoke the following command in your process:

```
spb -f psf_file -V 2> psferrors
```

where `psf_file` is the name of the generated PSF and `psferrors` is the file where validation errors are stored. Packagers can then examine this file and determine the appropriate course of action. You can debug the PSF using the SPB GUI with packaging policy help located in the Policy Help tab. The return values of the validation also indicate which message was the most severe message.

IMPORTANT

SPB cannot read a PSF from `stdin`, therefore, it cannot be used in a pipe symbol (|). The following command will not work correctly:

```
cat psf_file | spb -V
```

Return Values

Upon completion of the validation process using the CLI, SPB returns one of the following values to indicate the severity of the message:

`0`	Normal exit. Validation performed with no errors.
`1`	Validation found a warning.
`2`	Validation found an error.

For additional information on this and other SPB command line options, refer to the *spb* (1M) manpage.

Additional Information

For more information about SPB, see the SPB Help system and Quick Start Tutorial. An example of some of the topics available in the online help include:

- Product Dialog Box
- Manage Fileset Content Dialog Box
- Overriding Default File Permissions
- File Mapping Options
- Addressing Packaging Problems
- Restructuring the Software Package
- Modifying an Existing Package for the Next Release

5 Advanced Features

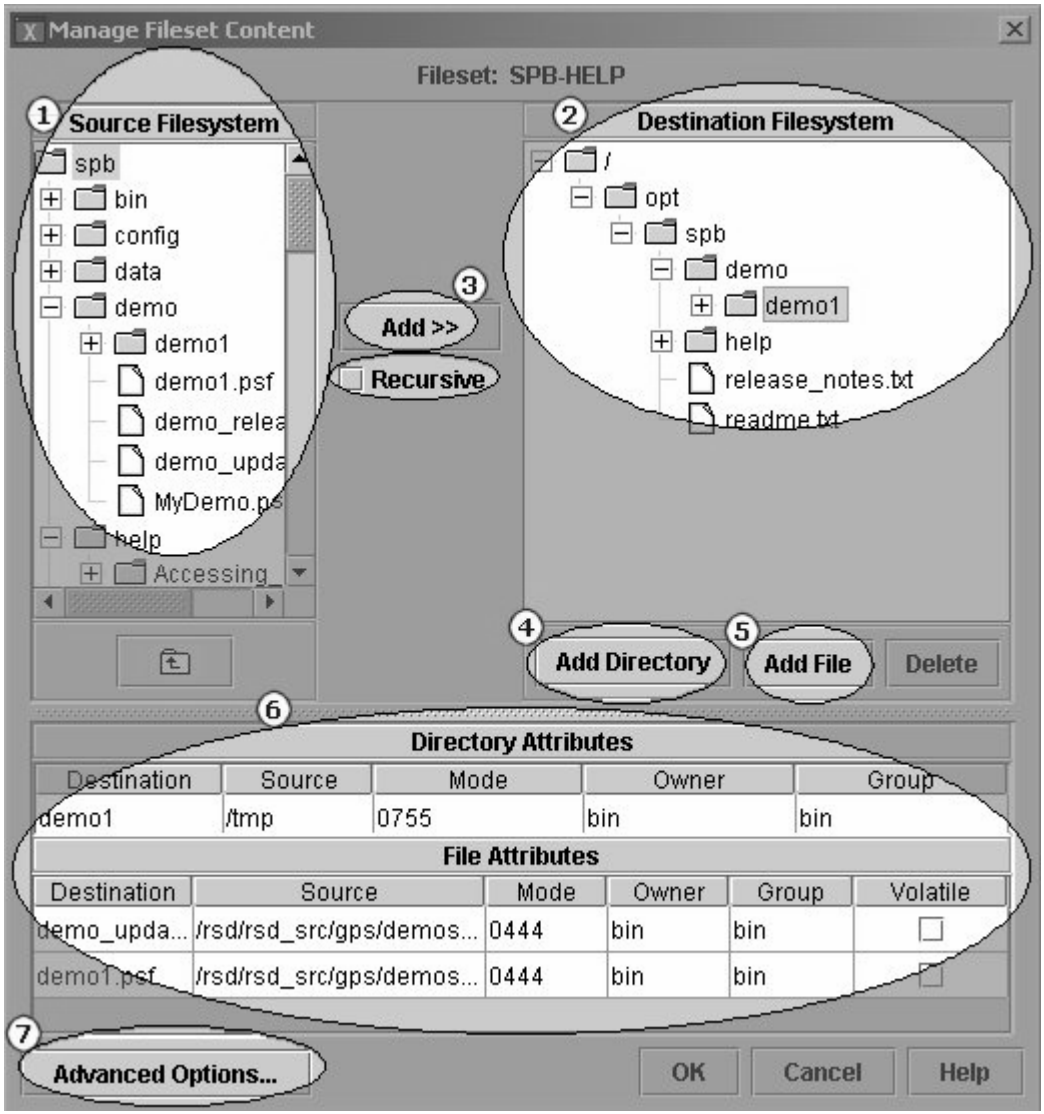
If you are an experienced packager, you might want to use SPB to add advanced features to your PSF.

This chapter covers the following advanced topics:

Managing Fileset Content

This section provides additional information on the Manage Fileset Content dialog box and its advanced features. The following figure highlights the regions and features.

Figure 5-1 Manage Fileset Content Dialog Box



The Manage Fileset Content dialog allows you to map source files and directories to the destination filesystem and exercise control over directory and file attributes. The following is a description of the regions and features identified in Figure 5-1 on page 51:

Regions and Features

1. **Source Filesystem -** Allows navigation of the Source Filesystem for selection of files and directories to be mapped to the Destination Filesystem.
2. **Add button -** Adds the files or directories selected from the Source Filesystem to the Destination Filesystem. Multiple files or directories may be selected for addition. If the **Recursive checkbox** is selected, all files or directories contained in the selected directory will be implicitly added.
3. **Move-up Directory Level button -** Allows you to move up one directory level in the Source Filesystem. The button is represented by a folder and up arrow, located at the bottom of the Source Filesystem.
4. **Destination Filesystem -** Displays the destination filesystem structure you have created for the package.
5. **Destination Filesystem buttons:**
   - **Add Directory button -** Adds a new directory to the Destination Filesystem. You can edit the directory name in the Destination Filesystem view or in the Directory Attributes table. Multiple directories can be added by specifying a path for the directory name.
   - **Add File button -** Adds a new file to the Destination Filesystem.
6. **Directory Attributes and File Attributes Tables:**
   - **Directory Attributes table -** Allows you to set permissions and other system properties.
   - **Files Attributes table -** Allows you to edit the source path, and set permissions and other system properties.
7. **Advanced Options button -** Launches the Advanced Options dialog box that allows you to customize file mode access permissions and enable the Implicit and/or Include file mapping functionality.

Using Advanced Features

File Mapping Options

Numerous options are available from within the Manage Fileset Content dialog box when mapping files from the Source Filesystem to the Destination Filesystem:

- **Recursive -** The recursive option adds the selected directory and all its contents recursively. Individual filenames are listed in the PSF.
- **File * -** This option is similar to the Recursive option; however, all files are implicitly added and represented only by an asterisk (*). The individual filenames are not listed in the PSF using this option. If you want to recursively include files and directories from the Source Filesystem without explicitly listing each file and directory, select the File * option.
- **Include -** This option allows you to enable the ability to map a file to the Destination Filesystem, which consists of a list of files, in PSF syntax, to include in the package.

IMPORTANT

If **File *** is used to add files, you will not be able to display the individual filenames from the Destination Filesystem. This makes it difficult to determine if you are delivering more files or directories than intended. A common problem encountered when using the File * option is the accidental inclusion of source control directories (e.g., RCS, CVS) and/or editor scratch files to the package. Selecting the **Recursive** option is an alternative way to explicitly add all files and directories under a particular directory. Using the Recursive option allows the packager to display and verify the files and directories that will be included, avoiding accidental inclusion of unnecessary files.

Setting File Mapping Options

You can set one of three file mapping options using the following steps:

To set the recursive option

Step 1. Select the **Recursive** checkbox.

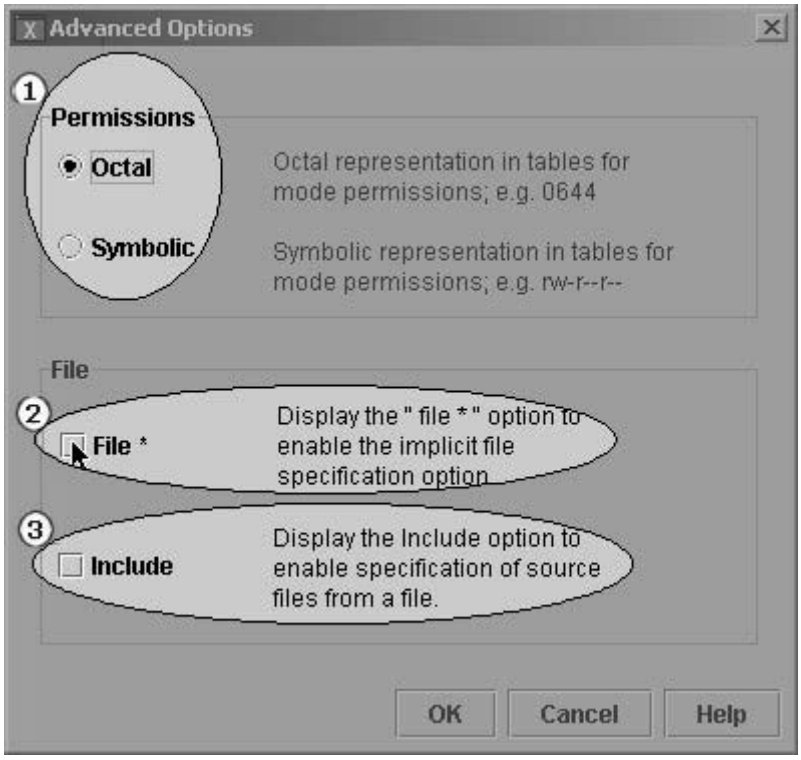
Step 2. Once the appropriate source and destination directories have been selected, click **Add**.

Step 3. Continue adding directories recursively or clear the **Recursive** checkbox.

To set the file * or include option

Step 1. Click the **Advanced Options** button.
The Advanced Options dialog box displays, as shown in Figure 5-2.

Figure 5-2 Advanced Options Dialog Box



Step 2. Select the file mapping option you want to enable by clicking in the check box. This will enable the mapping option and display a checkbox on the Manage Fileset Content main window, as shown below.

Figure 5-3 File Mapping Options Enabled

Step 3. From the main window, select the appropriate file mapping option.

Step 4. Once the source and destination directories have been selected, click **Add**.

Step 5. Continue adding directories using the selected file mapping method or clear the checkbox.

NOTE Only one file mapping option can be applied at a time. Once you have selected a file mapping option, you must clear the checkbox to disable the option.

File Mode Access Permissions

In the Mode field of the Directory Atributes and File Attributes tables (as shown in Figure 5-1 on page 51) a drop-down list is displayed that allows you to select file mode access permissions. You can select from the following options:

For File Attributes:

- Executable (0555)
- Data (0444)
- Writable (0644)
- Inherit - File will inherit permissions from the file system. The default mode permission is Inherit.
- Specify - A Mode dialog box appears allowing you to set your own permissions.

For Directory Attributes:

- Directory (0755)
- Inherit - File will inherit permissions from the directory. The default mode permission is Inherit.
- Specify - A Mode dialog box appears allowing you to set your own permissions.

To apply a mode to all files

Step 1. Place the cursor in any of the file's Mode fields and right-click. A drop-down list is displayed.

Step 2. Select **Apply to All**.
A **Mode** dialog box appears.

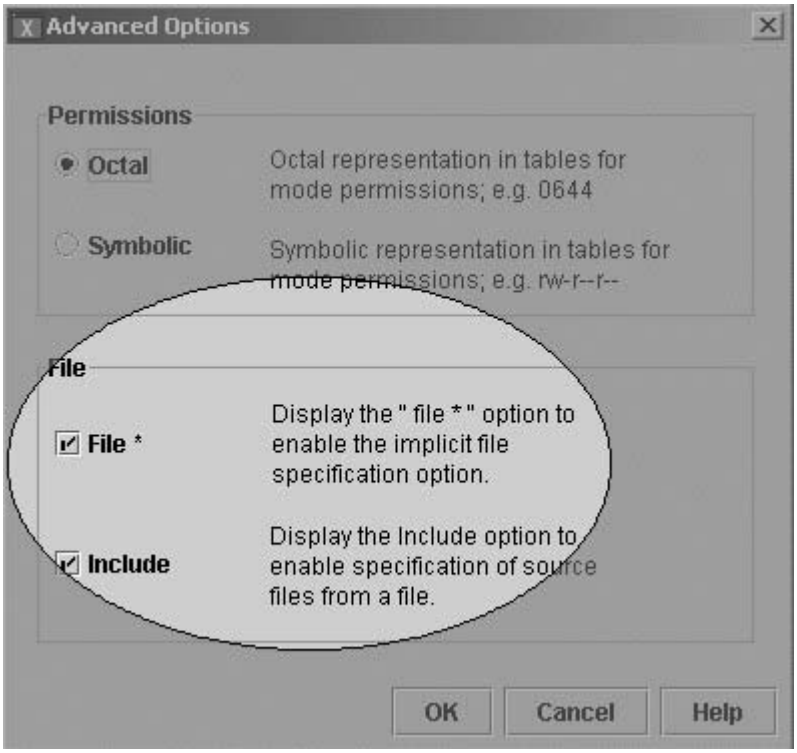
Step 3. Select the appropriate mode for all files that currently appear in the File Attributes table.

To change the default representation of the Mode field

The default representation for file mode access permissions is octal (e.g., 0644). However, you have the option to display the symbolic representation for permissions (e.g., rw-r--r--).

Step 1. Select the **Advanced Options** button.
The Advanced Options dialog box displays, as shown below.

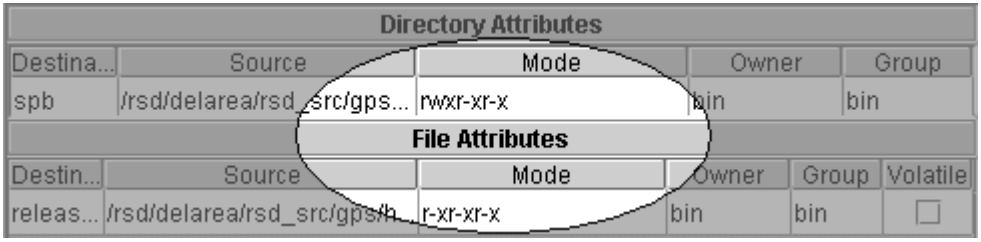
Figure 5-4 Permissions Selections



Step 2. Select **Symbolic** to change the mode permissions display.

Step 3. Click **OK**. The Mode field now displays a symbolic representation, as shown below.

Figure 5-5 Symbolic Permissions Representation



Creating and Using a Subproduct

Using subproducts provides a way for you to organize filesets into different groupings beyond that provided within a product. A subproduct is a reference to groups of logically related filesets. For example, you might create a subproduct that references a fileset grouping for the entire runtime configuration. It is important to remember that subproducts only *reference* filesets and do not physically *contain* them.

Specifying a subproduct lets you group filesets within a larger product specification. Attribute values are used to define the subproduct. If a subproduct is specified, the subproduct attributes, `tag` and `contents` are required for a valid PSF.

To create a subproduct

Step 1. Select the appropriate product element in the Package Structure that contains filesets.

Step 2. From the main menu, select **Structure->Add Element(s)->Subproduct**.

Step 3. Enter a subproduct name.

Step 4. Select the appropriate filesets to add to the subproduct.

Step 5. Click **Add**.

Step 6. Continue this process until all subproduct content has been added.

Step 7. To save and exit, click **OK** once all contents have been added.

Creating and Using a Bundle

A bundle is a reference to filesets, products, and/or subproducts. Bundles may reference collections of filesets that belong to several different products. Creating bundles consisting of multiple filesets allows you to treat several filesets as a single entity. By specifying a bundle, all filesets under the bundle are included in an operation. It is important to remember that bundles only *reference* filesets, subproducts, and/or products and do not physically *contain* these software elements.

NOTE Generally, performing a single operation on a bundle is the same as performing it individually on all the filesets listed in the bundle.

To create a bundle

Step 1. From the main menu, select **Structure->Add Elements(s)->Bundle**.

Step 2. Enter a bundle name.

Step 3. Select a software element from the Available Product Content list you want to add to the bundle.

Step 4. Click **Add**.

Step 5. To save and exit, click **OK** once all contents have been added to the bundle.

Creating and Using a Vendor or Category

Adding a vendor or category to your PSF provides more detail about its contents. For example you can:

- Add a vendor to display information regarding the PSF contents. The vendor's information will display when using the `swlist` command.
- Add a category to further identify the software package contents.

To add a vendor or category

Step 1. From the main menu, select **Structure->Add Element(s)->Vendor** (or **Category**, as appropriate.) The new tag displays in the Package Structure, and its associated Attribute Table.

Step 2. In the Attribute Table:

- (Required) Enter a `tag` in the Attribute Value field.
- (Optional) Enter a `title` in the Attribute Title field.
- (Optional) Enter a `description` in the Attribute Value field.

Creating and Using Vendor Defined Attributes

Vendor Defined Attributes (VDAs) are optional but can be useful in providing additional information about a software package. A VDA may be created for any software element in the PSF. VDAs are noted during packaging modification with the `swmodify` command. You can list any attribute with the `swlist` command.

To create a vendor defined attribute

Step 1. In the **Package Structure**, select the software element for which you want to create a VDA.

Step 2. From the main menu, select **Attributes->Vendor Defined Attributes**. The Vendor Defined Attributes dialog displays.

Step 3. Enter an Attribute Name.

Step 4. Enter the associated Attribute Value.

Step 5. Repeat Steps 3 and 4 until you have added all the VDAs you require.

Step 6. Click **OK**.
The VDA displays at the bottom of the Attribute Table for the selected software element.

To edit a vendor defined attribute

Once you have created a VDA, you can edit the attribute value as you would any other attribute within the Attribute Table:

Step 1. From the main menu, navigate to **Attributes->Vendor Defined Attributes**.

Step 2. From the Vendor Defined Attributes dialog box, you can perform the following tasks:

- Edit a VDA name.
- Delete a VDA.
- Arrange a VDAs order of appearance in the Attribute Table.

Overview of Software Specification Attributes

Software specification attributes are used to define a relationship or an assignment between a designated software element and other software element(s). Every attribute value in the PSF must use a designated value type, for **software specification** attributes this value type is `software_specification`. By using the `software_specification` value type to define a software specification attribute, you gain the ability to specify the software elements in greater detail.

There are three types of software specification attributes:

- Dependency attributes
  - — Corequisites attributes
  - — Prerequisites attributes
- Ancestor attributes
- Contents attributes

NOTE

Software specification attributes are treated differently than other attributes within the SPB GUI. For a software packager, it can be important to view the real-time status of software specification attributes. For this reason, these attributes are displayed in the Package Structure beneath the designated software element and are preceded by an icon which indicates its resolution status.

Software Specification Attributes

Dependency Attributes - A dependency attribute can only be specified for a fileset. Dependency attributes define a relationship between a specified fileset and another software element (fileset or product). The specified fileset is dependent on the other software element in the manner designated. A fileset dependency can be defined between the dependent fileset and the following:

- A fileset(s) residing in the same product
- A fileset(s) residing in a different product
- An entire product

Corequisites The corequisites attribute defines a fileset dependency that requires another fileset or product to be installed and configured in order for the dependent fileset to operate correctly. Multiple corequisites may be defined.

Prerequisites The prerequisites attribute defines a fileset dependency that requires another fileset to be installed and/or configured correctly before it can be installed or configured. Prerequisites imply an install-time dependency. Multiple prerequisites may be defined.

Ancestor Attribute

The ancestor attribute defines the name of a previous version of a fileset. This attribute designates the list of filesets that will match the current fileset when installed on a target system, if the `match_target` installation option is specified.

Contents Attribute

The contents attribute defines the list of the software elements contained within a subproduct or bundle. This attribute is automatically generated when you create and add content to a bundle or subproduct. You can only edit this attribute when it is used to define bundle contents.

Resolving Software Specifications

For a software specification attribute to be resolved with respect to other software on the source depot, it must be:

- Complete (if the dependency is an entire product or subproduct it must exist completely in the source depot),
- Free of errors (e.g., no incompatibility errors), and
- Available from the source depot or exist on the target host. (If the dependency is not available from the source, the dependency must exist on the target host.)

SPB and Validation

When assigning dependencies in your PSF using the SPB GUI, you should be aware of what SPB will and will not validate or resolve.

SPB will:

- Validate syntax for defined software specification attribute values
- Validate software specification attributes in the local PSF
- Validate dependency attributes contained in an OR corequisites set or an OR prerequisites set

SPB will not:

- Resolve a software specification attribute that is external to the local PSF (e.g., in a depot on another system)
- Import a software specification attribute that is external to the local PSF

Software elements and their associated software specification attributes are displayed in the Package Structure. You can view the status of a software specification attribute and where applicable, edit its associated attributes.

SPB provides real-time verification for the status of software specification attributes. Table 5-1 shows the Package Structure representation symbols and the status each defines:

Table 5-1 Software Specification Status

Icon Representation	Status
	Resolved
	Unresolved but may be found externally from the local PSF and will `swpackage` without an error
	Unresolved and will cause an error with `swpackage`

Working with Dependency Attributes

Software that depends on other software to install or run correctly is considered to have a dependency. When you specify software for the `swconfig`, `swcopy`, `swinstall`, `swremove`, `swverify` commands, these commands may automatically select additional software to meet dependencies.

Multiple dependency attributes may be specified for a corequisites attribute or a prerequisites attribute. There are two types of relationships that can be used when defining multiple dependency attributes:

- **AND -** Use the AND relationship to specify multiple dependency attributes, each of which must be satisfied. The AND relationship is the default.
- **OR -** Use the OR relationship to specify multiple dependency attributes in a set, where only one of the set must satisfy the dependency

NOTE The following procedures apply to both `corequisites` or `prerequisites` dependency attributes.

To add a dependency attribute using the AND relationship

NOTE When setting a dependency attribute, the AND relationship is the default.

Step 1. From the Package Structure, select the fileset for which you want to add a `corequisites` attribute.

Step 2. Select **Structure->Add Element(s)->Corequisites**.
The Corequisites dialog box appears.

Step 3. From the Available Content, select the software elements you want to add to the fileset as a `corequisites` attribute.

Step 4. Click **Add**.

Step 5. Continue adding corequisites as needed.

Step 6. Click **OK** once all `corequisites` attributes have been added to the fileset.

To add a dependency attribute using the OR relationship

IMPORTANT Use the OR relationship when you need to specify multiple `corequisites` or `prerequisites` attributes in a set, where only one of the set must satisfy the dependency. An OR relationship is specified within an OR corequisites set (or OR prerequisite set). The software specification value for a given OR set is comprised of the individual

software specification for each `corequisites` (or `prerequisites`) attribute it contains. When a new corequisite or prerequisite is added to an OR set, the software specification value for that attribute is appended to the OR set's software specification and separated by the pipe symbol (|).

Step 1. From the Package Structure, select the fileset for which you want to add an OR corequisites set.

Step 2. Select **Structure->Add Element(s)->Corequisites.** The Corequisites dialog box appears.

Step 3. Select the OR Relations tab.

Step 4. Click **Add Set**. A new, empty OR corequisites set is added to the Fileset Content.

Step 5. From the Fileset Content, select the appropriate OR corequisites set.

Step 6. From the Available Content, select the software element(s) you want to add to the OR corequisites set.
Multiple software elements may be selected to add to the set.

Step 7. Click **Add**. The OR corequisites set now contains the additional `corequisites` attributes.

Step 8. Click **OK** once all OR corequisites sets and their contents have been added.

To add remote content as a dependency attribute

NOTE For this procedure, you will use an existing `corequisites` attribute as a template for specifying remote content as a `corequisites` attribute.

Step 1. From the Package Structure, select the fileset for which you want to add remote content.

Step 2. Select **Structure->Add Element(s)->Corequisites** .The Corequisites dialog box appears.

Step 3. From the Fileset Content, select the `corequisites` attribute you want to use as a template.

Step 4. Edit the Software Spec field as appropriate to specify the remote content.

IMPORTANT The software specification cannot contain spaces.

Step 5. Click **Add Content**.
The Fileset Content now contains the new, remote `corequisites` attribute.

Step 6. Continue adding `corequisites` attributes as needed or click **OK** to exit.

Working with Depots

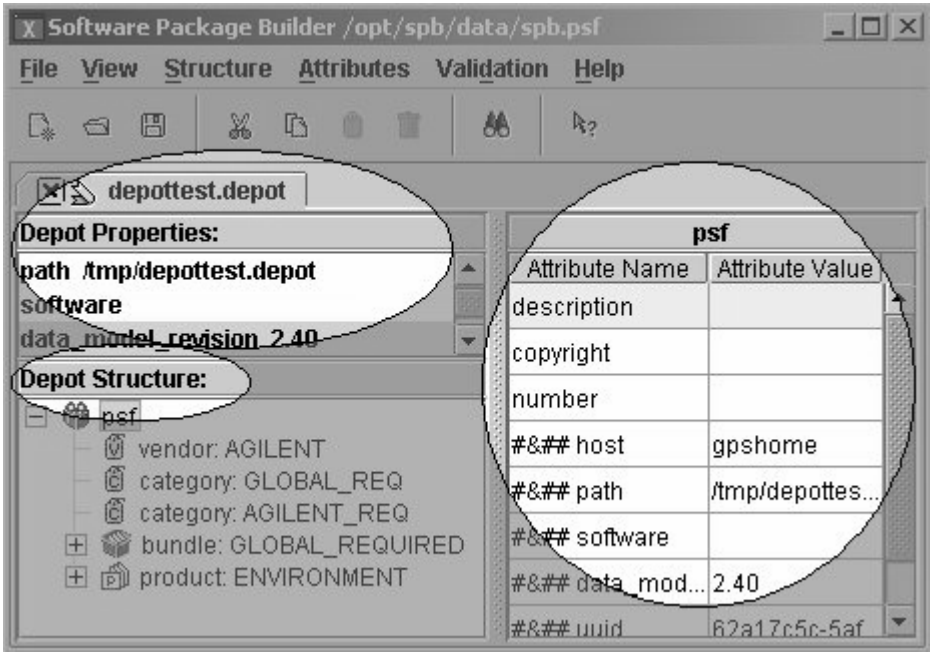
Within SPB you can search for and open depots. In the Depot region, the depot properties and the depot structure are displayed. When a depot is opened in SPB, it is READ-ONLY.

Within SPB you can perform the following depot-related tasks:

- Visually compare two or more depots.
- Create a PSF from a depot.
- Validate a depot.

Refer to Figure 5-6 to view the Depot region, which includes the depot properties and depot structure displays.

Figure 5-6 Depot Regions



Validating a Depot

To validate a depot perform the following:

1. From the main menu, select **File->Open Depot**.
2. Specify the hostname, path and name of the depot.
3. Review the validation messages for the depot.

Depot validation occurs in the exact same manner as a PSF. Upon opening the depot, it is automatically validated.

NOTE The depot is opened as a READ-ONLY file. Validation errors can be viewed but cannot be resolved from within SPB.

Comparing Two Depots

Use SPB to compare two or more depots that have identical content but different revision information. This information is displayed in the Depot Properties and in the Attribute Table.

1. Once a depot is open and active, highlight the PSF element.
2. View the Attribute Table to compare depot properties

NOTE The depot properties, which are set by SD when the depot is created are not valid PSF attributes. Therefore, the Depot Properties will appear in the PSF as comments.

Creating a PSF from a Depot

Use SPB to create a PSF template with similar software elements from a depot. Once the PSF is created, you can edit accordingly.

1. Select the appropriate depot tab.
2. From the main menu, select **File->Save As**.

3. Rename the depot and save as a PSF.
   The new PSF is created and its associated tab appears at the top of the Package Structure.

NOTE The depot properties, which are set by SD when the depot is created are not valid PSF attributes. Therefore, the Depot Properties will appear in the PSF as comments.When a PSF is created from a depot, the source information for files is lost.

Using Control Scripts

You can use control scripts to customize the behavior of your software package. SD-UX supports execution of both product and fileset control scripts. These shell scripts allow you to perform customized checks and operations as part of your regular software management tasks. The `swinstall`, `swconfig`, `swverify`, `swask`, and `swremove` commands can execute one or more of these scripts. Control scripts are usually supplied by software vendors, but you can write your own. All control scripts are optional.

Product level control scripts are run if any fileset within that product is selected for installation, configuration, verification, or removal. The activities in product control scripts must pertain to *all* filesets in that product, but not to any one fileset in particular.

Actions you want to apply to every fileset in a product should be in the appropriate product level control script. Fileset scripts must pertain only to the installation, configuration, or removal of that fileset, and not to any other fileset or to a parent product.

Control scripts can perform a wide variety of customizing and configuration tasks, such as (but not limited to):

- Verifying if someone is actively using the product and, if so, preventing reinstallation, update or removal
- Ensuring the local host system is compatible with the software (scripts can check beyond the compatibility enforced by the product's `uname` attributes)
- Removing obsolete files or previously installed versions of the product
- Creating links to, or additional copies of, files after they have been installed
- Copying configurable files into place on first-time installation
- Conditionally copying configurable files into place on later updates
- Modifying existing configuration files for new features
- Rebuilding custom versions of configuration files
- Creating device files or custom programs

- Killing and/or starting daemons

For more detailed information, refer to the chapter regarding the use of control scripts in the *Software Distributor Administration Guide* located at the following Web site:

`http://docs.hp.com/en/SD`

Additional Information

For more information about SPB, see the SPB Help system and Quick Start Tutorial. An example of some of the topics available in the online help include:

- Advanced Options Dialog Box
- Bundles Dialog Box
- Subproducts Dialog Box
- Vendor Defined Attributes Dialog Box
- Dependency Attributes
- Setting an OR Relationship for Dependency Attributes
- Working with Software Specification Attributes
  - — Corequisites Dialog Box
  - — Prerequisites Dialog Box
  - — Ancestors Dialog Box
- Running the `swpackage` Command
  - — Tools Menu
  - — Configuration Dialog Box
  - — Command Output Tab

Glossary

A-B

ancestor An attribute that names a previous version of a fileset. This is used to match filesets on a target system. If the `match_target` option is set to true, SD-UX matches the ancestor fileset name to the new fileset name.

and relationship The default relationship for specifying one or more dependency attributes (corequisites or prerequisites) where all dependencies must be satisfied.

architecture An attribute that represents the operating system platform on which the product runs. (e.g., IA/PA)

attribute Information that describes a software elements characteristics. Attributes are an essential part of the product specification file (PSF), providing such information as a product's name, title and description.

bundle A collection of references to filesets and/or products grouped for a specific purpose. By specifying a bundle, all products or filesets referenced in that bundle are automatically included in the operation.

C

category The type of software being packaged.

checkinstall script An optional script associated with a product or fileset that is executed by `swinstall` during the analysis phase. The result returned by the script determines if the fileset can be installed or updated.

checkremove script An optional script associated with a fileset that is executed during the `swremove` analysis phase. The result returned by the script determines if the fileset can be removed.

command line interface (CLI) The set of commands that can be executed directly from the operating system's command shell.

configure script An optional script associated with a fileset and automatically executed by `swinstall` (or manually executed by `swconfig`) after the installation of filesets is complete.

container A software element that physically stores the elements it contains.

control script An optional script packaged with software or added to software by modifying the IPD. Control scripts are run during `swconfig`, `swinstall`, `swremove`, or `swverify` operations. Control scripts may include: configure or unconfigure for `swconfig`; checkinstall, preinstall, postinstall and configure scripts for `swinstall`; the checkremove, unconfigure, preremove, and postremove scripts for `swremove`; and the fix or verify script for `swverify`.

copyright An attribute that defines the copyright for the destination depot (media) being created/modified by `swpackage`. It refers to the copyright information for the software product.

corequisites A dependency in which a fileset requires that another fileset be installed and configured at the same time. For example, if fileset A requires that fileset B is installed at the same time, fileset B is a corequisites.

D-E

dependency A relationship between filesets in which one requires another in a specific manner. For example, before fileset A can be installed, it may require fileset B to be installed. SD-UX supports corequisite and prerequisite dependencies.

dependent A fileset that has a dependency on another fileset. For example, if fileset A depends on fileset B, then B is a dependent or has a dependency on A.

depot A repository of software products and a catalog, organized so SD-UX commands can use it as a software source. The contents of a depot reside in a directory structure with a single, common root. A depot can exist as a directory tree on a SD-UX file system, on a CD-ROM, or as a tar archive on a tape. All depots share a single logical format, independent of the type of media on which the depot resides. Depots can reside on a local or remote system. You can package software directly into a depot or copy packaged software into the depot from elsewhere.

description An attribute for products and filesets, usually a paragraph description of that product or fileset.

destination The path at which a file will be installed.

destination filesystem The filesystem structure that will be created on the target system when the software product is installed.

directory An optional keyword that ends the software element specification in a PSF. No value is required.

end An optional keyword that ends the software element specification in a PSF. No value is required.

F-L

fileset A collection of related files. A fileset serves as a container for files, associated file attributes, and separate control scripts. Most SD-UX operations are performed on filesets.

graphical user interface (GUI) A program interface that takes advantage of the computer's graphics capabilities to make the program easier to use.

is_locatable In packaging, an attribute that defines whether a product can be installed to an alternate product directory or not. If specified, the attribute is set to a value of true. If not specified, the attribute is assigned a value of false.

M-O

machine_type In packaging, an attribute that describes the type of systems on which the product will run. (If not specified, the keyword is assigned a wildcard value (*) meaning it will run on all machines. If there are multiple machine platforms, you must separate each machine designation with a vertical bar (|). (e.g., IA64)

media Physical data storage media on which software is stored, such as tape, CD-ROM, or DVD.

multiple architecture multiple architecture - A single product that contains different versions of the same fileset which differ by their architecture attribute.

optional attribute An attribute whose inclusion in the product specification file is optional, will not effect the users ability to create a software package using `swpackage`.

or dependency set Used to identify multiple corequisites or prerequisites attributes for a fileset where only one of the set must satisfy the dependency.

or corequisites set See *OR dependency set*.

or prerequisites set See *OR dependency set*.

P

patch Software designed to update specific bundles, products, subproducts, filesets, or files on your system. By definition, patch software is packaged with the `is_patch` attribute set to true.

postinstall script An optional script associated with a fileset that is executed by swinstall after the corresponding fileset has been installed or updated.

postremove script An optional script associated with a fileset that is executed by `swremove` after the corresponding fileset has been removed.

preinstall script An optional script associated with a fileset that is executed by `swinstall` before installing or updating the fileset.

preremove script An optional script associated with a fileset that is executed by `swremove` before removing the fileset.

prerequisites A dependency in which one fileset requires another fileset to be installed and configured before the first fileset can be installed or configured. For example, fileset A may require that fileset B is installed before fileset A can be installed. Therefore, fileset B is a prerequisite for fileset A.

product A collection of filesets, subproducts and/or control scripts that form a set of related software.

product specification file (PSF) A file that defines the structure of a software package and maps your source filesystem area to create the destination filesystem on a target system. A PSF identifies the software package according to its attributes, contents, compatibilities, and dependencies.

Q-R

readme This attribute provides either the location of the text file containing the README information or the text value itself.

reference A software element that virtually stores (or references) the data for the software elements it contains.

remote content A software element that is external to the local PSF.

required attribute An attribute whose inclusion in the product specification file is mandatory and will cause an error if the user attempt to create a software package using swpackage.

root The root directory of a system (/).

root directory The directory on a target system in which all the files of the selected products will be installed. The default (/), can be changed to install into a directory that will eventually act as the root to another system.

S

SD-UX HP-UX Software Distributor. The format and syntax of SD-UX software in depots.

software depot A SD-UX format structure that contains one or more software products that can be installed on other systems or copied to other depots.

software element A product specification file (PSF) is comprised of five software elements that can be packaged, distributed, installed, or managed by Software Distributor (SD-UX). A software element may be a file, fileset, product, subproduct, or bundle.

software package Installable Software Distributor format software created with `swpackage`. Packaged software can be placed in a depot for distribution.

software specification attribute Attributes that are used to define a relationship or an assignment between a designated software element and other software element(s). Software specification attributes are defined using a software_specification value type.

software specification value type Defines a software element in great detail using the SD software_selection syntax, including information such as revision, architecture and version.

source filesystem The directory and associated files which comprise your software product. Files are mapped from the source filesystem to create the destination filesystem on a target system via the PSF.

subproduct A software element that serves as a reference for groups of logically related filesets. A subproduct can be used to partition a product that contains many filesets or to offer the user different views of the filesets. Subproducts are optional and considered an advanced packaging topic.

swinstall A SD-UX command that installs software.

swlist A SD-UX command that lists software elements, their attributes, and their organization. It lists both installed software and software contained within a depot.

swpackage A SD-UX command that uses a product specification file (PSF) to organize software products and package them into a depot. The depot can be accessed directly by SD-UX commands or mastered onto CD-ROM or tape.

swremove A SD-UX command that removes previously installed software or removes packaged software from a depot.

swverify A SD-UX command that verifies installed software or depot software for correctness and completeness.

T-Z

tag In packaging, an attribute that defines the distribution tag or software element's name attribute for the destination depot (media).

unconfigure script An optional script associated with a fileset that is executed by swremove before the removal of filesets begins.

vendor The vendor for the software being packaged. If a vendor specification is included in the PSF, the vendor and tag attributes are required for `swpackage`.

vendor defined attribute An attribute you define to provide additional information about a software package. A vendor defined attribute (VDA) may be created for any software element in the product specification file.

vendor tag Associates the product or bundle with the last-defined vendor object, if that object has a matching tag attribute.

Index

O

P

R

S

T

U

V