



Software Distribution Using the ESP Package Manager

ESP-004-20010620

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Preface

This document provides a tutorial and reference for the ESP Package Manager ("EPM") software, version 3.0.

Organization of this Manual

This document is organized into the following chapters and appendices:

- [1 – Introduction to EPM](#)
- [2 – Building EPM](#)
- [3 – Packaging Your Software with EPM](#)
- [4 – Advanced Packaging with EPM](#)
- [A – Software License Agreement](#)
- [B – Command Reference](#)
- [C – List File Reference](#)
- [D – Release Notes](#)
- [E – Sample List Files](#)

Notation Conventions

Various font and syntax conventions are used in this guide. Examples and their meanings and uses are explained below:

Example	Description
<code>epm</code> <code>epm(1)</code>	The names of commands; the first mention of a command or function in a chapter is followed by a manual page section number.
<code>/var</code> <code>/usr/bin/epm</code>	File and directory names.
<code>Request ID is Printer-123</code>	Screen output.
<code>lp -d printer filename ENTER</code>	Literal user input; special keys like ENTER are in ALL CAPS.
<code>foo start of long command \ end of long command ENTER</code>	Long commands are broken up on multiple lines using the backslash (\) character. Enter the commands without the backslash.
<code>12.3</code>	Numbers in the text are written using the period (.) to indicate the decimal point.

Abbreviations

The following abbreviations are used throughout this manual:

<i>kb</i>	Kilobytes, or 1024 bytes
<i>Mb</i>	Megabytes, or 1048576 bytes
<i>Gb</i>	Gigabytes, or 1073741824 bytes

Other References

[*ESP Package Manager home page*](#)

The official home page of the ESP Package Manager software.

[*title*](#)

description

[*title*](#)

description

[*title*](#)

description

[*title*](#)

description

1 – Introduction to EPM

This chapter provides an introduction to the ESP Package Manager ("EPM").

What is EPM?

Software distribution under UNIX/Linux can be a challenge, especially if you ship software for more than one operating system. Every operating system provides its own software packaging tools and each has unique requirements or implications for the software development environment.

The ESP Package Manager ("EPM") is one solution to this problem. Besides its own "portable" distribution format, EPM also supports the generation of several vendor-specific formats. This allows you to build software distribution files for almost any UNIX/Linux operating system from the same sources.

History and Evolution

When Easy Software Products was founded in 1993, we originally shipped software only for the SGI IRIX operating system. In 1997 we added support for Solaris, which was quickly followed by HP-UX support in 1998.

Each new operating system and supported processor required a new set of packaging files. While this worked, it also meant that we had to keep all of the packaging files synchronized manually. Needless to say, this process was far from perfect and we had more than one distribution that was not identical on all operating systems.

As we began developing the [Common UNIX Printing System \("CUPS"\)](#) in 1998, our goal was to add support for two additional operating systems: Linux and Compaq Tru64 UNIX. If we wanted to avoid the mistakes of the past, we clearly had to change how we produced software distributions.

The first version of EPM was released in 1999 and supported so-called "portable" software distributions that were not tied to any particular operating system or packaging software. Due to popular demand, we added support for vendor-specific packaging formats in the second major release of EPM, allowing the generation of portable or "native" distributions from one program and one set of software distribution files.

Existing Software Packaging Systems

As we looked for a solution to our problem, we naturally investigated the existing open-source packaging systems. Under Linux, we looked at the RedHat Package Manager ("RPM") and Debian packaging software ("dpkg" and "dselect"). For the commercial UNIX's we looked at the vendor-supplied packaging systems. Table 1.1 shows the results of our investigation.

Table 1.1: Software Packaging Formats

Format	Operating Systems ¹	Binaries?	Cross-Platform?	Patches?	Upgrades?	Conflicts?	Requires?	Replaces?	Config Files?	Map Files?
Debian	Corel Linux Debian GNU/Linux	Yes	Yes ²	No	Yes	Yes	Yes	Yes	Yes	No
depot	HP-UX	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes
inst	IRIX	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
pkg	Solaris	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes
RPM	Mandrake RedHat SuSE TurboLinux	Yes	Yes ²	No	Yes	Yes	Yes	No	Yes	No
setld	Tru64 UNIX	Yes	No	No	No	Yes	Yes	No	No	No

1. Standard packaging system for named operating systems.
2. These packaging systems are cross-platform but require the package management utilities to be installed on the platform before installing the package.

As you can see, none of the formats supported every feature we were looking for. One common fault of all these formats is that they do not support a common software specification file format. That is, making a Debian software distribution requires significantly different support files than required for a Solaris pkg distribution. This makes it extremely difficult to manage distributions for multiple operating systems.

All of the package formats support binary distributions. The RPM and Debian formats also support source distributions that specifically allow for recompilation and installation. Only the commercial UNIX formats support patch distributions – you have to completely upgrade a software package with RPM and Debian. All but the Solaris pkg format allow you to upgrade a package without removing the old version first.

When building the software packages, RPM and Debian force you to create the actual directories, copy the files to those directories, and set the ownerships and permissions. You essentially are creating a directory for your software that can be archived in the corresponding package format. To ensure that all file permissions and ownerships are correct, you must build the distribution as the root user, introducing potential security

risks and violating many corporate security policies. It can also make building distributions difficult when dynamic data such as changing data files or databases is involved.

The commercial UNIX formats use software list files that map source files to the correct directories and permissions. This allows for easier delivery of dynamic data, configuration management of what each distribution actually contains, and eliminates security issues with special permissions and building distributions as the root user. Using the proprietary format also has the added benefit of allowing for software patches and using the familiar software installation tools for that operating system. The primary disadvantage is that the same distributions and packaging software cannot be used on other operating systems.

Design Goals of EPM

Our goals for the first release of EPM were fairly simple:

1. Build binary software distributions using a common software specification format. The same distribution files must work for all operating systems.
2. Optionally strip executable files before packaging.
3. Map source files and directories to the installation locations and permissions.
4. Support configuration files and boot-time initialization scripts.
5. Automatically backup existing files when a product replaces an existing file.
6. Provide installation and removal scripts that will work on all systems without additional software.
7. Support automatic upgrades to newer versions of a product using full or (smaller) patch distributions.
8. Support software package conflicts, requirements, and replacements.
9. Support network installations where `/usr` is shared amongst client machines.
10. Make it all open-source under the GNU GPL.

As we approached EPM 2.x we added the following goals:

1. Support portable and vendor package formats from the same specification files. Make the interface easily extended to support new formats as they are implemented.
2. Provide a simple GUI installer that can be included with portable distributions, like the popular InstallShield software in the Microsoft Windows world.
3. Support variable substitution in filenames to allow for easier relocation and/or naming of files in the distribution.
4. Support wildcards in source filenames.

The EPM 3.x versions add still more goals:

1. Provide better documentation, like this manual.
2. Add support for executables and libraries created with libtool.
3. Add an `install(8)` replacement command that can be used to create list files.
4. Add a small script that can be installed with every portable software package to list and remove installed packages.
5. Add support for more vendor-specific formats; specifically AIX and BSD packaging formats.
6. Add support for relocatable packages.
7. Add support for Tru64-style "linked" packages, where symlinks are created that point to the corresponding files and directories in the relocated path.
8. Add better manpage installation support – specifically, add code to automatically locate the correct man directory for each file depending on the architecture.
9. Add support for dependency checking against vendor packages; that is, a portable package could

check its dependencies against portable, RPM, Debian, etc. packages, rather than just packages of the same format.

As you can see, the focus has been on making the binary software distribution process as easy as possible. Supporting source code distributions was not a goal since most RPM and Debian source distributions are little more than wrapping around a compressed tar file containing the source files and a configure script.

Resources

The EPM web site provides access to the current software and documentation for EPM:

<http://www.easysw.com/epm/>

The EPM source code can be downloaded in compress tar files or via the popular CVS software. Please see the EPM web site for complete instructions.

The Easy Software Products news server provides several newsgroups for EPM. You can access it at:

<news.easysw.com>

Commercial support for EPM is available from Easy Software Products and is one way to contribute to the continued development of EPM. The other way to contribute is by donating code, examples, and bug fixes. If you have adapted EPM for another operating system or have added a new feature that you feel will be generally useful, please contribute it!

2 – Building EPM

This chapter shows how to configure, build, and install the ESP Package Manager.

Requirements

EPM requires very little pre-installed software to work. Most items will likely be provided as part of your OS. Your development system will need a C compiler, the `make(1)` program (GNU, BSD, and most vendor make programs should work), the Bourne (or Korn or Bash) shell (`sh(1)`), and `gzip(1)`.

The optional graphical setup program requires a C++ compiler, the X11 libraries, and the FLTK library. FLTK is available at the following URL:

<http://www.fltk.org/>

Your end-user systems will require the Bourne (or Korn or Bash) shell (`sh`), the `df(1)` program, the `tar(1)` program, and the `gzip(1)` program to install portable distributions. All but the last are standard items, and most vendors include `gzip` as well.

Note:

The `gzip` program is only required to uncompress the software distribution `.tar.gz` file. If you supply the uncompressed `.tar` file or its contents, then `gzip` is not required on the end-user system.

EPM can also generate vendor-specific distributions. These require the particular vendor tool, such as `rpm(8)` and `dpkg(8)`, to generate the software distribution on the development system and load the software distribution on the end-user system.

Configuring the Software

EPM uses GNU `autoconf(1)` to configure itself for your system. The `configure` script is used to configure the EPM software, as follows:

```
./configure ENTER
```

Choosing Compilers

If the `configure` script is unable to determine the name of your C or C++ compiler, set the `CC` and `CXX` environment variables to point to the C and C++ compiler programs, respectively. You can set these variables using the following commands in the Bourne, Korn, or Bash shells:

```
export CC=/foo/bar/gcc ENTER
export CXX=/foo/bar/gcc ENTER
```

If you are using C shell or TCsh, use the following commands instead:

```
setenv CC /foo/bar/gcc ENTER
setenv CXX /foo/bar/gcc ENTER
```

Run the `configure` script again to use the new commands.

Choosing Installation Directories

The default installation prefix is `/usr`, which will place the EPM programs in `/usr/bin`, the setup GUI in `/usr/lib/epm`, and the man pages in `/usr/man`. Use the `--prefix` option to relocate these files to another directory:

```
./configure --prefix=/usr/local ENTER
```

The `configure` script also accepts the `--bindir`, `--libdir`, and `--mandir` options to relocate each directory separately, as follows:

```
./configure --bindir=/usr/local/bin --libdir=/usr/local/lib \
--mandir=/usr/local/share/man ENTER
```

Options for the Setup GUI

The setup GUI requires the X11 and FLTK libraries. If these libraries are not provided in standard locations, then the `--with-x-includes`, `--with-x-libs`, `--with-fltk-includes`, and `--with-fltk-libs` options can be used to tell the `configure` script where to find them, as follows:

```
./configure --with-x-includes=/usr/X11R6/include \
--with-x-libs=/usr/X11R6/lib \
--with-fltk-includes=/usr/local/include \
--with-fltk-libs=/usr/local/lib ENTER
```

Building the Software

Once you have configured the software, type the following command to compile it:

```
make ENTER
```

Compilation should take a few minutes at most. Then type the following command to determine if the software compiled successfully:

```
make test ENTER
```

The `test` target builds a portable and native distribution of EPM and reports if the two distributions were generated successfully.

Installing the Software

Now that you have compiled and tested the software, you can install it using the `make` command or one of the distributions that was created. You should be logged in as the super-user unless you specified installation directories for which you have write permission. The `su(8)` command is usually sufficient to install software:

```
su ENTER
```

Installing Using the `make` Command

Type the following command to install the EPM software using the `make` command:

```
make install ENTER  
Installing EPM setup in /usr/lib/epm  
Installing EPM programs in /usr/bin  
Installing EPM manpages in /usr/man/cat1 and /usr/man/man1  
Installing EPM documentation in /usr/share/doc/epm
```

Installing Using the Portable Distribution

The portable distribution can be found in a subdirectory named using the operating system, version, and architecture. For example, the subdirectory for a Linux 2.4.x system on an Intel-based system would be *linux-2.4-intel*. The subdirectory name is built from the following template:

os-major.minor-architecture

The `os` name is the common name for the operating system. Table 2.1 lists the abbreviations for most operating systems:

Table 2.1: Operating System Name Abbreviations

Operating System	Name
AIX	aix
Compaq Tru64 UNIX Digital UNIX OSF/1	tru64
FreeBSD	freebsd
HP-UX	hpux
IRIX	irix
Linux	linux
NetBSD	netbsd
OpenBSD	openbsd
Solaris	solaris

The `major.minor` string is the operating system version number. Any patch revision information is stripped from the version number, as are leading characters before the major version number. For example, HP-UX version B.11.11 will result in a version number string of `11.11`.

The `architecture` string identifies the target processor. Table 2.2 lists the supported processors:

Table 2.2: Processor Architecture Abbreviations

Processor(s)	Abbreviation
Compaq Alpha	alpha
HP Precision Architecture	hppa
INTEL 80x86	intel
MIPS RISC	mips
IBM Power PC	powerpc
SPARC MicroSPARC UltraSPARC	sparc

Software Distribution Using the ESP Package Manager

Once you have determined the subdirectory containing the distribution, type the following commands to install EPM from the portable distribution:

```
cd os-major.minor-architecture ENTER  
./epm.install ENTER
```

The software will be installed after answering a few yes/no questions.

Installing Using the Native Distribution

The `test` target also builds a distribution in the native operating system format, if supported. Table 2.3 lists the native formats for each supported operating system and the command to run to install the software.

Table 2.3: Native Operating System Formats

Operating System	Format	Command
AIX	???	???
Compaq Tru64 UNIX Digital UNIX OSF/1	setld	setld -a <i>directory</i> ???
HP-UX	depot	swinstall -f <i>directory</i>
IRIX	inst	swmgr -f <i>directory</i>
Linux	rpm	rpm -i <i>directory/epm-3.0.rpm</i>
Solaris	pkgadd	pkgadd -d <i>directory</i> epm

Packaging Your Software with EPM

This chapter describes how to use EPM to package your own software packages.

The Basics

EPM reads one or more software "list" files that describe a single software package. Each list file contains one or more lines of ASCII text containing product or file information. Comments start with the # character.

The source field can also use shell wildcards to include multiple files on a single line:

```
f 0444 root sys /usr/share/doc/epm *.html
```

Creating a List File

EPM 2.6 adds a new `mkepmlist` utility that recursively scans directories and generates the corresponding list file entries.

Product Information

The following is an excerpt from the EPM software list file (`epm.list`) provided with the software:

```
# Product information
%product ESP Package Manager
%copyright 1999-2001 by Easy Software Products, All Rights Reserved.
%vendor Easy Software Products
```

```
%license COPYING
%readme README
%description Universal software packaging tool for UNIX.
%version 2.2
%release 0
```

As you can see, product information lines (as well as other EPM directives) start with the percent (%) character. The attribute name is followed by the value separated by whitespace.

Adding Files, Directories, and Symlinks

Files

Following the product information is the list of files to be included in the distribution:

```
# Executables
%system all
f 0555 root sys /usr/bin/epm epm
f 0555 root sys /usr/lib/epm/setup setup
f 0444 root sys /usr/share/doc/epm/README README
f 0444 root sys /usr/share/doc/epm/COPYING COPYING
f 0444 root sys /usr/share/doc/epm/*.html

# Man pages
%system irix
f 0444 root sys /usr/share/catman/u_man/cat1/epm.1 epm.1
%system !irix
f 0444 root sys /usr/man/man1/epm.1 epm.man
```

The %system directive is one of two conditional statements that can be included in software list files. In this case we are installing the man pages in one of two directories depending on the operating system.

Plain files are indicated by the `f` at the beginning of each line. Directories, configuration files, initialization scripts, and symbolic links are specified using the letters `d`, `c`, `i`, and `l`, respectively. Files that should be included in a patch upgrade use uppercase letters instead of lowercase.

The remaining data fields on the line are the file permission bits, the owner, the group, the destination filename, and the source filename. The source and destination filenames can contain references to environment variables and variables passed on the EPM command-line. For example, the man page files can reference the `mandir` variable to relocate the installed man pages instead of using the %system conditional directive:

```
# Man pages
f 0444 root sys $mandir/cat1/epm.1 epm.1
f 0444 root sys $mandir/man1/epm.1 epm.man
```

As you can see, variables are referenced using the dollar sign (\$). As with most shells, variable names can be surrounded by curly braces (`${variable}`) to explicitly delimit the name.

The source field can also use shell wildcards to include multiple files on a single line:

```
f 0444 root sys /usr/share/doc/epm/*.html
```

Configuration Files

Configuration files use the same format as regular files; if the configuration file exists when the software is installed, then the new configuration file is stored as `filename.N` so it can be merged with the old configuration file manually. This is one of the configuration files supplied with the CUPS distribution:

```
c 0644 root sys /etc/cups/cupsd.conf conf/cupsd.conf
```

Directories

Directories use a source file of `-`:

```
d 0755 root sys /foo/bar/dir -
```

Initialization Scripts

Initialization scripts are scripts or programs that are run at boot time, usually to start daemon programs. EPM automatically determines the location of initialization files at install time, so it can handle the different locations used by various Linux distributions. This is the initialization script used by CUPS:

```
i 0555 root sys cups cups.sh
```

This specifies that the root name of the initialization script is `cups`, and the file `cups.sh` should be used as the source for the script. EPM creates links for startup and shutdown at run levels 0, 2, 3, and 5 as appropriate.

Symbolic Links

Symbolic links use the source field as the link value. That is, if you want to provide a symbolic link from `gzip` to `gunzip` in `/usr/bin` you'd use:

```
l 0555 root sys /usr/bin/gunzip gzip
```

Creating the Software Package

To build a distribution called "epm" from this list file, simply run:

```
epm epm
```

EPM will automatically load the file `epm.list` for the list file; to specify the file directly, use:

```
epm epm epm.list
```

The first argument is the name of the package, while the second is the list filename. The result will be a gzip'd tar file containing the distribution files and installation script needed to install the software.

Variables are specified using the equal sign (=) on the command-line or in the list file (`$name=value`); there is no limit on the number of variables you can specify:

```
epm mandir=/foo/bar/man epm epm.list
```

EPM can also produce vendor-specific distributions using the `-f` option:

```
epm -f format ...
```

The *format* option can be one of:

- `depot` or `swinstall` – HP–UX software distribution.
- `dpkg` – Debian software distribution.
- `inst` or `tardist` – IRIX software distribution.
- `native` – "Native" software distribution (RPM, INST, DEPOT, PKG, etc.) for the platform.
- `pkg` – Solaris software distribution.
- `portable` – Portable software distribution (default).
- `rpm` – RedHat software distribution.
- `setld` – Tru64 (setld) software distribution.

Everything in the software list file stays the same – you just use the `-f` option to select the format. For example, to build an RPM distribution of EPM, type:

```
epm -f rpm epm
```

The result will be an RPM distribution file instead of the portable distribution file.

Installing the Software Package

Including the Setup GUI

Advanced Packaging with EPM

Chapter summary.

Including Other List Files

Conflicts, Replaces, and Requires

Software conflicts and requirements are specified using the `%incompat` and `%requires` directives. If your software replaces another package, you can specify that using the `%replaces` directive (`%replaces` is silently mapped to `%conflicts` when the distribution format does not support package replacement.)

Dependencies are specified using the package name:

```
%requires foobar
%incompat foobar
%replaces foobar
```

or the filename:

```
%requires /usr/lib/libfoobar.so
%incompat /usr/lib/libfoobar.so.1.2
```

Package dependencies are currently enforced only for the same package format, so a portable distribution that requires package "foobar" will only look for an installed "foobar" package in portable format.

Filename dependencies are only supported by the Debian, portable, and RPM distribution formats.

Scripts

Conditional Directives

As stated before, the `%system` directive can be used to conditionally include specific files like the man pages in the EPM distribution.

The `%system` directive can match or not match specific operating system names or versions. The operating system name is the name reported by `uname` in lowercase, while the operating system version is the major and minor version number reported by `uname -r`:

```
%system irix
```

Only include the following files when building a distribution for the IRIX operating system.

```
%system linux-2.0
```

Only include the following files when building a distribution for Linux 2.0.x.

```
%system !irix !linux-2.0
```

Only include the following files when building a distribution for operating systems other than IRIX and Linux 2.0.x.

The special name `all` is used to match all operating systems:

```
%system all
```

For format-specific files, the `%format` directive can be used:

```
%format rpm
```

Only include the following files when building an RPM distribution.

```
%format !rpm
```

Only include the following files when not building an RPM distribution.x.

```
%format all
```

Include the following files for all types of distributions.

Using `epminstall`

Software Patches

Variables

EPM imports the current environment variables for use in your list file. You can also define new variable in the list file or on the command-line when running EPM.

Variables are defined by starting the line with the dollar sign (\$) followed by the name and value:

```
$name=value
$prefix=/usr
$exec_prefix=${prefix}
$bindir=$exec_prefix/bin
```


Variable substitution is performed when the variable is defined, so be careful with the ordering of your variable definitions.

Also, any variables you specify in your list file will be overridden by variables defined on the command-line or in your environment, just like with `make`. This can be a useful feature or a curse, depending on your choice of variable names.

As you can see, variables are referenced using the dollar sign (`$`). As with most shells, variable names can be surrounded by curly braces (`${variable}`) to explicitly delimit the name.

If you need to insert a `$` in a filename or a script, use `$$`:

```
%install echo Enter your name:
%install read $$name
%install echo Your name is $$name.
```

Files

Following the product information is the list of files to be included in the distribution:

```
# Executables
%system all
f 0555 root sys /usr/bin/epm epm
f 0555 root sys /usr/lib/epm/setup setup
f 0444 root sys /usr/share/doc/epm/README README
f 0444 root sys /usr/share/doc/epm/COPYING COPYING
f 0444 root sys /usr/share/doc/epm/*.html

# Man pages
%system irix
f 0444 root sys /usr/share/catman/u_man/cat1/epm.1 epm.1
%system !irix
f 0444 root sys /usr/man/man1/epm.1 epm.man
```

The `%system` directive is one of two conditional statements that can be included in software list files. In this case we are installing the man pages in one of two directories depending on the operating system.

Plain files are indicated by the `f` at the beginning of each line. Directories, configuration files, initialization scripts, and symbolic links are specified using the letters `d`, `c`, `i`, and `l`, respectively. Files that should be included in a patch upgrade use uppercase letters instead of lowercase.

The remaining data fields on the line are the file permission bits, the owner, the group, the destination filename, and the source filename. The source and destination filenames can contain references to environment variables and variables passed on the EPM command-line. For example, the man page files can reference the `mandir` variable to relocate the installed man pages instead of using the `%system` conditional directive:

```
# Man pages
f 0444 root sys $mandir/cat1/epm.1 epm.1
f 0444 root sys $mandir/man1/epm.1 epm.man
```

As you can see, variables are referenced using the dollar sign (`$`). As with most shells, variable names can be surrounded by curly braces (`${variable}`) to explicitly delimit the name.

Software Distribution Using the ESP Package Manager

Variables are specified using the equal sign (=) on the command-line or in the list file (\$name=value); there is no limit on the number of variables you can specify:

```
epm mandir=/foo/bar/man epm epm.list
```

EPM can also produce vendor-specific distributions using the `-f` option:

```
epm -f format ...
```

The *format* option can be one of:

- `depot` or `swinstall` – HP-UX software distribution.
- `dpkg` – Debian software distribution.
- `inst` or `tardist` – IRIX software distribution.
- `native` – "Native" software distribution (RPM, INST, DEPOT, PKG, etc.) for the platform.
- `pkg` – Solaris software distribution.
- `portable` – Portable software distribution (default).
- `rpm` – RedHat software distribution.
- `setld` – Tru64 (setld) software distribution.

Everything in the software list file stays the same – you just use the `-f` option to select the format. For example, to build an RPM distribution of EPM, type:

```
epm -f rpm epm
```

The result will be an RPM distribution file instead of the portable distribution file.

Appendix A – GNU General Public License

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

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B – Command Reference

Appendix summary

epm

Create software packages

Synopsis

```
epm [ -f format ] [ -g ] [ -k ] [ -n[mrs] ] [ -s setup.xpm ] [ --setup-image setup.xpm ] [ --setup-program /foo/bar/setup ] [ -v ] [ name=value name=value ] product [ listfile ]
```

Description

epm generates software packages complete with installation, removal, and (if necessary) patch scripts. Unless otherwise specified, the files required for *product* are read from a file named "*product.list*".

The *-f* option ("format") specifies the distribution format:

<i>deb</i>	Generate a Debian distribution suitable for installation on a Debian Linux system.
<i>inst, tardist</i>	Generate an IRIX distribution suitable for installation on a system running IRIX.
<i>native</i>	Generate an native distribution. This uses <i>rpm</i> for Linux, <i>inst</i> for IRIX, <i>pkg</i> for Solaris, and <i>swinstall</i> for HP-UX. All other operating systems default to the <i>portable</i> format.
<i>pkg</i>	Generate an ATTsoftware package. These are used primarily under Solaris.
<i>portable</i>	Generate a portable distribution based on shell scripts and tar files. The resulting distribution is installed and removed the same way on all operating systems. [default]
<i>rpm</i>	Generate a Red Hat Package Manager ("RPM") distribution suitable for installation on a Red Hat Linux system.
<i>setld</i>	Generate a Tru64 (setld) software distribution.
<i>swinstall, depot</i>	Generate a HP-UX software distribution.

Executable files in the distribution are normally stripped of debugging information when packaged. To disable this functionality use the *-g* option.

Intermediate (spec, etc.) files used to create the distribution are normally removed after the distribution is created. The *-k* option keeps these files in the distribution directory.

The *-s* and *--setup-image* options ("setup") include the ESP Software Wizard with the specified XPM image file with the distribution. This option is currently only supported by portable distributions.

The *--setup-program* option specifies the setup executable to use with the distribution. This option is currently only supported by portable distributions.

The *-v* option ("verbose") increases the amount of information that is reported. Use multiple *v*'s for more verbose output.

Distributions normally are named "product-version-system-release-machine.ext" and "product-version-system-release-machine-patch.ext" (for patch distributions.) The "system-release-machine" information can be customized or eliminated using the *-n* option with the appropriate trailing letters. Using *-n* by itself will remove the "system-release-machine" string from the filename entirely.

Debian, IRIX, portable, and Red Hat distributions use the extensions ".deb", ".tardist", "tar.gz", and ".rpm" respectively.

List Variables

EPM maintains a list of variables and their values which can be used to substitute values in the list file. These variables are imported from the current environment and taken from the command-line and list file as provided. Substitutions occur when the variable name is referenced with the dollar sign (\$):

```
%install echo What is your name:
%install read $$name
%install echo Your name is $$name

f 0555 root sys ${bindir}/foo foo
f 0555 root sys $datadir/foo/foo.dat foo.dat
```

Variable names can be surrounded by curly brackets (\${name}) or alone (\$name); without brackets the name is terminated by the first slash (/), dash (-), or whitespace. The dollar sign can be inserted using \$\$.

Environment Variables

The *RPMDIR* environment variable will override where *EPM* looks for RPM distributions you generate. The default locations are */usr/src/redhat/RPMS*, */usr/src/RPM/RPMS*, */usr/src/packages/RPMS*, and */usr/local/src/RPMS*.

Known Bugs

EPM does not currently support generation of IRIX software patches.

See Also

[epm\(1\)](#) – create software packages.

[epminstall\(1\)](#) – add a directory, file, or symlink to a list file.

[mkepmlist\(1\)](#) – make an epm list file from a directory.

[epm.list\(5\)](#) – epm list file format.

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epminstall

Add a directory, file, or symlink to a list file.

Synopsis

epminstall *options* file1 file2 ... fileN directory

epminstall *options* file1 file2

epminstall *options* -d directory1 directory2 ... directoryN

Description

epminstall adds or replaces a directory, file, or symlink in a list file. The default list file is *epm.list* and can be overridden using the EPMLIST environment variable or the `--list-file` option.

Entries are either added to the end of the list file or replaced in-line. Comments, directives, and variable declarations in the list file are preserved.

Options

epminstall recognizes the standard Berkeley *install* command options:

- b Make a backup of existing files (ignored, default for EPM.)
- c BSD old compatibility mode (ignored.)
- g *group* Set the group owner of the file or directory to *group*. The default group is "sys".
- m *mode* Set the permissions of the file or directory to *mode*. The default permissions are 0755 for directories and executable files and 0644 for non-executable files.
- s Strip the files (ignored, default for EPM.)
- u *owner* Set the owner of the file or directory to *owner*. The default owner is "root".
- list-file *filename.list* Specify the list file to update.

See Also

[epm\(1\)](#) – create software packages.

[mkepmlist\(1\)](#) – make an epm list file from a directory.

[epm.list\(5\)](#) – epm list file format.

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mkeplist

Make an EPM list file from a directory.

Synopsis

```
mkeplist [ -g group ] [ -u user ] [ --prefix directory ] directory [ ... directory ]
```

Description

mkeplist recursively generates file list entries for files, links, and directories. The file list is send to the standard output.

The *-g* option overrides the group ownership of the files in the specified directories with the specified group name.

The *-u* option overrides the user ownership of the files in the specified directories with the specified user name.

The *--prefix* option adds the specified directory to the destination path. For example, if you installed files to */opt/foo* and wanted to build a distribution that installed the files in */usr/local*, the following command would generate a file list that is installed in */usr/local*:

```
mkeplist --prefix=/usr/local /opt/foo >foo.list ENTER
```

See Also

[epm\(1\)](#) – create software packages.

[epminstall\(1\)](#) – add a directory, file, or symlink to a list file.

[epm.list\(5\)](#) – epm list file format.

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C – List File Reference

This appendix provides a complete reference for the EPM list file format.

Overview of the List File Format

Each *EPM* product has an associated list file that describes the files to include with the product. Comment lines begin with the "#" character and are ignored. All other non-blank lines must begin with a letter, dollar sign ("\$"), or the percent sign ("%").

List File Directives

The following list describes all of the list file directives supported by *EPM*:

\$name=value

Sets the named variable to *value*. **Note:** Variables set in the list file are overridden by variables specified on the command-line or in the current environment.

%copyright copyright notice

Sets the copyright notice for the file.

%description description text

Adds a line of descriptive text to the distribution. Multiple lines are supported.

%format format [... format]

Uses following files and directives only if the distribution format is the same as *format*.

%format !format [... format]

Uses following files and directives only if the distribution format is not the same as *format*.

- %include filename*
Includes files listed in *filename*.
- %incompat product*
- %incompat filename*
Indicates that this product is incompatible with the named product or file.
- %install script or program*
Specifies a script or program to be run after all files are installed. (This has been obsoleted by the *%postinstall* directive)
- %license license file*
Specifies the file to display as the software license.
- %packager name of packager*
Specifies the name of the packager.
- %patch script or program*
Specifies a script or program to be run after all files are patched. (This has been obsoleted by the *%postpatch* directive)
- %postinstall script or program*
Specifies a script or program to be run after all files are installed.
- %postpatch script or program*
Specifies a script or program to be run after all files are patched.
- %postremove script or program*
Specifies a script or program to be run after removing files.
- %preinstall script or program*
Specifies a script or program to be run before all files are installed.
- %prepatch script or program*
Specifies a script or program to be run before all files are patched.
- %preremove script or program*
Specifies a script or program to be run before removing files.
- %product product name*
Specifies the product name.
- %readme readme file*
Specifies a README file to be included in the distribution.
- %remove script or program*
Specifies a script or program to be run before removing files. (This has been obsoleted by the *%preremove* directive)
- %release number*
Specifies the release or build number of a product (defaults to 0).
- %replaces product*
Indicates that this product replaces the named product.
- %requires product*
- %requires filename*
Indicates that this product requires the named product or file.
- %vendor vendor or author name*
Specifies the vendor or author of the product.
- %version version number*
Specifies the version number of the product.
- %system system[-release] [... system[-release]]*
Specifies that the following files should only be used for the specified operating systems and releases.
- %system !system[-release] [... system[-release]]*
Specifies that the following files should not be used for the specified operating systems and releases.

%system all

Specifies that the following files are applicable to all operating systems.

c mode user group destination source

C mode user group destination source

Specifies a configuration file for installation. The second form specifies that the file has changed or is new and should be included as part of a patch. Configuration files are installed as "destination.N" if the destination already exists.

d mode user group destination –

D mode user group destination –

Specifies a directory should be created when installing the software. The second form specifies that the directory is new and should be included as part of a patch.

f mode user group destination source

F mode user group destination source

Specifies a file for installation. The second form specifies that the file has changed or is new and should be included as part of a patch.

f mode user group destination source/pattern

F mode user group destination source/pattern

Specifies one or more files for installation using shell wildcard patterns. The second form specifies that the files have changed or are new and should be included as part of a patch.

i mode user group service–name source

I mode user group service–name source

Specifies an initialization script for installation. The second form specifies that the file has changed or is new and should be included as part of a patch. Initialization scripts are stored in */etc/software/init.d* and are linked to the appropriate system-specific directories for run levels 0, 2, 3, and 5. Initialization scripts **must** accept at least the *start* and *stop* commands.

l mode user group destination source

L mode user group destination source

Specifies a symbolic link in the installation. The second form specifies that the link has changed or is new and should be included as part of a patch.

R mode user group destination

Specifies that the file is to be removed upon patching. The *user* and *group* fields are ignored. The *mode* field is only used to determine if a check should be made for a previous version of the file.

List Variables

EPM maintains a list of variables and their values which can be used to substitute values in the list file. These variables are imported from the current environment and taken from the command-line and list file as provided. Substitutions occur when the variable name is referenced with the dollar sign (\$):

```
%install echo What is your name:
%install read $$name
%install echo Your name is $$name

f 0555 root sys ${bindir}/foo foo
f 0555 root sys $datadir/foo/foo.dat foo.dat
```

Variable names can be surrounded by curly brackets (\${name}) or alone (\$name); without brackets the name is terminated by the first slash (/), dash (–), or whitespace. The dollar sign can be inserted using \$\$.

- Release Notes

This appendix lists the change log for each release of the EPM software.

Changes in EPM v3.0

- The mkeplist utility had a bad regular expression that thought that any argument (directory names, etc.) with a dash ("-") in it was an unsupported option.
- Fixed a bug in the removal script – config files were removed by the remove script...
- Changed the config file install logic to copy the new config file (instead of moving it), so that an unchanged config file can be detected and removed. This provides the best of both worlds – unchanged config files are update automatically by an upgrade/install, while changed ones are preserved.

Changes in EPM v2.8

- The line breaking code did not include an extra space, so filenames in the portable install/patch/remove scripts would be joined instead of separated.
- The setup GUI did not allow the user to toggle a software product for distribution if the product was selected (nav box around it).
- The mkeplist program didn't get the permissions of each file (just the parent directory.)
- The portable installation scripts used the -L or -h option to test for symlinks with the test command. The choice of option was based on the build platform, making the script non-portable. Now use -h

exclusively since it is supported on all UNIX's we have access to, even with GNU test even though it isn't documented...

Changes in EPM v2.7

- Fixed a bug in the configuration script with the `--with-fltk--includes` option.
- Tru64 UNIX distributions now use the name "tru64" instead of "dunix". "dunix" is still supported in list files for compatibility with old list files.
- Added support for portable scripts under AIX.
- Fixed the space checking code in portable installation scripts.
- Now break up long lines in the portable install/patch/ remove scripts.

Changes in EPM v2.6

- Changed the automatic version number generation code to properly handle patch, beta, and pre releases.
- Added support for release numbers in RPM files.
- Added support for version number ranges in dependencies, either as "low-version high-version", "< version", or "> version".
- Eliminated some GCC warnings about using a char to index into an array.
- Added a disk space check to the portable installation scripts.
- Added a new mkepmlist utility, based on a Perl script by Christian Lademann.
- Added a "keep files" option (`-k`) to `epm` to keep the intermediate (spec, etc.) files around after building the binary distribution.
- Added support for Tru64 UNIX software packages (setld).
- Patch distributions were incorrectly backing up the original files, causing the original backup to be lost.
- Pre/post install/remove scripts were not using the right filename for Solaris PKG distributions.

Changes in EPM v2.5

- Added support for pre-install, post-install, pre-patch, post-patch, pre-remove, and post-remove commands.
- There was no way to use a literal \$ in scripts or in filenames. Use \$\$ to include a single \$.
- The config and license file support for AT&T software packages did not check to see if the source file had an absolute path. This would produce an invalid prototype file.
- The RPM `--target` option was not being called with an equal sign, which caused problems with RPM 4.0.
- Updated the Debian packager to use the `prerm` and `postrm` script names to match reality.
- Updated the Debian packager to support the `Replaces` dependency.
- Updated the portable and RPM distributions to check for the new SuSE 7.1 `init.d` directories.
- RPM distributions now use `%config(noreplace)` for config files, to duplicate the behavior that is expected.
- The portable scripts now use the `autoconf` echo test to determine the proper options for `echo` (`-n` or `\c`), rather than hardcoding this based on the build system.

Changes in EPM v2.4

- The [] wildcard matching did not skip over the character that was matched. This prevented matches in most cases...

Changes in EPM v2.3

- Fix for an incredibly stupid bug in the portable distribution code – was using ! instead of ~ to mask off the write permission bits in the distribution archive.
- Now use getpwuid() instead of getlogin() to get the username of the packager.
- The RPM distributions now use the same init.d script logic as portable distributions. This should make them portable to all known Linux distributions as well as avoid a *very* nasty installer bug in RedHat 7.0.
- The HP-UX swinstall code did not properly handle directories or config files.
- The [] wildcard matching rule did not accept ranges (e.g. "[a-z]", "[0-9]", etc.)
- Added VPATH support and distribution targets to Makefile.
- Added support for defining variables in list files; the format is "\$name=value".
- The variable expansion code didn't check for \${name}.

Changes in EPM v2.2

- New HTML documentation files.
- Updated the BuildRoot directive in RPM spec files to be an absolute path; RedHat 6.2's version of RPM adds a leading slash otherwise.
- IRIX defaults to run level 2...
- The setup GUI now displays an error message if run by a non-root user.
- The setup GUI now provides "Install All" and "Install None" buttons in the software selection pane.
- Added a "native" distribution format to select the native format for a particular OS (Linux defaults to RPM format...)
- The tar file generation code now always appends at least 2 zeroed blocks to the end of the archive. This eliminates error messages from Solaris tar and seems to be compatible with all other tar programs.
- Added the SuSE RPM directory to the standard search path.
- Added support for a new %packager directive.
- The strip command used was redirecting stderr before redirecting stdout.
- The portable distributions now set the umask to avoid problems with buggy tar programs and Linux distributions.
- Added command-line option to specify the location of the setup program.
- Added support for wildcards in source filenames.
- The OS version number is now truncated to only contain the major and minor release numbers.

Changes in EPM v2.1

- Moved setup program to /usr/lib/epm (\$prefix/lib/epm) to avoid name clash with RedHat setup program.
- Added Debian distribution files from Jeff Licquia.
- Configure script changes for GCC 2.95.x and Solaris.
- Portability fixes.

- Now look for RPMS in different "standard" locations after building them; the RPMDIR environment variable can be used to override the default locations.
- The sample project list file (epm.list) was missing from the 2.0 distribution.
- Now check for write permission in /usr by writing a test file (/usr/.writetest); this should make diskless client installations more reliable.
- Added support for variables on the command line (name=value); insert into project filenames using \$name.
- Variable expansion is now done on all lines and fields. This allows variables to be used in scripts and in the permissions field, for example.
- Now only specify run levels 0 and 3 for init scripts (0, 3, and 5 for Linux.)
- Now support init scripts in /sbin/init.d and /sbin/init.d/rcN.d (SuSE.)
- RPM distributions should now work OK for non-Red Hat based systems, in particular for init scripts.
- PKG distributions are now also generated in the "package stream" format as well as the directory and tar.gz file formats.

Changes in EPM v2.0

- New "-f" option to generate vendor-specific software distributions. Now support AT&T, Debian, HP-UX, IRIX, and Red Hat software distributions.
- New "-s" option to include the ESP Software Wizard (GUI) with portable distributions.
- The "-t" option (test) is no longer supported.
- New "-v" option to control the amount of information that is reported.
- New graphical setup program for portable distributions.
- New "description" directive.
- New "format" directive.
- New "include" directive.
- New "replaces" directive.
- Portable distributions should now be more portable.

Changes in EPM v1.7

- The %requires and %incompat directives now support specification of files as well as products.
- The init script installation code now creates a link in the init.d subdirectory to avoid frustrating well-trained fingers.
- The progress messages for shared and non-shared software were the same.

Changes in EPM v1.6

- Installation archives were missing the ".ss" and ".pss" files that were added to support diskless installations.
- The scripts didn't handle removing distributions that had no non-shared components.
- The scripts didn't return a non-zero exit status if the user did not agree with the license or want to install.

Changes in EPM v1.5

- Now support diskless installations; all files destined for /usr are put in a separate archive and are installed (or removed) only if /usr is read+write.

Changes in EPM v1.4

- Now map group "sys" to "system" for Digital UNIX and "root" for Linux.
- The initialization script installation now checks for the presence of run levels 4 and 5.

Changes in EPM v1.3

- Now use the "p" option to tar to ensure that file permissions are created properly. This is normally the default for the super-user, but not under Digital UNIX!
- Initialization scripts are now linked to run levels 0, 2, 3, 4, and 5.

Changes in EPM v1.2

- Patch distributions were not correctly named.
- Added new "initialization script" file types "i" and "I". The new file types place the scripts in /etc/software/init.d and make links to the appropriate system-specific rc.d directories and run the scripts to start and stop things accordingly.

Changes in EPM v1.1

- The "whoami" command isn't always in the user's path, so scripts now use a hard-coded path (setup by the configure script) to the program.
- Added a check for IRIX64 (64-bit kernel instead of n32.)
- The %system directive now supports release numbers, e.g. "irix-6.5".
- The %system directive now supports "!" (not) operator so you can do things like "%system irix !irix-6.5" to select any IRIX release except IRIX 6.5.
- Files that already exist on the system are renamed to "filename.O" on installation and back to "filename" when removed (except for config files, which don't overwrite and aren't removed.)
- Prerequisites (%required directive) now look for required product in the current directory and install it automatically if it is available and not already installed.
- The copyright notice in the installation script was not displayed if the user used the "now" option.

