ReST Packager's Guide

An introduction to creating ReST packages.

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by Eric T Meek and Jeff M Larkin

Abstract

The most important aspect of creating any software package is distributing it in an uncomplicated and unified manner. However, creating robust software packages which are uncomplicated requires much planning. Using the ReST Packager, however, lessens the burden of pre-planning by providing a step-by-step wizard breaking down package creation into manageable sections. Each section has extensive documentation regarding the purpose of each feature and has color coded fields which show which are required and which are optional. Each feature has helpful tooltips providing a quick reminder of how to use it. It should be noted not all features available in the Packager are implemented in the Installer. However, filling out each feature available in the packager ensures completeness and compatibility with future versions of ReST. Essentially, the ReST Packager serves as a guide through the difficult process of creating robust ReST packages. This, in-turn, guides users though installing the software just packaged in a unified manner both in remote heterogeneous and future supported installation environments.

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Chapter 1. ReST Package Basics

Although used primarily by the ReST Installer, ReST packages are the means by which the ReST Application Suite is customized for individual pieces of software. The ReST package contains the software and metadata needed by the Installer to install software on remote machines. The package metadata is used by the Installer and Explorer to maintain the state of installed software and in future versions of ReST it will contain information needed to customize the Monitor to work with the installed packages. In order to produce a well-written package it is important to understand what is contained in the package and what conventions are expected by the ReST Suite.

The Package Structure

A ReST package is essentially a ZIP/JAR file containing two special files, a package XML file and a checksum file. The package XML file, name package.xml inside the package, contains both basic metadata about the package and instructions on how to install the package from source or pre-compiled binaries. The checksum file, at this time must be created by the ReSTPackager program contains checksums of each file within the package and is must pass before the Installer will run the package. Details about the package sources are not necessary, since they could be any file that is pertinent to the software being installed. Details about writing the package XML, including documentation of each XML tag, and creating the package file appear later in this document.

It is possible to extract the package.xml file from the package using the jar utility supplied with the Sun JDK. The simplest means of extracting the package.xml is with the command jar -xvf <package name> package.xml. If you would like to extract the remainder of the contents, simply leave the package.xml off the end of the command. For more information see the Package Makers guide in the ReST online documentation section.

Planning

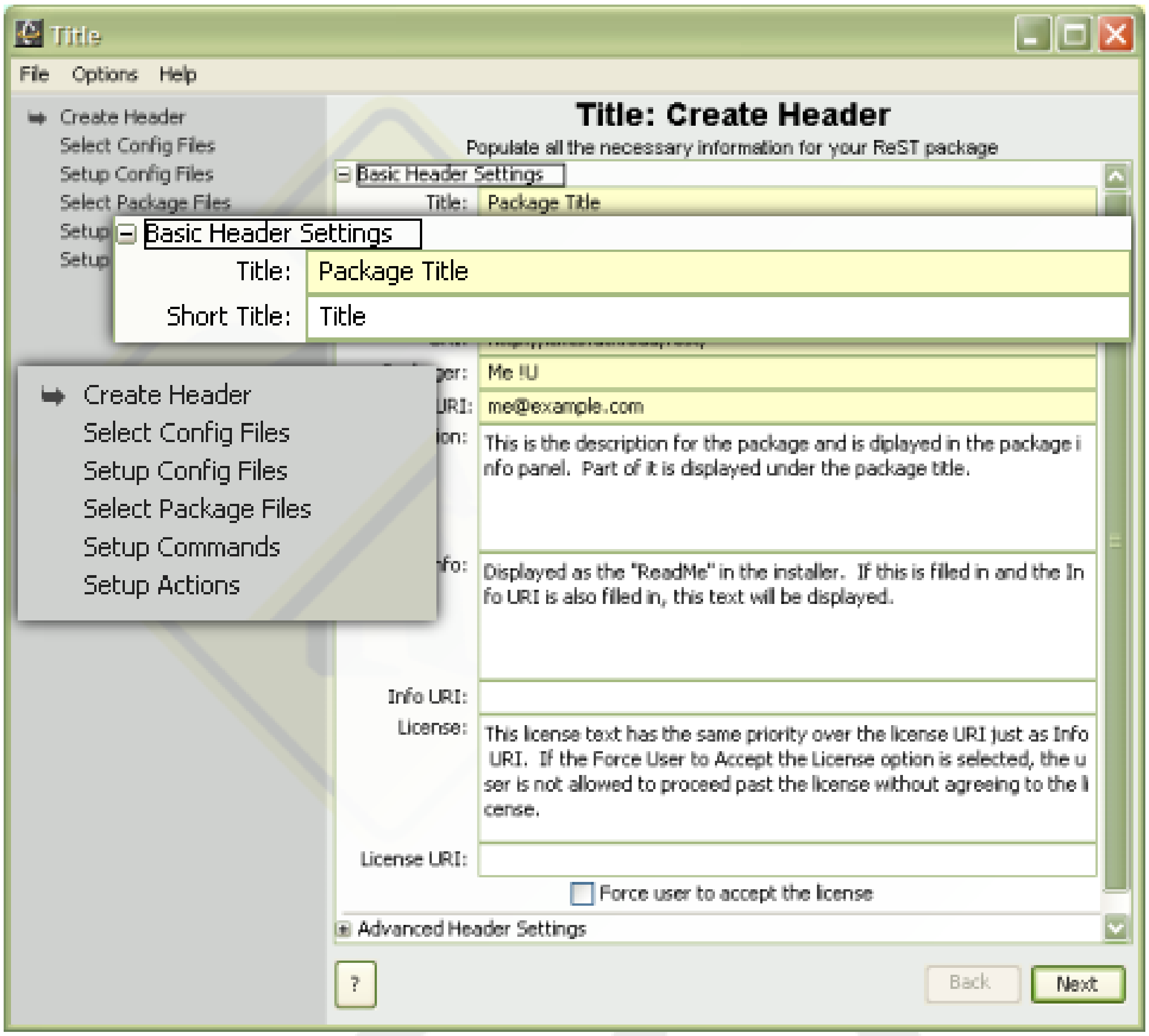
The planning step is the most important part in successfully creating a working package. Before writing the XML create a step-by-step list of how the software is installed. If possible, walk through the installation in a clean /bin/bash environment, since this will more realistically reflect the environment in which ReST will install the software. Once this list has been written, place a mark next to each command that would not need to be run on every machine in an homogeneous environment with a shared filesystem. Now note command options that should be offered for each command, for example **./configure --with-foo**. Try installing the software by walking through this list one command at a time; if it works without problem then fewer problems are likely to occur when the package is written.

Chapter 2. The Packager GUI

The Package Header

Upon opening the ReST packager, you will notice several distinct elements of the layout. First, the packager is built on the same framework (ReST Wizard Framework) as the ReST Installer. Using the same framework allows the packager to become familiar with the Wizard Framework as well as providing a simple means of walking packagers through the complex process of creating a ReST Package. Each major section in package creation is located on an distinct panel listed on the left side of the packager. The panel that is currently selected has an arrow on the left side (left callout in Figure 2.1). Separating the sections into distinct panels allows packagers to better focus on each individual section and have a firm roadmap for package creation. Each element has an associated tooltip which describes the purpose of the entry. After the packager is open, it is possible to open both ReST Packages (.rsp) and ReST Package XML (.xml). It is important to make sure that the all of the included files listed in the package files are accessible to the packager.

Figure 2.1. Create Header



Title: Package Title

Short Title: Title

Me !U

me@example.com

This is the description for the package and is diplayed in the package info panel. Part of it is displayed under the package title.

Displayed as the "ReadMe" in the installer. If this is filled in and the Info URI is also filled in, this text will be displayed.

Info URI:

License: This license text has the same priority over the license URI just as Info URI. If the Force User to Accept the License option is selected, the user is not allowed to proceed past the license without agreeing to the license.

License URI:

☐ Force user to accept the license

The common elements in all panels of the packager (cutout in regular size with the packager window in the background). Yellow dialogs denotes required entry and left panel list shows location and todo list of package creation.

There are several important tags in the above example. The `title`sets the package title that will appear in the Installer. If the title is longer than 25 characters, a second, shorter title may be set with the `role`attribute set to short. If no short title is provided and the title is longer than 25 characters, then in space-constrained parts of the application the long title will be truncated at 25 characters. The `base`element gives a way of grouping packages that should be installed in a similar area. For example, packages for the LAPACK and BLAS libraries have been written with a base of *lib*so that they, and other libraries, will be easy to find and use. The `base`should always be set to a value that will be valid for the filesystem on all target machines.

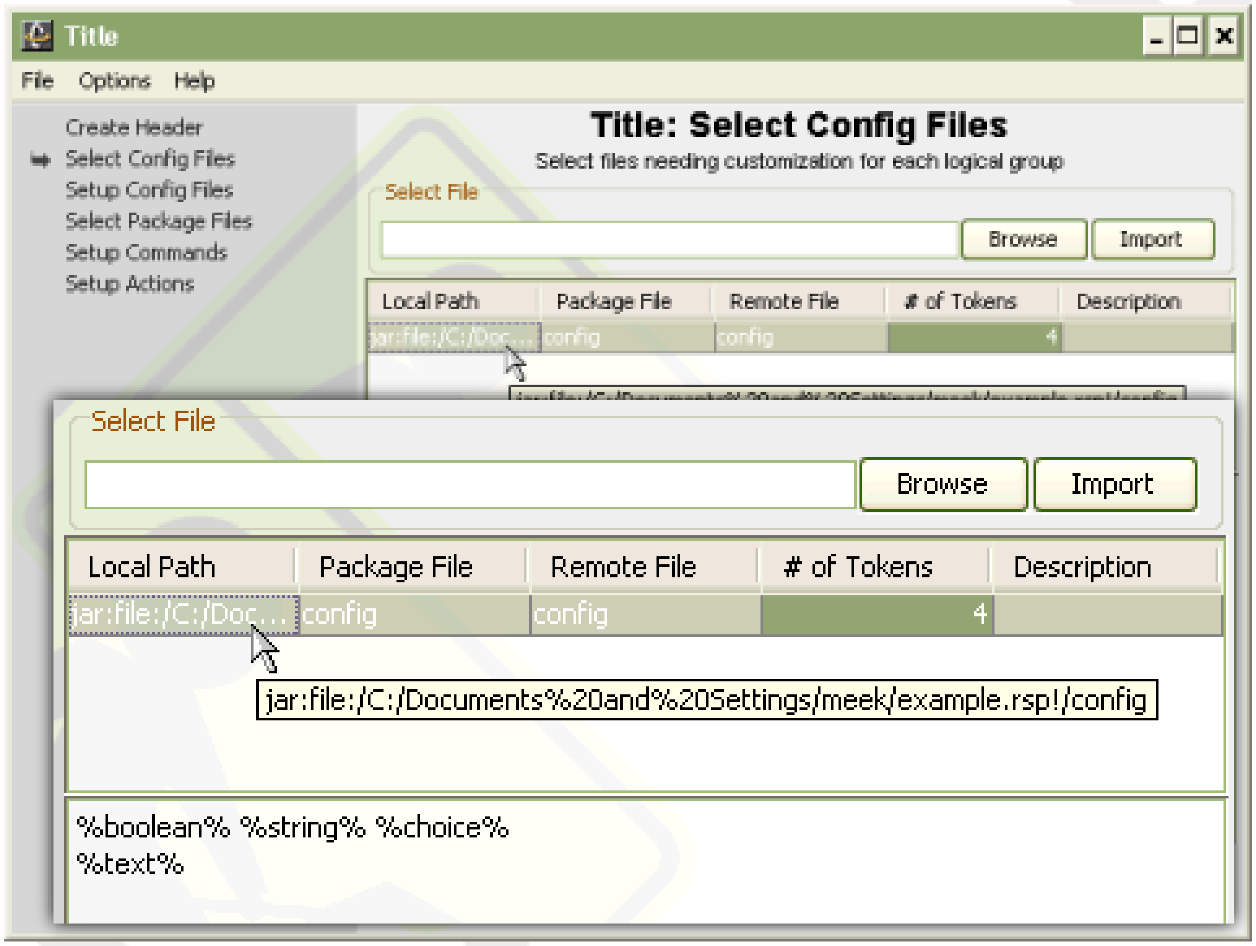
The contents of the `version`tag should be the version on the software in the package and not the version of the package itself. The version of the package can be given as an attribute of the `package`root element if desired. Additional tags exist for the package header, including options for editing configuration files, added files to the package, and defining actions that can be performed once the package has been installed. All of these tags are defined with examples in a reference sectionat the end of this document.

Configuration Files

Many software packages have configuration files that must be edited before the software can be used. To the developer of a software package writing the configuration files may be trivial, but this is often not the case for the end user. For this reason, the ReST Installer may be used to edit configuration files for the software package. The package must include a stub configuration file with a series of tokens to substitute. Each token appears with a % character on either side of the token, such as %token%. With a stub file created the packager must define the substitutions for this file in the Packager.

The configuration files are a special category of package files as stated above. The configuration (config) file tokens are substituted during transfer after all the package files are transferred and the preparation commands are completed. To add a config file to the package, browse to the files containing the tokens or type in the location and choose import. As the files are imported, they are scanned for any tokens contained and the number of tokens is displayed in the tokens column. Double clicking on a row or right clicking on it and selecting view will display the file in the viewer. If a config file needs deletion, right click on the file and select remove. The complete file path can be viewed as a tooltip by hovering the mouse cursor over the row as seen in Figure 2.2.

Figure 2.2. Select Configuration Files



Local Path	Package File	Remote File	# of Tokens	Description
jar:file:/C:/Doc...	config	config	4	

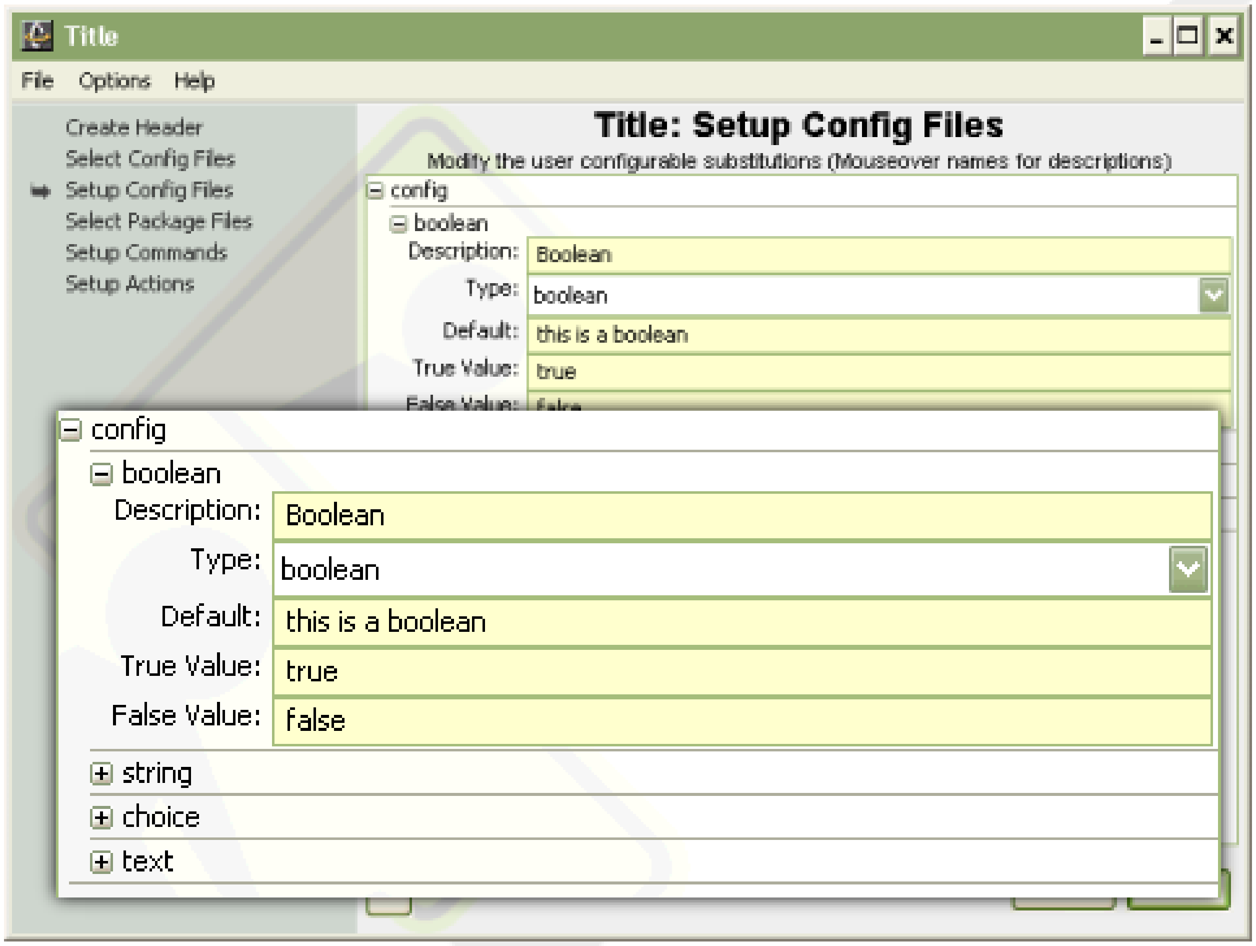
jar:file:/C:/Documents%20and%20Settings/meek/example.rsp!/config

%boolean% %string% %choice%
%text%

Selecting configuration files is easily done using the packager.

Once all the config files have been imported into the Packager the Setup Config Files panel display's the config files tokens needing to be setup. The `configfile`tag has three attributes: packagefile (the location of the stub file in the package), remotefile (where the resulting configuration file should be placed on the remote machine), and description (a simple description for the user). Additional information about the `configfile`and `sub`tags, including additional attributes to each, can be found in the reference section at the end of this document. Figure 2.3 shows the "config" config files with four tokens titled "boolean", "string", "choice" and "text". When the Setup Config Files panel initially loads, each config file is listed with a collapsable section containing the tokens. The first config file initially is expanded as show for the "config" configuration file in Figure 2.3. Each token also has a collapsable section under it, as show in Figure 2.4, with the various types of substitutions that can performed. It is important to note the names of the tokens are very important because they are what is displayed to the user when prompting for input.

Figure 2.3. Configuring Substitutions



Title: Setup Config Files

Modify the user configurable substitutions (Mouseover names for descriptions)

config

boolean

Description: Boolean

Type: boolean

Default: this is a boolean

True Value: true

False Value: false

string

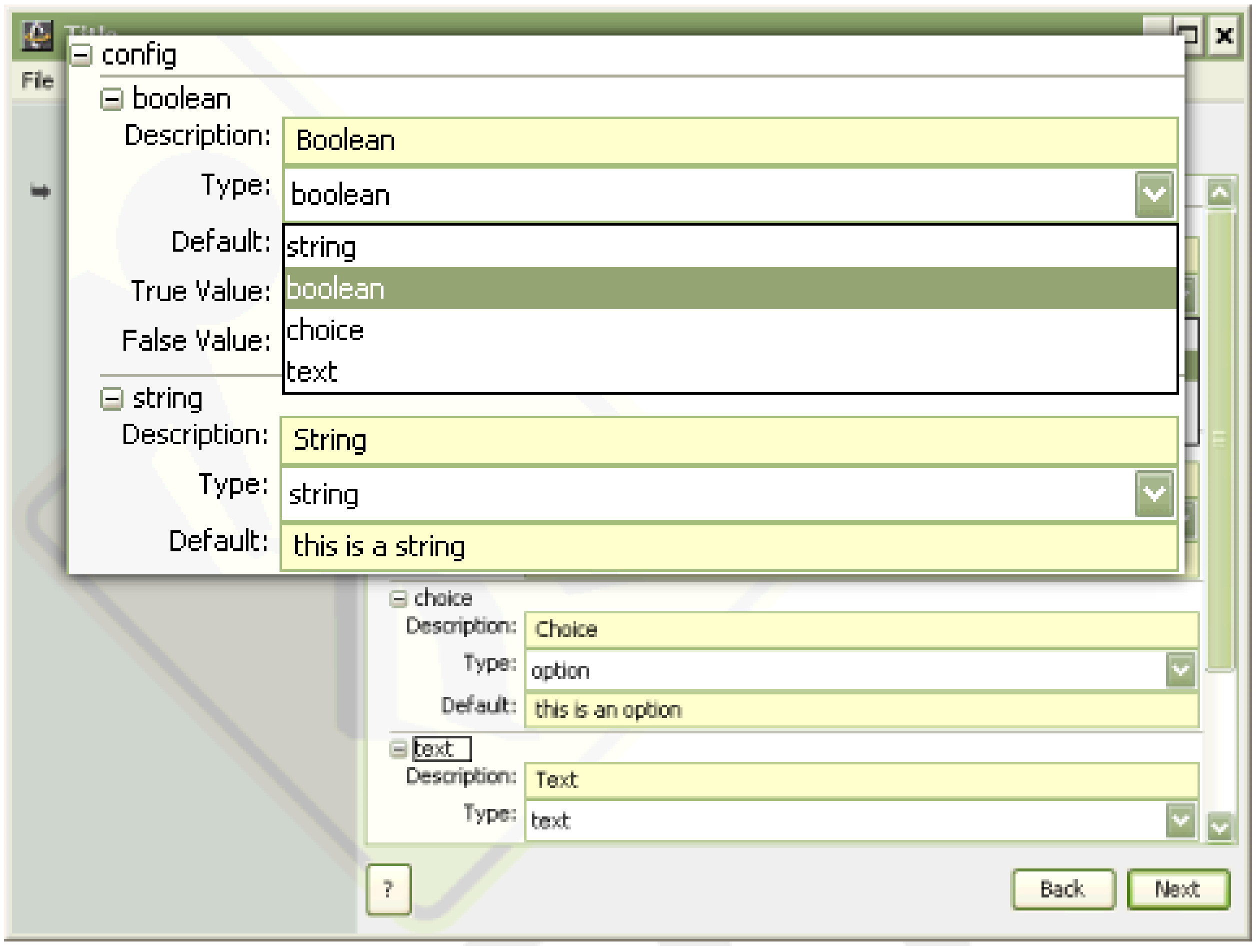
choice

text

Setting-up the configuration files substitutions

Once all the configuration files have been entered the Setup Config Files panel displays all the configuration (config) files with an associated listing of all the config files tokens. Each config file token also has a collapsable section allowing for selecting the type of substitution and setting up the token. Every token requires several common inputs, Type, Description and Default. The substitution type determines what the installer displays for input. Boolean displays a checkbox with the associated token name. String displays a single line text input box. Choice displays a drop-down box, similar to the box for Type, that can be made editable by the packager by selecting the appropriate checkbox. The choice values are input in a comma delimited list and may contain spaces. The final substitution type is text. The text area allows for substitutions to be made containing special characters such as tabs and newlines. As with all components, any field with a yellow background signifies required field for the specific substitution type.

Figure 2.4. Configuring Substitutions


config
boolean
Description: Boolean
Type: boolean
Default:
True Value:
False Value:
string
Description: String
Type: string
Default: this is a string
choice
Description: Choice
Type: option
Default: this is an option
text
Description: Text
Type: text

Types of configuration files substitutions

In the previous two figures (2.4 and 2.5) only four substitutions are made ReST, however, will handle as many substitutions as are needed. Each of the four substations represents a type of substitution supported by ReST , `string`(no more than one line of text), `text`(multiple lines of text), `choice`(a defined set of choices, much like available for command options) and boolean (a checkbox defining if a predefined substitution should take place). Each substitution type is useful for different types of substitutions. For example, boolean substitutions are useful when a single line needs to be commented or uncommented. This could be done by the following example

Example 2.1. Boolean Substation

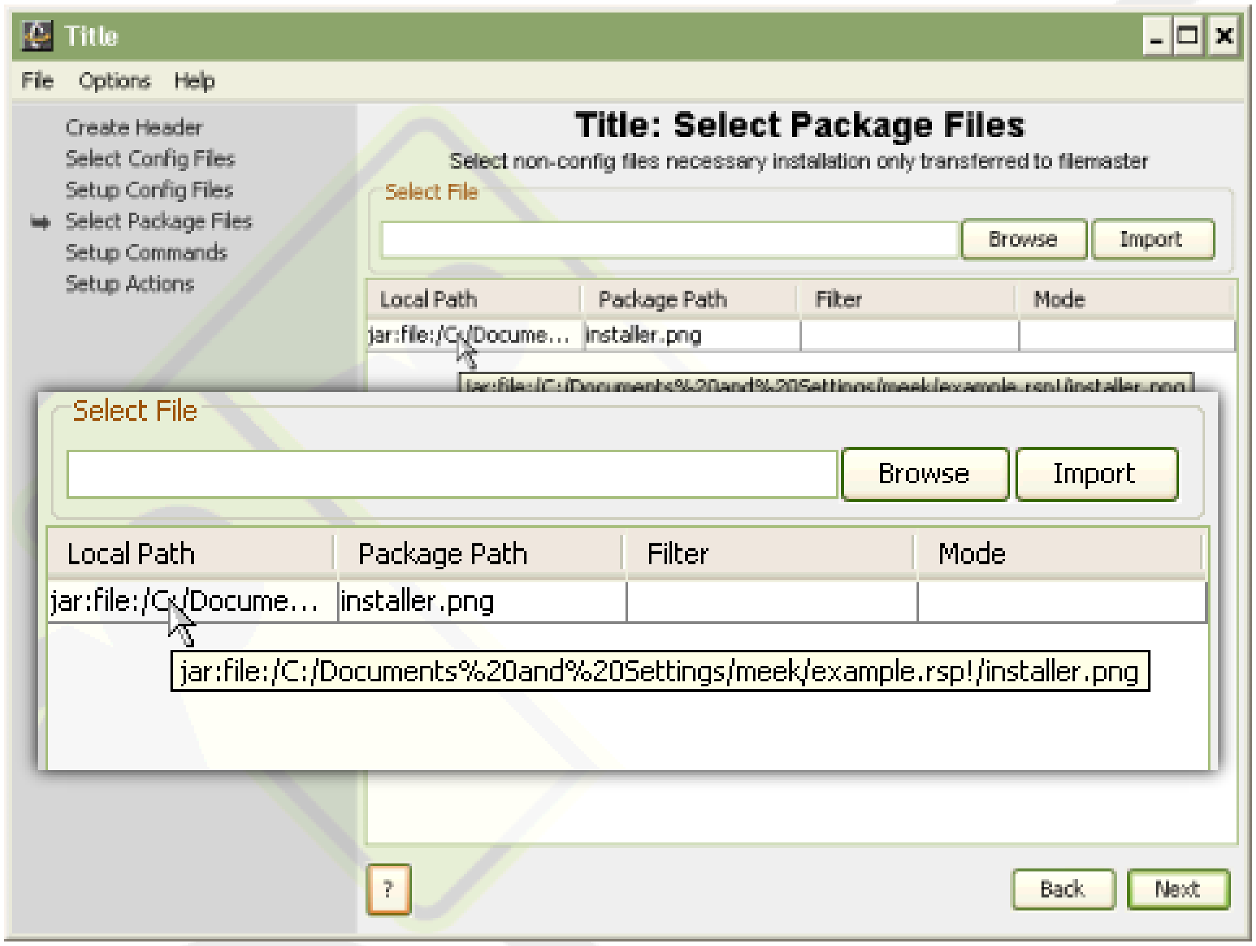
```
#Uncomment the next line to enable 3D mode %Enable 3D
      Mode%enable-opengl
```

The token is "Enable 3D Mode" and the most useful substitution type would be boolean. With the boolean type selected, two new fields are displayed, true value and false value. The user is displayed a checkbox when setting up the config file. If Default is set to "true" then the default substitution made is with the true value, otherwise, the false value is used for the substitution. So, if the true value is set to "" and the false value is "#", the user can change the value easily in a familiar way but clicking on a check box followed by "Enable 3D Mode".

The boolean substitution has the most complex substitution usage available in ReST. The other substitutions have less options available and are therefore less complex in their usage. The types of substitutions that are not boolean all have a default value. If no user customized value is provided then the default it substituted when the substitution takes place for all types except boolean.

The Package Files

Figure 2.5. Adding Files



Title: Select Package Files

Select non-config files necessary installation only transferred to filemaster

Local Path	Package Path	Filter	Mode
jar:file:/C:/Docume...	installer.png		

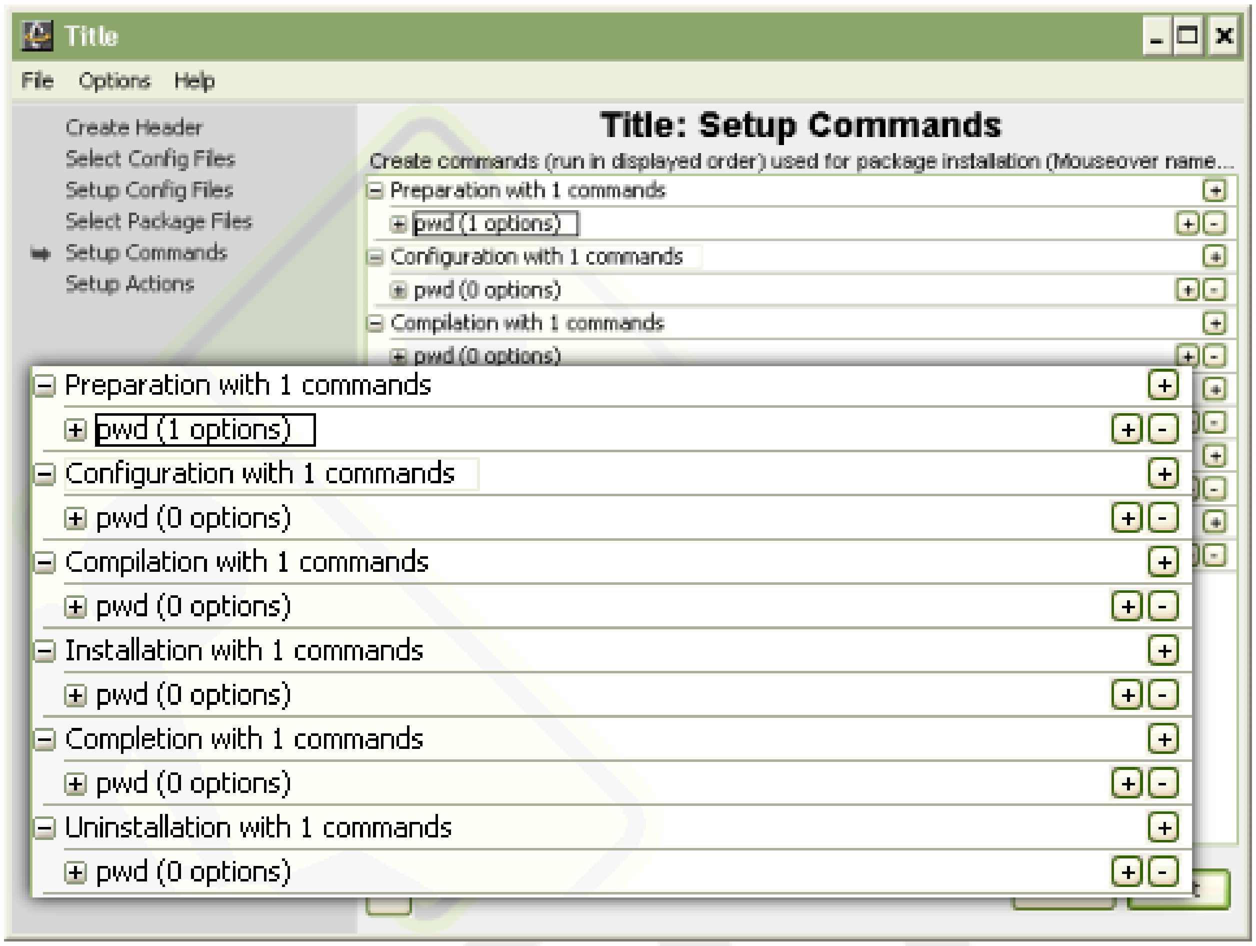
jar:file:/C:/Documents%20and%20Settings/meek/example.rsp!/installer.png

Adding files to the package

Adding files to the packages is very similar to adding config files except all the files in a directory can be added by selecting the containing dir. Package files are transferred before any of the package commands are executed. All of the package files are placed in the directory that package working directory. This provides the packager a common experience when creating packages and working with the package files.

The Package Commands

Figure 2.6. Command Sections


Title
File Options Help
Create Header
Select Config Files
Setup Config Files
Select Package Files
Setup Commands
Setup Actions
Title: Setup Commands
Create commands (run in displayed order) used for package installation (Mouseover name...
Preparation with 1 commands
pwd (1 options)
Configuration with 1 commands
pwd (0 options)
Compilation with 1 commands
pwd (0 options)
Installation with 1 commands
pwd (0 options)
Completion with 1 commands
pwd (0 options)
Uninstallation with 1 commands
pwd (0 options)

The six command sections

Commands in the package are broken into six *steps*, which simply provide a logical grouping of the commands that are run. The six steps as seen in Figure 2.6, in order, are *Preparation*, *Configuration*, *Compilation*, *Installation*, *Completion*, and *Uninstallation*, with the last grouping actually optional. Commands that need to be run first, before anything else can happen, such as extracting archives or creating directories should be placed in the preparation step. Package sources will be sent to the remote machine and package directories will be created prior to this step. Anything pertaining to configuring the software, such as running a **configure** script should be placed in the configuration step. Configuration files included in the package will be sent to the remote machine between these first two steps. Commands related to compiling and installing the package should be placed in the next two steps respectively. During the completion step the packager should clean up the build area however possible, such as deleting unneeded sources that remain. Lastly, if a packager would like to provide a means for automatically uninstalling their software, commands pertaining to this should be placed in the uninstallation step. Each step is essentially equal, but provides a logical way of organizing the package. Packagers are encouraged to group their commands using these logical step. Every step except the uninstallation step must be in the package XML, but may be empty if not needed.

Creating the commands

The sections below will provide an overview of how to write a package XML file. For more detailed information about the XML tags, including advanced attributes, please see the reference section at the end of this document.

The 6 Steps

As explained earlier, all commands for installing and uninstalling a package are organized into six logical steps: `preparation`, `configuration`, `compilation`, `installation`, `completion`, and `uninstallation`. The `uninstallation`step is optional, but recommended. These steps are essentially equal, except that configuration files are sent to the remote machine between the `preparation`and `configuration`steps. It is highly recommended that packagers take advantage of the six steps for logically grouping the package commands. Future version of the the ReST suite may contain optimizations or changes in the handling of these steps and forward compatibility is best ensured by using these steps. Below is an example of the six steps appearing in the package xml as seen in Figure 2.6.

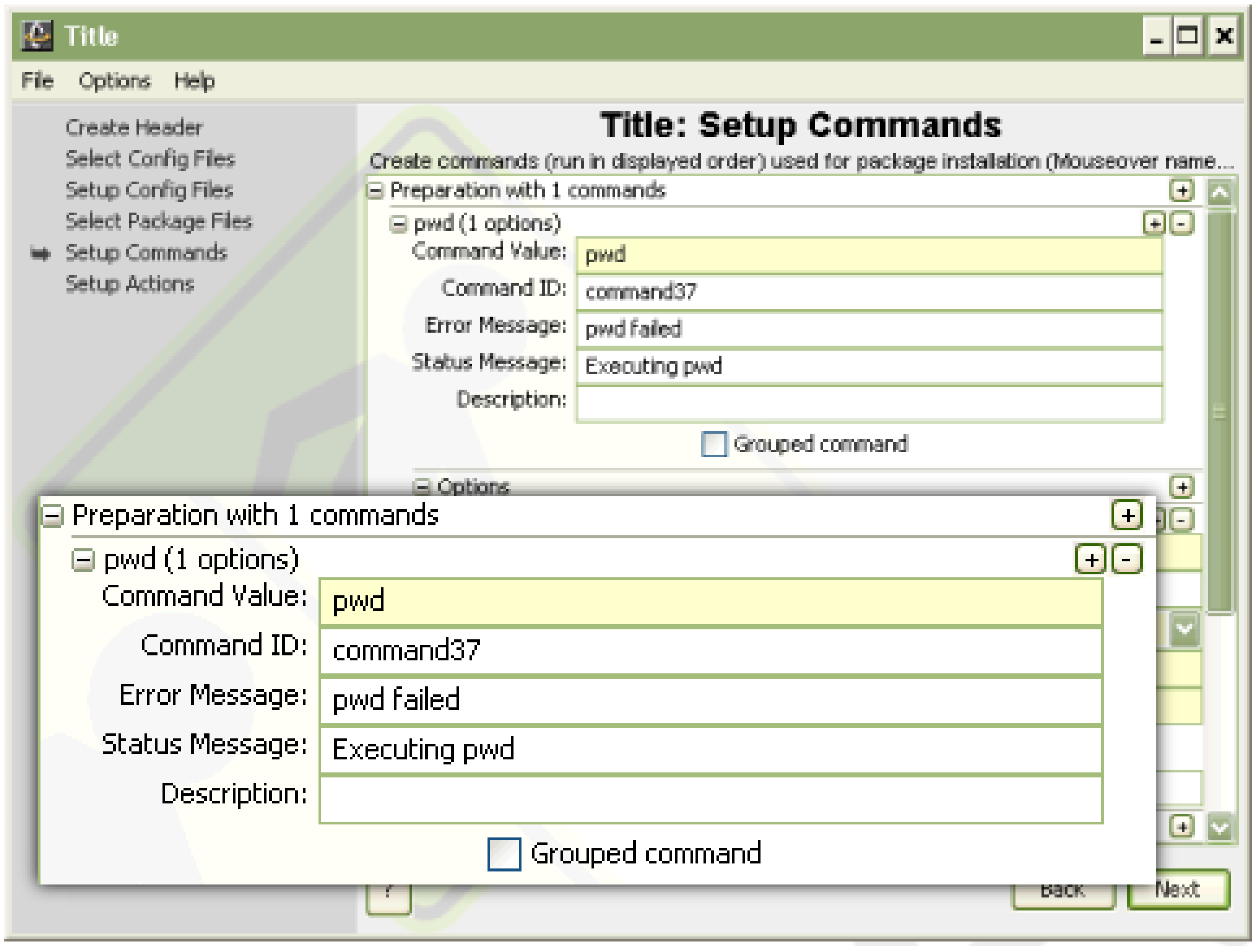
Example 2.2. The 6 Steps

```
<preparation> <command value="tar -xf
        example.tar"> <command value="cd example/">
        </preparation> <configuration> <command
        value="./configure --prefix=$PWD">
        </configuration> <compilation> <command
        value="make all"> </compilation>
        <installation> <command value="make install">
        </installation> <completion> <command
        value="make clean"> <command value="cd ..; /bin/rm -f
        example.tar"> </completion> <uninstallation>
        <command value="cd example"> <command value="make
        uninstall"> <command value="cd ..; /bin/rm -rf
        example/"> </uninstallation>
```

Package Commands

Package commands makeup the heart of rest packages. Commands are run in the bash shell and as seen in Figure 2.7 have several attributes. The most important attribute is the command value. The command value is that actual command that will be executed. Options for the command may be included in the command value but are better left as a command option included with the command. The description is the next most important value showing up as a tooltip when the Installer user modifies the command. It allows the packager to provide further information to the user as to the purpose of the command and what the user might decide to do with the command. The Command ID will be automatically generated by the packager, but should be customized for better interoperability with the Installer scripting mechanism and upcoming features of the ReST Tool Suite. The error message is displayed to the user associated with the machine the command failure occurred. The status message is displayed on the machine the command is running.

Figure 2.7. A Package Command



Title: Setup Commands

Create commands (run in displayed order) used for package installation (Mouseover name...

Preparation with 1 commands

pwd (1 options)

Command Value: pwd

Command ID: command37

Error Message: pwd failed

Status Message: Executing pwd

Description:

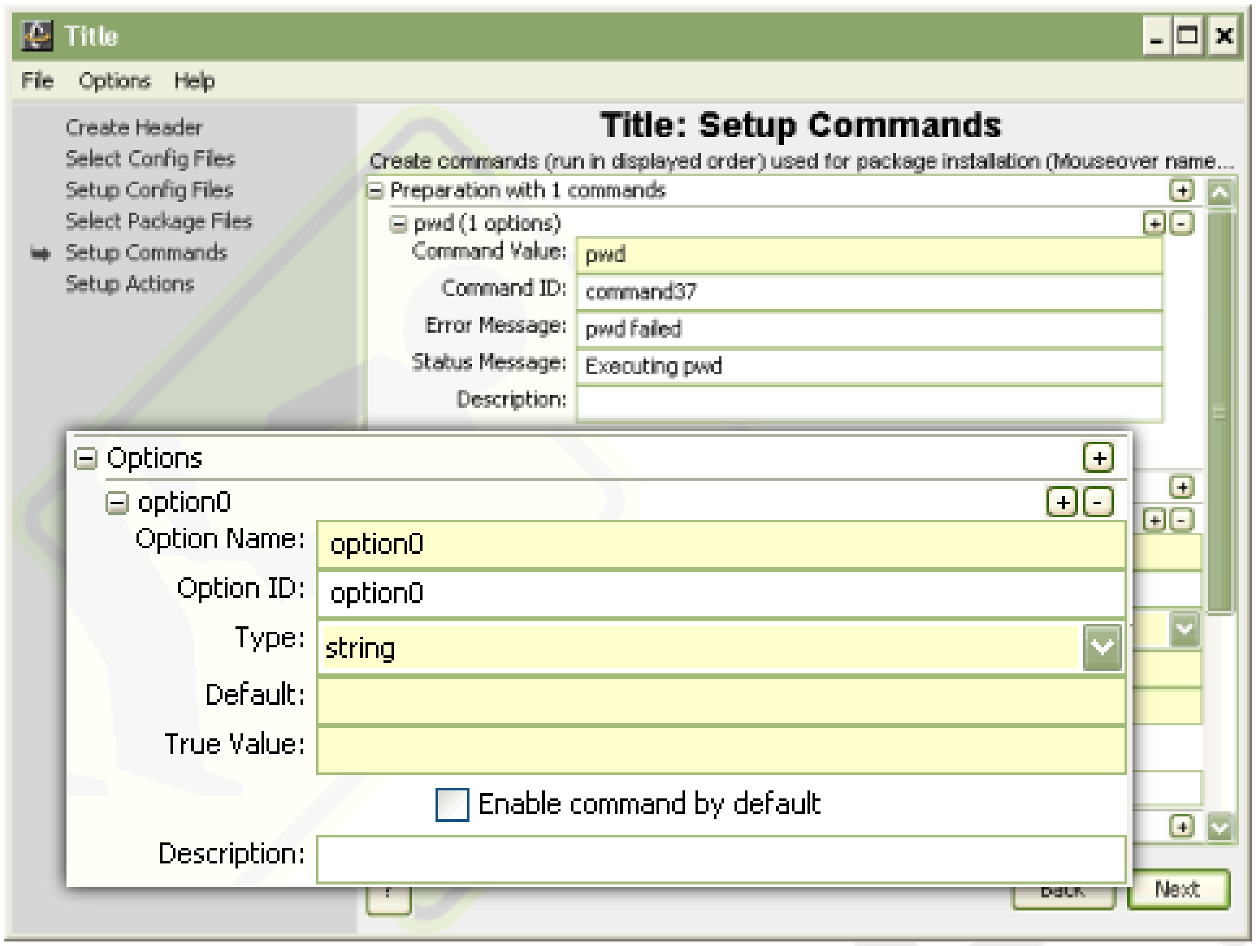
Grouped command

A package command

Command Options

Some commands may need to be configured by the user before they are run on the remote machine. For that reason the ReST XML allows `command`tags to contain `option`tags. The `option`tags define command-line arguments for a given command and can be configured by end users. A good example of a command that will likely contain options is the `./configure`script, which is included in many source distributions. It is common for this command to have many different command line options for properly configuring the build process. Below is an example of the `./configure`command with options.

Figure 2.8. A Package Command Option



Title: Setup Commands

Create commands (run in displayed order) used for package installation (Mouseover name...

Preparation with 1 commands

pwd (1 options)

Command Value: pwd

Command ID: command37

Error Message: pwd failed

Status Message: Executing pwd

Description:

Options

option0

Option Name: option0

Option ID: option0

Type: string

Default:

True Value:

Enable command by default

Description:

The package command option configuration GUI

Example 2.3. Command Option XML

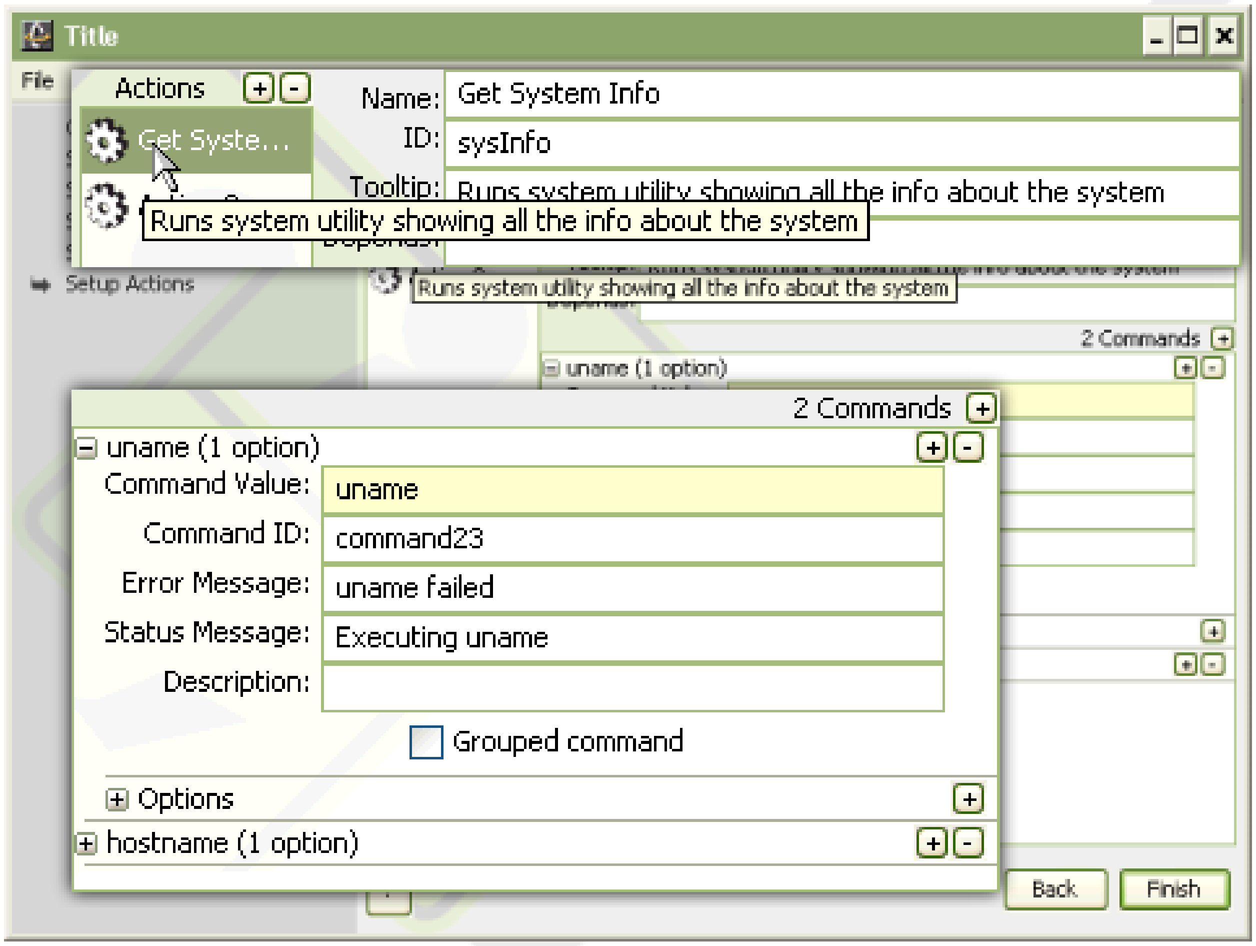
```
<command value="./configure" grouped="true">
        <option name="foo" type="text"
        default="/usr/local/lib/libfoo.a"
        truevalue="--with-libfoo="/> <option name="bar"
        type="boolean" default="false" truevalue="--with-libbar"
        falsevalue="--without-libbar"/> <option
        name="ouputlevel" type="choice" choices="debug,view,none"
        default="none" truevalue="--with-outputlevel "/>
        </command>
```

The above example defines three possible options for the `./configure`command. All of the options have four common attributes: name, type, default, and truevalue. The name attribute is exactly what would be expected, the name that the user will see when configuring this option. The type attribute may be either `string`, `boolean`, or `choice`. The default attribute defines what the value should be by default, which is required for installation in simple mode. Finally the truevalue attribute defines what is appended to the command if the option is enabled or if a option of type boolean is selected. For example, if option `foo`is enabled and the default value is left untouched the resulting string `--with-libfoo=/usr/local/lib/libfoo.a`will be appended to the command. Packagers are encouraged to expose all possible command-line options to the users through ReST as the packager is more knowledgeable about the software included than the user. Additional information about the `option`tag can be found in the reference section at the end of this document.

Actions

ReST actions are commands that exist on systems after a software package has been installed. For a piece of server software, for example, this could include starting, stopping, and restarting the server. An `action`is simply a wrapper around one or more `command`tags, much like each of the six steps described above, except that the `action`tag requires a name for the action. Actions can be run by the ReST Installer immediately after installation is complete or by the ReST Explorer at any time after package installation. Below are pictures of the Action setup GUI and an XML example of a package action.

Figure 2.9. The Action Setup Panel



Name: Get System Info
ID: sysInfo
Tooltip: Runs system utility showing all the info about the system

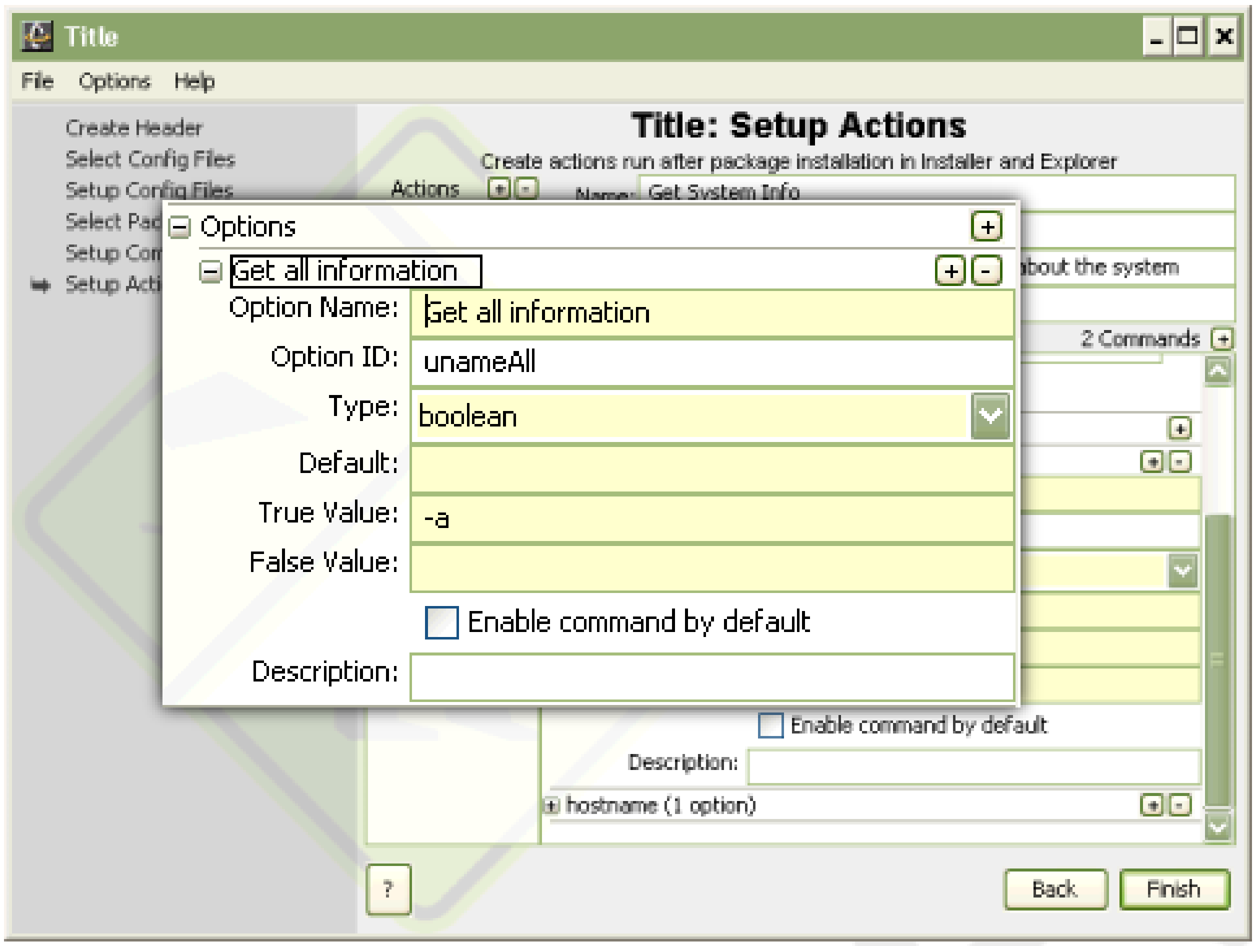
Runs system utility showing all the info about the system

Command Value: uname
Command ID: command23
Error Message: uname failed
Status Message: Executing uname
Description:

Important elements of the action panel

To add an Action to the package, click on the + button on the top right next to the "Actions" label (Figure 2.9). This will add an action to the list below the actions label. The action attributes can be set in the form to the right of the Actions + and - buttons. All value of the action, Name, ID, Tooltip and Description should be entered. Added commands to and actions is done the same way as to the six command sections and the action commands may also have command options that are also added in the same manner as in the "Setup Commands" panel (see Figure 2.10).

Figure 2.10. The Action Command Option Setup Panel



Title: Setup Actions

Create actions run after package installation in Installer and Explorer

Name: Get System Info

bout the system

2 Commands

Options

Get all information

Option Name: Get all information

Option ID: unameAll

Type: boolean

Default:

True Value: -a

False Value:

[ ] Enable command by default

Description:

[ ] Enable command by default

Description:

hostname (1 option)

Action Command option setup

Example 2.4. Package Actions XML

```
<actions> <action name="Start Server"
        tooltip="Start a server."> <command value="/bin/bash
        ./start_server.sh" statusmsg="Starting Server"
        errormsg="Failed to start server."/> </action>
        <action name="Kill Server" tooltip="Kill a server.">
        <command value="/bin/bash ./kill_server.sh"
        statusmsg="Killing Server" errormsg="Failed to kill
        server."/> </action> <action name="Restart
        Server" tooltip="Restart a server."> <command
        value="/bin/bash ./kill_server.sh" statusmsg="Killing
        Server" errormsg="Failed to kill server."/> <command
        value="/bin/bash ./start_server.sh" statusmsg="Starting
        Server" errormsg="Failed to start server."/>
        </action> </actions>
```

Chapter 3. Creating and using the package file

In the graphical packager simply select "File->Save". From the command line it is a little more complicated. Once the package XML has been written, stub configuration files have been created and source files have been gathered, it is time to combine all of the files into a ReST package. Part of the ReST suite is the ReST Packager utility. This utility combines all of the necessary files into one package for easy distribution. Below is an example of how the ReST Packager is used.

Example 3.1. Running the ReST Packager.

```
> java -jar ReSTPackager.jar -X examplepackage.xml
    -f example.rsp file1 file2 stub.cfg
```

In the above example, the user has run the ReST Packager, which is included in the ReST suite to create a package named example.rsp. The `-X`argument tells the ReST Packager to use `examplepackage.xml`as the package XML file for this package. The `-f`argument tells the packager the name of the file to create. The remaining arguments tell the Packager which files to include. Every file that is declared in the package.xml must be included in the Packager arguments. The resulting file can be distributed by whatever means desired and used with the ReST Installer.

Once the package file is created, it simply needs to be installed from the ReST Installer. To install the package, run the ReST Installer with the name of the package as an argument. The package can be local or placed on a web server, although larger packages will run more quickly if they are local. Here is an example of our package being used by the ReST Installer.

Example 3.2. Installing a Package

```
> java -jar ReSTInstaller.jar example.rsp
```

Chapter 4. Conclusions

The ReST package specification was designed to give packagers a flexible system for creating an application installer for their software. This document should have given you the basic knowledge needed to build a package for your software. More detailed information about the ReST package XML, including a full example can be found in the reference pages of this document. For questions about ReST and to provide feedback or suggestions, please feel encouraged to e-mail the authors of this document.

Package XML Elements

Name

`action` -- Commands that can be run after a package has been installed.

Description

Once a package has been installed there may be some commands that a user will be able to run. ReST calls these commands "actions" and allows them to be run in the Installer immediately after an installation or by the Explorer at any time after the package has been installed.

Atrributes

- name (required) - How the action should be known
- tooltip (required) - This will appear as a tooltip in the ReST applications
- id (optional) - A unique id for this action within the package. This is only needed if there are dependencies between actions.
- depends (optional) - A comma-separated list of action ids on which this action depends.

Parents

The following elements are valid parents of `action`: `actions`.

Children

The following elements are children of `action`: `command`.

Example

Example 7. Action Example

```
<action name="Start Server" tooltip="Start a server.">
  <command value="/bin/bash ./start_server.sh" statusmsg="Starting Server"
            errormsg="Failed to start server."/>
</action>
```

Name

`actions` -- Wrapper element for multiple action elements.

Description

This element appears in the ReST package header and contains 1 or more `action` elements.

Parents

The following elements are valid parents of `actions`: `header`.

Children

The following elements are children of `actions`: `action`.

Example

Example 8. Actions Example

```
<actions>
  <action name="Start Server" tooltip="Start a server.">
    <command value="/bin/bash ./start_server.sh" statusmsg="Starting Server"
              errormsg="Failed to start server."/>
  </action>
  <action name="Kill Server" tooltip="Kill a server.">
    <command value="/bin/bash ./kill_server.sh" statusmsg="Killing Server"
              errormsg="Failed to kill server."/>
</actions>
```

Name

`backgroundcolor` -- Declare the background color that should be used in the ReST applications when referencing this package.

Description

If the `backgroundcolor` element appears in an application's attributes then the declared color will be used instead of the default background color for applications referencing this package. The color should be given in hex notation as would be given in HTML code.

Parents

The following elements are valid parents of `backgroundcolor`: `explorerattributes`, `installerattributes`, `monitorattributes`.

Children

The following elements are children of `backgroundcolor`: *No Children*.

Name

`backgroundimage` -- Declare the background image that should be used in the ReST applications when referencing this package.

Description

If the `backgroundimage` element appears in an application's attributes then the given image will appear as a watermark in the background of ReST applications as they refernce this package. The image could be included in the ReST package or reference an image that appears in a web space.

Parents

The following elements are valid parents of `backgroundimage`: `explorerattributes`, `installerattributes`, `monitorattributes`.

Children

The following elements are children of `backgroundimage`: *No Children*.

Name

`base` -- Gives the base directory for this package.

Description

By defining a base directory for a package, multiple packages can be organized to share a common space. This is useful for organizing libraries, which can be given a base of *libs*, or software packages that include several plugable or optional components that may be installed at a later time.

Parents

The following elements are valid parents of `base`: `header`.

Children

The following elements are children of `name`: *No Children*.

Name

`checksumuri` -- Give the uri to a file that contains the checksum for this package.

Description

When a package is created with the ReST packager a checksum is printed, which can be placed in a file on a webspace. This element points to such a file to give the ReST application the ability to verify the package before using it. This behavior is optional. ReST packages already contain checksums of the files contained, which are verified when a package is used; package checksums are in addition to this behavior. At the current time `checksumuri` is not supported, but will be added to future versions of ReST.

Attributes

- forcechecksum - If set to true, ReST applications will not accept a package that does to match the given checksum. If set to false, the application will simply warn that the checksum does not match. If forcechecksum does not appear, false is assumed.

Parents

The following elements are valid parents of `chucksumuri`: `header`.

Children

The following elements are children of `chucksumuri`: *No Children.*

Name

`command` -- Run a command on the remote system.

Description

The `command` tag declares a single command to be run on the remote system. By default this command is run in a `/bin/bash` environment and commands should be written with this in mind. A `command` contains 0 or more `option` tags, allowing the command to be configured from the ReST application's GUI.

Attributes

- value (required) - The command to be run.
- shell (optional) - The shell in which to run the command. At this time `shell` is not supported, but support will be added in future versions of ReST.
- required (optional) - If the user should be given the option to not run this command, `required` should be set to false. If `required` is not given, the command will be run.
- grouped (optional) - If running the command on one machine in a given logical group is sufficient, set `grouped="true"`, if `grouped` is not given or `grouped="false"` the command will be run on every machine in the logical group.
- id (optional) - A unique id given to this command, which is used if command dependencies exist. Dependencies are not supported at this time.
- depends (optional) - A comma-separated list of ids on which this command depends. Dependencies are not supported at this time.
- errormsg (optional) - A short message that should be displayed as the status of a given location if the command fails.
- statusmsg (optional) - A short message that will be displayed as the status of a given location as it runs a command.
- description (optional) - A description of the command, used to help users understand the commands as they are configured.
- forceConfigure (optional) - By default command options are only configured in Advanced Mode for a given ReST application. However, if a given command *must* be configured, set `forceConfigure="true"`.

Parents

The following elements are valid parents of `command`: `action`, `compilation`, `completion`, `configuration`, `installation`, `preparation`, `uninstallation`.

Children

The following elements are children of `command`: `option`.

Example

Example 9. Command Example

```
<command value="make" grouped="true">
  <option type="boolean" truevalue="standard" name="Standard" enabled="true"/>
  <option type="boolean" truevalue="all" name="All"/>
  <option type="boolean" truevalue="server" name="Server"/>
  <option type="boolean" truevalue="agent" name="Agent"/>
  <option type="boolean" truevalue="C" name="C"/>
  <option type="boolean" truevalue="Fortran" name="Fortran"/>
  <option type="boolean" truevalue="matlab" name="Matlab"/>
  <option type="boolean" truevalue="octave" name="Octave"/>
  <option type="boolean" truevalue="mathematica" name="Mathematica"/>
  <option type="boolean" truevalue="gridrpc" name="GridRPC"/>
  <option type="boolean" truevalue="pdfgui" name="PDF Gui"/>
  <option type="boolean" truevalue="tools" name="Tools"/>
  <option type="boolean" truevalue="wrappers" name="Wrappers"/>
  <option type="boolean" truevalue="tester"  name="Tester"/>
  <option type="boolean" truevalue="regress" name="Regression Test Suite"/>
  <option type="boolean" truevalue="clean" name="Clean"/>
  <option type="boolean" truevalue="configclean" name="Configclean"/>
  <option type="boolean" truevalue="CLEAN" name="Clean every architecture"/>
</command>
```

Name

`compilation` -- The 3rd of the 5 steps to installing a package.

Description

This is the 3rd of the 5 steps to installing a package, occuring after configuration and before installation. Commands that relate to compiling the contained software should be done in this step.

Parents

The following elements are valid parents of `compilation`: `package`.

Children

The following elements are children of `compilation`: `command`.

Name

`completion` -- The 5th of the 5 steps to installing a package.

Description

This is the 5th of the 5 steps to installing a package, occuring after installation. Commands that must be run after a package is installed or relate to cleaning up the build area, such as removing unneeded files should be placed in this step.

Parents

The following elements are valid parents of `completion`: `package`.

Children

The following elements are children of `completion`: `command`.

Name

`configfile` -- Declare a file that must be configured by the user.

Description

A package may contain configuration files for the packaged software. These files will be configured from the GUI by the user. The `configfile` will contain several `sub` tags, which define tokens that will be replaced in the file.

Attributes

- packagefile (required) - The name of the file as it is contained in the package.
- remotefile (required) - The name of the file as it should be on the remote system. This can be a relative pathname (ex. src/file.conf).
- description (optional) - A description of the file's purpose or conventions.
- forceConfigure (optional) - If `forceConfigure="true"` the user will be required to edit the file, even if they are not in Advanced Mode in the ReST application. If `forceCongfigure` is not declated or `forceConfigure="false"` the defaults will be used for all substitutions.

Parents

The following elements are valid parents of `configfile`: `header`.

Children

The following elements are children of `configfile`: `sub`.

Example

Example 10. Configfile XML Example

```
<configfile packagefile="server_config"
                remotefile="NetSolve-2.0/server_config"
                description="NetSolve Server Configuration File">
  <sub name="nproc" description="Number of processors"
       default="2" type="string"/>
  <sub name="agent" description="The NetSolve Agent hostname"
       default="netsolve.cs.utk.edu" type="string"/>
  <sub name="scratch" description="Scratch Directory"
       default="/tmp/" type="string"/>
  <sub name="mpihosts" description="Number of MPI Hosts"
       default="4" type="string"/>
  <sub name="workloadmax" description="Maximum allowable workload"
       default="-1" type="string"/>
</configfile>
```

Example 11. Sample Configuration File Stub

```
@PROC:%nproc%
@AGENT:%agent%
@WORKLOADMAX:%workloadmax%
@SCRATCH:%scratch%
@MPIHOSTS ./MPImachines %mpihosts%
```

Name

`configuration` -- The 2nd of the 5 steps to installing a package.

Description

This is the 2nd of the 5 steps to installing a package, occuring after preparation and before compilation. Commands that relate to configuration for compilation (such as running `configure` scripts) should be done in this step. Configuration files are sent to the remote location immediately before this step.

Parents

The following elements are valid parents of `configuration`: `package`.

Children

The following elements are children of `configuration`: `command`.

Name

`def` -- Defines a substitution or command option in a `pre` set.

Description

This element is used to define a command option (if type="option") or substitution (if type="sub") within a `pre` set. See `predefs` for a usage example.

Attributes

- type (required) - Either *option* or *sub*, defining whether this definition is for a command option or configuration substitution.
- ref (required) - The id of the option or substitution to which this definition refers.

Parents

The following elements are valid parents of `def`: `pre`.

Children

The following elements are children of `def`: *No Children*.

Name

`description` -- Provide a description of the package.

Description

A description of the software included in this package. This description should give users an understanding of the software's purpose.

Parents

The following elements are valid parents of `description`: `header`.

Children

The following elements are children of `description`: *No Children*.

Name

`explorerattributes` -- Contains attributes to customize the look and feel of the ReST Explorer for a specific package.

Description

Contains attributes to customize the look and feel of the ReST Explorer for a specific package.

Parents

The following elements are valid parents of `explorerattributes`: `header`.

Children

The following elements are children of `explorerattributes`: `backgroundcolor`, `backgroundimage`, `icon`.

Name

`header` -- Provide basic metadata about the package.

Description

This item contains the package metadata.

Parents

The following elements are valid parents of `header`: `package`.

Children

The following elements are children of `header`: `action`, `actions`, `checksumuri`, `configfile`, `description`, `explorerattributes`, `info`, `infouri`, `license`, `licenseuri`, `monitorattributes`, `name`, `packagedir`, `packager`, `packagesrc`, `patch`, `predefs`, `title`, `packager`, `packager`.

Example

Example 12. Package Header Example

```
<header>
    <name>NetSolve</name>
    <title>NetSolve Installer</title>
    <version>2.0</version>
    <description>NetSolve is a grid middleware package</description>
    <uri>http://icl.cs.utk.edu/netsolve/</uri>

    <!-- Basic information about the packager -->
    <packager>
      <name>Jeff M. Larkin</name>
      <uri>mailto:larkin@cs.utk.edu</uri>
    </packager>

    <actions>
      <action name="Start Server" tooltip="Start a NetSolve server.">
        <command value="/bin/bash ./start_server.sh" statusmsg="Starting Server"
                 errormsg="Failed to start server."/>
      </action>
      <action name="Kill Server" tooltip="Kill a NetSolve server.">
        <command value="/bin/bash ./kill_server.sh" statusmsg="Killing Server"
                 errormsg="Failed to kill server."/>
      </action>
      </action>
    </actions>

    <configfile packagefile="server_config"
                remotefile="NetSolve-2.0/server_config"
                description="NetSolve Server Configuration File">
      <sub name="nproc" description="Number of processors"
           default="2" type="string"/>
      <sub name="agent" description="The NetSolve Agent hostname"
           default="netsolve.cs.utk.edu" type="string"/>
      <sub name="scratch" description="Scratch Directory"
           default="/tmp/" type="string"/>
      <sub name="mpihosts" description="Number of MPI Hosts"
           default="4" type="string"/>
      <sub name="workloadmax" description="Maximum allowable workload"
           default="-1" type="string"/>
    </configfile>
    <!-- Package source(s). We can do both remote and local files  -->
    <packagesrc>NetSolve-2.0.tgz</packagesrc>
    <packagesrc>config.guess</packagesrc>
    <packagesrc>start_server.sh</packagesrc>
    <packagesrc>kill_server.sh</packagesrc>

    <installerattributes>
        <backgroundimage>http://www.cs.utk.edu/~meek/icl/GSAP/netsolve_bg.png</backgroundimage>
        <icon>http://icl.cs.utk.edu/favicon.ico</icon>
    </installerattributes>
</header>
```

Name

`icon` -- Defines the icon to appear in the titlebar of a ReST application when referencing this ReST package.

Description

If `icon` is given in `explorerattributes`, `installerattributes`, `monitorattributes` and icon will appear in the titlebar of the related ReST application when referencing this package.

Parents

The following elements are valid parents of `icon`: `explorerattributes`, `installerattributes`, `monitorattributes`.

Children

The following elements are children of `icon`: *No Children*.

Name

`info` -- Give additional information about the software contained in this package.

Description

This is an optional tag to give additional information about the software contained in the package. The tag could be used to display the contents of a README file, for instance.

Parents

The following elements are valid parents of `info`: `header`.

Children

The following elements are children of `info`: *No Children*.

Name

`infouri` -- Give a link to a text file containing additional information about the software contained in this package.

Description

This is an optional tag to give additional information about the software contained in the package. The link should point to a text file located on a web server. The tag could be used to display the contents of a README file, for instance.

Parents

The following elements are valid parents of `infouri`: `header`.

Children

The following elements are children of `infouri`: *No Children*.

Name

`installation` -- The 4th of the 5 steps to installing a package.

Description

This is the 4th of the 5 steps to installing a package, occuring after compilation and before completion. Commands that relate to installing the software in its final location should be placed in this step.

Parents

The following elements are valid parents of `installation`: `package`.

Children

The following elements are children of `installation`: `command`.

Name

`installerattributes` -- Contains attributes to customize the look and feel of the ReST Installer for a specific package.

Description

Contains attributes to customize the look and feel of the ReST Installer for a specific package.

Parents

The following elements are valid parents of `installerattributes`: `header`.

Children

The following elements are children of `installerattributes`: `backgroundcolor`, `backgroundimage`, `icon`.

Name

`license` -- Define the licensing terms of the included software.

Description

License and licenseuri give the packager a way to provide licensing information about the enclosed software. License elements should contain the text of the license while Licenseuri is simply a link to a text file containing the license. If Licenseuri is used, the ReST application will retrieve the license file and display its contents. Both elements are optional.

Example

Example 13. License Example

```
<license forceaccept="true">This is the license that you must accept</license>
```

Parents

The following elements are valid parents of `license`: `header`.

Children

The following elements are children of `license`: *No Children*.

Name

`licenseuri` -- Define the licensing terms of the included software.

Description

License and licenseuri give the packager a way to provide licensing information about the enclosed software. License elements should contain the text of the license while Licenseuri is simply a link to a text file containing the license. If Licenseuri is used, the ReST application will retrieve the license file and display its contents. Both elements are optional.

Example

Example 14. Licenseuri Example

```
<licenseuri forceaccept="true">http://example.com/license.txt</license>
```

Parents

The following elements are valid parents of `licenseuri`: `header`.

Children

The following elements are children of `licenseuri`: *No Children*.

Name

`monitorattributes` -- Contains attributes to customize the look and feel of the ReST Monitor for a specific package.

Description

Contains attributes to customize the look and feel of the ReST Monitor for a specific package.

Parents

The following elements are valid parents of `monitorattributes`: `header`.

Children

The following elements are children of `monitorattributes`: `backgroundcolor`, `backgroundimage`, `icon`.

Name

`name` -- Gives the name of the packager.

Description

The name tag is used to provide the name of the packager. It is a generic element that could be extended for more uses in the future.

Parents

The following elements are valid parents of `name`: `packager`.

Children

The following elements are children of `name`: *No Children*.

Name

`option` -- Declares configurable options for a command.

Description

Some commands may be configurable through command-line options. Using one or more `option` tags within and command allows users to customize these options via the ReST GUI.

Attributes

- name (required) - The name to appear by the option during customization.
- default (required) - The default value for this option. This is appended to the command *after* the truevalue (if type is not boolean. This may be an empty string.
- type (required) - What type of substitution is this? Valid types are string (one line of text), choice (chosen from a list), boolean (true/false).
- truevalue (required) - If type=boolean, this is the value to to append to the command. If type is not boolean then this will be appended to the command before the value input from the user. This can be an empty string.
- falsevalue (required only if type=boolean) - The value to append if type is boolean and false is selected. This can be an empty string.
- choices (required if type=choice) - A comma separated list of possbile choices for this option.
- customChoice (optional) - If the type is choice and this attribute is set to true then the user may choose from the list of choices or give their own value for this option. If this attribute is false or not declared, the user is restricted to the given choices.
- id (optional) - A unique id given to this option, which is used if option dependencies exist. Dependencies are not supported at this time.
- depends (optional) - A comma-separated list of ids on which this option depends. Dependencies are not supported at this time.
- enabled (optional) - If true this option will be turned on by default. If false or missing this option will be turned off by default.
- description (optional) - A description of what this option does to the command.

Parents

The following elements are valid parents of `option`: `command`.

Children

The following elements are children of `option`: *No Children*.

Example

See `command` for an example of how to use options.

Name

`package` -- The ReST Package root element.

Description

This is the root element for a ReST package.

Attributes

- version (optional) - The version of this package. This does not necessarily match the version of the software contained in the package.

Parents

The following elements are valid parents of `package`: *No Parent*.

Children

The following elements are children of `package`: `compilation`, `completion`, `configuration`, `header`, `installation`, `preparation`, `uninstallation`.

Example

See ReST Package Maker's Guide Appendix for a full package example.

Name

`packagedir` -- Declare a directory within the structure of the package file.

Description

If the packager wishes to create a package that contains a directory structure, rather than a flat package, each directory inside the package must be declared with a `packagedir` tag.

Parents

The following elements are valid parents of `packagedir`: `header`.

Children

The following elements are children of `packagedir`: *No Children*.

Name

`packager` -- Information about the person who created this ReST Package.

Description

Information about the person who created this ReST Package. This information could include name, contact information, webpage, etc.

Parents

The following elements are valid parents of `packager`: `header`.

Children

The following elements are children of `packager`: `name`, `uri`.

Name

`packagesrc` -- Declares a file that appears in the ReST package.

Description

Every file that is contained in a package must be declared with a `packagesrc` tag, `configfile` tag, or a `patch` tag (but not multiple tags). Any other file that is contained in the package will be ignored.

Parents

The following elements are valid parents of `packagesrc`: `header`.

Children

The following elements are children of `packagesrc`: *No Children*.

Name

`patch` -- Declares a patch file to be applied to the sources contained in this file. (NOT CURRENTLY SUPPORTED)

Description

If the sources contained in this package need to be patched, a patch file can be included in the package and declared with a `patch` tag. The specifics of this patch file have not yet been determined and this tag is not yet supported by ReST.

Parents

The following elements are valid parents of `patch`: `header`.

Children

The following elements are children of `patch`: *No Children*.

Name

`pre` -- A set of predefined options and substitutions.

Description

The `pre` set gives developers a way to pre-define certain options and substitution cases for common installations. For example, if certain options are suggested when installing on x86 Linux, a `pre` set may be defined for x86 Linux installations. See `predefs` for a usage example.

Attributes

- name (required) - The name of this pre-defined set.
- description (optional) - A description of when this set is appropriate.
- id (optional) - A unique identifier for this set, used in package dependencies

Parents

The following elements are valid parents of `pre`: `predefs`.

Children

The following elements are children of `pre`: `def`.

Name

`predefs` -- Provide groups of pre-defined command options and configuration substitutions.

Description

When the developer wishes to pre-define certain options and configuration substitutions to help users by simplifying package configuration, the `predefs` group is used. These sets allow the user to suggest certain options and substitutions for common installation cases. For example, the developer may define pre-defined sets for x86 Linux and Solaris.

Parents

The following elements are valid parents of `predefs`: `header`.

Children

The following elements are children of `predefs`: `pre`.

Example

Example 15. Predef and Def Example

```
Example still to be written.
```

Name

`preparation` -- The 1st of the 5 steps to installing a package.

Description

This is the 1st of the 5 steps to installing a package, occuring before configuration. Commands that relate to compiling the contained software should be done in this step.

Parents

The following elements are valid parents of `preparation`: `package`.

Children

The following elements are children of `preparation`: `command`.

Name

`sub` -- Defines a substitution that will be made in a configuration file.

Description

This element maps a substitution in a configuration file. This substitution is only relevant to the file defined by the parent `configfile` tag.

Attributes

- name (required) - The token that will be substituted in the file. This token should not contain any spaces or special characters.
- description (recommended) - A description of what this particular substitution does in the configuration file.
- format (optional) - This parameter is used to validate that the input is of the proper form. This is not currently supported by ReST.
- default (required) - The default value is this substitution is not customized.
- type (required) - What type of substitution is this? Valid types are string (one line of text), option (chosen from a list), text (multiple lines of text), boolean (true/false).
- truevalue (required if type=boolean) - The value to subsitute if type is boolean and true is selected. This can contain an empty string.
- falsevalue (required if type=boolean) - The value to subsitute if type is boolean and false is selected. This can contain an empty string.
- choices (required if type=choice) - A comma separated list of possbile choices for this substitution.
- customChoice (optional) - If the type is choice and this attribute is set to true then the user may choose from the list of options or give their own value for this substitution. If this attribute is false or not declared, the user is restricted to the given choices.

Parents

The following elements are valid parents of `sub`: `configfile`.

Children

The following elements are children of `sub`: *No Children*.

Example

See `configfile` for an example of how to use this tag.

Name

`title` -- The title the will appear in the ReST applications for this package.

Description

The title the will appear in the ReST applications for this package. If the title is longer than 32 characters long (including spaces), an additional short title should be provided.

Atrributes

- role (optional) - If this is some special title, like a short title, what role does it serve? By default the ReST applications only support role *short*, but other roles may be added.

Parents

The following elements are valid parents of `title`: `header`.

Children

The following elements are children of `title`: *No Children*.

Name

`uninstallation` -- An option additional step to define how to uninstall a package.

Description

This is the an optional step the defines how to uninstall a package. Commands that relate to deleting the contained software should be done in this step.

Parents

The following elements are valid parents of `uninstallation`: `package`.

Children

The following elements are children of `uninstallation`: `command`.

Name

`uri` -- A standard URI that may be used to provide more information about a package or package author.

Description

A standard URI that may be used to provide more information about a package or package author. This may include a mailto URI.

Parents

The following elements are valid parents of `uri`: `header`, `packager`.

Children

The following elements are children of `uri`: *No Children*.

Name

`version` -- Give the version of packaged software.

Description

The version of the software included in this package. This should be the software version and not a version for the ReST package itself. The optional version attribute of package should be used instead to give a version of the ReST package, if desired.

Parents

The following elements are valid parents of `version`: `header`.

Children

The following elements are children of `version`: *No Children*.

Complete Package XML

Name

Complete Package XML Example -- Show the complete XML of a package.

Complete Package XML

Example 16. Example Package XML

```
<?xml version="1.0" encoding="UTF-8"?>
<package xmlns="http://icl.cs.utk.edu/ReST/Package/1.0"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://icl.cs.utk.edu/ReST/Package/1.0
                             http://icl.cs.utk.edu/rest/restpackage-1_0.xsd">

  <!-- Basic information about the software package -->
  <header>
    <title>NetSolve Installer</title>
    <base>NetSolve</base>
    <version>2.0</version>
    <description>NetSolve is a grid middleware package</description>
    <uri>http://icl.cs.utk.edu/netsolve/</uri>

    <!-- Basic information about the packager -->
    <packager>
      <name>Jeff M. Larkin</name>
      <uri>mailto:larkin@cs.utk.edu</uri>
    </packager>

    <actions>
      <action name="Start Server" tooltip="Start a NetSolve server.">
        <command value="/bin/bash ./start_server.sh" statusmsg="Starting Server"
                 errormsg="Failed to start server."/>
      </action>
      <action name="Kill Server" tooltip="Kill a NetSolve server.">
        <command value="/bin/bash ./kill_server.sh" statusmsg="Killing Server"
                 errormsg="Failed to kill server."/>
      </action>
      <action name="Restart Server" tooltip="Restart a NetSolve server.">
        <command value="/bin/bash ./kill_server.sh" statusmsg="Killing Server"
                 errormsg="Failed to kill server."/>
        <command value="/bin/bash ./start_server.sh" statusmsg="Starting Server"
                 errormsg="Failed to start server."/>
      </action>
      <action name="Start Agent" tooltip="Start a NetSolve Agent.">
        <command value="/bin/bash ./start_agent.sh" statusmsg="Starting Agent"
                 errormsg="Failed to start Agent"/>
      </action>
      <action name="Kill Agent" tooltip="Kill a NetSolve Agent.">
        <command value="/bin/bash ./kill_agent.sh" statusmsg="Killing Agent"
                 errormsg="Failed to kill Agent"/>
      </action>
      <action name="Restart Agent" tooltip="Restart a NetSolve Agent.">
        <command value="/bin/bash ./kill_agent.sh" statusmsg="Killing Agent"
                 errormsg="Failed to kill Agent"/>
        <command value="/bin/bash ./start_agent.sh" statusmsg="Starting Agent"
                 errormsg="Failed to start Agent"/>
      </action>
    </actions>

    <configfile packagefile="server_config"
                remotefile="NetSolve-2.0/server_config"
                description="NetSolve Server Configuration File">
      <sub name="nproc" description="Number of processors"
           default="2" type="string"/>
      <sub name="agent" description="The NetSolve Agent hostname"
           default="netsolve.cs.utk.edu" type="string"/>
      <sub name="scratch" description="Scratch Directory"
           default="/tmp/" type="string"/>
      <sub name="mpihosts" description="Number of MPI Hosts"
           default="4" type="string"/>
      <sub name="workloadmax" description="Maximum allowable workload"
           default="-1" type="string"/>
      <sub name="testing" description="Testing PDF"
           truevalue="" falsevalue="#" type="boolean" default="true"/>
      <sub name="qsort" description="QuickSort PDF"
           truevalue="" falsevalue="#" type="boolean" default="true"/>
      <sub name="area" description="Area PDF"
           truevalue="" falsevalue="#" type="boolean" default="true"/>
      <sub name="mandelbrot" description="Mandelbrot PDF"
           truevalue="" falsevalue="#" type="boolean" default="true"/>
      <sub name="blas_subset" description="BLAS Subset PDF"
           truevalue="" falsevalue="#" type="boolean" default="true"/>
      <sub name="lapack_subset" description="LAPACK Subset PDF"
           truevalue="" falsevalue="#" type="boolean" default="true"/>
      <sub name="lapack" description="LAPACK PDF"
           truevalue="" falsevalue="#" type="boolean" default="false"/>
      <sub name="lapack_extended" description="LAPACK Extended Drivers PDF"
           truevalue="" falsevalue="#" type="boolean" default="false"/>
      <sub name="scalapack" description="SCALAPACK PDF"
           truevalue="" falsevalue="#" type="boolean" default="false"/>
      <sub name="sparse_iterative_solve" description="Sparse Iterative Solvers PDF"
           truevalue="" falsevalue="#" type="boolean" default="false"/>
      <sub name="sparse_direct_solve" description="Sparse Direct Solvers PDF"
           truevalue="" falsevalue="#" type="boolean" default="false"/>
      <sub name="arpack" description="ARPACK PDF"
           truevalue="" falsevalue="#" type="boolean" default="false"/>
      <sub name="testingglobus" description="Globus Testing PDF"
           truevalue="" falsevalue="#" type="boolean" default="false"/>
      <sub name="restrictions" description="Maximum allowable workload"
           default="" type="text">* 10</sub>
    </configfile>
    <configfile packagefile="MPImachines"
                remotefile="NetSolve-2.0/MPImachines"
                description="NetSolve MPI Hosts File">
      <sub name="hosts" description="List of MPI Hosts" type="text" default="">
enterprise
enterprise
enterprise
enterprise
      </sub>
    </configfile>
    <configfile packagefile="netsolve.env"
                remotefile="netsolve.env"
                description="NetSolve Environment Variables">
      <sub name="agent" description="NetSolve Agent"
           default="netsolve.cs.utk.edu" type="string"/>
    </configfile>
    <!-- Package source(s). We can do both remote and local files  -->
    <packagesrc>NetSolve-2.0.tgz</packagesrc>
    <packagesrc>config.guess</packagesrc>
    <packagesrc>start_server.sh</packagesrc>
    <packagesrc>start_agent.sh</packagesrc>
    <packagesrc>kill_agent.sh</packagesrc>
    <packagesrc>kill_server.sh</packagesrc>

    <installerattributes>
        <backgroundimage>http://www.cs.utk.edu/~meek/icl/GSAP/netsolve_bg.png</backgroundimage>
        <icon>http://icl.cs.utk.edu/favicon.ico</icon>
    </installerattributes>
  </header>

  <!-- Things to do before anything else -->
  <preparation>
    <command value="gunzip -f NetSolve-2.0.tgz" grouped="true"/>
    <command value="tar -xf NetSolve-2.0.tar" grouped="true"/>
    <command value="cd NetSolve-2.0/" grouped="false"/>
  </preparation>

  <!-- Configuration of the package before compilation -->
  <configuration>
    <!-- This is the configure line -->
    <command value="./configure" grouped="true">
      <!-- One of the possible configure options -->
      <option name="lapack" type="text" default="/usr/local/lib/libpack.a"
              truevalue="--with-lapack="/>
      <option name="blas" type="text" default="/usr/local/lib/libblas.a"
              truevalue="--with-blaslib="/>
      <option name="petsc" type="text" default=""
              truevalue="--with-petsc="/>
      <option name="petsclibdir" type="text" default=""
```

```
            truevalue="--with-petsclibdir="/>
    <option name="aztec" type="text" default=""
            truevalue="--with-aztec="/>
    <option name="azteclib" type="text" default=""
            truevalue="--with-azteclib="/>
    <option name="superlu" type="text" default=""
            truevalue="--with-superlu="/>
    <option name="superlulib" type="text" default=""
            truevalue="--with-superlulib="/>
    <option name="ma28" type="boolean" default="false"
            truevalue="--with-ma28"/>
    <option name="itpack" type="boolean" default="false"
            truevalue="--with-itpack"/>
    <option name="arpacklib" type="text" default=""
            truevalue="--with-arpacklib="/>
    <option name="mpi" type="text" default=""
            truevalue="--with-mpi=" falsevalue="--without-mpi"/>
    <option name="scalapack" type="text" default=""
            truevalue="--with-scalapacklib="/>
    <option name="blacslib" type="text" default=""
            truevalue="--with-blacslib="/>
    <option name="mldk" type="text" default=""
            truevalue="--with-mldk="/>
    <option name="rpclib" type="text" default=""
            truevalue="--with-rpclib="/>
    <option name="rpcinc" type="text" default=""
            truevalue="--with-rpcinc="/>
    <option name="octave-include" type="text" default=""
            truevalue="--with-octave-include="/>
    <option name="gpg" type="text" default="/usr/bin/gpg"
            truevalue="--with-gpg=" falsevalue="--without-gpg"/>
    <option name="buildgpg" type="text" default=""
            truevalue="--with-buildgpg="/>
    <option name="nws" type="text" default=""
            truevalue="--with-nws="/>
    <option name="ibp" type="text" default=""
            truevalue="--with-ibp="/>
    <option name="kerberos" type="text" default=""
            truevalue="--with-kerberos"/>
    <option name="proxy" type="choice" choices="nestolve,globus" default=""
            truevalue="--with-proxy "/>
    <option name="ouputlevel" type="choice" choices="debug,view,none" default="none"
            truevalue="--with-outputlevel "/>
    <option name="infoserver" type="text" default=""
            truevalue="--enable-infoserver"/>
  </command>
</configuration>

<!-- Source Compilation -->
<compilation>
  <command value="make" grouped="true">
    <option type="boolean" truevalue="standard" name="Standard" enabled="true"/>
    <option type="boolean" truevalue="all" name="All"/>
    <option type="boolean" truevalue="server" name="Server"/>
    <option type="boolean" truevalue="agent" name="Agent"/>
    <option type="boolean" truevalue="C" name="C"/>
    <option type="boolean" truevalue="Fortran" name="Fortran"/>
    <option type="boolean" truevalue="matlab" name="Matlab"/>
    <option type="boolean" truevalue="octave" name="Octave"/>
    <option type="boolean" truevalue="mathematica" name="Mathematica"/>
    <option type="boolean" truevalue="gridrpc" name="GridRPC"/>
    <option type="boolean" truevalue="pdfgui" name="PDF Gui"/>
    <option type="boolean" truevalue="tools" name="Tools"/>
    <option type="boolean" truevalue="wrappers" name="Wrappers"/>
    <option type="boolean" truevalue="tester"  name="Tester"/>
    <option type="boolean" truevalue="regress" name="Regression Test Suite"/>
    <option type="boolean" truevalue="clean" name="Clean"/>
    <option type="boolean" truevalue="configclean" name="Configclean"/>
    <option type="boolean" truevalue="CLEAN" name="Clean every architecture"/>
  </command>
</compilation>

<!-- Package Installation -->
<installation>
  <!--<command value="make install"/>-->
</installation>

<!-- Clean-up what is no longer needed -->
<completion>
  <command value="cd ../"/>
```

```
    <command value="rm -rf NetSolve-2.0.tar" grouped="true"/>
    <command value="rm -rf NetSolve-2.0.tgz" grouped="true"/>
  </completion>

</package>
```