

xCAT 2 How to Install Additional Software

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1.0 Introduction

xCAT 2 Cookbook illustrates how you can install the operating systems on the nodes. There are times you want to install addition software. This document explains how you can add additional software into the cluster for both stateful and stateless cases. It will also introduce a new command called 'updatenode' to allow you to configure or reconfigure the nodes. Please note all the discussion below except chapter 5 is for Linux only. There are a lot of differences in AIX. Please refer to “xCAT2 AIX Cookbook” for related topics in AIX.

2.0 Install Additional Software for Stateless Nodes

1. copy the extra rpms you are going to add on to

`/install/post/otherpkgs/<os>/<arch>/*` directory or its subdirectories where `<os>` and `<arch>` are defined in the `nodetype` table.

Use the following command to find out `<os>` and `<arch>` for a node.

```
nodels node1 nodetype.os nodetype.arch
```

2. add rpm names (without version number) with their subdirectories into

`/install/custom/netboot/<ostype>/profile.otherpkgs.pkglist` where `<profile>` is defined in the `nodetype` table. `<ostype>` is the operating system name without the version number. The following os types are recognized by xCAT.

```
centos
fedora
rh
sles
windows
```

Note: The default package lists are usually stored under

`/opt/xcat/share/xcat/netboot/<ostype>/` directory.

For example, file `/install/custom/netboot/sles/compute.otherpkgs.pkglist` will look like this if you want to add RSCT packages (`src`, `rsct.core` and `rsct.core.utils`):

```
src
rsct.core
rsct.core.utils
```

If you have copied the rpms into a subdirectory, say `rsct`, then the file should look like this:

```
rsct/src
rsct/rsct.core
rsct/rsct.core.utils
```

Please see Appendix for the format of a `otherpkgs.pkglist` file.

3. run `/opt/xcat/share/xcat/netboot/<ostype>/genimage`, the extra rpms are automatically installed into the image. Then run `packimage`.

4. if you have additional configuration scripts for the software that would like to run after the node is boot up, copy the script to `/install/postscripts` directory and add the confirmation script to the `postscripts` table.

```
cp myconfigsript /install/postscripts/
chtab node=compute postscripts.postscripts=myconfigsript
```

After setting up, deploy the node as usual. The additional software will be installed and configured during the node deployment.

3.0 Install Additional Software for Stateful Nodes

1. Copy the extra rpms you are going to add on to

`/install/post/otherpkgs/<os>/<arch>/*` directory or its subdirectories where `<os>` and `<arch>` are defined in the `nodetype` table.

Use the following command to find out `<os>` and `<arch>` for a node.

```
nodels node1 nodetype.os nodetype.arch
```

2. [only for Linux]

You should create `repodata` for the `/install/post/otherpkgs/<os>/<arch>/` directory. The `repodata` is necessary for “yum” and “zypper” to know about the repository.

The command “`createrepo`” is used to create `repodata`, before executing the command, please make sure the “`createrepo`” rpm package is installed. Remember that on SLES11, the “`createrepo`” rpm package is in the SLE-11-SDK-DVD Media 1 ISO, not in the install ISO.

After “`createrepo`” is installed, run the following command to create `repodata` for the directory `/install/post/otherpkgs/<os>/<arch>/`.

```
createrepo /install/post/otherpkgs/<os>/<arch>/
```

3. Add rpm names (without version number) with their subdirectories into `/install/custom/install/<ostype>/profile.otherpkgs.pkglist` where `<profile>` is defined in the `nodetype` table. `<ostype>` is the operating system name without the version number. The following os types are recognized by xCAT.

```
centos
fedora
rh
sles
windows
```

Note: The default package lists are usually stored under `/opt/xcat/share/xcat/install/<ostype>/` directory.

For example, file `/install/custom/install/sles/compute.otherpkgs.pkglist` will look like this if you want to add RSCT packages (`src`, `rsct.core` and `rsct.core.utils`):

```
src
rsct.core
rsct.core.utils
```

If you have copied the rpms into a subdirectory, say `rsct`, then the file should be look like this:

```
rsct/src
rsct/rsct.core
rsct/rsct.core.utils
```

Please see the Appendix for the format of an `otherpkgs.pkglist` file.

4. If 'otherpkgs' is not already in the `postscripts` table, add it to either the `xcatdefaults` row or a row specifically for your node or nodegroup. The `otherpkgs` script name should be added to the `postbootscripts` attribute (for newer xcat releases) or the `postscripts` attribute (for older xcat releases). For example:

```
chtab node=compute postscripts.postbootscripts+=otherpkgs
```

5. If you have additional configuration scripts for the software that would like to run after the node is booted up, copy the script to `/install/postscripts` directory and add the configuration script to the `postscripts` table. For example:

```
cp myconfigscript /install/postscripts/
chtab node=compute postscripts.postbootscripts+=myconfigscript
```

After setting this up, deploy the node as usual. The addition software will be installed and configured during the node deployment.

4.0 Install Additional Software for Stateless Nodes after the Nodes are Up and Running

1. follow step 1-4 in chapter 3.

2. run `updatenode` command

```
updatenode <noderange> otherpkgs
```

If you have a configuration script (as mentioned in step 5 of the previous chapter), run

```
updatenode <noderange> otherpkgs,myconfigscript
```

5.0 Rerun Postscripts or Run Additional Scripts with the updatenode Command

You can use `updatenode` command to perform the following functions after the nodes are up and running:

- install additional software for stateful nodes (described in chapter 4)
- run postscripts defined in the `postscripts` table for both stateful and stateless nodes.
- run any script for both stateful and stateless nodes.

The later 2 functions works on AIX as well.

The following are some examples of how to use it:

To re-run all the postscripts for the nodes:

```
updatenode <noderange>
```

To re-run the syslog postscripts for the nodes:

```
updatenode <noderange> syslog
```

To run a list of scripts, make sure the scripts are copied to `/install/postscripts` directory, then

```
updatenode <noderange> script1,script2
```

Note: `script1,script2` may or may not be defined in the `postscripts` table. However if you want `script1` and `script2` get invoked next time the nodes are deployed, add them into the `postscripts` table.

6.0 Appendix: File Format for otherpkgs.pkglist File

The `otherpkgs.pclist` file can contain the following types of entries:

- rpm name without version numbers
- otherpkgs subdirectory plus rpm name
- blank lines
- comment lines starting with “#”
- `#INCLUDE: <full file path>#` to include other pkglist files
- `#NEW_INSTALL_LIST#` to signify that the following rpms will be installed with a new rpm install command (zypper, yum, or rpm as determined by the function using this file)
- rpms to remove *before* installing marked with a “-”
- rpms to remove *after* installing marked with a “--”

These are described in more detail in the following sections.

6.1 RPM Names

A simple `otherpkgs.pkglist` file just contains the the name of the rpm file without the version numbers.

For example, if you put the following three rpms under `/install/post/otherpkgs/<os>/<arch>/` directory,

```
rsct.core-2.5.3.1-09120.ppc.rpm
rsct.core.utils-2.5.3.1-09118.ppc.rpm
src-1.3.0.4-09118.ppc.rpm
```

The `otherpkgs.pkglist` file will be like this:

```
src
rsct.core
rsct.core.utils
```

6.2 RPM Names with otherpkgs Subdirectories

If you create a subdirectory under `/install/post/otherpkgs/<os>/<arch>/`, say `rsct`, the `otherpkgs.pkglist` file will be like this:

```
rsct/src
rsct/rsct.core
rsct/rsct.core.utils
```

6.3 Include Other pkglist Files

The `#INCLUDE` statement is supported in xCAT 2.3 and later.

You can group some rpms in a file and include that file in the `otherpkgs.pkglist` file using `#INCLUDE:<file>#` format.

```
rsct/src
rsct/rsct.core
rsct/rsct.core.utils
#INCLUDE:/install/post/otherpkgs/myotherlist#
```

where `/install/post/otherpkgs/myotherlist` is another package list file that follows the same format.

Note the trailing “#” character at the end of the line. It is important to specify this character for correct pkglist parsing.

6.4 Multiple Install Lists

The `#NEW_INSTALL_LIST#` statement is supported in xCAT 2.4 and later.

You can specify that separate calls should be made to the rpm install program (zypper, yum, rpm) for groups of rpms by specifying the entry “#NEW_INSTALL_LIST# on a line by itself as a separator in your pkglist file. All rpms listed up to this separator will be installed together. You can have as many separators as you wish in your pkglist file, and each sublist will be installed separately in the order they appear in the file.

For example:

```
compilers/vacpp.rte
compilers/vac.lib
compilers/vacpp.lib
compilers/vacpp.rte.lnk
#NEW_INSTALL_LIST#
pe/IBM_pe_license
```

6.5 Remove RPMs Before Installing

The “-” syntax is supported in xCAT 2.3 and later.

You can also specify in this file that certain rpms to be removed before installing the new software. This is done by adding '-' before the rpm names you want to remove. For example:

```
rsct/src
rsct/rsct.core
rsct/rsct.core.utils
#INCLUDE:/install/post/otherpkgs/myotherlist#
-perl-doc
```

If you have #NEW_INSTALL_LIST# separators in your pkglist file, the rpms will be removed before the install of the sublist that the “-<rpmname>” appears in.

6.6 Remove RPMs After Installing

The “--” syntax is supported in xCAT 2.3 and later.

You can also specify in this file that certain rpms to be removed after installing the new software. This is done by adding '--' before the rpm names you want to remove. For example:

```
pe/IBM_pe_license
--ibm-java2-ppc64-jre
```

If you have #NEW_INSTALL_LIST# separators in your pkglist file, the rpms will be removed after the install of the sublist that the “--<rpmname>” appears in.