CSM Support For CentOS and Scientific Linux

Version 1.0

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Disclaimer: CSM has been verified with the versions of CentOS and Scientific Linux listed in this document.   While the CSM service and development organizations will do their best to support CSM running with these distros, it should be noted that some of the underlying components (e.g. IBM Java, and the IBM server hardware) make no claim to support RHEL clones such as these.   If a problem is encountered, a service call can be made (1-800-IBM-SERV) and the CSM service group will try to resolve the problem on a best-effort basis. Alternatively, you can post the problem to the CSM User Forum (http://www-128.ibm.com/developerworks/forums/dw_forum.jsp?forum=907&cat=53).   In either case, no guarantee is made that the problem can be fixed.

Please also note that, due to the similarity between RHEL and CentOS/SL, not every single CSM function has been tested specifically on CentOS and SL.   The functions that were most likely to behave differently (e.g. node installation) were given priority in testing. CSM development will fix any unanticipated customer problems on a best-effort basis.

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1.0 Overview

This document will introduce how you can use CSM 1.6.0 to deploy CentOS and Scientific Linux (SL) to CSM nodes, and how to change CSM to support a new clone distribution.

CentOS and SL are cloned from Red Hat EL AS. Most of the files in these 2 clone distributions are created by rebuilding the source code of Red Hat EL AS, except some small changes (mostly to remove Red Hat trademarks). So these 2 clone distributions are very similar to the Red Hat EL AS release.

CSM 1.6.0 now supports installing these 2 clone distributions to nodes, and managing them after install. A machine with CentOS/SL can also act as a CSM management server or install server.

In CSM 1.6.0.0, the following service levels of CentOS/SL are supported:
● CentOS 4.0 x86 32bit
● CentOS 4.1 x86 32bit
● CentOS 4.2 x86 32bit
● CentOS 4.3 x86 32bit
● CentOS 4.0 x86 64bit
● CentOS 4.1 x86 64bit
● CentOS 4.2 x86 64bit
● CentOS 4.3 x86 64bit
● Scientific Linux 4.0 x86 32bit
● Scientific Linux 4.1 x86 32bit
● Scientific Linux 4.2 x86 32bit
● Scientific Linux 4.3 x86 32bit
● Scientific Linux 4.0 x86 64bit
● Scientific Linux 4.1 x86 64bit
● Scientific Linux 4.2 x86 64bit
● Scientific Linux 4.3 x86 64bit

In CSM 1.6.0.1, more service levels of CentOS/SL are supported:
● CentOS 4.4 x86 32bit
● CentOS 4.4 x86 64bit
● Scientific Linux 4.4 x86 32bit
● Scientific Linux 4.4 x86 64bit

All of the above service levels can run on the CSM management server, install servers and nodes.

2.0 Using CSM to Deploy CentOS or Scientific Linux on Nodes

The process to install nodes with CentOS/SL is the same as installing Red Hat EL AS on nodes.

You can define nodes with these clone distributions, setup the installation environment, and install these clone distribution to nodes. If needed, you can also install CSM server packages on a CentOS/SL machine.

One of the main differences is how the install-related node attributes should be set.   Unlike Red Hat EL 4, the CentOS/SL version number contains a "dot", such as 4.0, 4.1 and so on. You need to separate this version number into 2 parts separated by the "dot". The first part should be set to attribute InstallDistributionVersion, and the last part should be changed to the equivalent Red Hat service level name.   See the table below for examples.

Node Attribute	RHEL AS 4	RHEL AS 4 QU2	CentOS 4.0	CentOS 4.1	SL 4.0	SL 4.1
InstallDistributionName	RedHatEL-AS	RedHatEL-AS	CentOS	CentOS	ScientificLinux	ScientificLinux
InstallDistributionVersion	4	4	4	4	4	4
InstallServiceLevel	GA	QU2	GA	QU2	GA	QU2

Following sections contain details on the process of deploying these 2 clone distribution to nodes.

2.1 Install CSM Server Packages on a CentOS/SL Machine (installms)

This is an optional step. You do not have to use a CentOS/SL management server to deploy CentOS/SL to nodes. The management server can run any CSM 1.6.0 supported distribution.

To install CSM server packages on a CentOS/SL machine, you just need to run the CSM command **installms**.

If you have CentOS/SL CDs, you can insert them in the CDROM when **installms** prompts.

If you have CentOS/SL ISO files, you can use the option **-p** of **installms** to specify the ISO file paths.

In CSM 1.6.0, after running **installms**, 2 new predefined node groups will be added for CentOS nodes and SL nodes (they will be added on all types of management servers, not just on CentOS/SL management servers):
● CentOS4Nodes
● ScientificLinux4Nodes

You can refer to the CSM Command and Reference for more information about the **installms** command**.**

2.2 Define or Change Node Attributes (definenode/chnode)

Before deploying CentOS/SL to nodes, you need run the CSM command **definenode** or **chnode** to set correct node attributes for nodes.

As mentioned above, you should set correct values for InstallDistributionName, InstallDistributionVersion and InstallServiceLevel.   Except for these 3 attributes, the other node attributes have the same meaning as they do for a normal Red Hat EL node.

The following is an example nodedef file for a CentOS 4.4 x86 32bit node:

xblade07.clusters.com:
  ConsoleMethod = blade
  ConsolePortNum = 7
  ConsoleRedirectionAfterPOST = 0
  ConsoleSerialDevice = ttyS1
  ConsoleSerialSpeed = 19200
  ConsoleServerName = 172.20.3.113
  HostRAIDEnabled = 0
  HWControlNodeId = xblade07
  HWControlPoint = 172.20.3.113
  InstallAdapterMacaddr = 00:0D:60:9C:05:3A
  InstallAdapterName = eth0
  InstallAdapterType = ent
  InstallCSMVersion = 1.7.0
  InstallDiskType = ide
  InstallDistributionName = CentOS
  InstallDistributionVersion = 4
  InstallMethod = kickstart
  InstallOSName = Linux
  InstallPkgArchitecture = i386
  InstallServiceLevel = QU4
  ManagementServer = 172.20.3.20
  Mode = Managed
  PowerMethod = blade

You do not need to specify an explicit value for the attribute InstallTemplate for CentOS/SL nodes. The command **csmsetupinstall** will use the corresponding Red Hat EL 4 kickstart template file by default. For example, for CentOS 4.1 x86 64bit nodes, CSM will choose /opt/csm/install/kscfg.tmpl.RedHatEL-AS3-x86_64 as the install template file.

A CentOS node will be included in the predefined node group "CentOS4Nodes" after it is defined. A SL node will be included in the predefined node group "ScientificLinux4Nodes" after it is defined.

2.3 Copy Clone Distribution CD Sources (copycds)

This is an optional step. If you do not run **copycds** to copy CentOS/SL install RPM packages, the command **csmsetupinstall** will prompt you to insert CDs. Or it will try to search ISO files first, if the option -p is provided.

Running the command **copycds** to copy CentOS/SL CDs will behave the same as copying Red Hat EL CDs.   For example, you can run **copycds** as following to copy install RPM packages from CentOS 4.0 x86 32bit ISO files that are in the current directory:

copycds -p . InstallDistributionName=CentOS InstallDistributionVersion=4
InstallServiceLevel=GA InstallPkgArchitecture=i386

2.4 Copy CSM Packages (copycsmpkgs)

If the distribution name of the management server is not same as the distribution name of the nodes, you should run the command **copycsmpkgs** to copy CSM packages that will be needed for the nodes. Otherwise this is an optional step.

This command will behave the same as copying CSM packages for a Red Hat EL release.   For example, you can run this command to copy CSM packages for CentOS 4.0 x86 32bit nodes:

copycsmpkgs -p . InstallDistributionName=CentOS InstallDistributionVersion=4
InstallServiceLevel=GA InstallPkgArchitecture=i386

2.5 Configure the Installation environment (csmsetupinstall)

To deploy CentOS/SL to nodes, you need to run the command **csmsetupinstall** to set up the installation environment.   This command will behave the same as setting up the installation environment for a Red Hat EL release.

2.6 Deploy the Operating System to Nodes (installnode)

You need run the **installnode** command to deploy the operating system to nodes.   This command will behave the same as installing a Red Hat EL release.

2.7 Other CSM functions

You can also run other CSM commands (e.g. updatenode, cfmupdatenode, dsh, monitoring commands, etc.) to manage installed CentOS/SL nodes.   These commands will behave the same as with Red Hat EL nodes.

3.0 Changing CSM to Support a New Clone Distribution

To change CSM to support a new clone distribution whose effective distribution (the distribution that this clone distribution is based on) is now enabled in CSM.   You can do it with following steps:

1. Install the RPM package csm.core and add a new entry in /opt/csm/install/pkgdefs/distro_id.pm.
2. Add a new pkgdefs file under /opt/csm/install/pkgdefs

3.1 Add a New Entry in /opt/csm/install/pkgdefs/distro_id.pm

The following is an example for CSM supporting CentOS4.0:

```
$::distro_id{'CentOS4-GA-i386'}=
{
        distro_name => 'CentOS',
        distro_version => '4',
        svc_level => 'GA',
        arch => 'i386',
        id_name => '/etc/redhat-release',
        id_type => 'file',
        id_val => 'CentOS release 4.0'
        effective_distro_name => 'RedHatEL-AS",
        effective_distro_version => '4',
        effective_svc_level => 'GA',
}
```

This file defines information that CSM can use it to recognize a supported distribution. The following attributes are required for a clone distribution:

- $::distro_id{'<full distro name>'}:   this should contain the full distribution name.   The string in <full distro name> is the key of the above information, and it should be unique in this file. It should be named as "<Distribution name><Version>-<Service level>-<Architecture>".
- distro_name: this attribute indicates the distribution name of the new distro to be supported.
- distro_version: this attribute indicates the distribution version of this distro.
- svc_level: this attribute indicates the service level of this distro.
- arch: this attribute indicates the architecture information of this distro. The valid values of this attribute are "i386", "x86_64" and "ppc64".
- id_name: this attribute indicates the resource name that will be used when CSM is trying to detect the current system's distribution name, version and service level. This resource can be a file, RPM package or a command.

- **id_type:**   this attribute indicates the resource type. A valid resource type can be "file", "rpm_version" or "command".
    - ➤ For a "file" type resource, CSM will read all information from the file and compare every line with the resource value defined by "id_val".
    - ➤ For an "rpm_version" type resource, CSM will run "rpm -q" command to query the version of this rpm, and compare the result with the resource value defined by "id_val".
    - ➤ For a "command" type resource, CSM will run this command and compare the result with the resource value defined by "id_val".
- **id_val:**   this attribute indicates the value of this resource.
    - ➤ For a "file" type resource, the id_val can contain only a sub-string of a line. If this sub-string can be found in this file, CSM will recognize this distribution. Regular expressions are supported in this value.
    - ➤ For an "rpm_version" type resource, the id_val can indicate a version range of this rpm (to make sure CSM can recognize this distribution after this rpm is updated). The low version and the high version are separated by a comma. This version value includes a version number and a release number, and the version number and the release number are separated by a dash sign. If the version of this rpm is no less than the low version number and is not greater than the high version number, this distribution will be recognized by CSM. If the low version or high version is omitted, that means the range is open-ended.
    - ➤ For a "command" type resource, the id_val can contain a sub-string of a line. If this sub-string can be found in the output of this command, CSM will recognize this distribution. Regular expressions are supported in this value. The regular expression should be Perl style, but it should not contain the division sign. For an example:

        ......
        'id_name' => 'cat /etc/redhat-release',
        'id_type' => 'command',
        'id_val' => '.* Enterprise Linux AS .* Taroon Update 2',
- **effective_distro_name:**   indicates the effective distribution's name. This attribute means that for all distro-specific choices the CSM software has to make (other than what is covered in the pkgdefs file), CSM will treat the distro named in distro_name as if it was the distro named in effective_distro_name.   If this attribute has not been set, CSM will take the value of attribute distro_name as its effective distribution name.
- **effective_distro_ver:**   indicates the effective distribution's version. If this attribute has not been set, CSM will take the value of attribute distro_ver as its effective distribution version.
- **effective_svc_level:**   indicates the effective distribution's service level. If this attribute has not been set, CSM will take the value of attribute svc_level as its effective distribution service level.

CSM will consider a distribution as a supported distribution only if a distribution entry can be found in this file.

3.2 Create a pkgdefs File.

To support a cloned distribution of a supported distribution, users need to create a new pkgdefs file for each service level. For an example, the files Linux-CentOS4-x86_64.pm should be created to make CSM support CentOS 4 on i386 platforms.   This pkgdefs file gives CSM all the distro-specific info it needs to support this cloned distribution.

The pkgdefs file needs to be named: Linux-<Distro name><Distro version>-<Architecture>.pm .

We suggest you copy an existing pkgdefs file to a new file, for instance Linux-CentOS4.pm. And change following things in it:
■   Package Name: it should follow <Distro name><Distro version><Architecture> format. For example,
     package CentOS4x86_64;
■   Inherited pkgdefs file: should be the pkgdefs file of the supported effective distribution. For example, when supporting CentOS 4.0 on i386 platform:
     do " $progdir/pkgdefs/Linux-RedHatEL-AS4.pm";
■   Distro definitions: $::pkgdefs{DISTRO_NAME} indicates the formal name of one distribution.   And $::pkgdefs{DISTRO_RPMDIR} indicates the directory on the CDs where installing RPM packages can be found, for example:
     ■ $::pkgdefs{DISTRO_NAME} = "CentOS release 4.0";
     ■ $::pkgdefs{DISTRO_RPMDIR}   = "CentOS/RPMS";
■   Distribution Disk Definitions: indicates the information that is used by CSM to identify the CDs. For example,

```
   %disc_info=(
     GA        =>
     {
      key        => "1109642504.647574",
      diskid_target     => "CentOS4-i386",
      rpm       => "",
      name      => $::pkgdefs{DISTRO_NAME},
      num       => 4,
     }
   );
```

   In **%disc_info,** you need to set the values of following keys:

     •   **key:**   indicates a string in file ".diskinfo" in the CDs.
     •   **diskid_target:**   indicates the directory under /csminstall/Linux/<Distro name>/<Distro version>/<Architecture>/<Service level> that CSM copy RPM packages to.
     •   **num:**   indicates the ordinal number of the disk.