IBM Cluster Systems Management V1.3.2 expanded to Linux on IBM @server pSeries platform with additional new functions

Overview

IBM Cluster Systems Management (CSM) V1.3.2 now extends cluster management support to Linux on pSeries®. CSM helps consolidate the management of large numbers of pSeries and IBM @server xSeries® servers. Originally introduced for Linux on xSeries, then AIX® on pSeries, CSM is now available for Linux on pSeries.

CSM is intended to simplify the tasks of installing, operating, and maintaining clusters of servers. It is designed to include remote hardware control, utilities for administering software updates across all servers in the cluster, cluster-wide resource monitoring tools, and automatic triggers that can be used to alert system managers or initiate corrective actions when problems occur.

New for CSM for Linux on pSeries

- Includes the functionality of CSM 1.3.1 plus install scripts for administrators to set up customization during install
- Runs on pSeries models 615, 630, 650, and 655, and SuSE Linux Enterprise Server (SLES) 8 and TurboLinux Enterprise Server (TLES) 8.

New for CSM for Linux on xSeries

- Runs on new hardware xSeries 445 and BladeCenter™ HS20 8832.
- Improved installation mechanism for SuSE and SuSE SLES distributions: CSM now uses AutoYaST, the native SuSE/SLES installer.

New for CSM for AIX 5L

- Support for configuring secondary adapters at install time, allowing the administrator to set up additional Ethernet adapters: increases efficiency and usability by allowing these additional adapters to be set up across multiple nodes when the cluster is installed.
- Use of the AIX geninstall command to directly install the CSM management server (instead of the CSM command instalms)
- Increased usability and efficiency of CSM install by using the new AIX command nim_master_setup to automate NIM setup
- Install scripts for administrators to set up any needed customization during install

Key prerequisites

CSM for Linux on pSeries:
- SuSE SLES 8 or TurboLinux TLES 8
- Specified IBM eServer Cluster 1600 or pSeries servers

CSM for Linux on xSeries:
- SuSE 8.1 or SuSE SLES 8; or Red Hat 8.0 or AS 2.1
- IBM eServer Cluster 1350 or specified xSeries servers

CSM for AIX 5L:
- AIX 5L V5.2 for management servers; V5.1 or V5.2 for any other servers
- IBM eServer Cluster 1600 or specified pSeries servers

Planned availability dates:

November 14, 2003, except for:
- October 14, 2003: Via Web download for CSM for Linux on pSeries and CSM for Linux on xSeries
- December 19, 2003: Support of up to 128 operating system images for CSM for Linux on pSeries
- December 19, 2003: CSM for Linux on pSeries to run on IBM eServer 615 and 655 servers

At a glance

IBM Cluster Systems Management (CSM) V1.3.2 extends cluster management support to the Linux on pSeries platform in addition to the Linux on xSeries and AIX 5L platforms. CSM is a key component of IBM cluster offerings and allows mix-and-match CSM clusters.

IBM CSM V1.3.2 for AIX 5L and for xSeries Linux is designed to offer:

- New command provides a snapshot of status of nodes in the cluster.
- New scripts for backup and restore of data on the management server.
- Innovative diagnostic probes help verify correctness before installing the nodes in the cluster.

New for CSM for Linux on xSeries

- Runs on new hardware and additional Linux distributions
- Improved installation mechanism for SuSE and SuSE SLES distributions

New for CSM for AIX 5L

- Support for configuring secondary adapters at install time
- Ability to directly install the CSM management server
- Install scripts for administrators to set up any needed customization

For ordering, contact:
Your IBM representative, an IBM Business Partner, or the Americas Call Centers at 800-IBM-CALL

Reference: RE001

This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: http://www.ibm.com.
For both CSM for AIX 5L and CSM for Linux on xSeries:

- Runs on new hardware — p615, p630, p650, and p655 — and the software Linux distributions SLES 8 and TLES 8.

For both CSM for AIX 5L and CSM for Linux on xSeries:

- A new command called csmstat is designed to provide a snapshot of the cluster. It can be run across all the nodes in the cluster or for a particular set of nodes or node groups. It will return for each node the network reach-ability of the node, power status, status of network interfaces on the nodes, and LED/LCD display. For customers familiar with PSSP, this functionality is very similar to what the PSSP command spmon -d was often used for.

- CSM now provides backup and restore scripts to save and restore certain CSM management server data. These scripts can be used in a variety of ways, such as setting up new clusters using configuration data from existing customers, moving a cluster’s management server to a backup server, or helping to save certain data prior to a management server operating system upgrade and then restoring it.

- New diagnostic probes to help customers determine if certain things are correct before installing the nodes in the cluster. These probes help verify that the management server is correctly set up and that the hardware control points, console servers, and associated information are all configured correctly.

CSM for Linux on xSeries is designed to provide the following new function:

- The install mechanism for SuSE and SuSE SLES distributions has been changed. Previously, CSM made use of the open source package System Installation Suite (SIS). CSM will now use AutoYaST, the native SuSE/SLES installer.

Note: CSM already uses the native install mechanism on RedHat — Kickstart.

CSM for AIX 5L new function includes:

- Support for configuring secondary adapters at install time, allowing the administrator to set up additional Ethernet adapters. This is designed to increase efficiency and usability by allowing these additional adapters to be set up across multiple nodes when the cluster is installed.

- Use of the AIX geninstall command directly to install the CSM management server instead of the CSM command installms. This is more intuitive for AIX users who are accustomed to installing their file sets with geninstall (formerly installp).

- Increased usability and efficiency of CSM install of AIX by using the new AIX command nim_master_setup to automate NIM setup.

- Install scripts are available for administrators to set up any needed customization during install. These install scripts can be run before rebooting, after rebooting, or during update of the node.

- Support to remote power on, off, and query of the Hardware Management Console (HMC)-attached pSeries server. This support is an enhancement to the current LPAR remote power support for the server.

Accessibility by people with disabilities

The following features support use by people with disabilities:

- Operation by keyboard alone
- Optional font enlargement and high-contrast display settings

Product positioning

CSM for AIX 5L and Linux offers a way to manage a collection of AIX or Linux servers (nodes) from a single-point-of-control.

Functions include automated setup, hardware control, monitoring, and configuration file management. Administrators can manage individual nodes, run commands across nodes or groups of nodes, monitor system resources, and run automated responses to events. CSM is designed to exploit the advanced hardware management features of the servers in the Cluster 1600 or Cluster 1350, or a cluster of xSeries servers.

CSM includes technology derived from IBM Parallel System Support Programs (PSSP) for AIX and is positioned as a complementary offering to PSSP and AIX-based clusters. It is aimed at customers who want robust cluster systems management on an AIX 5L or open, Intel®-based server platform. CSM and the IBM Cluster 1600 or Cluster 1350 are ideal for high-performance and commercial computing workloads, including applications in scientific and technical computing, Life Sciences, and e-business infrastructure (for example, Web serving and collaboration/e-mail).

CSM delivers a robust, scalable management platform to help ease administration. It may help reduce life cycle costs. Customers can manage their AIX 5L or Linux servers from a central location, rather than having to manage each system individually. The “central location” is a single point of control known as the management server. It must be a pSeries machine running AIX V5.2. The machines within the cluster are referred to as managed nodes and can be pSeries machines running AIX 5.2 or AIX 5L for POWER V5.1. They can also be xSeries machines running CSM for Linux.

Customers can scale their systems incrementally as workload demand increases, without increasing the management complexity.

Customers benefit from IBM’s established leadership in supercomputing systems, because the technology and experience/skills gained from the SP™ and AIX platforms are being leveraged on Linux. Customers may be more willing to adopt Linux in a production environment when it is backed by superior management software.
Statement of direction

IBM plans to provide the following function:

• Support for up to 1024 nodes for CSM for Linux on xSeries in the first half of 2004.
• CSM for Linux on xSeries to run on IBM eServer xSeries Opteron model e325 in the fourth quarter of 2003.

All statements regarding IBM’s future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Reference information


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Software key management

The programs use an access/usage protection method that requires a password key to enable the software function. The key is contained in a file on the product medium and must be installed per the installation instructions.

Existing customers

Existing customers of CSM 1.3.1 may use their existing key file. No changes are required to use CSM 1.3.2.

Try & Buy

You can experience the power and value of CSM and clustering at no charge for 60 days under the Try & Buy option. You can then use all functions of CSM for 60 days, after which CSM will no longer function. Whenever you purchase and receive a full production license and key for CSM (refer to Ordering information section), and accept its IPLA License Agreement, you may use CSM for production purposes. CSM configuration data stored during Try & Buy will remain available for later production use.

For AIX® 5L situations: Apply AIX 5L Service (refer to the Software requirements section) then simply run /opt/csm/bin/csmconfig -L and accept the 60-day IBM License Agreement (ILA), which will be presented for your acceptance.

For Linux situations:

- Download CSM for Linux on xSeries® V1.3 for Try & Buy from:
  http://techsupport.services.ibm.com/server/cluster/fixes
- Click CSM for Linux 1.3.2 for xSeries or CSM for Linux 1.3.2 for pSeries.

The ILA license acceptance procedure is the same as for AIX 5L.

Offering Information

Product information will be available through the Offering Information Web site:

http://www.ibm.com/common/ssi

Publications

The following softcopy publications are available for CSM:

<table>
<thead>
<tr>
<th>Title</th>
<th>Order number</th>
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<tbody>
<tr>
<td>Linux on xSeries or pSeries</td>
<td></td>
</tr>
<tr>
<td>CSM Administration Guide</td>
<td>SA22-7873</td>
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<tr>
<td>CSM Planning and Installation Guide</td>
<td>SA22-7853</td>
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<tr>
<td>CSM Hardware Control Guide</td>
<td>SA22-7856</td>
</tr>
<tr>
<td>CSM Command and Technical Reference</td>
<td>SA22-7933</td>
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<tr>
<td>RSCT Administration Guide</td>
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<td>RSCT Technical Reference</td>
<td>SA22-7893</td>
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<tr>
<td>RSCT Messages</td>
<td>GA22-7894</td>
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<tr>
<td>RSCT Group Services and Programming Guide</td>
<td>SA22-7888</td>
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<td>AIX</td>
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<tr>
<td>CSM Administration Guide</td>
<td>SA22-7918</td>
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<tr>
<td>CSM Planning and Installation Guide</td>
<td>SA22-7919</td>
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<tr>
<td>CSM Hardware Control Guide</td>
<td>SA22-7920</td>
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<tr>
<td>CSM Command and Technical Reference</td>
<td>SA22-7934</td>
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<tr>
<td>RSCT Administration Guide</td>
<td>SA22-7889</td>
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<td>and Reference</td>
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1 Reliable Scalable Cluster Technology. This function is included in the AIX operating system. For more information on the RSCT function, refer to Software Announcement 202-270, dated October 8, 2002.

Publications available from the Web: Upon program availability, all publications listed in the previous section will be available from the Web for download from the IBM Publications Center and at the IBM Cluster software library at:

http://www.ibm.com/servers/eserver/clusters/library

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Technical information

Hardware requirements

CSM for Linux on pSeries

CSM for Linux on pSeries runs on select pSeries with SuSE SLES 8 or TLES 8, p615, p630, p650, and p655. HMC support is required for remote hardware control. CSM Remote Hardware Control is supported as follows:

- Maximum of 16 supported pSeries systems per HMC: In mixed environments, a maximum of 8 of each of the unique machine type-models (within the cluster maximum of 16).
- Maximum of 32 LPARs per HMC.

For CSM V1.3.2 hardware control to function properly, the following hardware and hardware specifications are required for CSM V1.3.2 for Linux:

- On the CSM management server:
  - One Ethernet adapter for each management virtual LAN (VLAN) used for hardware control
  - One Ethernet adapter for each cluster VLAN used for CSM installation and administration
  - Additional disk space on the management server for the Linux operating system and RPMs
  - A minimum of 128 MB of memory and 120 MB of disk space to install CSM
  - 2 GB of disk space for each version of Linux to be fully installed on the nodes
- On each managed node:
  - A minimum of 128 MB of memory and 20 MB of disk space to install and run CSM
  - Additional disk space for the Linux operating system and RPMs
  - TCP/IP and a minimum of one PXE-enabled network adapter for the cluster VLAN used for CSM installation and administration
  - Appropriate cabling

CSM for Linux on xSeries

CSM for Linux on xSeries is a key element of the IBM eServer Cluster 1350 platform for deploying Linux applications requiring a cluster. CSM also runs on a cluster of xSeries x330, x342, x335, x345, x360, BladeCenter™ 8677-1xx, BladeCenter HS20 8678, BladeCenter HS20 8832, IntelliStation® Z-Pro 6221, x440, and x445 servers.

The following hardware and hardware specifications are required for CSM V1.3.2 for Linux:

- On the CSM management server:
  - One Ethernet adapter for each management virtual LAN (VLAN) used for hardware control
  - One Ethernet adapter for each cluster VLAN used for CSM installation and administration

Note: A management VLAN is the VLAN that connects the management server to the terminal servers and the RSA PCIs, or hardware control points.

- Additional disk space on the management server for the Linux operating system and RPMs
- A minimum of 128 MB of memory and 20 MB of disk space to install CSM
- 2.0 GB of disk space for each version of Linux to be fully installed on the nodes
- On each managed node:
  - A minimum of 128 MB of memory and 20 MB of disk space to install and run CSM
  - Additional disk space for the Linux operating system and RPMs
  - TCP/IP and a minimum of one PXE-enabled network adapter for the cluster VLAN used for CSM installation and administration
  - Appropriate cabling

For CSM V1.3.2 hardware control to function properly, the following hardware and hardware specifications are required:

- One RSA PCI adapter for every 24 nodes
- Optionally, if a terminal server is desired, one or more of the following terminal servers for remote console support is required:
  - Avocent CPS1600
  - Computone IntelliServer RCM8, RCM24, or RCM48
  - Equinox ESP-8 or ESP-16
  - Equinox ELS-16 II
  - MRV iTouch IR-8020, IR-8040, LX-4016, LX-4008, or LX-4032

Note: For xSeries and IntelliStation, if you do not have a terminal server, the remote console function (rconsole) will not work and automatic MAC address collection will not work for the full installation of Linux nodes.

For specific hardware control point and console server product details, refer to the documentation shipped with the hardware.

IBM suggests a networking configuration where each terminal server is connected to the management VLAN through its Ethernet port, and up to 16 nodes (depending on the terminal server type) through the nodes' serial or COM ports. IBM suggests that each IBM RSA PCI be connected to the management VLAN through its Ethernet port. However, to conserve IP addresses, one IBM RSA PCI could be connected to the management VLAN with up to 15 management processors daisy-chained from it to the management VLAN. For optimal security, CSM cluster hardware control functions must be restricted to users with root access by isolating the management server network.
Note: Certain configurations including other Intel™ processor-based servers and other Linux distributions may be requested by special bid.

CSM for AIX 5L CSM for AIX 5L runs on pSeries and RS/6000® servers and nodes with AIX 5L V5.1 or V5.2.

HMC support is required for remote hardware control. The HMC must be a HMC for pSeries V1.3.2, or later. CSM remote hardware control is supported as follows:

- Maximum of eight p690 or p670 systems per HMC
- Maximum of 16 of any combination of p615, p630, p650, or p655 systems per HMC
- Maximum of eight p690 or p670 and any eight p615, p630, p650, or p655 combinations
- Maximum of 32 LPARs per HMC

CSM will provide distributed management services for any pSeries servers running AIX 5L. An HMC is required for remote hardware control (remote power, remote console, and network boot) and network operating system installation.

The CSM single-point-of-control server is known as the management server and needs to be a pSeries or RS/6000 machine running AIX V5.2. The other machines within the cluster are referred to as managed nodes and can be pSeries or RS/6000 machines running AIX V5.2 or V5.1 with service. They can also be xSeries machines running CSM for Linux on xSeries V1.3.2 or pSeries machines running CSM for Linux on pSeries V1.3.2.

The following additional hardware and hardware specifications are required for CSM 1.3 for AIX 5L:

- On the CSM management server:
  - One Ethernet adapter for each management virtual LAN (VLAN) used for hardware control
  - One Ethernet adapter for each cluster VLAN used for CSM installation and administration
  - A minimum of 128 MB of memory and 120 MB of disk space to install CSM
  - 2 GB of disk space for each version of AIX 5L installation images
  - Additional disk space for the base AIX 5L operating system and file sets

- On each managed node:
  - One Ethernet adapter for the cluster VLAN used for CSM installation and administration
  - A minimum of 128 MB of memory and 20 MB of disk space to install and run CSM
  - Additional disk space for the base AIX 5L operating system and file sets

CSM for AIX 5L V1.3.2 also provides new support for the following IBM hardware:

- The new pSeries High Performance Switch (HPS)
- SP™ Expansion I/O units (#2055) with IBM POWER3™ SMP High Nodes (model 9076-NH0, #2054) or IBM 375 MHz POWER3 SMP High Nodes (model 9076-NH1, #2058)
- 7040-61D (RIO-2) I/O Drawer

Software requirements

CSM for Linux on pSeries

- The default base versions of SuSE SLES 8 as distributed and supported by SuSE or TurboLinux TLES 8 as distributed by TurboLinux, which currently include:
  - pdksh 5.2.14, or any later levels, which maintain full backward compatibility (on the management server only)
  - perl 5.8, or any later levels, which maintain full backward compatibility
  - nfs-utils 1.0, or any later levels, which maintain full backward compatibility (on the management server only)
  - rdist 6.1.5, or any later levels, which maintain full backward compatibility
  - tcl 8.4, or any later levels, which maintain full backward compatibility
  - tk 8.9, or any later levels, which maintain full backward compatibility
  - expect 5.34, or any later levels, which maintain full backward compatibility
  - expat 1.95.2, or any later levels, which maintain full backward compatibility
  - termcap 2.0.8, or any later levels, which maintain full backward compatibility
  - rsync 2.5.5, or any later levels, which maintain full backward compatibility
  - perl-XML-Parser 2.31, or any later levels, which maintain full backward compatibility (on the management server only)
  - dhcp-server 3.0, or any later levels, which maintain full backward compatibility (on the management server only)
  - dhcp-base 3.0, or any later levels, which maintain full backward compatibility (on the management server only)
  - rsh-server 0.17, or any later levels, which maintain full backward compatibility

Certain CSM for Linux on pSeries functions require non-IBM software. The following non-IBM software is required and can be obtained from the following sources:

- AutoUpdate V4.8, or later levels, which maintain full backward compatibility

Necessary if you want to perform the software maintenance installation and upgrade of non-CSM RPMs on your Linux-managed nodes from the management server. Download the software from: http://freshmeat.net/projects/autoupdate

For your convenience, the following required non-IBM software is included on the CSM CD-ROM:

- tftp-HPA 0.34
- conserver 7.2 (CSM for Linux includes software developed by Ohio State University and its contributors.)
The following non-IBM software is required if you want to perform remote hardware control operations for pSeries servers attached with a HMC:

- openCIMOM Version 0.7: Obtain the download Web site address from:
  https://techsupport.services.ibm.com/server/cluster

The following kernel level of SuSE SLES 8 can be used: SuSE base kernel (2.4.19)

CSM for Linux on xSeries

- Red Hat 8.0 and AS 2.1
- SuSE SLES 8 and SuSE 8.1

CSM for Linux on xSeries will also run on clusters of the following servers with one of the operating systems mentioned previously:

- Cluster 1300 and Cluster 1350
- xSeries x335, x345, x360, x440, and x445
- BladeCenter 8677-1xx, BladeCenter HS20 8678, and BladeCenter HS20 8832
- IntelliStation Z-Pro 6221

The CSM management server must be at the highest level of CSM in the cluster.

CSM for Linux on xSeries requirements for Red Hat, SuSE SLES, or SuSE are as follows:

- The default base version of Red Hat 8.0 or AS 2.1, as distributed and supported by Red Hat, which currently includes:
  - pdksh 5.2, or any later levels, which maintain full backward compatibility
  - perl 5.6, or any later levels, which maintain full backward compatibility
  - nfs-utils 0.3, or any later levels, which maintain full backward compatibility (on the management server only)
  - dhcp 2.0, or any later levels, which maintain full backward compatibility (on the management server only)
  - rdist 6.1.5, or any later levels, which maintain full backward compatibility (on the management server only)
  - tcl 8.3, or any later levels, which maintain full backward compatibility
  - expect 5.32, or any later levels, which maintain full backward compatibility

- dhcp-server 3.0, or any later levels, which maintain full backward compatibility
- expat 1.95.4, or any later levels, which maintain full backward compatibility (on the management server only)
- expect 5.34, or any later levels, which maintain full backward compatibility
- freetype2 2.0.9, or any later levels, which maintain full backward compatibility
- nfs-utils 1.0.1, or any later levels, which maintain full backward compatibility
- pdksh 5.2.14, or any later levels, which maintain full backward compatibility
- perl 5.8, or any later levels, which maintain full backward compatibility
- perl-HTML-Parser 3.26, or any later levels, which maintain full backward compatibility (on the management server only)
- perl-HTML-Tagset 3.03, or any later levels, which maintain full backward compatibility (on the management server only)
- perl-URI 1.20, or any later levels, which maintain full backward compatibility (on the management server only)
- perl-XML-DOM 1.39, or any later levels, which maintain full backward compatibility (on the management server only)
- perl-XML-Parser 2.31, or any later levels, which maintain full backward compatibility (on the management server only)
- perl-XML-RegExp 0.03, or any later levels, which maintain full backward compatibility (on the management server only)
- perl-libwww-perl 5.65, or any later levels, which maintain full backward compatibility (on the management server only)
- rdist 6.1.5, or any later levels, which maintain full backward compatibility
- rsh-server 0.17, or any later levels, which maintain full backward compatibility (on the nodes only)
- tcl 8.4, or any later levels, which maintain full backward compatibility
- telnet-server 1.0, or any later levels, which maintain full backward compatibility (on the nodes only)
- termcap 2.0.8, or any later levels, which maintain full backward compatibility (on the management server only)
- x86 4.2.0, or any later levels, which maintain full backward compatibility

- The default base version of SuSE SLES 8 as distributed and supported by SuSE, which currently includes:
  - dhcp-base 3.0, or any later levels, which maintain full backward compatibility
  - dhcp-server 3.0, or any later levels, which maintain full backward compatibility

Note: The latest libstdc++ library that comes with RH AS 2.1 updates (libstdc++-2.96-116) is not compatible with the current level of CSM code. Customers need to use the 2.96-108 version of libstdc++ on their RH AS 2.1 machines.

The following kernel levels of Red Hat can be used:

- Red Hat 8.0 base kernel (2.4.18-14), or later
- Red Hat AS 2.1 base kernel (2.4.9-e.3), or later
- The default base version of SuSE 8.1 as distributed and supported by SuSE, which currently includes:
  - dhcp-base 3.0, or any later levels, which maintain full backward compatibility

- dhcp-server 3.0, or any later levels, which maintain full backward compatibility
- expat 1.95.4, or any later levels, which maintain full backward compatibility (on the management server only)
- expect 5.34, or any later levels, which maintain full backward compatibility
- freetype2 2.0.9, or any later levels, which maintain full backward compatibility
- nfs-utils 1.0.1, or any later levels, which maintain full backward compatibility
- pdskh 5.2.14, or any later levels, which maintain full backward compatibility
- perl 5.8, or any later levels, which maintain full backward compatibility
- perl-HTML-Parser 3.26, or any later levels, which maintain full backward compatibility (on the management server only)
- perl-HTML-Tagset 3.03, or any later levels, which maintain full backward compatibility (on the management server only)
- perl-URI 1.20, or any later levels, which maintain full backward compatibility (on the management server only)
- perl-XML-DOM 1.39, or any later levels, which maintain full backward compatibility (on the management server only)
- perl-XML-Parser 2.31, or any later levels, which maintain full backward compatibility (on the management server only)
- perl-libwww-perl 5.65, or any later levels, which maintain full backward compatibility (on the management server only)
- rdist 6.15, or any later levels, which maintain full backward compatibility
- rsh-server 0.17, or any later levels, which maintain full backward compatibility (on the nodes only)
- tcl 8.4, or any later levels, which maintain full backward compatibility
- termcap 2.0.8, or any later levels, which maintain full backward compatibility (on the management server only)
- tk 8.4, or any later levels, which maintain full backward compatibility
- xf86 4.2.0, or any later levels, which maintain full backward compatibility

The following kernel level of SuSE SLES 8, or SuSE 8.1 can be used:
- SuSE base kernel (2.4.18)

The following additional non-IBM software is required with SuSE SLES 8:
- perl-XML-RegExp. It is available at:
- For your convenience, the following required non-IBM software is included on the CD-ROM:
  - syslinux 1.64
  - tftp-HPA 0.34
  - conserver 7.2 (CSM for Linux includes software developed by Ohio State University and its contributors.)
- Perl-libnet 1.0703
- expect 5.3
- rdist 6.15
- fping 2.462

Note: The distribution of syslinux includes the source code and associated documentation. All copyright notices and license terms and conditions in the documentation must be adhered to. You can find version and distribution information for this product that are part of your selected installation options in the IBM CSM README file.

The following non-IBM software is required if a customer wants to perform the software maintenance installation and upgrade of non-CSM RPMs:
- AutoUpdate V4.8, or later levels, which maintain full backward compatibility

   It can be obtained from: http://freshmeat.net/projects/autoupdate

CSM for AIX 5L

For all AIX servers, the following CSM for AIX 5L 1.3.1 service is required to convert CSM 1.3.1 installations to the 1.3.2 level:

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<tr>
<th>Description</th>
<th>APAR numbers</th>
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<tr>
<td>CSM for AIX 5.2, V1.3.2</td>
<td>IY47447</td>
</tr>
<tr>
<td>CSM for AIX 5.1, V1.3.2</td>
<td>IY47826</td>
</tr>
</tbody>
</table>

The CSM management server must be running AIX 5L V5.2 with Recommended Maintenance package 5200-01. The other machines within the cluster are referred to as managed nodes and can be running AIX 5L V5.2 with 5200-01 and APARs as above, or V5.1 with the 5100-04 Recommended Maintenance package. They can also be xSeries machines running CSM for Linux on xSeries V1.3.

Certain CSM for AIX 5L functions require non-IBM software. The following non-IBM software is required and can be obtained from the following sources:
- AutoUpdate V4.8 and Perl-libnet V1.0703

   Necessary if you want to perform the software maintenance installation and upgrade of non-CSM RPMs on your Linux-managed nodes from the AIX management server. Download the software from:
   http://freshmeat.net/projects/autoupdate

- openCIMOM Version 0.7

   Necessary if you want to perform remote hardware control operations for IBM pSeries servers attached with a HMC. Obtain the software from the “AIX toolbox for Linux applications” CD (Refer to Software Announcement 201-090, dated April 17, 2001), or obtain the download Web site address from https://techsupport.services.ibm.com/server/cluster

Service

Service for CSM for AIX and Linux can be obtained at:
http://techsupport.services.ibm.com/server/cluster

For your convenience, a complete CSM for Linux 1.3.2 image can be obtained from:
http://techsupport.services.ibm.com/server/cluster
Compatibility: CSM for Linux on xSeries V1.3.2 is a functional enhancement and complete replacement of CSM for Linux on xSeries V1.3.1. CSM for AIX 5L, V1.3.2 is a functional enhancement and complete replacement of CSM for AIX 5L, V1.3.1.

CSM 1.3.2 has been tested for compatibility with Red Hat 9.0.

Limitations

CSM for Linux on pSeries

- SuSE SLES 8 and TurboLinux TLES 8 are the only Linux distributions supported.
  
  Note: To see if CSM runs on the desired combination of Linux Distribution and hardware, refer to the “Frequently Asked Questions” section at:
  
  http://techsupport.services.ibm.com/server/cluster
  
  - The maximum number of managed nodes that CSM for Linux on pSeries runs on is 32 at CSM 1.3.2 general availability, and will be subsequently increased to 128 (refer to Planned availability dates section).
  
  - The p650 cannot be used as a management server.

CSM for Linux on xSeries

- Red Hat 8.0 or AS2.1; or SuSE 8.0, SuSE SLES 8, or SuSE 8.1 is required for the cluster management server.

  Note: The latest libstdc++ library that comes with RH AS 2.1 updates (libstdc++2.96-116) is not compatible with the current level of CSM code. Customers need to use the 2.96-108 version of libstdc++ on their RH AS 2.1 machines.

  Note: Combinations of CSM with Linux operating systems are dependent upon specific hardware models. To see if CSM runs on the desired combination of Linux Distribution and hardware, refer to the “Frequently Asked Questions” section at:

  http://techsupport.services.ibm.com/server/cluster

  - Full operating system install of SuSE SLES 7 or SuSE 8.0 is not supported. Managed nodes of SuSE SLES 7 and SuSE 8.0 are supported.

  - There is limited hardware control support for the x440.

  - Multiple Install Servers are only supported for installing nodes with CSM and Red Hat Linux.

  - You cannot mix enterprise and professional versions of distributions in the same cluster (Red Hat AS 2.1 and Red Hat 8.0), nor Red Hat and SuSE distributions in the same cluster (for example, Red Hat AS 2.1 and SLES 8).

  - The maximum number of managed nodes that CSM for Linux on xSeries can run on is 512.

  - For xSeries and IntelliStations, if you do not have a terminal server, the remote console function (rconsone) will not work and automatic MAC address collection will not work for the full installation of Linux nodes.

  - HS20 8832 blades that are added to a BladeCenter chassis (8677-1xx) that contains HS20 8687 blades will require updates to the BIOS and reconfiguration of each of the HS20 8687 blades.

  Note: Technical support applies only to the IBM licensed products above. If these products are running on an operating system (or with a corequisite, prerequisite product) that is no longer supported, IBM technical support may be limited to defects that can be replicated on supported environments (that is, supported versions of the operating systems).

CSM for AIX 5L

- AIX 5L V5.2 is required for the cluster management server.

- The maximum number of OSIs (AIX 5L OSIs plus Linux OSIs) that can be managed under CSM for AIX 5L is 128.

- CSM for AIX 5L does not run on the RS/6000 SP Switch nor SP Switch2.

- PSSP and CSM will not coexist in the same cluster.

Planning information

Planning information is provided in the CSM Planning and Installation Guides (for AIX 5L: SA22-7919, for Linux: SA22-7853), and in the CSM Hardware Control Guides (for AIX 5L: SA22-7920, for Linux: SA22-7856).

Packaging

Cluster Systems Management for Linux on pSeries is shipped under machine type-model 5765-G16. A license key is required to execute Cluster Systems Management for Linux on pSeries. License keys are obtained by ordering type-model 5765-G16.

The 5765-G16 package includes:

- CD-ROM containing CSM 1.3.2 software and license use key file

- IBM Agreement for Acquisition of Support (Z125-6011)

- Addendum for Support (Software Maintenance) for Select iSeries™ and pSeries Programs (Z125-6495)

Cryptographic utilities are included on a separate CSM for Linux CD.

Cluster Systems Management for Linux on xSeries is shipped under machine type-model 5765-E88. A license key is required to execute Cluster Systems Management for Linux on xSeries. License keys are obtained by ordering type-model 5765-E88.

The 5765-E88 package includes:

- CD-ROM containing CSM 1.3.2 software and license use key file

- IBM Agreement for Acquisition of Support (Z125-6011)

- Addendum for Support (Software Maintenance) for Select iSeries and pSeries Programs (Z125-6495)

Cryptographic utilities are included on a separate CSM for Linux CD.

CSM for AIX 5L is included in the AIX 5L V5.1 and V5.2 operating systems. AIX Service is required to upgrade CSM 1.3.1 to 1.3.2 (refer to the Software requirements section). A license key is required to execute CSM for AIX 5L. License keys are obtained by ordering type-model 5765-F67.

The 5765-F67 package includes:

- CD-ROM containing license use key file

- Read This First memo (G111-2830)

- IBM Agreement for Acquisition of Support (Z125-6011)

- Addendum for Support (Software Maintenance) for Select iSeries and pSeries Programs (Z125-6495)
Cryptographic utilities are included on the AIX 5L Expansion Pack.

**Security, auditability, and control**

Cluster Systems Management uses the security and auditability features of the default base version of the AIX 5L V5.1, AIX 5L V5.2, Red Hat Linux, or SuSE Linux operating system.

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

**Ordering information**

CSM for Linux on pSeries is a product with one charge unit: active processors. The number of processors is the sum of the active number of processors in each of the machines on which CSM for Linux will be installed or run, or to which CSM Remote Hardware Control commands will be issued. One license is required for each machine running CSM. A license key is required to execute CSM for Linux on pSeries and will be sent with the product order.

**Note:** The charge unit for CSM for AIX 5L is now per active processor running the operating system rather than the maximum potential number of processors.

**Existing customers**

**Linux on xSeries:** Customers of CSM for Linux on xSeries 1.3.1 may use their existing license key file. No key changes are required to use CSM for Linux on xSeries 1.3.2.

**Note:** CSM for Linux on xSeries is also orderable via Passport Advantage. Refer to Software Announcement 202-262, dated October 8, 2002.

**AIX:** Customers cannot directly order CSM for AIX 5L, V1.3.2. CSM 1.3.1 customers must add AIX service (refer to the Software requirements section), and may use their existing 5765-F67 license key file. No key changes are required to use CSM for AIX 5L, V1.3.2.

**Base license ordering information: CSM V1.3.2**

**Program name:** Cluster Systems Management V1.3.2

For each AIX 5L machine (type-model) on which CSM will be run, new users of CSM for AIX 5L, V1.3.2 should specify machine type 5765, model F67, and the defined feature numbers with quantity equal to the total number of active processors in that machine.

For each pSeries machine (type-model) on which CSM will be run, new users of CSM for Linux on pSeries V1.3.2 should specify machine type 5765, model G16, and the defined feature numbers with quantity equal to the total number of active processors in that machine.

CSM is installed once per instance of parent operating system (AIX 5L or Linux) on any server. One CSM management server is required per CSM cluster (refer to the Software requirements section). For example, if ordering CSM for three machines (a 4-way, an 8-way, and a 16-way), order three licenses with the respective quantities each (for a total quantity of 28). The block of 250 processors feature number is provided for convenience with large orders.

CSM for AIX 5L is shipped on the AIX 5L V5.2 base CD. A 5765-F67 license and key is required to use CSM.

**Medium: CD-ROM**

**CSM for Linux on pSeries**

<table>
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<th>Number of processors</th>
<th>5765-G16 0001</th>
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<td>Block of 250 processors</td>
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<td></td>
</tr>
<tr>
<td>Cryptographic CD</td>
<td>5819</td>
<td></td>
</tr>
</tbody>
</table>

2. One-time charge
3. This feature number contains export-regulated function.

This software license includes Software Maintenance, previously referred to as Software Subscription and Technical Support.

Extending coverage for a total of three years from date of acquisition may be elected. Order the program number, feature number, and quantity to extend coverage for your software licenses. If maintenance has expired, specify the after license feature number.

**Maintenance IASP PID: 1-Year 5771-CSL**

**Use Authorizations: (to be ordered in quantity of processors)**

| SW Maintenance No Charge Registration | 0386 |
| SW Maintenance 1-Year Renewal | 0388 |
| SW Maintenance 1-Year After License | 0390 |

**250 Use Authorizations: (to be ordered in quantities of 250 processors)**

| SW Maintenance No Charge Registration | 0387 |
| SW Maintenance 1-Year Renewal | 0389 |
| SW Maintenance 1-Year After License | 0391 |

**Maintenance IASP PID: 3-Year 5773-CSL**

**Use Authorizations: (to be ordered in quantity of processors)**

| SW Maintenance 3-Year Registration | 0362 |
| SW Maintenance 3-Year Renewal | 0364 |
| SW Maintenance 3-Year After License | 0366 |

**250 Use Authorizations: (to be ordered in quantities of 250 processors)**

| SW Maintenance 3-Year Registration | 0363 |
| SW Maintenance 3-Year Renewal | 0365 |
| SW Maintenance 3-Year After License | 0367 |

**Customization options**

**Expedite shipments**

| Local IBM Office Expedite | 3445 |
Licensing: IBM International Program License Agreement. Proofs of Entitlement (PoE) are required for all authorized use.

This software license includes Software Maintenance, previously referred to as Software Subscription and Technical Support.

The following agreements apply for maintenance and do not require customer signatures:
- IBM Agreement for Acquisition of Support (Z125-6011)
- Addendum for Support (Software Maintenance) for Select iSeries and pSeries Programs (Z125-6495)

Limited warranty applies: Yes

Warranty: This program has warranty for a minimum of one year from acquisition from IBM or authorized Business Partner. The warranty provided to the customer, for at least one year from acquisition, is access to databases (read Web sites) for program information, FAQs, including any known fixes to defects, which customers can download or obtain otherwise and install at their leisure.

Program technical support: Technical support of a program product will be available for a minimum of three years from the general availability date, as long as your Software Maintenance is in effect. This Technical Support allows you to obtain assistance (via telephone or electronic means) from IBM for product-specific, task-oriented questions regarding the installation and operation of the program product. Software Maintenance also provides you with access to updates, releases, and versions of the program. Customers will be notified, via announcement letter, of discontinuance of support with 12 months notice. If you require additional technical support from IBM, including an extension of support beyond the discontinuance date, contact your IBM representative or Business Partner. This extension may be available for a fee.

Money-back guarantee: If for any reason you are dissatisfied with the program, return it within 30 days from the invoice date, to the party (either IBM or its reseller) from whom you acquired it, for a refund. This applies only to your first acquisition of the program.

Copy and use on home/portable computer: No

Volume Orders (IVO): Yes, contact your IBM representative.

Passport Advantage applies: Yes and through the Passport Advantage Web site at:
http://www.ibm.com/software/passportadvantage

Software Maintenance applies: Yes

All distributed software licenses include Software Maintenance (Software Subscription and Technical Support) for a period of 12 months from the date of acquisition providing a streamlined way to acquire IBM software and assure technical support coverage for all licenses. Extending coverage for a total of three years from date of acquisition may be elected.

While your Software Maintenance is in effect, IBM provides you assistance for your routine, short duration installation and usage (how-to) questions and code-related questions. IBM provides assistance via telephone and, if available, electronic access, only to your information systems technical support personnel during the normal business hours (published prime shift hours) of your IBM support center. (This assistance is not available to your end users.) IBM provides Severity 1 assistance 24 hours a day, every day of the year. For additional details, consult your IBM Software Support Guide at:
http://techsupport.services.ibm.com/guides/handbook.html

Software Maintenance does not include assistance for
- The design and development of applications
- Your use of programs in other than their specified operating environment
- Failures caused by products for which IBM is not responsible under this agreement

Other support: pSeries software maintenance

AIX/UNIX® Upgrade Protection applies: No

Entitled upgrade for current AIX/UNIX Upgrade Protection licensees: No

iSeries software subscription applies: No

Variable charges apply: No

Educational allowance available: Yes, 15% education allowance applies to qualified education institution customers.

Prices

CSM for Linux on pSeries

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<th>Description</th>
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<td>CSM for Linux</td>
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<td>Block of 250 processors</td>
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Software Maintenance

This software license includes Software Maintenance, previously referred to as Software Subscription and Technical Support.

**CSM for Linux on pSeries OTC 1-Year Software Maintenance Program 5771-CSL**

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<th>Program name</th>
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<th>Maint. after-license billing feature number</th>
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**CSM for Linux on pSeries OTC 3-Year Software Maintenance Program 5773-CSL**

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<td>0365</td>
<td>50,750</td>
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</table>

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