



Sun HPC ClusterTools™ 8.2 Software Installation Guide

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Preface

This document describes the procedure for installing Sun HPC ClusterTools™ 8.2 software. These instructions are intended for an experienced system administrator. For example, to install the cluster tools software on one or more nodes, you must be familiar with the following tasks in the Solaris™ 10 Operating System, or Red Hat or SuSe Linux:

- Logging in as superuser
- Using the `df` command to check disk space
- Reading `/var/adm/messages` for possible error messages and debugging information
- Exporting and mounting an NFS file system and using commands and scripts, such as `mount`, `share`, `/etc/init.d/nfs.server`
- Enabling superuser login access to a server
- Setting directory and file permissions to allow read and write access

Before You Read This Book

To follow the procedures described in this document, you should be familiar with the related topics discussed in the following documents:

- The *Sun HPC ClusterTools 8.2 Software Release Notes*.
- Documentation that accompanied your server hardware.
- Documentation for the Solaris 10 OS.
- If you are using one of the Distributed Resource Manager (DRM) applications, see the related documentation. One example of a DRM is Sun™ Grid Engine software.

How This Book Is Organized

Chapter 1 provides an overview of the Sun HPC ClusterTools software installation utilities.

Chapter 2 describes various installation dependencies.

Chapter 3 explains how to install the Solaris OS-based version of the Sun HPC ClusterTools software command-line interface (CLI) tools.

Chapter 4 explains how to install and verify the Linux-based version of Sun HPC ClusterTools software.

Using UNIX Commands

This document might not contain information on basic UNIX[®] commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- Software documentation that you received with your system
- Solaris[™] Operating System documentation, which is at:

(<http://docs.sun.com>)

Shell Prompts

| Shell | Prompt |
|---------------------------------------|----------------------|
| C shell | <i>machine-name%</i> |
| C shell superuser | <i>machine-name#</i> |
| Bourne shell and Korn shell | \$ |
| Bourne shell and Korn shell superuser | # |

Related Documentation

| Application | Title | Part Number |
|-------------------------------|--|-------------|
| Sun HPC ClusterTools Software | <i>Sun HPC ClusterTools 8.2 Software Release Notes</i> | 821-0223-10 |
| | <i>Sun HPC ClusterTools 8.2 Software User's Guide</i> | 821-0225-10 |

The Sun HPC ClusterTools documentation is available online at:

(<http://www.sun.com/documentation>)

For more information about the Sun HPC ClusterTools software, see the related Web site at:

(<http://www.sun.com/clustertools>)

For more information about Open MPI and its components, see the Open MPI web site at:

(<http://www.open-mpi.org>)

For more information about Sun Grid Engine software, see the Sun Grid Engine web site at:

(<http://www.sun.com/software/gridware>)

Documentation, Support, and Training

The Sun web site provides information about the following additional resources:

- Documentation (<http://www.sun.com/documentation>)
- Support (<http://www.sun.com/support>)
- Training (<http://www.sun.com/training>)

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Sun HPC ClusterTools 8.2 Software Installation Guide, part number 821-0223-10.

Introduction to Sun HPC ClusterTools 8.2 Software

This chapter provides an overview of the software installation utilities. It contains the following topics:

- “Overview” on page 1
- “Summary of Tasks Performed by Sun HPC ClusterTools Software Utilities” on page 3
- “Recommendations for Installing Sun HPC ClusterTools 8.2 Software on Large Cluster Installations” on page 5

Overview

This manual explains how to use the Sun HPC ClusterTools software installation utilities to install and remove Sun HPC ClusterTools software on one or more cluster nodes. See [TABLE 1-1](#) for a summary of the Solaris OS interfaces.

TABLE 1-1 Sun HPC ClusterTools Software Installation Utilities

| Utility | Description |
|------------------------|--------------------------------------|
| <code>ctinstall</code> | Installs software on cluster nodes. |
| <code>ctremove</code> | Removes software from cluster nodes. |

The tools install a complete copy of the Sun HPC ClusterTools software, locally on each node in the cluster.

For Linux-based installations, RPM packages are provided. [Chapter 4](#) contains the information about how to install and configure RPM packages for Red Hat and SuSe Linux.

Centralized and Local Command Initiation

You can choose between two methods of initiating operations on the cluster nodes:

- Local – Initiate commands directly on the node you are logged in to. The effects of the command are restricted to the local node.
- Centralized – Initiate commands from a central host, specifying the nodes on which the command is to take effect. The initiating host establishes remote connections to the target nodes and broadcasts the commands to them over an `rsh`, `ssh`, or `telnet` connection. The central (initiating) host can be part of the cluster or it can be an administrative system external to the cluster.

Note – Centralized operations are performed on the specified nodes in parallel. That is, when a command is specified on the central host, the operation is initiated on all the specified nodes at the same time.

Support for centralized command initiation is built into the Sun HPC ClusterTools software installation utilities. Issuing these commands from a central host has the equivalent effect as invoking the commands locally using one of the Cluster Console tools, `cconsole`, `ctelnet`, or `crlogin`. For alternative tools, see [“To Install the Linux Packages” on page 24](#).

The Sun HPC ClusterTools software CLI utilities provide several options that are specific to the centralized command initiation mode and are intended to simplify management of parallel installation of the software from a central host. These options support:

- Creating corresponding versions of local log files on the central host for easier access
- Generating a list of nodes that had successful operations and another list of nodes that were unsuccessful. These pass/fail node lists can then be used in subsequent operations, such as software removal.

The initiating system can be one of the cluster nodes or it can be external to the cluster. It must be a Sun system running the Solaris 9 or Solaris 10 Operating System (Solaris OS). Compute nodes must run the Solaris 10 OS.

Sun HPC ClusterTools 8.2 Installation Log Files

The Sun HPC ClusterTools 8.2 installation tools log information about installation-related tasks locally on the nodes where installation tasks are performed. The default location for the log files is `/var/sadm/system/logs/hpc`. If installation tasks are initiated from a central host, a summary log file is also created on the central host.

Local, Node-Specific Log Files

Two types of log files are created locally on each cluster node where installation operations take place.

- Task-specific logs – Separate log files are created for each installation-related task. They are:

- `ct_install.log`
- `ct_remove.log`
- `ct_act.log`
- `ct_deact.log`
- `ct_startd.log`
- `ct_stopd.log`

These log files contain detailed logging information for the most recent associated task. Each time a task is repeated, its log file is overwritten.

- History log – A `ct_history.log` file is created to store all installation-related tasks performed on the local node. This provides a convenient record of the Sun HPC ClusterTools 8.2 software installation history on the local node. Each time a new installation task is performed on the node, a new log entry is appended to the history log.

These node specific installation log files are created regardless of the installation method used, local or centralized.

Central Node Summary Log

When installation tasks are initiated from a central host, a summary log file named `ct_summary.log` is created on the central host. This log file records the final summary report that is generated by the CLI. The `ct_summary.log` is not overwritten when a new task is performed. As with the `ct_history.log` file, new entries are appended to the summary log file.

Summary of Tasks Performed by Sun HPC ClusterTools Software Utilities

This section describes an overview of the installation-related tasks you can perform.

Note – The command-line interface (CLI) tools require superuser privileges to execute.

Select an Activity

The various installation-related operations are independent of each other. With the CLI, you simply start the applicable utility: `ctinstall`, or `ctremove`. The operations these tools control are described below.

Install the Software

The installation activity loads the Sun HPC ClusterTools software onto cluster nodes.

With the CLI command `ctinstall`, you can install individual Sun HPC ClusterTools 8.2 software packages as well as install the entire software suite.

A complete copy of the Sun HPC ClusterTools software is installed locally on each node in the cluster.

The next sections describe the installation choices you can make when you install Sun HPC ClusterTools software.

Remove the Sun HPC ClusterTools Software

This operation deletes Sun HPC ClusterTools software packages from the cluster nodes on which it is executed. If a node is active at the time you initiate the removal operation, it will be deactivated automatically before the software is removed.

With the CLI command `ctremove`, you can remove individual Sun HPC ClusterTools software packages as well as remove the entire software suite.

Recommendations for Installing Sun HPC ClusterTools 8.2 Software on Large Cluster Installations

The following are tips for installing Sun HPC ClusterTools 8.2 software on clusters containing hundreds of nodes using the centralized method:

- Minimize other system activity during installation – Invoking installation of Sun HPC ClusterTools 8.2 software on hundreds of nodes from a central host imposes high demands on system resources. Avoid system resource exhaustion by keeping the cluster nodes as quiescent as possible during the installation.
- Use a node list file – For various centralized installation tasks, you specify the nodes on which the task is to be invoked. You have the choice of specifying the nodes either on the command line, using the `-n` option or by referencing a node list file using the `-N` option. If you reference a node list file, you only enter the node names once when you create the file.
- Reduce system resource consumption on the central host – You can avoid overtaxing system resources on a single central host by using more than one central host. Simply divide the total list of nodes to be installed on into separate node lists, and initiate the installation commands on the various central hosts, with each host using a different node list.
- Use the `-g` option with CLI-initiated tasks – Use the `-g` option with CLI commands to obtain a list of nodes that successfully executed the command and a separate list of nodes that failed. You can then reference the list of failed nodes with the `-N` option in a later retry of the command.
- Use the `-k` option with CLI-initiated tasks – Use the `-k` option with CLI commands to have all logs saved on the central node where the command was initiated. This option makes it unnecessary to go to each node to examine local logs.

Note – When using the telnet connection method, all nodes specified in a given centralized invocation must share the same password. If you have more than one password for the nodes in the cluster, separate the nodes into installation groups in which all nodes share the same password, and perform separate command invocations for each node group.

Preparing for Installation

Before installing Sun HPC ClusterTools software, you need to ensure that the hardware and software that make up your cluster meet certain requirements. These requirements are described in the following sections:

- “General Prerequisites” on page 7
 - “Supported Compilers” on page 8
 - “Cluster Console Tools” on page 8
 - “Setting Up a `known_hosts` File” on page 9
-

General Prerequisites

Before installing Sun HPC ClusterTools software, be sure that all hardware is installed and configured. The system from which the installation is to be initiated must have `rsh`, `ssh`, or `telnet` network connections to the target nodes.

TABLE 2-2 outlines additional prerequisites for installation.

TABLE 2-2 General Prerequisites for Installing Sun HPC ClusterTools Software

| Description | Requirement |
|-------------|--|
| Hardware | Sun UltraSPARC or x64-based systems. For Sun UltraSPARC systems, the minimum compatible processor is the UltraSPARC III. |

TABLE 2-2 General Prerequisites for Installing Sun HPC ClusterTools Software

| Description | Requirement |
|---------------------|---|
| Disk space | Approximately 50-105 Mbytes per node. |
| Operating system | Solaris 10 11/06 or any subsequent Solaris release that supports Sun HPC ClusterTools 8.2 software. |
| Resource management | Sun HPC ClusterTools 8.2 software includes Open MPI Runtime Environment (ORTE) for launching and control of parallel jobs. One example of a distributed resource management framework operating under integration with ORTE is Sun Grid Engine Version 6. |

Supported Compilers

Sun HPC ClusterTools 8.2 software supports Sun™ Studio 12 Update 1, PGI, GCC, Pathscale, and Intel C, C++, and Fortran compilers.

Cluster Console Tools

The Cluster Console tools, `cconsole`, `ctelnet`, and `crlogin`, are available in the package `SUNWccconf`, which is bundled with the Solaris Cluster software. Solaris Cluster software can be downloaded from the following URL:

(<http://www.sun.com/download/products.xml?id=4581ab9e>)

Although you do not need Cluster Console for centralized installation of Sun HPC ClusterTools software, it can be a convenient tool for various administrative operations, such as booting cluster nodes in a Custom JumpStart installation.

Centralized command initiation provides a command execution summary for each initiated activity. This summary reports the results of the operation, identifying the nodes on which the operation was successful and the nodes on which it failed. Such reports are not available when using the Cluster Console tools.

Setting Up a `known_hosts` File

If you are using `ssh` to connect to your remote nodes, you must set up your `~/.ssh/known_hosts` file to contain the remote nodes' host key, especially if you try to run on a cluster with many nodes for the first time.

Setting up the `known_hosts` file avoids having to respond to the following prompts when running `mpirun` to the remote nodes:

```
% /opt/SUNWhpc/HPC8.2/bin/mpirun -host host04,host05,host06 hostname

The authenticity of host 'host04 (129.148.9.88)' can't be established.
RSA key fingerprint is ff:73:0e:91:7b:19:e6:a3:9a:f8:6c:07:0a:ce:1a:f2.
Are you sure you want to continue connecting (yes/no)?
The authenticity of host 'host05 (129.148.9.84)' can't be established.
RSA key fingerprint is 11:f6:bd:f7:a9:5b:05:ab:73:ee:81:0f:c8:2f:ac:cb.
Are you sure you want to continue connecting (yes/no)?
The authenticity
of host 'host06 (129.148.9.86)' can't be established.
RSA key fingerprint is c1:24:c4:9c:86:33:25:3b:08:59:12:b5:1b:9d:b2:c6.
Are you sure you want to continue connecting (yes/no)?
Host key verification failed.
yes
Please type 'yes' or 'no': yes
...
```

Installing the Software on Solaris

This chapter explains how to install Sun HPC ClusterTools software on Solaris using the installation utilities. For information about how to install Sun HPC ClusterTools software on a Linux-based system, see [Chapter 4](#).

The Sun HPC ClusterTools software command-line interface (CLI) utilities are:

- `ctinstall` – Install the software on the cluster nodes.
- `ctremove` – Remove the software from the cluster nodes.

Note – If you use `rsh` connections for centralized operations on hundreds of nodes at a time, the operations may encounter system resource limitations that prevent the connections from being established to all the nodes. For clusters with hundreds of nodes, it is best to perform these operations on subsets of nodes, one subset at a time, with no more than 200 nodes in a subset.

This chapter contains the following topics:

- [“Download and Extract the Software” on page 11](#)
- [“Remove the Previous Sun HPC ClusterTools Software Installation” on page 13](#)
- [“Install the Software” on page 16](#)
- [“Additional Steps” on page 20](#)

Download and Extract the Software

Note – You must log in as `root` to install and configure the Sun HPC ClusterTools 8.2 software. This is because `ctinstall` and the other commands use the Solaris OS `pkg*` commands; the `pkg*` commands must be executed as `root`.

Before you can install and configure the software, you must make sure you have downloaded the correct software archive for your hardware platform. Once you have downloaded the software, you need to extract it to the correct directory. If you have installed a previous version of the software, there are additional steps you need to do to prepare for installation. The following procedure explains these steps.

▼ To Download and Extract the Software

1. **Boot the cluster nodes.**
2. **Download and extract the archive file containing the Sun HPC ClusterTools software to a location (such as a shared file system) that is visible to all the nodes in the cluster.**
 - a. **Make sure that all the compute and administrative nodes have access to the shared file system.**
 - b. **Make sure that the file system is readable by superuser and accessible through a common path from all nodes.**

For centralized installations, do this on the central host as well.

You can obtain the correct HPC ClusterTools archive file for your platform from the following location:

<http://www.sun.com/clustertools/>

3. **Log in as superuser on the system from which you will be initiating the command: the central host or, if initiating the command locally, directly on a cluster node.**
 4. **If the Sun HPC ClusterTools software has not been installed yet, change directory to one of the following:**
 - a. **If you are installing the software on a SPARC-based system, change directory to `/sun-hpc-ct8.2-sparc/Product/Install_Uilities/bin`**
 - b. **If you are installing on an x64-based system, change directory to `/sun-hpc-ct8.2-i386/Product/Install_Uilities/bin`**
- If the software has already been installed, go to Step 5.

5. **If the software was previously installed, remove the previous version of the software by changing the directory to**

```
$INSTALL_LOC/SUNWhpc/HPC8.2/bin/Install_Uutilities/bin.
```

`$INSTALL_LOC` is the location where the software was installed.

To remove a previous version of the software, see [“Remove the Previous Sun HPC ClusterTools Software Installation”](#) on page 13.

You can now start using the CLI commands. They are described separately below, with examples of common applications given for each.

For usage information on any command, either enter the command without options or with the `-h` option.

```
# ./command  
or  
# ./command -h
```

Remove the Previous Sun HPC ClusterTools Software Installation

If you have previously installed Sun HPC ClusterTools software on your cluster nodes, you must remove it before you can reinstall the software.

Use the `ctremove` command to remove Sun HPC ClusterTools software from cluster nodes.

`ctremove` Options

See Table 1 for a summary of the `ctremove` options.

Note – If the nodes are active at the time `ctremove` is initiated, they will be deactivated automatically before the removal process begins.

TABLE 3-1 `ctremove` Options

| Options | Description |
|-----------------|---|
| General | |
| <code>-h</code> | Command help. |
| <code>-l</code> | Execute the command on the local node only. |

TABLE 3-1 `ctremove` Options (Continued)

| Options | Description |
|------------------------------------|--|
| -R | Specify the full path to be used as the root path. |
| -x | Turn on command debug at the specified nodes. |
| Command Specific | |
| -p | List of packages to be selectively removed. Separate names by comma. |
| Centralized Operations Only | |
| -g | Generate node lists of successful and unsuccessful removals. |
| -k | Specify a central location for storing copies of local log files. |
| -n | List of nodes targeted for removal. Separate names by comma. |
| -N | File containing list of nodes targeted for removal. One node per line. |
| -r | Remote connection method: <code>rsh</code> , <code>ssh</code> , or <code>telnet</code> . |
| -S | Specify full path to an alternate <code>ssh</code> executable. |

Removing Nodes From a Central Host

This section shows examples of software removal in which the `ctremove` command is initiated from a central host.

To Remove Software From Specified Cluster Nodes

```
# ./ctremove -N /tmp/nodelist -r rsh
```

This command removes the software from the nodes listed in `/tmp/nodelist`. The remote connection method is `rsh`.

To Remove the Software and Generate Log Files

```
# ./ctremove -N /tmp/nodelist -r rsh -k /tmp/cluster-logs -g
```

This command is the same as the command in the previous section, except that it specifies the options `-k` and `-g`.

To Remove Specified Software Packages

```
# ./ctremove -N /tmp/nodelist -r rsh -p SUNWompi,SUNWompimn
```

This command removes the packages `SUNWompi` and `SUNWompimn` from the nodes listed in `/tmp/nodelist`. The remote connection method is `rsh`.

Removing Software From the Local Node

This section shows software removal from the local node.

To Remove Software Locally

```
# ./ctremove -l
```

This command removes the software on the local node.

To Remove Specified Software Packages

```
# ./ctremove -l -p SUNWompi,SUNWompimn
```

This command removes the packages `SUNWompi` and `SUNWompimn` from the local node.

Install the Software

ctinstall Options

Use the `ctinstall` command to install Sun HPC ClusterTools software on cluster nodes. See [TABLE 3-2](#) for a summary of the `ctinstall` options.

TABLE 3-2 `ctinstall` Options

| Options | Description |
|------------------------------------|---|
| General | |
| -h | Command help. |
| -l | Execute the command on the local node only. |
| -R | Specify the full path to be used as the root path. |
| -x | Turn on command debug at the specified nodes. |
| Command Specific | |
| -c | Specify the server and mount path for the software. |
| -d | Specify a non-default <i>install from</i> location. The default is <i>distribution/Product</i> , relative to the directory where <code>ctinstall</code> is invoked. |
| -p | List of packages to be installed. Separate names by comma. |
| -t | Specify a nondefault <i>install to</i> location. The default is <i>/opt</i> . |
| Centralized Operations Only | |
| -g | Generate node lists of successful and unsuccessful installations. |
| -k | Specify a central location for storing log files of all specified nodes. |
| -n | List of nodes targeted for installation. Separate names by comma. |
| -N | File containing list of nodes targeted for installation. One node per line. |
| -r | Remote connection method: <code>rsh</code> , <code>ssh</code> , or <code>telnet</code> . |
| -S | Specify full path to an alternate <code>ssh</code> executable. |

Note – The options `-g`, `-k`, `-n`, `-N`, `-r`, and `-S` are incompatible with local (non-centralized) installations. If the `-l` option is used with any of these options, an error message is displayed.

Install the Software from a Central Host

This section shows examples of software installations in which the `ctinstall` command is initiated from a central host.

To Install From a Central Host Using `rsh`

```
# ./ctinstall -n node1,node2 -r rsh
```

This command installs the full Sun HPC ClusterTools software suite on `node1` and `node2` from a central host. The node list is specified on the command line. The remote connection method is `ssh`. This requires a trusted hosts setup.

The software will be ready for use when the installation process completes.

To Install From a Central Host Using `ssh`

```
# ./ctinstall -n node1,node2 -r ssh
```

This example is the same as that in the previous section, except that the remote connection method is `ssh`. This method requires that the initiating node be able to log in as superuser to the target nodes without being prompted for any interaction, such as a password.

To Install From a Central Host Using `telnet`

```
# ./ctinstall -N /tmp/nodelist -r telnet
```

This command installs the full Sun HPC ClusterTools software suite on the set of nodes listed in the file `/tmp/nodelist` from a central host. A node list file is particularly useful when you have a large set of nodes or you want to run operations on the same set of nodes repeatedly.

The node list file has the following contents:

```
# Node list for the above example  
  
node1  
node2
```

The remote connection method is `telnet`. All cluster nodes must share the same password. If some nodes do not use the same password as others, install the software in groups, each group consisting of nodes that use a common password.

The software will be ready for use when the installation process completes.

To Install the Software and Save the Log Files

```
# ./ctinstall -N /tmp/nodelist -r telnet -k /tmp/cluster-logs -g
```

The command in this section is the same as that shown in the previous section, except that it includes the `-k` and `-g` options.

In this example, the `-k` option causes the local log files of all specified nodes to be saved in `/tmp/cluster-logs` on the central host.

The `-g` option causes a pair of node list files to be created on the central host in `/var/sadm/system/logs/hpc/nodelists`. One file, `ctinstall.pass$$`, contains a list of the nodes on which the installation was successful. The other file, `ctinstall.fail$$`, lists the nodes on which the installation was unsuccessful. The `$$` symbol is replaced by the process number associated with the installation.

These generated node list files can then be used for command retries or in subsequent operations using the `-N` switch.

Note – Specify a directory that is local to the central host (for example, `/tmp`). This will avoid unnecessary network traffic in the transfer of log files and will result in faster execution of the operation.

To Install Specified Software Packages

The following command installs only the specified software packages.

```
# ./ctinstall -N /tmp/nodelist -r telnet -p SUNWompi
```

This command installs the packages `SUNWompi` and `SUNWompimn` on the set of nodes listed in the file `/tmp/nodelist`. No other packages are installed. The remote connection method is `telnet`.

“Solaris OS Packages” on page 19 lists the packages in the Sun HPC ClusterTools 8.2 installation.

The `-p` option can be useful if individual packages were not installed on the nodes by `ctinstall`.

```
# ./ctinstall -N /tmp/nodelist -r rsh
```

This command installs and activates the full Sun HPC ClusterTools software suite on the nodes listed in the file `/tmp/nodelist`. The remote connection method is `rsh`.

Solaris OS Packages

The following is the Solaris OS package breakdown for the Sun HPC ClusterTools 8.2 (Open MPI) release.

TABLE 3-3 Solaris OS Packages in the Sun HPC ClusterTools 8.2 Installation

| Package Name | Contents |
|-------------------------|--|
| <code>SUNWompi</code> | Open MPI Message Passing Interface files |
| <code>SUNWompiat</code> | Open MPI installer utilities |
| <code>SUNWompimn</code> | Open MPI Message Passing Interface man pages |
| <code>SUNWomsc</code> | Extra package to include miscellaneous files |
| <code>SUNWompir</code> | Open MPI Root Filesystems files |

Install the Software Locally

This section shows examples of software installations in which the `ctinstall` command is initiated on the local node. The installation options shown in this example include:

- “To Install the Complete Software Suite Locally” on page 20
- “To Install Specified Software Packages Locally” on page 20

Note – The options `-g`, `-k`, `-n`, `-N`, `-r`, and `-S` are incompatible with local (non-centralized) installations. If the `-l` option is used with any of these options, an error message is displayed.

To Install the Complete Software Suite Locally

```
# ./ctinstall -l
```

This command installs the full Sun HPC ClusterTools software suite on the local node only.

To Install Specified Software Packages Locally

```
# ./ctinstall -l -p SUNWompi,SUNWompimn
```

The command in this section installs the packages `SUNWompi` and `SUNWompimn` on the local node.

“Solaris OS Packages” on page 19 lists the packages in the Sun HPC ClusterTools 8.2 installation.

Additional Steps

This chapter describes the final steps needed to get your Sun HPC system ready for use after installing the software, and information about viewing installation log files.

Enabling Close Integration With Batch Processing Systems

Open Run-Time Environment (ORTE) provides close integration with several distributed resource management (DRM) systems, such as Sun Grid Engine. For information on how close integration works and how to set up the integration for each of the supported resource managers, refer to the *Sun HPC ClusterTools Software Administrator's Guide*.

The *Sun HPC ClusterTools 8.2 Software User's Guide* contains information about how to set up close integration with Sun Grid Engine.

Sun HPC ClusterTools 8.2 Installation Log Files

The Sun HPC ClusterTools 8.2 installation tools log information about installation-related tasks locally on the nodes where installation tasks are performed. The default location for the log files is `/var/sadm/system/logs/hpc`. If installation tasks are initiated from a central host, a summary log file is also created on the central host.

Local, Node-Specific Log Files

Two types of log files are created locally on each cluster node where installation operations take place.

- Task-specific logs – Separate log files are created for each installation-related task. They are:
 - `ct_install.log`
 - `ct_remove.log`
 - `ct_act.log`
 - `ct_deact.log`
 - `ct_startd.log`
 - `ct_stopd.log`

These log files contain detailed logging information for the most recent associated task. Each time a task is repeated, its log file is overwritten.

- History log – A `ct_history.log` file is created to store all installation-related tasks performed on the local node. This provides a convenient record of the Sun HPC ClusterTools 8.2 software installation history on the local node. Each time a new installation task is performed on the node, a new log entry is appended to the history log.

These node specific installation log files are created regardless of the installation method used, local or centralized.

Central Node Summary Log

When installation tasks are initiated from a central host, a summary log file named `ct_summary.log` is created on the central host. This log file records the final summary report that is generated by the CLI. The `ct_summary.log` is not overwritten when a new task is performed. As with the `ct_history.log` file, new entries are appended to the summary log file.

Installing the Linux Packages

This chapter includes the following sections:

- “Supported Linux Versions” on page 23
- “To Unpack the Linux Packages” on page 24
- “To Install the Linux Packages” on page 24
- “To Verify the Linux Installation” on page 25

Supported Linux Versions

Sun HPC ClusterTools 8.2 software supports Red Hat Linux (RHEL) 5 and SuSe Linux (SLES) versions 10. The Linux packages are delivered in RPM and tarball format. Ten ClusterTools 8.2 RPMs are available and built with each of the following compilers:

- Sun Studio
- GNU (GCC)
- Intel
- Pathscale
- PGI compilers

For each compiler-specific RPM, and i386 (32-bit) and x86_64 (64-bit) RPM is available. The file names of the RPMs are as follows, where x is the build number of the most recent build of the software:

- `ClusterTools_gnu-8.2-<x>.i386.rpm`
- `ClusterTools_gnu-8.2-<x>.x86_64.rpm`
- `ClusterTools_intel-8.2-<x>.i386.rpm`
- `ClusterTools_intel-8.2-<x>.x86_64.rpm`

- ClusterTools_sun-8.2-<x>.i386.rpm
- ClusterTools_sun-8.2-<x>.x86_64.rpm
- ClusterTools_pathscale-8.2-<x>.i386.rpm
- ClusterTools_pathscale-8.2-<x>.x86_64.rpm
- ClusterTools_pgi-8.2-<x>.i386.rpm
- ClusterTools_pgi-8.2-<x>.x86_64.rpm

To Unpack the Linux Packages

In this example, the commands install the SuSe Linux version 9 package built with the Sun Studio 12 compiler. Substitute the file name of the Linux version you want to install for `ClusterTools-8.2_compiler-name-x.x86_64.rpm`.

1. Create a scratch directory (called `$SCRATCH_DIR` in this example) on the system on which you are installing the ClusterTools 8.2 software.
2. Type the following commands to unpack the Linux packages, substituting the name of your scratch directory and the name of the Linux package you want to install.

```
# cd SunHPCClusterTools_8.2/  
# cp sun-hpc-ct-8.2-Linux-x86_64.tar.gz $SCRATCH_DIR  
# cd $SCRATCH_DIR  
# gunzip sun-hpc-ct-8.2-Linux-x86_64.tar.gz  
# tar xvf sun-hpc-ct-8.2-Linux-x86_64.tar
```

To Install the Linux Packages

You need to install the RPM packages individually on each Linux node in your cluster. To facilitate the process, you might want to use a parallel SSH tool such as `cconsole`. For more information on `cconsole`, see [“Cluster Console Tools” on page 8](#).

Other parallel SSH tools include the following:

- `Mrxvt`
- `Konsole`
- `omnitty`
- `pssh`

- taktuk
- dish

The following example shows the commands you would type to install the ClusterTools 8.2 package (built with the Sun Studio compiler) for SuSe Linux version 9.

Note – You only need to use the `rpm --erase` command if you already have a previous version of Sun HPC ClusterTools software installed on the system.

```
# cd sun-hpc-ct-8.2-Linux-x86_64/Product/Install_Uilities/bin
# rpm --erase ClusterTools
# rpm --install
ClusterTools-8.2-23.x86_64-sles9-built-with-sun.rpm
```

To Verify the Linux Installation

The Linux packages for the Sun HPC ClusterTools 8.2 software are located in `/opt/clustertools/8.2` (by default). To verify that the software is installed properly, you can try launching a simple non-MPI parallel job using `mpirun`. The following example shows a sample job:

```
% /opt/SUNWhpc/HPC8.2/bin/mpirun hostname
```

where *hostname* is the name of the system on which you installed the Linux package.

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