Installing Platform Product Suite™ for SAS® (Unix)

Version 3.0
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Platform

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Your comments should pertain only to Platform LSF documentation. For product support, contact support@platform.com.

Introduction

This document describes how to install the software required to run the **Platform Product Suite for SAS**™ software ("Product Suite for SAS") with the SAS Management Console® software on UNIX hosts. The Product Suite for SAS software includes the **Process Manager**™ **Server** and **Client**, and the **Platform LSF**® software ("LSF"). Each of these components is required to run jobs using the Product Suite for SAS. A separate document describes how to install **Platform Grid Management Service**™.

The Process Manager Server controls the submission of jobs to LSF, managing any dependencies between the jobs.

LSF dispatches all jobs submitted to it by the Process Manager Server, and returns the status of each jobs to the Process Manager Server. LSF also manages any resource requirements and performs load balancing within the compute cluster.

The Process Manager Client allows you to monitor your workload as it runs.

You can install all of the components on a single host, or you can install the Process Manager Server and LSF on separate hosts. This document describes how to install all components on a single host.

For an overview of the Process Manager components, see the introductory chapter in *Administering Process Manager*.

Assumptions

The following instructions assume that:

◆ You will install LSF and the Process Manager Server and Client on a single UNIX host. This host will act as the central point of control for a cluster of LSF hosts that actually run the jobs.

◆ You are creating an LSF cluster composed of only UNIX hosts. There will be no Windows hosts in your cluster.

Technical Support

Should you encounter problems or have questions regarding the use of LSF and scheduling jobs from SAS Management Console, please contact SAS directly. You can use one of the following methods to contact the SAS Technical Support staff.

1 Online problem/question submission:

   http://support.sas.com/techsup/contact/track_intro.html

   Choose SAS Management Console as the 'Product' value.

2 E-mail problem/question submission via EMITS facility:

   http://support.sas.com/techsup/contact/emits.html

   Choose SAS Management Console as the 'Product' value.

3 Telephone Support Information for North America:

   http://support.sas.com/techsup/contact/telephone_support.html

4   If you are not based in North America, use the links in the following URL for information on how to contact other SAS Technical Support offices around the world:

`http://support.sas.com/techsup/contact/index.html`

While any SAS software user may contact Technical Support, priority is given to designated SAS support personnel at your site. (Note, you can use web-based forms to find out who the SAS support personnel are at your site or re-designate SAS support personnel at your site using links from this URL:

`http://support.sas.com/techsup/contact/index.html`

Supported Systems

SAS Management Console version

SAS 9.1 Service Pack 3 or higher

LSF version and platforms

LSF version 6.0 on the following UNIX platforms:

◆ Sun SPARC systems running Solaris 2.7, 2.8, or 2.9 64-bit

Solaris 2.7 requires a Sun Microsystem patch upgrade. See "Installing Library Patch Upgrade for Solaris 2.7 64-bit Machine" on page 14.

◆ Solaris 2.10 on Sparc, 64-bit
◆ SGI IRIX 6.5.8
◆ Alpha 5 Tru64
◆ HP TRU64 5.1
◆ AIX 5.1, 5.3 64-bit (fileset `xlC.aix50.rte` must be at level 6.0.0.0 or later)
◆ HP-UX 11.11, 11.23 IA-64
◆ HP-UX 11 PA-RISC 64-bit
◆ Linux2.4 glibc2.3 Itanium 64-bit
◆ Linux2.4 glibc2.3 x86 32-bit
◆ Linux2.6 SLES9 and RHEL4 on x86
◆ Linux2.6 SLES9 and RHEL4 on AMD64
◆ Linux2.6 SLES9 and RHEL4 on EM64T

Process Manager Server requirements

It is recommended that you install the Process Manager Server software on a dedicated machine.

The Process Manager Server software must be installed on an LSF server host, but it is recommended that it not be an LSF master host.

The Process Manager Server software runs on the following UNIX operating systems:

◆ SGI IRIX 6.5.8
◆ Alpha 5 Tru64
◆ HP TRU64 5.1
◆ AIX 5.1, 5.3 64-bit (fileset `xlC.aix50.rte` must be at level 6.0.0.0 or later)
◆ HP-UX 11.11, 11.23 IA-64
◆ HP-UX 11 PA-RISC 64-bit
◆ Solaris 2.7, 2.8, 2.9 64-bit
◆ Solaris 2.10 on Sparc, 64-bit
◆ Linux2.4 glibc2.3 Itanium 64-bit
◆ Linux2.4 glibc2.3 x86 32-bit
◆ Linux2.6 SLES9 and RHEL4 on x86
◆ Linux2.6 SLES9 and RHEL4 on AMD64

◆ Linux2.6 SLES9 and RHEL4 on EM64T

J2RE 1.4 (Java Runtime Environment) is installed with the Process Manager Server.

The Process Manager Server requires the following:

◆ Approximately 135 MB free disk space for installation, and an additional 2 KB per job to handle jobs running simultaneously

◆ 256 MB RAM for processing purposes

Installation Directories

The Process Manager and LSF installation produces the following directory structure:

◆ LSF_TOP is the directory in which LSF files are installed. For example:
`/usr/local/lsf`

Generally, LSF_TOP is mounted from a file server and all files associated with LSF (state files, binaries for the different architectures, configuration files) are stored in this file share.

◆ Machine-independent files are independent of the host type, and are shared by all host types (man pages, configuration files, include files, examples, etc.)

◆ Machine-dependent files are installed under LSF_TOP/6.0/*platform_name.*

These directories and the files underneath represent the machine- dependent files. Machine-dependent files are specific to a particular host type and are the LSF command binaries, server daemons, libraries, and utilities.

◆ JS_TOP is the directory in which the Process Manager Server and Client files are installed. For example:
`/usr/local/pm`

Pre-Installation Requirements

❏ License files provided to you by SAS, which license both LSF and the Process Manager Server.

❏ A shared file system for the hosts. The shared file system needs to be writable by root during the installation. See "Determine Hosts on which to Install LSF" on page 9 for details on share management.

❏ The installation must be performed as root. This includes the distribution installation as well as the host setup steps. The root account must be able to write into the file system mounted at LSF_TOP.

❏ During installation, you will be required to provide an LSF primary administrator account. You can use an existing user account, or you can create a new account. The default is lsfadmin.

This account must:

❖ Exist on all hosts in the LSF cluster

❖ Have the same UID (user id) on each host in the cluster

Create a dedicated primary LSF administrator account to allow more than one person to modify the configuration files. Assigning an individual user account as the LSF administrator prevents anyone else from modifying the configuration.

CAUTION **Do not configure the root account as the primary LSF administrator.**

Determine Hosts on which to Install LSF

There are two scenarios for installing LSF. Pick the one that best suits your environment.

Install LSF locally on one host

Install LSF locally on one host and run LSF only on one host. If this is how you plan to install LSF, there is no need to export or mount a file system. LSF can be installed in a local directory such as `/usr/local/lsf`.

Proceed to "Install the Platform Process Manager Software" on page 11.

Install LSF on a file server

The file server that you select to install LSF can be:

◆ A host in the LSF cluster that shares its distribution through NFS

For example, there are two hosts in the cluster, hostA and hostB.

❖ On hostA, the directory `/usr/local/lsf` is shared by exporting.

❖ On hostB, `/usr/local/lsf` is mounted from `hostA:/usr/local/lsf`.

◆ A dedicated server that is not part of the LSF cluster, and is used to store files. This configuration is used for larger clusters of 10 or more hosts, or if you want the added reliability and availability of a dedicated file server.

For instructions on preparing the shares, proceed to "Prepare Shares to Install LSF on a File Server" on page 10.

Prepare Shares to Install LSF on a File Server

Prerequisites for creating shares

Regardless of whether you install on one host and share the distribution or whether you install on a dedicated server, the share must be set up so that root can write to the file system from the client. This is controlled with the root option of the Solaris `share` command, or the `exportfs` command in other UNIX platforms such as HP-UX.

Create and share the LSF directories on the file server

1 Log on to the file server host as `root`.

2 Create the share:

Solaris

a Edit the `/etc/dfs/dfstab` file and add the line:

share -F nfs -o rw,root=client1:client2 -d "LSF share" /export/lsf

b Run the command `shareall`.

Other UNIX platforms:

a Edit the `/etc/exports` file and add the line:

/export/lsf -root=client1:client2

b If the host has not shared a file system before, you may need to start the NFS service using a script in `/etc/init.d`, `/sbin/init.d`.

c Run the command:

exportfs /export/lsf

3 Make sure the NFS service is started and that NFS will start at boot.

On many systems it is possible to share a file system but that will not automatically start NFS.

Mount directories on LSF hosts

Repeat the following steps on each LSF host.

1 Log on as root to an LSF host that will be running LSF jobs.

2 Edit the `/etc/fstab` file (`/etc/vfstab` on Solaris) and add an entry such as:

fileserver:/export/lsf /usr/local/lsf nfs hard,bg,intr 0 0

Refer to your local man pages for `fstab` and `mount` to see the local format. The options '`hard,bg,intr`' are recommended but not mandatory.

3 Make sure the `/usr/local/lsf` directory exists on the host.

4 Mount the directory. Run the command:

mount /usr/local/lsf

Where to go next

Install the Platform Process Manager Software

The following instructions assume you are installing both LSF and Process Manager together on the same UNIX host.

Prepare the license files

Use the license files obtained from SAS and copy the contents into a file where both LSF and Process Manager can access their license information. For example, in a location available to both, create a file called `license.dat`.

Prepare distribution files

The Process Manager distribution files are located on a CD labeled **Platform Product Suite for SAS (for UNIX)** in the root directory.

1 Log in as `root` to one of the hosts that will be running LSF jobs.

2 Mount the **Platform Product Suite for SAS** CD. For example: on `/mnt/cdrom`.

3 If the SAS Software Navigator was used to extract the package, then you have a directory containing the installation files. For example, for AIX, the directory is called `pm3.0_sas_aix5.tar/pm3.0_sas_pinstall`. This directory contains the following:

   ❖ `install.config`—the configuration file where you define your installation prior to installing

   ❖ `jsinstall`—the install script for installing both LSF and the Process Manager Server and Client

   Otherwise, locate the package for your operating system and unpack it. For example, for AIX, you need the following file:

   pm3.0_sas_aix5.tar

   Extract the file as follows:

   # **tar xvf pm3.0_sas_aix5.tar**

   This creates a directory called `pm3.0_sas_pinstall`, containing the following:

   ❖ `install.config`—the configuration file where you define your installation prior to installing

   ❖ `jsinstall`—the install script for installing both LSF and the Process Manager Server and Client

Edit install.config

1   Change to the `pm3.0_sas_pinstall` directory:

   # **cd pm3.0_sas_pinstall**

2   As an **administrator**, edit `install.config` to define your configuration. Remove the comment symbol (#) and set values for the following parameters:

   a   `JS_TOP`

   Specify the full path to the Process Manager directory. For example:

   `JS_TOP=/usr/share/js`

   b   `JS_HOST`

   Specify the fully-qualified host name of the Process Manager Server host. For example:

   `JS_HOST=hostB.platform.com`

   c   `JS_PORT=1966`

   Use the default port number, 1966.

   Ensure that you change this value if another process is already using the port. For example:

   `JS_PORT=1234`

   d   `JS_ADMINS`

   Specify the user name of the primary LSF administrator. For example:

   `JS_ADMINS=lsfadmin`

   e   `JS_LICENSE`

   Specify the full path and name of the license file from SAS. For example:

   `JS_LICENSE=/usr/share/lsf/6.0/cluster1/license.dat`

   f   `JS_MAILHOST`

   Specify the name of the mail server host if you want to receive emails from LSF. The default is *localhostname*. For example:

   `JS_MAILHOST=`[**SMTP**|**Exchange:**]*hostname*

   g   `LSF_INSTALL`

   Specify LSF_INSTALL=true (case sensitive) to install both LSF and Process Manager. (If LSF is already installed, specify LSF_INSTALL=false and specify LSF_ENVDIR.)

   h   `LSF_TOP`

   Specify the full path to the top-level LSF installation directory in the following format:

   LSF_TOP="*/path*"

   where *path* must be shared and accessible to all hosts in the cluster. This cannot be the root directory (/).

   i   `LSF_CLUSTER_NAME`

   Specify a name for the LSF cluster to be created. Specify up to 39 characters, no spaces. Do not use an LSF host name. For example:

   `LSF_CLUSTER_NAME="sas_cluster"`

3   Save `install.config`.

Using 64-bit Hardware in 32-bit Kernel Mode on an AIX5 Platform

If a host has 64-bit hardware but runs in 32-bit kernel mode, you must install and enable the `bos.64bit` fileset.

You must also make modifications to LSF. See "Modifying LSF environment for AIX5" on page 16.

Installing Library Patch Upgrade for Solaris 2.7 64-bit Machine

If you are running Process Manager on a Solaris 2.7 64-bit machine, you need to ensure that you have the latest shared library patch for C++ from Sun Microsystems.

1   Navigate to Sun Microsystem's patch access.
2   Search for patch 106327-23 and download it. (This patch is dependent on 106950-13 or greater.)
3   Unzip files to a temporary directory and apply the patch.

Run the install script

1   As `root`, run the install script as follows:

   # **./jsinstall -f install.config**

   This installs first LSF and then Process Manager. A directory is created for each component. An `Install.log` file is created in each directory. All the events of the installation are logged here.

2   Review the license agreement. When asked if you purchased LSF, respond accordingly.

3   Accept the terms and conditions of the agreement by specifying **y**.

4   When prompted, select the LSF component for the current operating system, and press **Enter**. The software performs a pre-installation check, prior to installing LSF.

5   When prompted, select the Process Manager Server and Client for the current operating system, and press **Enter**. A message tells you when installation is successful.

Set up server hosts with hostsetup

You now need to set up LSF hosts. Repeat the following steps on each LSF host on which jobs will run. Start with the LSF master host.

1   Log on as `root`.

2   Run `hostsetup` and configure the daemons to start automatically at boot. From `/usr/local/lsf/6.0/install`:

   ./hostsetup --top="/usr/local/lsf" --boot="y"

```
-------------------------------------------------------
    L S F    H O S T S E T U P    U T I L I T Y
--------------------------------------------------------

This script sets up local host (LSF server or client)
environment.
Setting up LSF server host "curie" ...

Checking LSF installation for host "hostB" ... Done

LSF service ports are defined in
/usr/local/lsf/conf/lsf.conf.

Checking LSF service ports definition on host "curie" ...
Done

... Setting up LSF server host "hostB" is done

... LSF host setup is done.
```

Where to go next   "Start Up LSF" on page 16

Start Up LSF

Set up the LSF environment (cshrc.lsf and profile.lsf)

Before using LSF, you must set up the LSF execution environment.

After logging on to an LSF host as an administrator, use one of the following shell environment files to set your LSF environment:

◆ For example, in `csh` or `tcsh`:

   source `LSF_TOP`/conf/cshrc.lsf

◆ For example, in `sh`, `ksh`, or `bash`:

   . `LSF_TOP`/conf/profile.lsf

These two files are created by `lsfinstall` to set LSF_ENVDIR and update the PATH environment variables.

Modifying LSF environment for AIX5

If you have a host with 64-bit hardware running in 32-bit kernel mode, you must modify `cshrc.lsf` and `profile.lsf`.

In **cshrc.lsf:**

Change

```
if ( "$_shlap64" != "0" )  then
   set BINARY_TYPE="aix5-64"
else
    set BINARY_TYPE="aix5-32"
endif
```

to

```
if ( "$_shlap64" != "0" )  then
   set BINARY_TYPE="aix5-64"
else
    set BINARY_TYPE="aix5-64"
endif
```

In **profile.lsf:**

Change

```
if [ `ps -e -o "comm" |grep shlap64` ]; then
   BINARY_TYPE="aix5-64"
else
   BINARY_TYPE="aix5-32"
fi
```

to

```
if [ `ps -e -o "comm" |grep shlap64` ]; then
   BINARY_TYPE="aix5-64"
else
   BINARY_TYPE="aix5-64"
fi
```

Start LSF

Use `lsadmin` and `badmin` to start LSF:

1   Log on as `root` to each LSF server host.

    Start with the LSF master host, and repeat these steps on all LSF hosts.

2   Use the following commands to start the LSF cluster:

    `# lsadmin limstartup`

    `# lsadmin resstartup`

    `# badmin hstartup`

Before using any LSF commands, wait a few minutes for all the LIMs to do the following:

◆   Contact each other

◆   Select a master host

◆   Exchange initialization information

Where to go next   "Check LSF Status" on page 18

Check LSF Status

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Example command output

The LSF commands shown in this section show examples of typical output. The output you see will differ according to your local configuration.

The commands are described briefly so that you can easily use them as a "sanity check" for your LSF installation. See the *LSF Reference* for complete usage and command options. You can use these commands on any LSF host. If you get proper output from these commands, your cluster is ready to use. If your output from the commands discussed in this section has errors, see the *LSF Reference* for help.

Check cluster configuration (lsadmin)

lsadmin ckconfig -v
The `lsadmin` command controls the operation of an LSF cluster and administers the LSF daemons, `lim` and `res`. Use the `lsadmin ckconfig` command to check the LSF configuration files. The `-v` flag displays detailed information about the LSF configuration:

```
% lsadmin ckconfig -v

LSF 6.0, Jun 5 2004
Copyright 1992-2004 Platform Computing Corporation
Reading configuration from /usr/local/lsf/conf/lsf.conf
Jun 5 10:54:14 2004 24854 5 6.0 /usr/local/lsf/6.0/sparc-sol2/etc/lim -C

Checking configuration files ...
Jun 5 10:54:14 2004 24854 7 6.0 setMyClusterName: searching cluster files ...
Jun 5 10:54:14 2004 24854 7 6.0 setMyClusterName: local host hostA belongs to cluster
sas_cluster
Jun 5 10:54:14 2004 24854 3 6.0 domanager():
/usr/local/lsf/conf/lsf.cluster.sas_cluster(13): The cluster manager is the invoker
<lsfadmin> in debug mode
Jun 5 10:54:14 2004 24854 7 6.0 initReadLoad: I have 1 CPUs
Jun 5 10:54:14 2004 24854 6 6.0 Checking Done.
---------------------------------------------------------
No errors found.
```

The messages shown are typical of normal output from `lsadmin ckconfig -v`. Other messages may indicate problems with your LSF configuration. See the *LSF Reference* for help with some common configuration errors.

Where to go next
"Find out Cluster Status (lsid and lsload)" on page 19

Find out Cluster Status (lsid and lsload)

lsid   Tells you if your LSF environment is set up properly. `lsid` displays the current LSF version number, cluster name, and host name of the current LSF master host for your cluster.

The LSF master name displayed by `lsid` may vary, but it is usually the first host configured in the `Hosts` section of `LSF_CONFDIR/lsf.cluster.`*cluster_name*.

```
% lsid
LSF 6.0, Jun 5 2004
Copyright 1992-2004 Platform Computing Corporation

My cluster name is sas_cluster
My master name is hostB
Cluster in ISV mode: SAS
```

If you see the message

```
Cannot open lsf.conf file
```

the LSF_ENVDIR environment variable is probably not set correctly. Use `cshrc.lsf` or `profile.lsf` to set up your environment.

lsload   Displays the current load levels of the cluster. The output contains one line for each host in the cluster. The status should be `ok` for all hosts in your cluster. For example:

```
% lsload
HOST_NAME       status   r15s   r1m  r15m   ut     pg  ls     it   tmp   swp   mem
hosta               ok    0.0   0.0   0.0   6%    0.2   2   1365   97M   65M   29M
hostb              -ok    0.0   0.0   0.0   9%    0.0   4      1  130M  319M   12M
hostc               ok    2.5   2.2   1.9  64%   56.7  50      0  929M  931M 4000M
hostd               ok    0.2   0.2   0.2   1%    0.0   0    367   93M   86M   50M
hoste             busy   *6.2   2.2   1.9  64%   56.7  50      0  929M  931M 4000M
hostf          unavail
```

A `busy` status is shown for hosts with any load index beyond its configured thresholds. An asterisk (*) marks load indices that are beyond their thresholds, causing the host status to be `busy`. A minus sign (-) in front of the value `ok` means that RES is not running on that host.

If you see the message

```
LIM is down
```

or

```
LIM is not responding
```

after starting or reconfiguring LSF, wait a few seconds and try `lsload` again to give the LIMs time to initialize.

`lsload` also shows if LSF is licensed for the host. If you see the message

```
Host does not have a software license
```

you must install a valid LSF license or make sure that the license server is running properly.

Other useful commands

◆ The `lshosts` command displays configuration information for LSF hosts and their static resource information.

◆ The `lsinfo` command displays cluster configuration information about resources, host types, and host models.

Check LSF Batch configuration (badmin)

badmin ckconfig -v

The `badmin` command controls and monitors the operation of the LSF Batch system. Use the `badmin ckconfig` command to check the LSF Batch configuration files. The `-v` flag displays detailed information about the configuration:

```
% badmin ckconfig -v

Checking configuration files ...

Jun  5 17:39:57 2004 20246 6 6.0 minit: Trying to call LIM to get cluster name ...
Jun  5 17:39:58 2004 20246 6 6.0 Batch is enabled
Jun  5 17:39:58 2004 20246 6 6.0 Process Manager Server is enabled
Jun  5 17:39:58 2004 20246 6 6.0 autoAdjustInit: Auto-adjustment is disabled
Jun  5 17:39:58 2004 4433 6 6.0 Checking Done
---------------------------------------------------------
No errors found.
```

The messages shown above are the normal output from `badmin ckconfig -v`. Other messages may indicate problems with the Platform LSF Batch configuration. See the *LSF Reference* for help with some common configuration errors.

Find out LSF Batch system status (bhosts and bqueues)

bhosts

The `bhosts` command tells you if LSF Batch is running properly. `bhosts` displays the status of LSF Batch server hosts in the cluster, and other details about the batch hosts:

◆ Maximum number of job slots allowed by a single user

◆ Total number of jobs in the system, jobs running, jobs suspended by users, and jobs suspended by the system

◆ Total number of reserved job slots

The status should be `ok` for all hosts in your cluster. For example:

```
% bhosts
HOST_NAME          STATUS       JL/U     MAX  NJOBS     RUN  SSUSP  USUSP     RSV
hosta              ok            -        -       0       0      0      0       0
hostb              ok            -        -       0       0      0      0       0
hostc              ok            -        -       0       0      0      0       0
hostd              ok            -        -       0       0      0      0       0
```

If you see the message

```
lsbatch daemons not responding
```

after starting or reconfiguring LSF, wait a few seconds and try `bhosts` again to give the SBDs time to initialize.

bqueues   LSF Batch queues organize jobs with different priorities and different scheduling policies. The `bqueues` command displays available queues and their configuration parameters. For a queue to accept and dispatch jobs, the status should be `Open:Active`.

```
% bqueues
QUEUE_NAME      PRIO STATUS           MAX JL/U JL/P JL/H NJOBS  PEND   RUN  SUSP
owners           43  Open:Active        -    6    -    -      0     0     0     0
priority         43  Open:Active        -    -    -    -      0     0     0     0
night            40  Open:Active        -    -    -    -      0     0     0     0
chkpnt_rerun_qu  40  Open:Active        -    -    -    -      0     0     0     0
short            35  Open:Active        -    -    -    -      0     0     0     0
license          33  Open:Active        -    -    -    -      0     0     0     0
normal           30  Open:Active        -    -    -    -      0     0     0     0
idle             20  Open:Active        -    -    -    -      0     0     0     0
```

The queue information displayed by `bqueues` is configured in `lsb.queues`. Eight queues are defined by default in `lsb.queues`. Modify this file to add, delete, or change queues.

bqueues -l   To see more detailed queue information, use `bqueues -l`:

```
% bqueues -l normal

QUEUE: normal
  -- For normal low priority jobs, running only if hosts are lightly loaded.  This is
the default queue.


PARAMETERS/STATISTICS
PRIO NICE STATUS           MAX JL/U JL/P JL/H NJOBS  PEND   RUN SSUSP USUSP  RSV
 30   20  Open:Active        -    -    -    -     8     8     0     0     0    0


 STACKLIMIT MEMLIMIT
   2048 K     5000 K


SCHEDULING PARAMETERS
           r15s   r1m  r15m   ut     pg    io    ls    it    tmp    swp    mem
 loadSched  -     -     -     -      -     -     -     -     -      -      -
 loadStop   -     -     -     -      -     -     -     -     -      -      -


USERS:  all users
HOSTS:  all hosts used by the LSF Batch system
```

`bqueues -l` shows the following kinds of information about the queue:

◆ What kinds of jobs are meant to run on the queue

◆ Resource usage limits

◆ Hosts and users are able to use the queue

◆ Scheduling threshold values:

❖ `loadSched` is the threshold for LSF to dispatch a job automatically

❖ `loadStop` is the threshold for LSF to suspend a job automatically

Other useful commands   ◆ The `bparams` command displays information about the LSF Batch configuration parameters.

◆ The `bhist` command displays historical information about jobs.

For more information

◆ See the *LSF Administrator's Guide* for more information about seeing the status of your cluster.
◆ See the *LSF Reference* for detailed information about the commands described in this section.
◆ See *Administering Process Manager* for detailed information about Process Manager configuration and maintenance.

Where to go next

Start the Process Manager Components

Start the Process Manager Server

1 After the installation is complete, set the Process Manager environment:

❖ On `csh` or `tcsh`:

source *JS_TOP*/conf/cshrc.js

❖ On `sh`, `ksh` or `bash`:

. *JS_TOP*/conf/profile.js

where JS_TOP is the top-level Process Manager installation directory, the value specified in the `install.config` file.

2 Run `jadmin start` to start the Process Manager Server:

jadmin start

3 To start the daemon on the Server host at boot time, run `bootsetup` on the Server host.

Set the client environment

1 Set the Process Manager environment on each client:

❖ On `csh` or `tcsh`:

source *JS_TOP*/conf/cshrc.js

❖ On `sh`, `ksh` or `bash`:

. *JS_TOP*/conf/profile.js

where JS_TOP is the top-level Process Manager installation directory, the value specified in the `install.config` file.

2 After the Process Manager Server has started, run the client applications to verify the success of the installation:

a Run `floweditor`
b Run `caleditor`
c Run `flowmanager`

Both the Calendar Editor and the Flow Manager require a connection to the Server to be able to start. If you are unable to start either application, there is an error in the configuration, or the Server is not started.

Where to go next Install any additional clients required. For instructions, see *Administering Process Manager.*

To install Platform Grid Management Service, see *README for Platform LSF Grid Management Services - Version 6.0 (README.gms).*