

Platform LSF
Version 9 Release 1.2

*Release Notes for IBM Platform
License Scheduler*



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Note

Before using this information and the product it supports, read the information in "Notices" on page 7.

First edition

This edition applies to version 9, release 1, modification 2 of IBM Platform License Scheduler (product number 5725G82) and to all subsequent releases and modifications until otherwise indicated in new editions.

Significant changes or additions to the text and illustrations are indicated by a vertical line (|) to the left of the change.

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Release Notes for IBM Platform License Scheduler

Version: 9.1.2

Release date: December 2013

Last modified: November 18, 2013

Support: www.ibm.com/support

Upgrade and compatibility notes

IBM Platform LSF compatibility

IBM Platform License Scheduler (License Scheduler) 9.1.2 is fully compatible with IBM Platform LSF (LSF) 7.0.6, 8.0, 8.0.1, 8.3, 9.1, 9.1.1, 9.1.1.1, and 9.1.2.

System requirements

Operating system support:

- AIX 6 and AIX 7 on POWER
 - Solaris 10 and 11 on Sparc
 - Linux on x86-64 Kernel 2.6 and 3.0
 - Windows 2003/2008/XP/7 32-bit (client only)
-

Scalability

Functional limits

- 200 projects associated with each feature, 250 features simultaneously
- 1 **blcollect** can pull 400 features from a single license server

Non-functional limits

- 2000 features per license server, 60 license servers, 20 projects per feature
- 2000 features per license server, 1 license server, 200 projects per feature
- 400 features per collector

You can use an alternate executable that wraps the **lmstat** command. These wrappers can do several things including:

- Run **lmstat** with additional switches to isolate output required for License Scheduler management.
 - Run **lmstat** and modify the output format to avoid **blcollect** errors.
 - Run **lmstat** and modify the license count to take some licenses out of the control of License Scheduler.
-

What's changed in License Scheduler Version 9.1.2

License Scheduler Basic Edition

License Scheduler is now available in two editions: Basic Edition and Standard Edition.

License Scheduler Basic Edition is available with LSF and is not intended to apply policies on how licenses are shared between clusters or projects. Rather, License Scheduler Basic Edition is intended to replace an external load information manager (**elim**) to collect external load indicies for licenses managed by FlexNet. To replace this **elim**, License Scheduler Basic Edition limits the license use of jobs of a single cluster to prevent overuse of the licenses and tracks license use of individual jobs by matching license checkouts to these jobs. License Scheduler Basic Edition provides cluster mode features distributed to a single cluster with one service domain per license feature.

License Scheduler Standard Edition provides full functionality for cluster mode, project mode, and fast dispatch project mode features and feature groups for multiple clusters with multiple service domains per license feature, and also provides support for **taskman** jobs.

Important: A License Scheduler entitlement file (`ls.entitlement`) is now required to run License Scheduler Standard Edition. Copy the entitlement file (`ls.entitlement`) to the `$LSF_ENVDIR` directory before starting License Scheduler to run as Standard Edition.

To install and run License Scheduler Basic Edition, download and install the License Scheduler packages as described in the *Installing and starting License Scheduler* section of *Using IBM Platform License Scheduler*, but follow any specific steps for installing and configuring License Scheduler Basic Edition instead of Standard Edition.

License Scheduler Standard Edition is assumed in all License Scheduler documentation unless it is explicitly stated as describing Basic Edition.

Combine multiple FlexNet features into one feature name

The **FLEX_NAME** parameter (in the Feature section of `lsf.licensescheduler`) now accepts a space-delimited list of feature names to combine multiple FlexNet features into one feature name specified under the **NAME** parameter. This allows you to use the same feature name for multiple FlexNet features (that are interchangeable for applications). LSF recognizes the alias of the combined feature (specified in **NAME**) as a feature name instead of the individual FlexNet feature names specified in **FLEX_NAME**. When submitting a job to LSF, users specify the combined feature name in the **bsub** rusage string, which allows the job to use any token from any of the features specified in **FLEX_NAME**.

Configure remote FlexNet license server hosts

If there are remote license servers within a domain, you may now designate at least one remote license server within that domain as a remote agent host. The license collector connects to the remote agent host and calls **lmstat** on the remote agent host and gets license information from all license servers that the remote agent host serves.

The license collector (**blcollect**) is a multi-threaded daemon that queries all FlexNet license servers under License Scheduler for license usage information. The license collector calls **lmutil** (or **lmstat**) to collect information from each license server. When there are both local and remote license servers (that is, license servers that are in a different subnet from the host running **blcollect**), the threads that collect information from the remote license servers are slower than the threads that collect information from local license servers.

The **REMOTE_LMSTAT_PROTOCOL** parameter in the Parameters section of `lsf.licensescheduler` defines the connection command (and command options, if required) to connect to remote servers, while the **REMOTE_LMSTAT_SERVERS** parameter in the ServiceDomain section of `lsf.licensescheduler` specifies the remote agent hosts within a domain.

New and changed configuration parameters

`lsf.licensescheduler`

- Parameters section
 - **REMOTE_LMSTAT_PROTOCOL**: Specifies the method (command and optional command options) that License Scheduler uses to connect to the remote agent host if there are remote license servers that need a remote agent host to collect license information.
`REMOTE_LMSTAT_PROTOCOL=ssh [ssh_command_options] | rsh [rsh_command_options] | lsrsh [lsrun_command_options]`
- ServiceDomain section
 - **REMOTE_LMSTAT_SERVERS**: Defines the remote license servers and, optionally, the remote agent hosts that serve these remote license servers.
`REMOTE_LMSTAT_SERVERS=host_name[(host_name ...)] [host_name[(host_name ...)] ...]`
- Feature section
 - **FLEX_NAME**: You can now specify a space-delimited list of feature names to combine multiple FlexNet features into one feature name specified under the **NAME** parameter. This allows you to use the same feature name for multiple FlexNet features (that are interchangeable for applications).
`FLEX_NAME=feature_name1 [feature_name2 ...]`

Known issues and limitations

Hierarchical group paths require LSF, Version 9.1.1, or later

To use hierarchical project group paths (by defining **PROJECT_GROUP_PATH** in `lsf.licensescheduler`), you need LSF, Version 9.1.1, or later.

`lmstat` is not included with License Scheduler

The `lmstat` (or `lmutil lmstat`) command is no longer included with License Scheduler. This command is included with FlexNet, and is usually in the `/etc/flexlm/bin` directory.

When single job requires more tokens than the allocation buffer

In fast dispatch project mode, you must make sure that you set the **DEMAND_LIMIT** parameter to a value greater than the expected maximum number of license tokens required by any single job.

In cluster mode, you must make sure that you set the allocation buffer for dynamic distribution of licenses greater than the expected maximum number of license tokens required by any single job.

Jobs using more than one feature triggering preemption

In project mode, when a job that uses more than one feature triggers a preemption, an over-preemption may occur. For example, only one job needs to be preempted, but **bld** preempts two or more jobs.

To work around this issue, use fast dispatch project mode instead of project mode.

Released license tokens are reserved again after restart

For dynamic license features with duration specified in rusage, after restarting **bld** or **mbatchd** (with **badmin reconfig**, **badmin mbdrestart** or **bladmin reconfig**), released licenses are reserved again for the specified duration.

Set file descriptor limit large enough

Make sure the operating system file descriptor limit is large enough to support all **taskman** tasks, License Scheduler (**bl***) commands, and connections between License Scheduler and LSF. Use `LS_MAX_TASKMAN_SESSIONS` in `lsf.licensescheduler` to define the maximum number of taskman jobs that can run simultaneously.

blusers -J shows only tokens and features requested by the job

In project mode, **blusers -J** does not display additional tokens checked out by the job or features not originally requested by the job.

Installation

When installing License Scheduler standalone, the installer removes EGO environment variables from `cshrc.lsf` and `profile.lsf`. Specify a different `LSF_TOP` from the LSF installation to install standalone License Scheduler.

Preemption

If the LSF administrator has defined `JOB_CONTROLS` in `lsb.queues` so that job controls (such as the signal `SIGTSTP`) take effect when License Scheduler preemption occurs, `LIC_SCHED_PREEMPT_STOP=Y` in `lsf.conf` must also be defined for License Scheduler preemption to work.

Theoretical limit for license utilization

License Scheduler is often held up as a license utilization optimization engine. Unfortunately application behavior and interaction with a license server can limit the maximum theoretical utilization a business can meet.

Managing licenses has complex interdependencies and behaviors. When a job launches, it does NOT immediately check out a license and hold that license for the duration of the job execution. Applications frequently check out a license after the application is launched and do not keep it until the job terminates. Some applications even do multiple license checkout/in during a single run.

If you are not using the **DURATION** and **DYNAMIC** parameters in License Scheduler, the time an application is running without a license checked out is lost license utilization because LSF/License Scheduler holds the licenses in a **RESERVED** state.

When checking the license server state using `lmstat`, it appears as though there are unallocated keys but no additional jobs being dispatched.

Due to unpredictably and license model complexity, loss of license utilization is a fact of managing licenses using License Scheduler when license checkout time is not identical to application execution time.

feature.servicedomain.dat file grows too big with large scale configuration

If, for example, you configure License Scheduler with 500 features, 100 projects, and 50 service domains, License Scheduler records information into data files every minute, causing potential performance issues.

License Scheduler preempted job not redispached before pending jobs

Fairshare policy is based in part on accumulated in use tokens. Since preempted jobs may already have accumulated in use time, new pending jobs may be dispatched first.

brun job is preempted by License Scheduler and resumed by mbschd

License Scheduler sends a preemption command to the `mbatchd` to preempt a `brun` job. The job is preempted but then runs again. This repeats until the job is done.

Incorrect output for hierarchical fairshare among Project Groups

When License Scheduler hierarchical fairshare is configured, running `blinfo` without the `-G` flag displays incorrect share information. The same error occurs in output from `blparams` and `blinfo -p`.

Same class-C features cannot be merged to the tasks

In project mode, when there is more than one job in the system submitted by the same user and on the same host, License Scheduler distributes them to each job in a round robin fashion giving each job at most one class-C license.

The job suspended unnecessarily on the specific condition involving hierarchical fairshare

This bug only impacts on batch jobs in project mode. Assume `LM_STAT_INTERVAL` is set to a low value (for example, 10) in `lsf.licensescheduler`. The `mbatchd` updates license request every 15 seconds. This combination means that a running job can be preempted in the next scheduling session if there is ownership defined.

Freed licenses are reserved after bladadmin reconfig

After taskman reconnects to `bld` (after running `bladadmin reconfig`), a taskman job start time is the current time not the previous taskman started time. The `bld` reserves token for the duration.

Install License Scheduler 9.1.2

Installing License Scheduler involves the following steps:

1. Get an entitlement file (License Scheduler Standard Edition only).
2. Run the installation program.

Run the License Scheduler installation

See *Using IBM Platform License Scheduler* for installation and configuration steps.

IBM Platform Application Center 9.1.2

IBM Platform Application Center provides a web-based user interface for job submission, job and LSF host monitoring, and reporting. License Scheduler monitoring and reporting is now included in IBM Platform Application Center.

You must install LSF before installing IBM Platform Application Center. See *Installing IBM Platform Application Center* for installation and configuration steps.

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