

IBM Spectrum Computing LSF Support Tool Suite V1.0 User Reference Guide

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Abstract:

IBM Spectrum Computing Support Tool Suite includes 9 different tools to help analyze an LSF Cluster's health.

It includes:

1. LSF Cluster Health Checker
2. LSF Binary Version Checker
3. LSF Work File System Profiler
4. Network System Diagnosis
5. Hostname Resolution Profiler
6. User Name Resolution Profiler
7. LSF lsb.events File Analyzer
8. LSF Daemon Timing Log File Analyzer
9. LSF Cluster Recovery Tool

Download Instructions:

This tool supports LSF Version 7, 8 and 9 on Windows, AIX, Solaris and Linux Platforms.

Download the appropriate package for your LSF cluster from:

<http://www.ibm.com/support/customer/care/sas/f/plcomp/>

Running IBM Spectrum Computing Support Tool Suite:

This tool can be run interactively or directly with command line options. Run `./support_tools` for an interactive session or `./support_tools -h` to see a list of all available command line options.

On Windows hosts:

- i. Navigate to the package's directory.
- ii. Execute `support_tools_32/64.exe` file.

On AIX, Sprac and Linux hosts:

- i. Navigate to the directory of the package.
- ii. Extract the `.tar.gz` extension package.
For example:

```
tar -zxvf support_tools_lsf706_linux2.6_glibc2.3-x86_64.tar.gz
```
- iii. Source your LSF profile.
For example:
For C Shell:

```
source LSF_TOP/conf/cshrc.lsf
```


For Bourne or K Shell:

```
source LSF_TOP/conf/profile.lsf
```
- iv. Execute `support_tools`.
To run it interactively:

```
./support_tools
```


To find out command line options:

```
./support_tools -h
```

1. LSF Cluster Health Checker

You must run LSF cluster health checker as Primary LSF Administrator or root on your LSF master hosts. It checks for the following:

- Operating system environment
- LSF daemon versions and patch levels
- LSF binary owner and permissions
- LSF daemon CPU and memory usage
- LSF master communications and connections
- LSF working directory owner, permissions, available space and performance
- LSF daemon log directory available space and size
- Host name resolution performance
- User name resolution performance

Note: When LSF cluster health checker is run on LSF master as root, it also checks:

- Additional OS resource limits for LSF daemons (e.g. file descriptor limit for MBD)
- Ownership and setuid for "suid root" LSF binaries (e.g. lsadmin, badmin)

Running LSF Cluster Health Checker

LSF cluster health checker supports command line and interactive mode. Running LSF support tools without any options will launch the tool interactively.

Command line mode:

```
./support_tools -C -O <logfile>.

[root@node01 lsfsuptools]# ./support_tools -C -O healthchecker.out
Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Oct 20 2014
Running on host: node01 ..... Mon Oct 27 16:42:05 2014
Checking LSF cluster <lsf_cluster> as <root>
Threshold value used to mark a checking item "OK" or "Not OK"
Average time used to access a file (open/read/close).....50.0 ms
...
```

Interactive mode:

```
[root@node01 lsfsuptools]# ./support_tools
Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Oct 20 2014
Do you agree with license agreement and continue? [y/n]: y
Input a log file name [no log]: healthchecker.out
Please choose one of the following tools:
1) LSF cluster health checker
2) LSF binary version checker
3) LSF work file system profiler
4) Network system diagnosis
5) Host name resolution profiler
6) User name resolution profiler
7) lsb.events file analyzer
8) LSF daemon timing log file analyzer
9) Name look up/ Reverse Name look up
Which one do you want to run? ([1-9]): 1
Checking LSF cluster <LSF_cluster> as <root>
Threshold value used to mark a checking item "OK" or "Not OK"
Average time used to access a file (open/read/close).....50.0 ms
Average time used to access a file (open/read/close).....50.0 ms
Average time used to resolve a host or a user name.....20.0 ms
Number of batch event files.....500
Maximum number of file descriptors for MBD(number of servers + 100).....100
```

```

...
Checking name resolution performance:
nscd daemon.....Running
LSF hostname resolution:
would you like to print the list of each host resolution time [Y/N]: y
Total 1 hosts, resolved 1, failed 0, average 0.0 ms each.....OK
node01 0ms
Username resolution:
Total 714 users, resolved 714, failed 0, average 0.1 ms each.....OK

```

2. LSF Binary Version Checker

LSF Binary Version Checker generates a report of your LSF Cluster's binary type, kernel, glibc version, operating system, CPU architecture and build information.

Running LSF Binary Version Checker

LSF Binary Version Checker supports command line and interactive mode. Running LSF support tools without any parameters will launch the tool interactively.

Command line mode:

```
./support_tools -B <0 for un-shared installation|1 for shared installation > [-O <logfile>]
```

./support_tools -B 1 -O lsfbinver.out

```

Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Oct 20 2014
Running on host: node01 ..... Wed Oct 29 10:34:24 2014
Checking LSF versions:
Binary type: linux2.6-glibc2.3-x86_64
egoconfig version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
egosh version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
egosc version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
lim version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
pim version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
venkd version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
wsgserver version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
melim version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
pem version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK

```

Interactive mode:

Running LSF support tools without any parameters will launch the tool interactively.

./support_tools

```

Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Oct 20 2014
Do you agree with license agreement and continue? [y/n]: y
Input a log file name [no log]: lsfbinver.out
Running on host: node01 ..... Wed Oct 29 10:37:04 2014

```

Please choose one of the following tools:

- 1) LSF cluster health checker
- 2) LSF binary version checker
- 3) LSF work file system profiler
- 4) Network system diagnosis
- 5) Host name resolution profiler
- 6) User name resolution profiler
- 7) lsb.events file analyzer
- 8) LSF daemon timing log file analyzer
- 9) Name look up/ Reverse Name look up

Which one do you want to run? ([1-9]): **2**

Check all binaries version

Is your LSF installed in a shared environment? [y/n]:**y**

Checking LSF versions:

```
Binary type: linux2.6-glibc2.3-x86_64
egoconfig version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
egosh version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
egosc version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
lim version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
pim version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
vemkd version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
wsgserver version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
melim version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
pem version: Spectrum EGO 1.2.10.0 build 238688, Jul 04 2014.....OK
```

3. LSF Work File System Profiler

LSF work directory, `LSF_SHAREDDIR`, stores all running, pending, suspended and finished job information in flat files. If you have too many files under this directory or under `LSF_SHAREDDIR/info/`, depending on your filesystem, you may notice delays when performing I/O operations which in turn may slow down LSF.

This tool profiles your file system's performance, specifically for LSF shared work directory, `LSB_SHAREDDIR`.

Running LSF Work File System Profiler

LSF Work File System Profiler supports command line and interactive mode. Running LSF support tools without any parameters will launch the tool interactively.

Command line mode:

```
./support_tools -F -O lsfwrk.out
```

```
Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Oct 20 2014
Running on host: node01 ..... Tue Oct 20 11:02:01 2014
Profiling performance of LSF working file system </lsf/lsf912/work/lsf912/logdir/info>...
You need to be primary LSF admin to do this, otherwise you will get permission denied
Total 3 job files accessed, average time 1.3 ms each.....OK
```

Interactive mode:

```
./support_tools
```

```
Support Tool Suite 1.0. Linked with LSF 9.1.1.0, May 16 2013
Do you agree with license agreement and continue? [y/n]: y
Input a log file name [no log]: lsfwrk.out
Running on host: node01 ..... Tue Oct 20 11:02:01 2014
```

Please choose one of the following tools:

- 1) LSF cluster health checker
- 2) LSF binary version checker
- 3) LSF work file system profiler
- 4) Network system diagnosis
- 5) Host name resolution profiler
- 6) User name resolution profiler
- 7) lsb.events file analyzer
- 8) LSF daemon timing log file analyzer

Which one do you want to run? ([1-8]): 3

```
Profiling performance of LSF working file system </lsf/lsf912/work/lsf912/logdir/info>...
You need to be primary LSF admin to do this, otherwise you will get permission denied
Total 3 job files accessed, average time 1.3 ms each.....OK
```

4. Network System Diagnosis

Network System Diagnosis tool tests network connectivity between two LSF hosts. The tool can be run interactively or as a batch command. No matter which method you choose, the tool can be run in two different modes: LSF or Standalone.

Note: When Network System Diagnosis runs, start server node before running client node.

4.1 Run interactively

LSF Mode

In LSF mode, the tool runs as a client and tries to connect to your master host's LSF daemons using TCP or UDP protocol. You should perform this test from an execution host.

```
./support_tools
Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Oct 20 2014
Do you agree with license agreement and continue? [y/n]: y
Input a log file name [no log]: no
Running on host: node01 ..... Tue Oct 21 11:15:17 2014

Please choose one of the following tools:
1) LSF cluster health checker
2) LSF binary version checker
3) LSF work file system profiler
4) Network system diagnosis
5) Host name resolution profiler
6) User name resolution profiler
7) lsb.events file analyzer
8) LSF daemon timing log file analyzer
9) Name look up/ Reverse Name look up
Which one do you want to run? ([1-9]): 4
Running network diagnostic program...
Run as LSF mode or stand alone mode? ([L] for LSF; [S] for stand-alone)[L]:
```

1) Enter L for LSF mode

```
Running network diagnostic program...
Run as LSF mode or stand alone mode? ([L] for LSF; [S] for stand-alone)[L]: L
```

2) Enter T to test TCP connectivity or U for UDP. LSF LIM daemon uses both TCP and UDP connections where all other daemons only use TCP connections.

```
TCP or UDP? ([T] for TCP; [U] for UDP)[T]: U
UDP Client connecting to LIM...
```

3) If you entered TCP, you will be prompted to select one of the following LSF daemons LIM, RES, SBD and MBD. If you entered UDP, it will test for LIM daemon's UDP connection.

```
TCP or UDP? ([T] for TCP; [U] for UDP)[T]: T
Ping: ([L] for LIM; [R] for RES; [S] for SBD; [M] for MBD)[L]: L
```

4) Enter the host name that you want to check the connection from.

Example of testing TCP connection for lim deamon in LSF mode:

```
./support_tools -N -O network_system_diag_tcp_lim.log
Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Oct 20 2014
```

```

Running on host: lsf_master ..... Tue Oct 21 11:23:34 2014
Running network diagnostic program...
In LSF mode, the program will run as client...
TCP or UDP? ([T] for TCP; [U] for UDP)[T]: T
Ping: ([L] for LIM; [R] for RES; [S] for SBD; [M] for MBD)[L]: L
Which host you want to ping? [local]: node01
Starting TCP Client on host <node01>, connecting to LIM on <node01> port <900>
tcp_client: got reply from LIM on host <node01> at: Tue Oct 21 11:22:01 2014
tcp_client: with <2334> bytes of configuration data

```

Example of testing UDP connection for lim daemon in LSF mode:

```

./support_tools -N -O network_system_diag_udp_lim.log
Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Oct 20 2014
Running on host: lsf_master ..... Tue Oct 21 11:23:34 2014
Running network diagnostic program...
Run as LSF mode or stand alone mode? ([L] for LSF; [S] for stand-alone)[L]: L
In LSF mode, the program will run as client...
TCP or UDP? ([T] for TCP; [U] for UDP)[T]: U
UDP Client connecting to LIM...
Which host you want to ping? [local]: node01
Starting UDP Client on <node01>, connecting to LIM on <node01> port <900>
udp_client: Got lim reply from host <node01.eng.platformlab.ibm.com>: OK

```

5) Collect the log from your run and send it to IBM Spectrum Support.

Standalone Mode

Standalone mode tests for TCP and UDP network connectivity outside of LSF between two LSF hosts where one acts as a server and the other as a client.

Host where the tool acts as a server	Host where the tool acts as a client
<pre> root->host_A:/tmp>./support_tools Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Oct 20 2014 Do you agree with license agreement and continue? [y/n]: y Input a log file name [no log]: no Running on host: host_B Tue Oct 21 11:15:17 2014 Please choose one of the following tools: 1) LSF cluster health checker 2) LSF binary version checker 3) LSF work file system profiler 4) Network system diagnosis 5) Host name resolution profiler 6) User name resolution profiler 7) lsb.events file analyzer 8) LSF daemon timing log file analyzer 9) Name look up/ Reverse Name look up Which one do you want to run? ([1-9]): 4 Running network diagnostic program... Run as LSF mode or stand alone mode? ([L] for LSF; [S] for stand-alone)[L]: </pre>	<pre> root->host_B:/tmp>./support_tools Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Oct 20 2014 Do you agree with license agreement and continue? [y/n]: y Input a log file name [no log]: no Running on host: host_B... Tue Oct 21 11:15:17 2014 Please choose one of the following tools: 1) LSF cluster health checker 2) LSF binary version checker 3) LSF work file system profiler 4) Network system diagnosis 5) Host name resolution profiler 6) User name resolution profiler 7) lsb.events file analyzer 8) LSF daemon timing log file analyzer 9) Name look up/ Reverse Name look up Which one do you want to run? ([1-9]): 4 Running network diagnostic program... Run as LSF mode or stand alone mode? ([L] for LSF; [S] for stand-alone)[L]: </pre>

1) Enter "S" for Stand alone mode

```
Run as LSF mode or stand alone mode? ([L] for LSF; [S] for stand-alone)[L]: S
```

2) Perform network communication test using client server model. (Simulating LSF's network communication between daemons and clients)

Host where the tool acts as a server	Host where the tool acts as a client
<pre>Run as LSF mode or stand alone mode? ([L] for LSF; [S] for stand-alone)[L]: S Please input data size to transfer in byte[64]: 1024 TCP or UDP? ([T] for TCP; [U] for UDP)[T]: T Run as server or client? ([S] for server; [C] for client)[S]: S Server port: 1234 Starting TCP Server on host <host_A>, server port <1234></pre>	<pre>Run as LSF mode or stand alone mode? ([L] for LSF; [S] for stand-alone)[L]: S Please input data size to transfer in byte[64]: 1024 TCP or UDP? ([T] for TCP; [U] for UDP)[T]: T Run as server or client? ([S] for server; [C] for client)[S]: C Port and server host in form: port@host_B: 1234@host_b Starting TCP Client on host <host_B>, connecting to server on <host_A> port <1234> Connection timeout in second? [no timeout]: Data receiving timeout in second? [no timeout]: Connection timeout(sec.)=no timeout, Data receiving timeout(sec.)=no timeout connected-tcp-client: data (size=1024 bytes) sent to host: host_A(IP=9.21.61.158, Port=1234)</pre>

3Got some help from Sunyi

) Collect the test results and send it to IBM Spectrum Support.

4.2 Command line mode

- The options:

```
./support_tools -N [-p Protocol<TCP|UDP>][-m mode<Standalone|LSF> ] [-t type <Server|Client>][-d Daemon <LIM|RES|SBD|MBD>] [-a <port@ip|port|@ip>] [-w <connection timeout@receive timeout> ][-s <datasize>] [-O <logfile>]
```

- The specification of the time out parameter(-w):

- o TCP client:

- o **Linux:**

```
Connect timeout:
    0: wait forever;
    >0: the seconds to wait
```

```
Receive timeout:
    0: wait forever;
    >0: the seconds to wait
```

- o **Windows:**

Don't use the timeout parameter, and it will be wait forever..

- o UDP client:

- o **Linux:**

```
Receive timeout:
    0: wait forever;
    >0: the seconds to wait.
```

- o **Windows:**

The same as linux.

- o TCP server:

- o **Linux:**

```
Receive timeout:
    0: wait for 0 second.
    >0: the seconds to wait.
```

- o **Windows:**

The same as linux.

- o UDP server:

- o **Linux:**

```
Receive timeout:
    0: wait for 0 second.
    >0: the seconds to wait.
```

- o **Windows:**

The same as linux.

- Examples of command line mode:

- TCP:
 - Server:**
./support_tools -N -p TCP -m Standalone -t Server -a 20001 -w 300@300 -s 64 -O ./test.log
 - Client:**
./support_tools -N -p TCP -m Standalone -t Client -a 20001@intell15 -w 5@0 -s 64 -O ./test.log
- UDP:
 - Server:**
./support_tools -N -p UDP -m Standalone -t Server -a 20001 -s 65 -w 10@10 -O ./test.log
 - Client:**
./support_tools -N -p UDP -m Standalone -t Client -a 20001@intell15 -s 65 -w 10@10 -O ./test.log
- Ping LSF daemons using TCP:
 - ./support_tools -N -p TCP -m LSF -t Client -d LIM -a @intell15 -s 65 -O ./test.log
 - ./support_tools -N -p TCP -m LSF -t Client -d RES -a @intell15 -s 65 -O ./test.log #Not supported yet
 - ./support_tools -N -p TCP -m LSF -t Client -d SBD -a @intell15 -s 65 -O ./test.log
 - ./support_tools -N -p TCP -m LSF -t Client -d MBD -a @intell15 -s 65 -O ./test.log

Host where the tool acts as a server	Host where the tool acts as a client
<pre>./support_tools -N Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Oct 20 2014 Running on host: name1 Tue Oct 21 11:16:14 2014 Running network diagnostic program... Run as LSF mode or stand alone mode? ([L] for LSF; [S] for stand-alone)[L]:</pre>	<pre>./support_tools -N Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Oct 20 2014 Running on host: name1 Tue Oct 21 11:16:14 2014 Running network diagnostic program... Run as LSF mode or stand alone mode? ([L] for LSF; [S] for stand-alone)[L]:</pre>

5. Host Name Resolution Profiler

This tool can check for DNS hostname/IP resolution performance of all LSF server hosts of an LSF cluster, all hosts in a DNS database, or a specific host.

Running Host Name Resolution Profiler

LSF Host Name Resolution Profiler supports command line and interactive modes. Running LSF support tools without any parameters will launch the tool interactively.

Command line Mode:

```
./support_tools -H <0 for all LSF hosts | 1 for all DNS hosts | 2 for individual host>
```

```
./support_tools -H 0 -O hostreso.out
Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Nov 3 2014
Running on host: node01 ..... Sun Nov 9 18:54:53 2014
Profiling all LSF hostname resolution
would you like to print the list of each host resolution time [Y/N]: N
Fail to resolve host: host1, Name or service not known
Fail to resolve host: host2, Name or service not known
Fail to resolve host: host3, Name or service not known
Total 29 hosts, resolved 26, failed 3, average 0.0 ms each.....OK
```

Interactive Mode:

```
./support_tools
Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Nov 3 2014
Do you agree with license agreement and continue? [y/n]: y
Input a log file name [no log]: hostreso.out
Running on host: supp09 ..... Sun Nov 9 18:56:46 2014
```



```

Please choose one of the following tools:
1) LSF cluster health checker
2) LSF binary version checker
3) LSF work file system profiler
4) Network system diagnosis
5) Host name resolution profiler
6) User name resolution profiler
7) lsb.events file analyzer
8) LSF daemon timing log file analyzer
9) Name look up/ Reverse Name look up
Which one do you want to run? ([1-9]): 5
Profiling hostname resolution
Which hosts to profile? ([0] for all LSF hosts; [1] for all DNS hosts; [2] for individual host)[0]: 1
Loaded 8 host names, trying to resolve them...
would you like to print the list of each host resolution time [Y/N]: Y
Fail to resolve host: localhost6.localdomain6, Name or service not known
Total 0 ms used for 8 hosts, 7 resolved, 1 failed, an average of 0.0 ms each, performance: OK
localhost.localdomain 0ms
supp09 0ms
localhost6.localdomain6 0ms
rsrtm802 0ms
rtm-91-rs 0ms
rsrtm91 0ms
rslsfvml 0ms
jazz07.rchland.ibm.com 0ms

```

6. User Name Resolution Profiler

This tool evaluates the performance of all users' name resolution (average resolution time) in NIS database.

Running User Name Resolution Profiler

Command line Mode:

```

./support_tools -U -O log.txt
Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Nov 3 2014
Running on host: node01 ..... Sun Nov 9 19:08:53 2014
Profiling username resolution
Loaded 867 user names, trying to resolve them...
Total 1 ms used for 867 users, 867 resolved, 0 failed, an average of 0.0 ms each, performance: OK

```

Interactive mode:

```

./support_tools
Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Nov 3 2014
Do you agree with license agreement and continue? [y/n]: y
Input a log file name [no log]:
Running on host: node01 ..... Sun Nov 9 19:01:20 2014

Please choose one of the following tools:
1) LSF cluster health checker
2) LSF binary version checker
3) LSF work file system profiler
4) Network system diagnosis
5) Host name resolution profiler
6) User name resolution profiler
7) lsb.events file analyzer
8) LSF daemon timing log file analyzer
9) Name look up/ Reverse Name look up
Which one do you want to run? ([1-9]): 6
Profiling username resolution
Loaded 867 user names, trying to resolve them...
Total 478 ms used for 867 users, 867 resolved, 0 failed, an average of 0.6 ms each, performance: OK

```

7. LSF lsb.events File Analyzer

LSF batch events log file, lsb.events, records LSF batch event history such as job start. This file used for mbatchd daemon restart and failure recovery.

This tool examines an lsb.events file and performs the following:

- Create a statistic report of an lsb.events files's job type, runtimes and current status.
- Create a report with resource requirement and scheduler metrics info.
- Parse event lines to human readable format.
- Finds duplicated events.
- Check for missing event of a job.
- Generate a new clean event file.
- Display specific fields of lsb.events file.
- Export to an Excel file.

Running LSF lsb.events File Analyzer

LSF LSF lsb.events File Analyzer supports command line and interactive modes. Running LSF support tools without any parameters will launch the tool interactively.

Command line mode options:

```
Generate LSF statistic report > ./support_tools -E -c <event_file>
Generate resreq & sched report > ./support_tools -E -l <event_file>
Duplication checking > ./support_tools -E -d <event_file>
Parse events > ./support_tools -E -p <event_file>
Generate a new clean event file> ./support_tools -E -o <new_event_file> <event_file>
display specific event fields > ./support_tools -E -r "record field1 [field2...]" <event_file>
Check missing events > ./support_tools -E -m <event_file>
Exported events to Excel > ./support_tools -E -e <export_file> <event_file>
Stat during specified period > ./support_tools -E [-b begin_time] [-f final_time]
<event_file_directory or event_file> begin time and final time for the events are in format
[[year:]month:]day:]hour:minute
```

Example:

```
./support_tools -E -c /lsf/lsf913/work/solar/logdir/lsb.events
Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Nov 3 2014
Running on host: supp09 ..... Mon Nov 10 18:51:31 2014
<310234> lines read

===== Statistics report for event file =====

===== Statistics about job submission based on JOB_NEW events =====
3      JOB_NEW events read
300000 total submitted (each array element is one job)
3      array jobs (maximum size [100000] average size [100000])
100000 parallel jobs (bsub -n)
100000 rerunnable jobs (bsub -r)
0      interactive jobs (bsub -I)
0      interactive jobs with pty (bsub -Ip or -Is)
0      block mode jobs (bsub -K)
0      dependancy jobs (bsub -w)
0      exclusive jobs (bsub -x)
0      user priority jobs (bsub -sp)
0      job group jobs (bsub -g)
0      with fairshare user group (bsub -G)
300000 with project name defined (bsub -P)
1      different projects
0      file transfer jobs (bsub -f)
0      with begin time (bsub -b)
```

```

0      with termination time (bsub -t)
0      advanced reservation jobs (bsub -U)
0      license scheduler jobs (bsub -Lp)
300000 SLA jobs (bsub -sla)
2      different job submission users
200000 with job-level resreq (bsub -R)
1      different select resreq strings
0      asked hosts jobs (bsub -m)
0      different asked hosts requests
1      estimated number of different resource requirements(buckets)

```

```

===== Statistic based on jobs status events =====
300000 total in core (bjobs -uall -a) [100%]

```

Interactive mode:

```

./support_tools
Support Tool Suite 1.0. Linked with LSF 9.1.3.0, Nov  3 2014
Do you agree with license agreement and continue? [y/n]: y
Input a log file name [no log]:
Running on host: supp09 ..... Mon Nov 10 18:33:57 2014

Please choose one of the following tools:
1) LSF cluster health checker
2) LSF binary version checker
3) LSF work file system profiler
4) Network system diagnosis
5) Host name resolution profiler
6) User name resolution profiler
7) lsb.events file analyzer
8) LSF daemon timing log file analyzer
9) Name look up/ Reverse Name look up
Which one do you want to run? ([1-9]): 7
Please input the absolute path of lsb.events file: /lsf/lsf913/work/solar/logdir/lsb.events
Choose one of the following options:
1) Create a system statistic report
2) Create a report with resource requirement and scheduler metrics info
3) Parse event fields
4) Check duplicated event
5) Check missing event of a job
6) Generate a new clean event file
7) Display specific fields of specific event
8) Export to an Excel file
([1-8]): 1
<310234> lines read

```

```

===== Statistics report for event file =====

```

```

===== Statistics about job submission based on JOB_NEW events =====
3      JOB_NEW events read
300000 total submitted (each array element is one job)
3      array jobs (maximum size [100000] average size [100000])
100000 parallel jobs (bsub -n)
100000 rerunnable jobs (bsub -r)
0      interactive jobs (bsub -I)
0      interactive jobs with pty (bsub -Ip or -Is)
0      block mode jobs (bsub -K)
0      dependancy jobs (bsub -w)
0      exclusive jobs (bsub -x)
0      user priority jobs (bsub -sp)
0      job group jobs (bsub -g)
0      with fairshare user group (bsub -G)
300000 with project name defined (bsub -P)
1      different projects
0      file transfer jobs (bsub -f)
0      with begin time (bsub -b)
0      with termination time (bsub -t)
0      advanced reservation jobs (bsub -U)
0      license scheduler jobs (bsub -Lp)

```

```

300000 SLA jobs (bsub -sla)
2      different job submission users
200000 with job-level resreq (bsub -R)
1      different select resreq strings
0      asked hosts jobs (bsub -m)
0      different asked hosts requests
1      estimated number of different resource requirements(buckets)

```

8. LSF Daemon Timing Log File Analyzer

This tool analyzes an LSF cluster's daemon timing log files and generates a timing report of LSF function calls; the report lists each function call's average, minimum and maximum time taken. It runs standalone outside of LSF.

Running LSF Deamon Timing Log File Analyzer

To run this analyzer you need to first configure LSF to turn on daemon timing debug.

1) Turn on LSF timing debug.

Set the corresponding parameter in your LSF `lsf.conf` configuration file (`timing_level` is a positive integer value, valid values are 1|2|3|4|5).

```

LSB_TIME_MBD=timing_level
LSB_TIME_SBD=timing_level
LSF_TIME_LIM=timing_level
LSF_TIME_RES=timing_level

```

Reconfigure LSF

```

lsadmin reconfig
badmin reconfig

```

2) Run timing log file analyzer

Timing data is automatically appended to your LSF deamon log (MBD, SBD, LIM, RES). They are stored under `LSF_LOGDIR` (defined in `lsf.conf`) and the default location is `<LSF_TOP>/log/`.

LSF daemon timing logfile analyzer usage:

Total Summary

```
./support_tools -A [-p <pid>] -l <time_log_file>
```

Total Summary (include children)

```
./support_tools -A -c -l <time_log_file>
```

Data for Subroutine

```
./support_tools -A [-s <function_name>] -l <time_log_file>
```

Plot Subroutine

```
./support_tools -A [-P ][-s <function_name>] -l <time_log_file>
```

9. LSF Cluster Recovery Tool

Sometimes, LSF master batch daemon (mbatchd) hung or kept dying when processing certain job events in `lsb.events` file. It usually requires removing those problematic jobs from the `lsb.events` file so that LSF master can be restarted normally. This tool is to search the very big `lsb.events` file, remove the problematic jobs by the given job ids, and then get the client production recovered quickly with minimal impact to business. Without the tool, it would take a lot of effort and time to do so manually.

In production environment down situation, it is strongly recommended that you work with IBM Support Representative to identify the problematic jobs and use this tool to remove them.

The tool removes jobs specified by the `jobId` list from `lsb.events` file and generates a new events file, so that `mbatchd` can start from this new events file to recover quickly. You must run the tool as primary LSF Administrator or root on your LSF master hosts. Currently, it only supports Linux platform

Run LSF Cluster Recovery Tool

Currently, LSF Cluster Recovery Tool only supports command line mode.

1. Shutdown `sbatchd` and `mbatchd` on master host.
2. Run LSF Cluster Recovery tool to remove the problematic jobs from `lsb.events` file.
Make sure the `remove_events.sh` always locates in the same directory as `support_tools` binary
There are two methods to input the `jobId`.

1> Input job id list in command line, use space as separator:

```
./support_tools -R <jobId1 jobId2 .....jobIdn>
```

2> Input `jobId` list in a file:

```
./support_tools -R -f <jobId File>
```

Put each `jobId` in a separate line in the file:

```
jobId1  
jobId2  
.....  
jobIdn
```

A new `lsb.events.new` will be generated by the tool.

Run the following commands:

```
~>mv lsb.events lsb.events.orig #save the original lsb.events file
```

```
~>mv lsb.events.new lsb.events #make sure the owner and permission are the same as the original lsb.events file
```

Run "`diff lsb.events lsb.events.new`" to review and confirm the difference.

3. Start up `sbatchd` on the master, `sbatchd` will start up `mbatchd`. Check the cluster that the jobs should be removed.