

Moab

Is Moab Multithreaded?

```
[root@vbox-head-centos6 ~]# showconfig -v|grep THREAD
THREADPOOLSIZE      8
```

I commonly use `ps` to see how many threads (or linux lightweight processes) are in use, e.g.

```
ps -elmT
```

F	S	UID	PID	SPID	PPID	C	PRI	NI	ADDR	SZ	WCHAN	TTY	TIME	CMD
...														
1	-	0	8222	-	1	2	-	-	231521	-	?		06:23:22	moab
1	S	0	-	8222	-	0	80	0	-	-	poll_s	-	01:14:49	-
1	S	0	-	8223	-	0	80	0	-	-	futex_	-	00:00:07	-
1	S	0	-	8224	-	0	80	0	-	-	futex_	-	00:00:07	-
1	S	0	-	8225	-	0	80	0	-	-	futex_	-	00:00:07	-
1	S	0	-	8226	-	0	80	0	-	-	futex_	-	00:00:07	-
1	S	0	-	8227	-	0	80	0	-	-	futex_	-	00:00:07	-
1	S	0	-	8228	-	0	80	0	-	-	futex_	-	00:00:07	-
1	S	0	-	8229	-	0	80	0	-	-	futex_	-	00:00:07	-
1	S	0	-	8230	-	0	80	0	-	-	futex_	-	00:00:07	-
1	S	0	-	8231	-	0	80	0	-	-	futex_	-	00:00:37	-
1	S	0	-	8232	-	0	80	0	-	-	poll_s	-	01:37:43	-
1	S	0	-	8233	-	1	80	0	-	-	poll_s	-	03:29:11	-
...														

You can also `gdb` the moab process and look at the thread list:

```
[root@vbox-head-centos6 ~]# gdb `which moab` `pgrep moab`
(gdb) info thread
 12 Thread 0x2aaaad5e4700 (LWP 8223) 0x00002aaaaacd968c in
pthread_cond_wait@@GLIBC_2.3.2 () from /lib64/libpthread.so.0
 11 Thread 0x2aaaad7e5700 (LWP 8224) 0x00002aaaaacd968c in
pthread_cond_wait@@GLIBC_2.3.2 () from /lib64/libpthread.so.0
 10 Thread 0x2aaaad9e6700 (LWP 8225) 0x00002aaaaacd968c in
pthread_cond_wait@@GLIBC_2.3.2 () from /lib64/libpthread.so.0
  9 Thread 0x2aaaadbe7700 (LWP 8226) 0x00002aaaaacd968c in
pthread_cond_wait@@GLIBC_2.3.2 () from /lib64/libpthread.so.0
  8 Thread 0x2aaaadde8700 (LWP 8227) 0x00002aaaaacd968c in
pthread_cond_wait@@GLIBC_2.3.2 () from /lib64/libpthread.so.0
  7 Thread 0x2aaaadfe9700 (LWP 8228) 0x00002aaaaacd968c in
pthread_cond_wait@@GLIBC_2.3.2 () from /lib64/libpthread.so.0
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```
6 Thread 0x2aaaae1ea700 (LWP 8229) 0x00002aaaaacd968c in
pthread_cond_wait@@GLIBC_2.3.2 () from /lib64/libpthread.so.0
5 Thread 0x2aaaae3eb700 (LWP 8230) 0x00002aaaaacd968c in
pthread_cond_wait@@GLIBC_2.3.2 () from /lib64/libpthread.so.0
4 Thread 0x2aaaae5ec700 (LWP 8231) 0x00002aaaaacd9a5e in
pthread_cond_timedwait@@GLIBC_2.3.2 () from /lib64/libpthread.so.0
3 Thread 0x2aaaae7ed700 (LWP 8232) 0x00002aaaabbc7623 in select ()
from /lib64/libc.so.6
2 Thread 0x2aaaae9ee700 (LWP 8233) 0x00002aaaabbc7623 in select ()
from /lib64/libc.so.6
* 1 Thread 0x2aaaac0921a0 (LWP 8222) 0x00002aaaabbc7623 in select ()
from /lib64/libc.so.6
(gdb)
```

You can get a backtrace of each of them by running the command: thread apply all bt

When I do this, I can see there are 8 request handlers, a LazyWriteWatchDog, a communication thread, a cache thread, and the main scheduling thread.

(gdb) thread apply all bt

```
Thread 12 (Thread 0x2aaaad5e4700 (LWP 8223)):
#0 0x00002aaaaacd968c in pthread_cond_wait@@GLIBC_2.3.2 ()
from /lib64/libpthread.so.0
#1 0x000000000063fc4b in MTPGetRequest (ThreadPool=0x37026f0) at MTP.c:139
#2 0x000000000063fcf8 in MTPHandleRequestsLoop (Data=0x37026f0) at
MTP.c:216
#3 0x00002aaaaacd5aa1 in start_thread () from /lib64/libpthread.so.0
#4 0x00002aaaabbcebcd in clone () from /lib64/libc.so.6
```

```
Thread 11 (Thread 0x2aaaad7e5700 (LWP 8224)):
#0 0x00002aaaaacd968c in pthread_cond_wait@@GLIBC_2.3.2 ()
from /lib64/libpthread.so.0
#1 0x000000000063fc4b in MTPGetRequest (ThreadPool=0x37026f0) at MTP.c:139
#2 0x000000000063fcf8 in MTPHandleRequestsLoop (Data=0x3702728) at
MTP.c:216
#3 0x00002aaaaacd5aa1 in start_thread () from /lib64/libpthread.so.0
#4 0x00002aaaabbcebcd in clone () from /lib64/libc.so.6
```

```
Thread 10 (Thread 0x2aaaad9e6700 (LWP 8225)):
#0 0x00002aaaaacd968c in pthread_cond_wait@@GLIBC_2.3.2 ()
from /lib64/libpthread.so.0
#1 0x000000000063fc4b in MTPGetRequest (ThreadPool=0x37026f0) at MTP.c:139
#2 0x000000000063fcf8 in MTPHandleRequestsLoop (Data=0x3702760) at
MTP.c:216
#3 0x00002aaaaacd5aa1 in start_thread () from /lib64/libpthread.so.0
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---Type <return> to continue, or q <return> to quit---

#4 0x00002aaaabbcebcd in clone () from /lib64/libc.so.6

Thread 9 (Thread 0x2aaaadbe7700 (LWP 8226)):

#0 0x00002aaaaacd968c in pthread_cond_wait@@GLIBC_2.3.2 ()

from /lib64/libpthread.so.0

#1 0x000000000063fc4b in MTPGetRequest (ThreadPool=0x37026f0) at MTP.c:139

#2 0x000000000063fcf8 in MTPHandleRequestsLoop (Data=0x3702798) at MTP.c:216

#3 0x00002aaaaacd5aa1 in start_thread () from /lib64/libpthread.so.0

#4 0x00002aaaabbcebcd in clone () from /lib64/libc.so.6

Thread 8 (Thread 0x2aaaadde8700 (LWP 8227)):

#0 0x00002aaaaacd968c in pthread_cond_wait@@GLIBC_2.3.2 ()

from /lib64/libpthread.so.0

#1 0x000000000063fc4b in MTPGetRequest (ThreadPool=0x37026f0) at MTP.c:139

#2 0x000000000063fcf8 in MTPHandleRequestsLoop (Data=0x37027d0) at MTP.c:216

#3 0x00002aaaaacd5aa1 in start_thread () from /lib64/libpthread.so.0

#4 0x00002aaaabbcebcd in clone () from /lib64/libc.so.6

Thread 7 (Thread 0x2aaaadfe9700 (LWP 8228)):

#0 0x00002aaaaacd968c in pthread_cond_wait@@GLIBC_2.3.2 ()

from /lib64/libpthread.so.0

#1 0x000000000063fc4b in MTPGetRequest (ThreadPool=0x37026f0) at MTP.c:139

#2 0x000000000063fcf8 in MTPHandleRequestsLoop (Data=0x3702808) at MTP.c:216

---Type <return> to continue, or q <return> to quit---

#3 0x00002aaaaacd5aa1 in start_thread () from /lib64/libpthread.so.0

#4 0x00002aaaabbcebcd in clone () from /lib64/libc.so.6

Thread 6 (Thread 0x2aaaae1ea700 (LWP 8229)):

#0 0x00002aaaaacd968c in pthread_cond_wait@@GLIBC_2.3.2 ()

from /lib64/libpthread.so.0

#1 0x000000000063fc4b in MTPGetRequest (ThreadPool=0x37026f0) at MTP.c:139

#2 0x000000000063fcf8 in MTPHandleRequestsLoop (Data=0x3702840) at MTP.c:216

#3 0x00002aaaaacd5aa1 in start_thread () from /lib64/libpthread.so.0

#4 0x00002aaaabbcebcd in clone () from /lib64/libc.so.6

Thread 5 (Thread 0x2aaaae3eb700 (LWP 8230)):

#0 0x00002aaaaacd968c in pthread_cond_wait@@GLIBC_2.3.2 ()

from /lib64/libpthread.so.0

#1 0x000000000063fc4b in MTPGetRequest (ThreadPool=0x37026f0) at MTP.c:139

#2 0x000000000063fcf8 in MTPHandleRequestsLoop (Data=0x3702878) at MTP.c:216

#3 0x00002aaaaacd5aa1 in start_thread () from /lib64/libpthread.so.0

#4 0x00002aaaabbcebcd in clone () from /lib64/libc.so.6

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Thread 4 (Thread 0x2aaaae5ec700 (LWP 8231)):

```
#0 0x00002aaaaacd9a5e in pthread_cond_timedwait@@GLIBC_2.3.2 ()
   from /lib64/libpthread.so.0
#1 0x00000000004eea5e in MLogQueue::FlushQueueToDisk (this=0x28f60b0)
---Type <return> to continue, or q <return> to quit---
   at MLogQueue.c:196
#2 0x00000000004eea9f in LazyWriteWatchdog (LogQueue=0x28f60b0)
   at MLogQueue.c:40
#3 0x00002aaaaacd5aa1 in start_thread () from /lib64/libpthread.so.0
#4 0x00002aaaabbcebcd in clone () from /lib64/libc.so.6
```

Thread 3 (Thread 0x2aaaae7ed700 (LWP 8232)):

```
#0 0x00002aaaabbcb7623 in select () from /lib64/libc.so.6
#1 0x00000000000638daf in MUSleep (SleepDuration=Unhandled dwarf expression
opcode 0xf3
) at MTime.c:2101
#2 0x0000000000081e3b4 in MSysCommThread () at MSysCommThread.c:790
#3 0x00002aaaaacd5aa1 in start_thread () from /lib64/libpthread.so.0
#4 0x00002aaaabbcebcd in clone () from /lib64/libc.so.6
```

Thread 2 (Thread 0x2aaaae9ee700 (LWP 8233)):

```
#0 0x00002aaaabbcb7623 in select () from /lib64/libc.so.6
#1 0x00000000000638daf in MUSleep (SleepDuration=Unhandled dwarf expression
opcode 0xf3
) at MTime.c:2101
#2 0x00000000000631031 in MOCacheThread () at MSysObject.c:483
#3 0x00002aaaaacd5aa1 in start_thread () from /lib64/libpthread.so.0
#4 0x00002aaaabbcebcd in clone () from /lib64/libc.so.6
```

Thread 1 (Thread 0x2aaaac0921a0 (LWP 8222)):

```
#0 0x00002aaaabbcb7623 in select () from /lib64/libc.so.6
#1 0x00000000000638daf in MUSleep (SleepDuration=Unhandled dwarf expression
opcode 0xf3
) at MTime.c:2101
---Type <return> to continue, or q <return> to quit---
#2 0x0000000000066f387 in MUIAcceptRequests (SS=Unhandled dwarf expression
opcode 0xf3
) at MUIAcceptRequest.c:501
#3 0x0000000000062f06d in MSysMainLoop () at MSysMainLoop.c:1448
#4 0x00000000000410484 in main (ArgC=1, ArgV=0x7ffffffe658,
   EnvP=0x7ffffffe668) at MServer.c:289
(gdb)
```

You can also detect thread (LWP) ids in the log.

Unique solution ID: #1207

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