
Subject: [PATCH 1/8] Scaling msgmni to the amount of lowmem

Posted by [Nadia Derby](#) on Mon, 11 Feb 2008 14:16:47 GMT

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[PATCH 01/08]

This patch computes msg_ctlmni to make it scale with the amount of lowmem. msg_ctlmni is now set to make the message queues occupy 1/32 of the available lowmem.

Some cleaning has also been done for the MSGPOOL constant: the msgctl man page says it's not used, but it also defines it as a size in bytes (the code expresses it in Kbytes).

Signed-off-by: Nadia Derby <Nadia.Derbey@bull.net>

```
include/linux/msg.h | 14 ++++++++--
ipc/msg.c           | 37 ++++++++-----
2 files changed, 48 insertions(+), 3 deletions(-)
```

Index: linux-2.6.24-mm1/include/linux/msg.h

```
=====
--- linux-2.6.24-mm1.orig/include/linux/msg.h 2008-02-07 15:01:38.000000000 +0100
+++ linux-2.6.24-mm1/include/linux/msg.h 2008-02-07 15:23:17.000000000 +0100
@@ -49,16 +49,26 @@ struct msginfo {
    unsigned short msgseg;
};

+/*
+ * Scaling factor to compute msgmni:
+ * the memory dedicated to msg queues (msgmni * msgmnb) should occupy
+ * at most 1/MSG_MEM_SCALE of the lowmem (see the formula in ipc/msg.c):
+ * up to 8MB      : msgmni = 16 (MSGMNI)
+ * 4 GB          : msgmni = 8K
+ * more than 16 GB : msgmni = 32K (IPCMNI)
+ */
+#define MSG_MEM_SCALE 32
+
+#define MSGMNI 16 /* <= IPCMNI */ /* max # of msg queue identifiers */
+#define MSGMAX 8192 /* <= INT_MAX */ /* max size of message (bytes) */
+#define MSGMNB 16384 /* <= INT_MAX */ /* default max size of a message queue */

/* unused */
-#define MSGPOOL (MSGMNI*MSGMNB/1024) /* size in kilobytes of message pool */
+#define MSGPOOL (MSGMNI * MSGMNB) /* size in bytes of message pool */
#define MSGTQL MSGMNB /* number of system message headers */
#define MSGMAP MSGMNB /* number of entries in message map */
```

```

#define MSGSSZ 16          /* message segment size */
-#define __MSGSEG ((MSGPOOL*1024)/ MSGSSZ) /* max no. of segments */
+#define __MSGSEG (MSGPOOL / MSGSSZ) /* max no. of segments */
#define MSGSEG (__MSGSEG <= 0xffff ? __MSGSEG : 0xffff)

#ifdef __KERNEL__
Index: linux-2.6.24-mm1/ipc/msg.c
=====
--- linux-2.6.24-mm1.orig/ipc/msg.c 2008-02-07 15:02:29.000000000 +0100
+++ linux-2.6.24-mm1/ipc/msg.c 2008-02-07 15:24:19.000000000 +0100
@@ -27,6 +27,7 @@
#include <linux/msg.h>
#include <linux/spinlock.h>
#include <linux/init.h>
+#include <linux/mm.h>
#include <linux/proc_fs.h>
#include <linux/list.h>
#include <linux/security.h>
@@ -78,11 +79,45 @@ static int newq(struct ipc_namespace *
static int sysvipc_msg_proc_show(struct seq_file *s, void *it);
#endif

+/*
+ * Scale msgmni with the available lowmem size: the memory dedicated to msg
+ * queues should occupy at most 1/MSG_MEM_SCALE of lowmem.
+ * This should be done staying within the (MSGMNI , IPCMNI) range.
+ */
+static void recompute_msgmni(struct ipc_namespace *ns)
+{
+ struct sysinfo i;
+ unsigned long allowed;
+
+ si_meminfo(&i);
+ allowed = (((i.totalram - i.totalhigh) / MSG_MEM_SCALE) * i.mem_unit)
+ / MSGMNB;
+
+ if (allowed < MSGMNI) {
+ ns->msg_ctlmni = MSGMNI;
+ goto out_callback;
+ }
+
+ if (allowed > IPCMNI) {
+ ns->msg_ctlmni = IPCMNI;
+ goto out_callback;
+ }
+
+ ns->msg_ctlmni = allowed;
+
+

```

```

+out_callback:
+
+ printk(KERN_INFO "msgmni has been set to %d for ipc namespace %p\n",
+ ns->msg_ctlmni, ns);
+}
+
void msg_init_ns(struct ipc_namespace *ns)
{
    ns->msg_ctlmax = MSGMAX;
    ns->msg_ctlmnb = MSGMNB;
- ns->msg_ctlmni = MSGMNI;
+
+ recompute_msgmni(ns);
+
    atomic_set(&ns->msg_bytes, 0);
    atomic_set(&ns->msg_hdrs, 0);
    ipc_init_ids(&ns->ids[IPC_MSG_IDS]);

--

```

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