Subject: Re: [PATCH 2.6.24-rc3-mm1] IPC: make struct ipc_ids static in ipc_namespace
Posted by Pavel Emelianov on Fri, 23 Nov 2007 11:06:49 GMT
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Pierre Peiffer wrote:
> Ok, I have the patch ready, but before sending it, I worry about the size of
> struct ipc_namespace if we mark struct ipc_ids as ___cacheline_aligned....
>
> Of course, you we fall into a classical match: performance vs memory size.
>
> As I don't think that I have the knowledge to decide what we must focus on, here
> after is, for info, the size reported by pahole (on x86, Intel Xeon)
>
> With the patch sent at the beginning of this thread we have:
>
> struct ipc_namespace {
> struct kref kref; /* 0 4 */
> struct ipc_ids ids[3]; /* 4 156 */
> /* --- cacheline 2 boundary (128 bytes) was 32 bytes ago --- */
> int sem_ctls[4]; /* 160 16 */
> int used_sems; /* 176 4 */
> int msg_ctlmax; /* 180 4 */
> int msg_ctlmnb; /* 184 4 */
> int msg_ctlmni; /* 188 4 */
> /* --- cacheline 3 boundary (192 bytes) --- */
> atomic_t msg_bytes; /* 192 4 */
> atomic_t msg_hdrs; /* 196 4 */

cacheline boundary is to be here as well... But anyway, please, see my
last comment :)

> size_t shm_ctlmax; /* 200 4 */
> size_t shm_ctlall; /* 204 4 */
> int shm_ctlmni; /* 208 4 */
> int shm_tot; /* 212 4 */
>
> /* size: 216, cachelines: 4 */
> /* last cacheline: 24 bytes */
> }; /* definitions: 1 */
>
> With the new patch, if we mark the struct ipc_ids as ____cacheline_aligned, we
> have (I put kref at the end, to save one more cacheline):
>
> struct ipc_namespace {
> struct ipc_ids sem_ids; /* 0 64 */
>
> /* XXX last struct has 12 bytes of padding */

```
>
>       /* --- cacheline 1 boundary (64 bytes) --- */
>       int                     sem_ctls[4];          /*    64    16 */
>       int                     used_sems;            /*    80     4 */
>
>       /* XXX 44 bytes hole, try to pack */
>
>       /* --- cacheline 2 boundary (128 bytes) --- */
>       struct ipc_ids          msg_ids;              /*   128    64 */
>
>       /* XXX last struct has 12 bytes of padding */
>
>       /* --- cacheline 3 boundary (192 bytes) --- */
>       int                     msg_ctlmax;           /*   192     4 */
>       int                     msg_ctlmnb;           /*   196     4 */
>       int                     msg_ctlmni;           /*   200     4 */
>       atomic_t                msg_bytes;            /*   204     4 */
>       atomic_t                msg_hdrs;             /*   208     4 */
>
>       /* XXX 44 bytes hole, try to pack */
>
>       /* --- cacheline 4 boundary (256 bytes) --- */
>       struct ipc_ids          shm_ids;              /*   256    64 */
>
>       /* XXX last struct has 12 bytes of padding */
>
>       /* --- cacheline 5 boundary (320 bytes) --- */
>       size_t                  shm_ctlmax;           /*   320     4 */
>       size_t                  shm_ctlall;           /*   324     4 */
>       int                     shm_ctlmni;           /*   328     4 */
>       int                     shm_tot;              /*   332     4 */
>       struct kref             kref;                 /*   336     4 */
>
>       /* size: 384, cachelines: 6 */
>       /* sum members: 252, holes: 2, sum holes: 88 */
>       /* padding: 44 */
>       /* paddings: 3, sum paddings: 36 */
> };    /* definitions: 1 */
>
> We can put all sysctl related values together, in one cacheline and keep ipc_ids
> cacheline aligned ? But I really wonder about the performance gain here...
```

Well I think you're right. The structure gains 50% in size... Really too much to fight for performance in IPC :)

Thanks for checking this thing.

You may put my Acked-by in the original patch.

Thanks,
Pavel

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