Subject: Re: [RFC] [PATCH 0/3] Add group fairness to CFS
Posted by Ingo Molnar on Wed, 23 May 2007 18:32:52 GMT
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* Srivatsa Vaddagiri <vatsa@in.ibm.com> wrote:

> Here's an attempt to extend CFS (v13) to be fair at a group level,
> rather than just at task level. The patch is in a very premature state
> (passes simple tests, smp load balance not supported yet) at this
> point. I am sending it out early to know if this is a good direction
> to proceed.

cool patch! :-)

> Salient points which needs discussion:
>
> 1. This patch reuses CFS core to achieve fairness at group level also.
>
>  To make this possible, CFS core has been abstracted to deal with
>  generic schedulable "entities" (tasks, users etc).

yeah, i like this alot.

The "struct sched_entity" abstraction looks very clean, and that's the main thing that matters: it allows for a design that will only cost us performance if group scheduling is desired.

If you could do a -v14 port and at least add minimal SMP support: i.e. it shouldnt crash on SMP, but otherwise no extra load-balancing logic is needed for the first cut - then i could try to pick all these core changes up for -v15. (I'll let you know about any other thoughts/details when i do the integration.)

> 2. The per-cpu rb-tree has been split to be per-group per-cpu.
>
>  schedule() now becomes two step on every cpu : pick a group first
>  (from group rb-tree) and a task within that group next (from that
>  group's task rb-tree)

yeah. It might even become more steps if someone wants to have a different, deeper hierarchy (at the price of performance). Containers will for example certainly want to use one more level.

> 3. Grouping mechanism - I have used 'uid' as the basis of grouping for
>  timebeing (since that grouping concept is already in mainline
>  today). The patch can be adapted to a more generic process grouping
>  mechanism (like http://lkml.org/lkml/2007/4/27/146) later.

yeah, agreed.

> Some results below, obtained on a 4way (with HT) Intel Xeon box. All
> number are reflective of single CPU performance (tests were forced to
> run on single cpu since load balance is not yet supported).
>
>
>            uid "vatsa"           uid "guest"
>              (make -s -j4 bzImage)    (make -s -j20 bzImage)
>
> 2.6.22-rc1           772.02 sec  497.42 sec (real)
> 2.6.22-rc1+cfs-v13           780.62 sec  478.35 sec (real)
> 2.6.22-rc1+cfs-v13+this patch     776.36 sec  776.68 sec (real)
>
> [ An exclusive cpuset containing only one CPU was created and the
> compilation jobs of both users were run simultaneously in this cpuset
> ]

looks really promising!

> I also disabled CONFIG_FAIR_USER_SCHED and compared the results with
> cfs-v13:
>
>      uid "vatsa"
>      make -s -j4 bzImage
>
> 2.6.22-rc1+cfs-v13   395.57 sec (real)
> 2.6.22-rc1+cfs-v13+this_patch  388.54 sec (real)
>
> There is no regression I can see (rather some improvement, which I
> can't understand atm). I will run more tests later to check this
> regression aspect.

kernel builds dont really push scheduling micro-costs, rather try
something like 'hackbench.c' to measure that. (kernel builds are of
course one of our primary benchmarks.)

> Request your comments on the future direction to proceed!

full steam ahead please! =B-)

 Ingo

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Containers mailing list
Containers@lists.linux-foundation.org
https://lists.linux-foundation.org/mailman/listinfo/containers

Subject: Re: [RFC] [PATCH 0/3] Add group fairness to CFS
Posted by Srivatsa Vaddagiri on Fri, 25 May 2007 07:59:36 GMT
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On Wed, May 23, 2007 at 08:32:52PM +0200, Ingo Molnar wrote:
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> > to proceed.
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> cool patch! :-)

Thanks!

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> performance if group scheduling is desired.
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> it shouldnt crash on SMP, but otherwise no extra load-balancing logic is
> needed for the first cut - then i could try to pick all these core
> changes up for -v15. (I'll let you know about any other thoughts/details
> when i do the integration.)

Sure ..I will work on a -v14 port. I would like to target for something which:

1. doesn't break performance/functionality of existing CFS scheduler
  -if- CONFIG_FAIR_USER_SCHEDULER is disabled. This also means load
  balance should work as it works today when the config option is
  disabled.

  Do you recommend a set of tests that I need to run to ensure there
  is no regression? I know that there is a bunch of scheduler
  tests floating around on lkml ..Just need to dig to them (or if
  someone has all these tests handy on a website, I will download from
  that site!)

2. Provides fairness at group (user) level at the cost of missing load
   balance functionaility (missing until I get around to work on it that
   is).

> kernel builds dont really push scheduling micro-costs, rather try
> something like 'hackbench.c' to measure that. (kernel builds are of
> course one of our primary benchmarks.)

sure i will try that on my next version.

--
Regards,
vatsa

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Containers mailing list
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https://lists.linux-foundation.org/mailman/listinfo/containers