Custom Search   Search

Re: crush: straw is dead, long live straw2

[Date Prev][Date Next][Thread Prev][Thread Next][Date Index][Thread Index]

- *Subject*: Re: crush: straw is dead, long live straw2
- *From*: Sage Weil <sweil@xxxxxxxxxxx>
- *Date*: Fri, 12 Dec 2014 06:46:24 -0800 (PST)
- *Cc*: ceph-devel@xxxxxxxxxxxxxxx
- *In-reply-to*: <20141212091408.GN4150@thinkpad.thebehrens.net>
- *References*: <alpine.DEB.2.00.1412081516010.18281@cobra.newdream.net> <20141212091408.GN4150@thinkpad.thebehrens.net>
- *User-agent*: Alpine 2.00 (DEB 1167 2008-08-23)

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On Fri, 12 Dec 2014, Thorsten Behrens wrote:
> Sage Weil wrote:
> > Calculating the ln() function is a bit annoying because it is a floating
> > point function and CRUSH is all fixed-point arithmetic (integer-based).
> > The current draft implementation uses a 128 KB lookup table (2 bytes per
> > entry for 16 bits of input precision).  It seems to be about 25% slower
> > than the original straw code in my simple microbenchmark, but I'm not sure
> > that's a number we should trust since it loops through a zillion inputs
> > and will pull most of the lookup table into the processor caches.
> >
> > We could probably try a few others things:
> >
> [snip]
>
> My Hacker's Delight copy has a number of further variants (on
> pp. 215), unfortunately only covering log_2 (which is trivially the
> number of leading zeros in the binary representation) and log_10. But
> since the logarithms are simply related by a multiplicative constant,
> something clever might be doable here with a bit of thinking.

Any log will definitely do; the next steps are to do a division and then
take the max.  Simply counting 0's isn't precise enough, though.. we need
a lot more precision than that.

The table lookup is (I think) on the order of 50-100 cycles with a cold
cache; that's what we need to beat!

sage


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    - **Re: crush: straw is dead, long live straw2**
        - *From:* Milosz Tanski
    - **Re: crush: straw is dead, long live straw2**
        - *From:* Joe Landman

- **References**:
    - **crush: straw is dead, long live straw2**
        - *From:* Sage Weil
    - **Re: crush: straw is dead, long live straw2**
        - *From:* Thorsten Behrens

- Prev by Date: **Re: the cpu optimize in ceph**
- Next by Date: **Reducing backfilling/recovery long tail**
- Previous by thread: **Re: crush: straw is dead, long live straw2**
- Next by thread: **Re: crush: straw is dead, long live straw2**
- Index(es):
    - **Date**
    - **Thread**

[Index of Archives]　　　[CEPH Users]　　　[Ceph Large]　　　[Information on CEPH]　　　[Linux BTRFS]　　　[Linux USB Devel]
[Video for Linux]　　　[Linux Audio Users]　　　[Yosemite News]　　　[Linux Kernel]　　　[Linux SCSI]