

# Re: On schedulers

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*Source:* <http://unix.derkeiler.com/Mailing-Lists/FreeBSD/arch/2007-08/msg00010.html>

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- *From:* Jeff Roberson <[jroberson@xxxxxxxxxxxxxxxxx](mailto:jroberson@xxxxxxxxxxxxxxxxx)>
  - *Date:* Fri, 3 Aug 2007 03:51:39 -0700 (PDT)
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On Thu, 2 Aug 2007, Jeff Roberson wrote:

On Thu, 2 Aug 2007, Niki Denev wrote:

-----BEGIN PGP SIGNED MESSAGE-----  
Hash: SHA1

Ivan Voras wrote:

Hi,

I've just stumbled on the LKML (via Slashdot) discussion on schedulers, nicely compiled here: <http://kerneltrap.org/node/14023> . I don't think 3D performance is of concern for FreeBSD, but I'm wondering how would ULE and the latest incarnation of 4BSD fare in that discussion?

Specifically, I'm interested in this result in Linux:

2.6.22-ck1 2.6.22-cfs-v19

```
-----  
-----  
quake + 0 loops | 41 fps quake + 0 loops | 41 fps  
quake + 1 loop | 3 fps quake + 1 loop | 41 fps  
quake + 2 loops | 2 fps quake + 2 loops | 32 fps  
quake + 3 loops | 1 fps quake + 3 loops | 24 fps  
quake + 4 loops | 0 fps quake + 4 loops | 20 fps  
quake + 5 loops | 0 fps quake + 5 loops | 16 fps
```

(for the impatient: the benchmark is of running quake with several "idle loop" processes, presumably on a single CPU machine. On the left is the SD (staircase deadline) and on the right is the CF

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(completely fair)  
scheduler).

How would this behave on FreeBSD? Is there a paper on  
how ULE should  
behave / is modeled?

This is on a Intel C2D E6420 with 2G of ram,  
Nvidia 7900GTO (nvidia-driver-1.0.9746)  
running xorg-server-6.9.0\_5 on a recent -CURRENT :

idle is basically a small C program with just for(;;) in its main()  
function.

I've run glxgears for 20 secs each (to get four reports)  
Both idle and glxgears are run as normal user.

Can you tell me what % cpu is going to each process during this time? These results are  
surprising. For workloads like this ULE should essentially implement a 'fair' scheduling  
policy. However, so should 4BSD. So I'm not yet sure why the slowdown wouldn't be relative  
to the number of running threads. Also, 'vmstat 1' output would be useful.

Can I recreate this test without a fancy video card? I have the following in my laptop:

```
vgapci0@pci1:0:0: class=0x030000 card=0x054f1014 chip=0x4e541002 rev=0x80  
hdr=0x00  
vendor = 'ATI Technologies Inc.'  
device = 'Radeon Mobility M10 NT (RV350-WS)'
```

Well this must behave very differently when you have hardware acceleration. I for example see ~288 fps with  
no other cpu hogs running. This consumes 100% of the cpu. With 1 cpu hog running I see ~148. With two I  
see ~100 fps. It's also worth noting that at no time does interactivity suffer.

My 'idle' is called loop.sh as I don't think it's particularly idle. ;-) Here it is:

```
while true; do  
echo -n;  
done;
```

This does no system calls and spends all of it's time in user-space.

Thanks,  
Jeff

Thanks,

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Jeff

SMP+ULE 0 idle

101446 frames in 5.0 seconds = 20289.099 FPS  
101590 frames in 5.0 seconds = 20317.975 FPS  
101701 frames in 5.0 seconds = 20340.037 FPS  
101489 frames in 5.0 seconds = 20297.670 FPS

SMP+ULE 1 idle

97430 frames in 5.0 seconds = 19485.840 FPS  
102176 frames in 5.0 seconds = 20435.017 FPS  
102402 frames in 5.0 seconds = 20480.318 FPS  
102430 frames in 5.0 seconds = 20485.865 FPS

SMP+ULE 2 idle

30 frames in 5.0 seconds = 5.978 FPS  
31 frames in 5.0 seconds = 6.182 FPS  
31 frames in 5.0 seconds = 6.172 FPS  
30 frames in 5.2 seconds = 5.744 FPS

SMP+ULE 3 idle

29 frames in 5.2 seconds = 5.631 FPS  
30 frames in 5.0 seconds = 5.952 FPS  
31 frames in 5.1 seconds = 6.054 FPS  
32 frames in 5.2 seconds = 6.213 FPS

SMP+ULE 4 idle

21 frames in 5.1 seconds = 4.151 FPS  
20 frames in 5.1 seconds = 3.942 FPS  
21 frames in 5.2 seconds = 4.066 FPS  
20 frames in 5.2 seconds = 3.841 FPS

UP+ULE 0 idle

102152 frames in 5.0 seconds = 20430.299 FPS  
102572 frames in 5.0 seconds = 20514.236 FPS  
102533 frames in 5.0 seconds = 20506.522 FPS  
102129 frames in 5.0 seconds = 20425.654 FPS

UP+ULE 1 idle

21 frames in 5.1 seconds = 4.158 FPS  
24 frames in 5.2 seconds = 4.624 FPS  
26 frames in 5.0 seconds = 5.153 FPS  
28 frames in 5.0 seconds = 5.586 FPS

UP+ULE 2 idle

21 frames in 5.1 seconds = 4.093 FPS  
21 frames in 5.1 seconds = 4.093 FPS  
21 frames in 5.1 seconds = 4.115 FPS  
21 frames in 5.1 seconds = 4.115 FPS

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UP+ULE 3 idle

20 frames in 5.3 seconds = 3.804 FPS  
19 frames in 5.2 seconds = 3.624 FPS  
19 frames in 5.2 seconds = 3.619 FPS  
19 frames in 5.3 seconds = 3.612 FPS

UP+ULE 4 idle

19 frames in 5.3 seconds = 3.600 FPS  
17 frames in 5.0 seconds = 3.388 FPS  
17 frames in 5.0 seconds = 3.393 FPS  
17 frames in 5.0 seconds = 3.380 FPS

SMP+4BSD 0 idle

102440 frames in 5.0 seconds = 20487.893 FPS  
102285 frames in 5.0 seconds = 20456.848 FPS  
102276 frames in 5.0 seconds = 20455.065 FPS  
102312 frames in 5.0 seconds = 20462.289 FPS

SMP+4BSD 1 idle

101798 frames in 5.0 seconds = 20359.526 FPS  
102732 frames in 5.0 seconds = 20546.202 FPS  
102619 frames in 5.0 seconds = 20523.692 FPS  
102788 frames in 5.0 seconds = 20557.526 FPS

SMP+4BSD 2 idle

6 frames in 5.0 seconds = 1.193 FPS  
5 frames in 5.0 seconds = 0.994 FPS  
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SMP+4BSD 3 idle

6 frames in 5.0 seconds = 1.193 FPS  
5 frames in 5.0 seconds = 0.994 FPS  
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SMP+4BSD 4 idle

6 frames in 5.0 seconds = 1.193 FPS  
5 frames in 5.0 seconds = 0.994 FPS  
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UP+4BSD 0 idle

102864 frames in 5.0 seconds = 20572.665 FPS  
102569 frames in 5.0 seconds = 20513.792 FPS  
102559 frames in 5.0 seconds = 20511.775 FPS  
102333 frames in 5.0 seconds = 20466.543 FPS

UP+4BSD 1 idle

6 frames in 5.0 seconds = 1.193 FPS

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5 frames in 5.0 seconds = 0.994 FPS  
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UP+4BSD 2 idle

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UP+4BSD 3 idle

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UP+4BSD 4 idle

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