

Performance test – PostgreSQL 9.2 vs. 9.3 on FreeBSD 10.0

2014-04-20

We suspect that the shift from SYSV shared memory to mmap in PostgreSQL *might* be a performance problem on FreeBSD.

Lets try with pgbench. I basically copied the procedure from a post on the dragonflybsd list¹.

Hardware

CPU: Intel(R) Xeon(R) CPU E5-2650 0 @ 2.00GHz. 32 threads total.

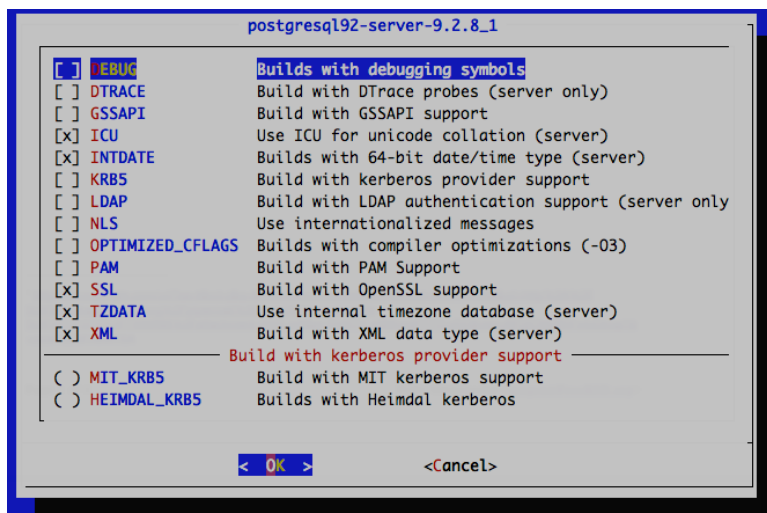
Memory: 95 GB

Software

FreeBSD 10.0-p2, GENERIC kernel.

PostgreSQL 9.2.8 compared to PostgreSQL 9.3.4, both built from ports *with ICU patch enabled*:

```
cd /usr/ports/postgresql92-server
make clean install clean
```



¹ http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CDYQFjAB&url=http%3A%2F%2Flists.dragonflybsd.org%2Fpipermail%2Fusers%2Fattachments%2F20121010%2F7996ff88%2Fattachment-0002.pdf&ei=DoRTU_ejBlfnygP77YLoDQ&usq=AFQjCNGBhFx4zQnup1b-uazeY0ZMYMWT6A

Test procedure

```
createdb bench
pgbench -i -s 800 bench
# Dummy run to warm up caches for 30 minutes
pgbench -j 6 -c 6 -T 1800 -S bench

# run three times and take the average of the result
for run in 1 2 3
do
    for clients in 1 3 6 9 12 15 18 24 32 48 64 80
    do
        pgbench -j ${clients} -c ${clients} -T 300 -S bench \
            > result_${clients}-${run}.txt
    done
done

perl -e 'while (<>) {if (m/number of clients: (\d*)/) { $c=$1; } elsif (m/^tps
= ([0-9.]*).*excluding/) { $a{$c} += $1; } } print join ("\t", (sort {$a <=>
$b} (keys %a))); print "\n"; foreach $key (sort {$a <=> $b} (keys %a))
{ printf "%.0f\t", $a{$key} / 3 ;} print "\n";' result_* > result-summary.txt
```

postgresql.conf

```
max_connections = 100
update_process_title = off
autovacuum = off
log_destination = 'syslog'
default_tablespace = 'opt'
default_statistics_target = 50
maintenance_work_mem = 1GB
constraint_exclusion = on
checkpoint_completion_target = 0.9
effective_cache_size = 64GB
work_mem = 480MB
wal_buffers = 8MB
checkpoint_segments = 16
shared_buffers = 7680MB
```

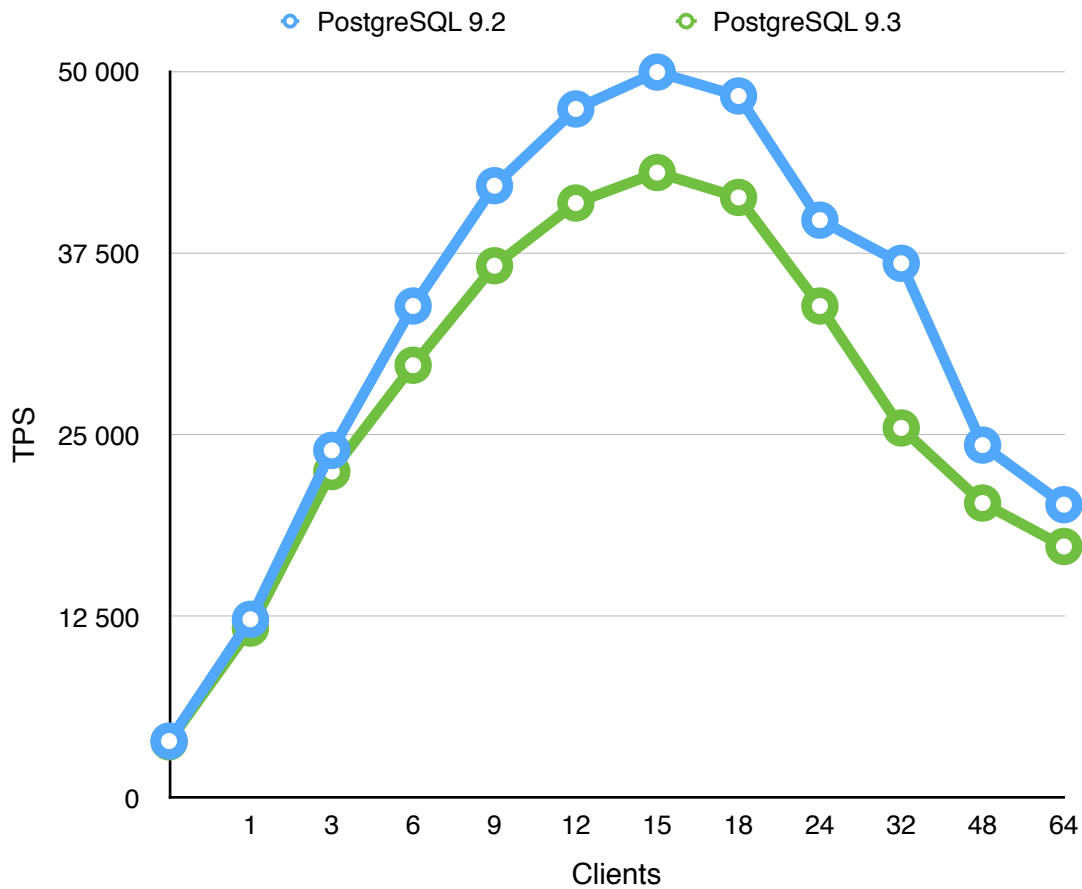
/boot/loader.conf

```
kern.ipc.semmani="256"
kern.ipc.semms="512"
kern.ipc.semume="40"
kern.ipc.semnu="256"
```

/etc/sysctl.conf

```
kern.maxfiles=200000
kern.ipc.shm_use_phys=1
kern.ipc.shmmax=8586447872
kern.ipc.shmall=2096301
```

	1	3	6	9	12	15	18	24	32	48	64	80
PostgreSQL 9.2	3944	12320	23941	33873	42146	47424	49962	48318	39777	36809	24302	20202
PostgreSQL 9.3	3893	11714	22481	29795	36640	40955	43050	41337	33869	25481	20318	17331



Results

Well, so far, it seems that mmap does actually have a negative performance impact on FreeBSD 10.0. With 9.2, up to 17 % more TPS could be achieved (for 32 clients).

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