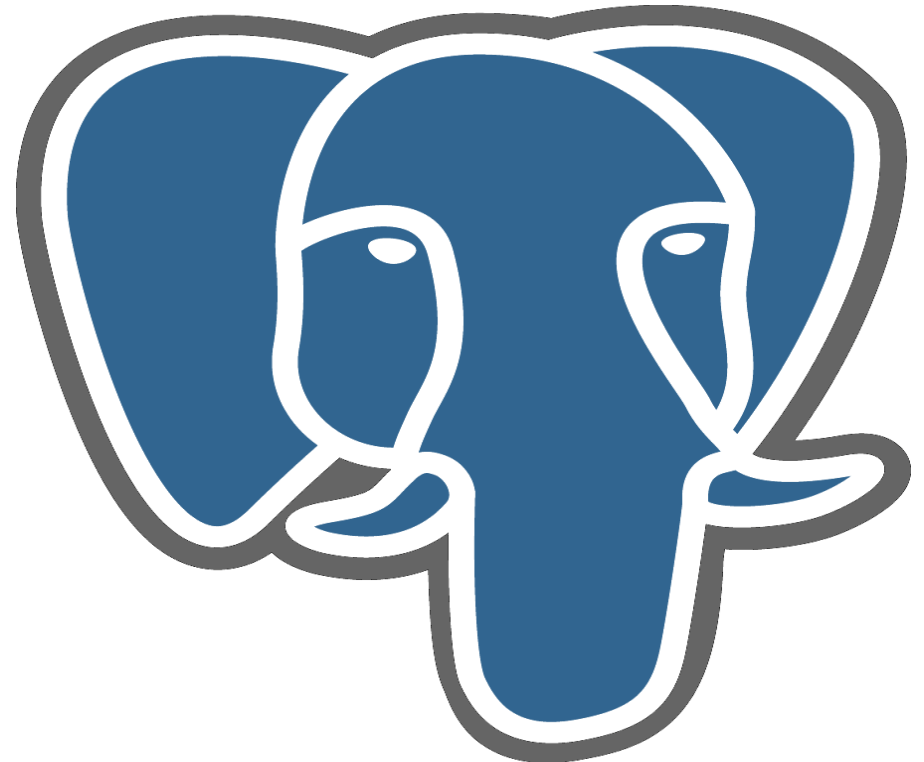# 2ndQuadrant ✛
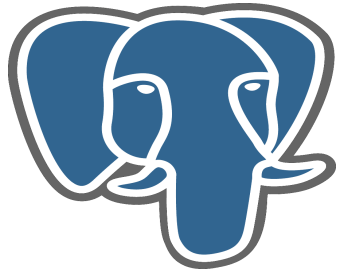## Advanced PostgreSQL Professional Services
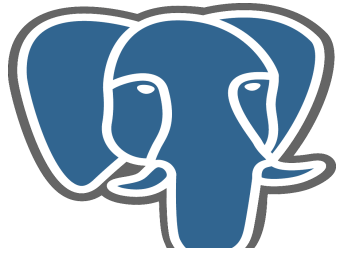
PostgreSQL 8.3
Performance Features

Simon Riggs
2nd Quadrant

Performance Features

- Enhanced Scalability
- HOT
- Database Size Reductions
- Smoothing
  - Checkpoint smoothing
  - Xlog File Switch tuning
- Performance Logging

- Async Commit
- COPY tuning
- Recovery I/O Reduction
- Sort Optimizations
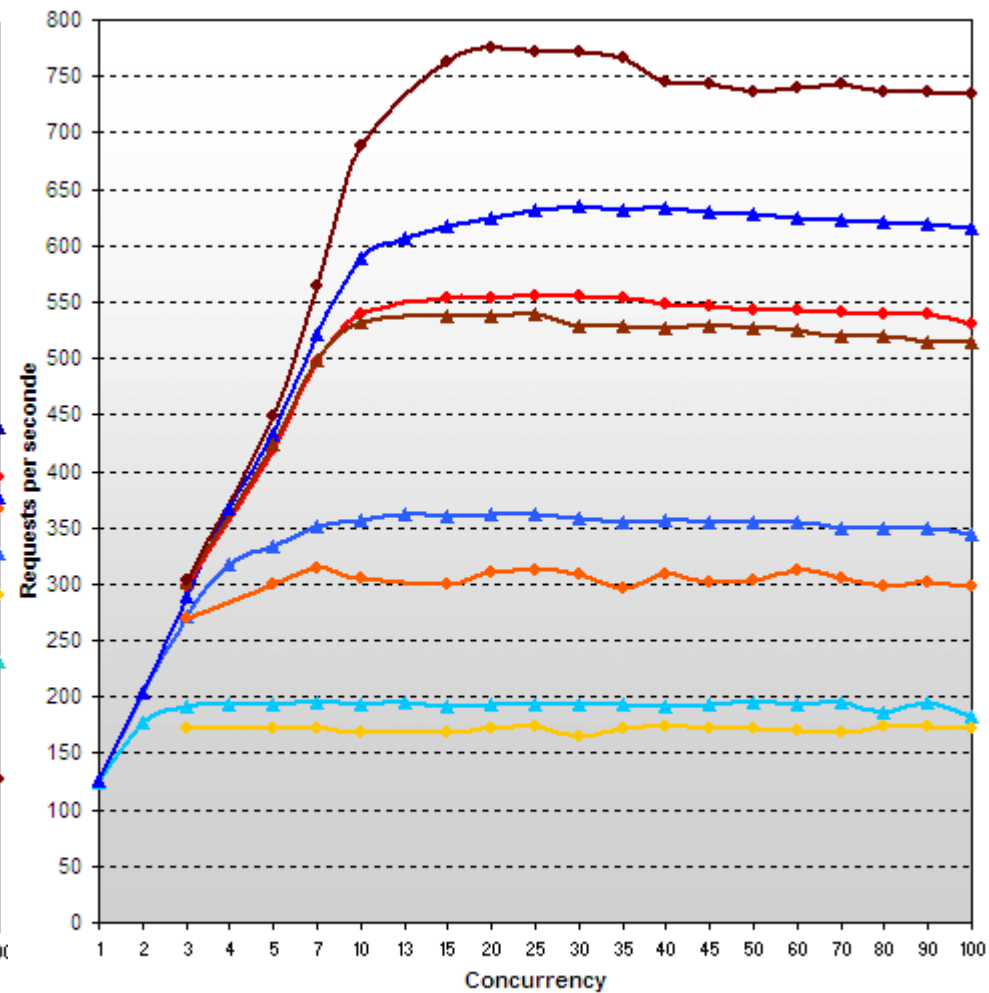- L2 Cache tuning
- Synchronous Scan

MySQL v PostgreSQL Scalability

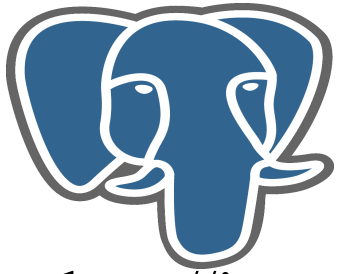Tweakers.net Database-simulatie
MySQL 5.0.20a vs. 5.0.32-bk
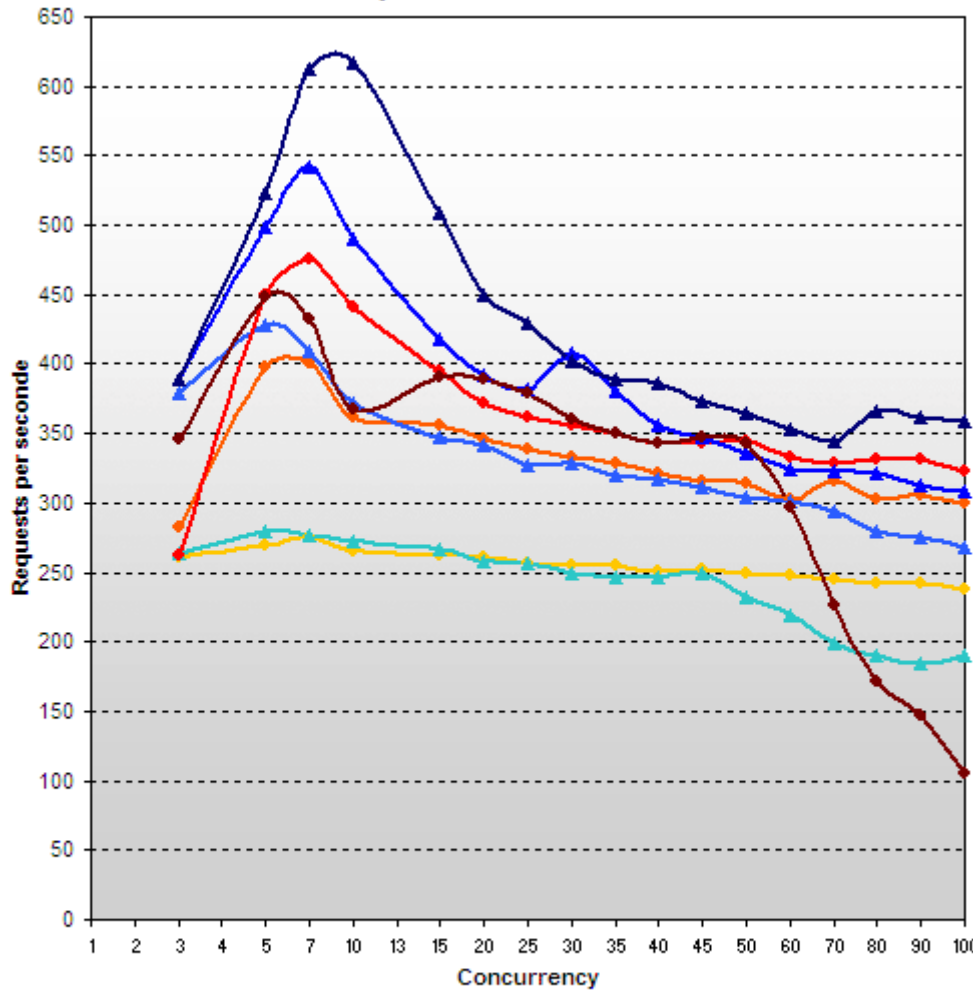
Tweakers.net Database-simulatie
Clovertown vs. Woodcrest - PostgreSQL 8.2-dev

MySQL v PostgreSQL Scalability

http://jamonation.com/node/734

pgsql sysbench on 8-core opteron, FreeBSD 7.0 with N CPUs active

- 8 cpus
- 4 cpus
- 2 cpus
- 1 cpu (SMP kernel)
- 1 cpu (UP kernel)

mysql sysbench on 8-core opteron

- NetBSD 4.99.31
- FreeBSD 7.0
- NetBSD 4.99.31+sched_m2
- NetBSD 4.99.31+sched_m2+jemalloc+libpthread

Transactions/sec

Concurrency (# threads)

Concurrency (# threads)
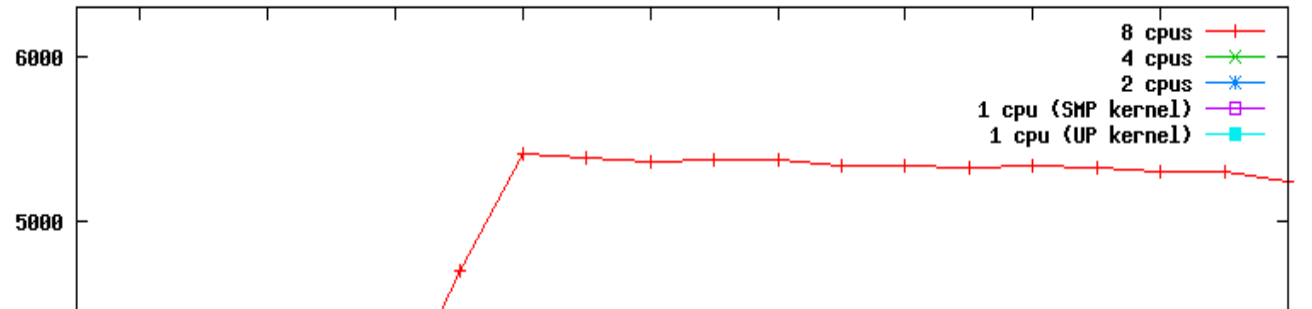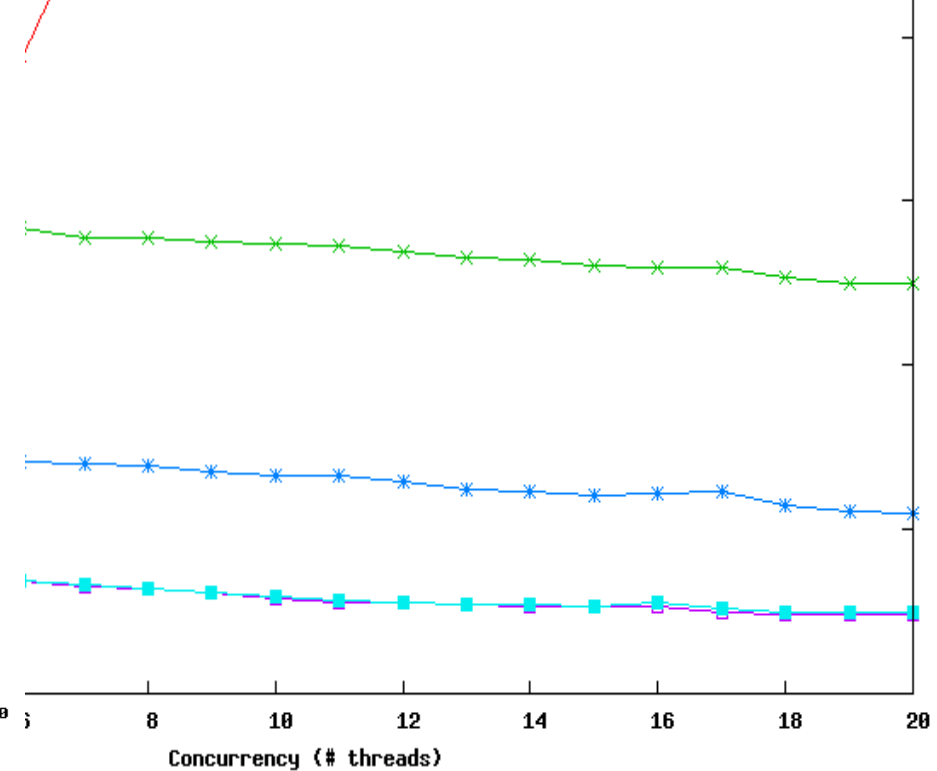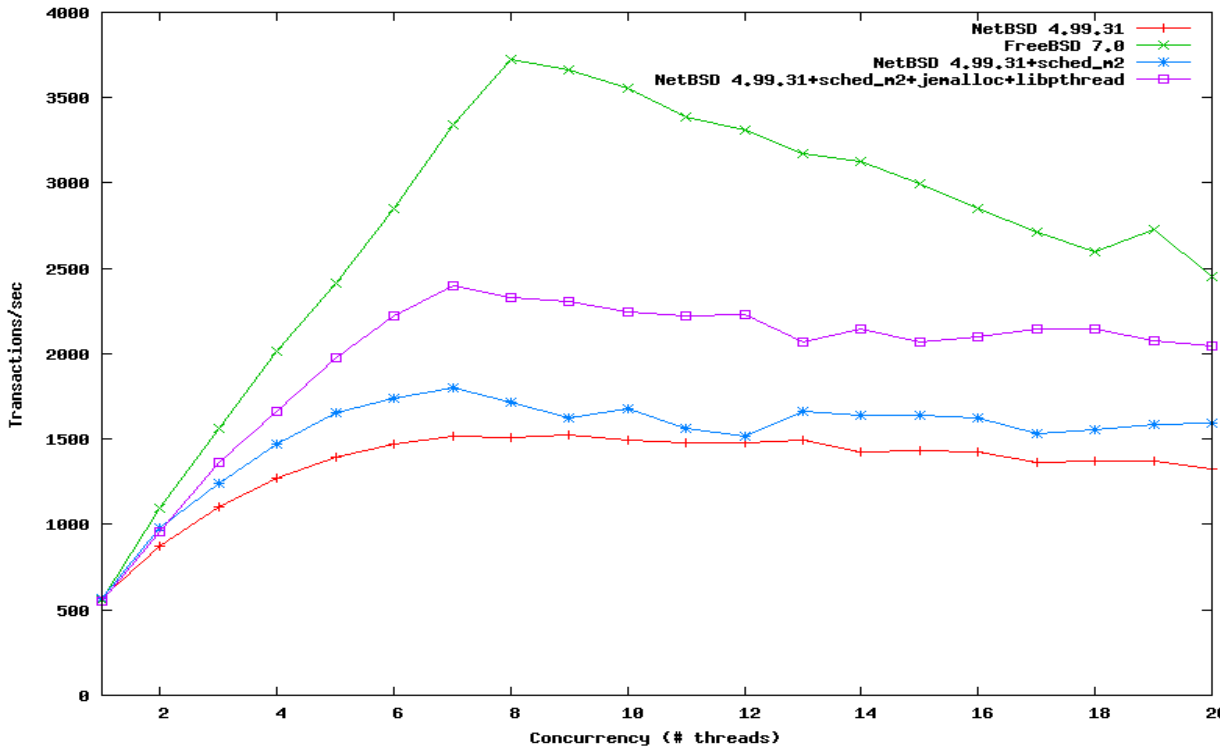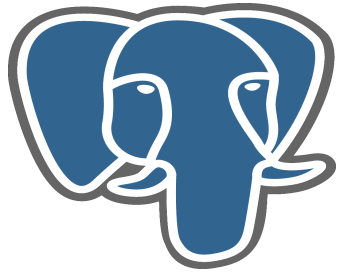
Heap Only Tuples (HOT)

- Frequent updates cause mini-VACUUMs to occur on blocks as-needed
  - No need to wait for a full table VACUUM
  - Provides consistent performance
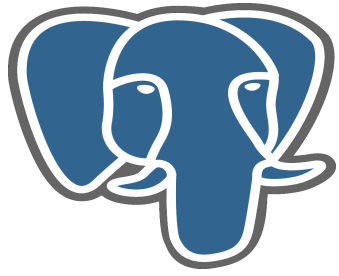- Mechanism: Don't store index entries when we update a row that fits on the same block
- Only if we don't update an indexed columns
- 18 month R&D project, 8 people, ~4 man years

Async Commit

- Option to not wait for disk write when we COMMIT
- Can provide as much as 900% performance gain
- Can be applied on selected transactions only
  - Can mix async commit and standard synch-commit
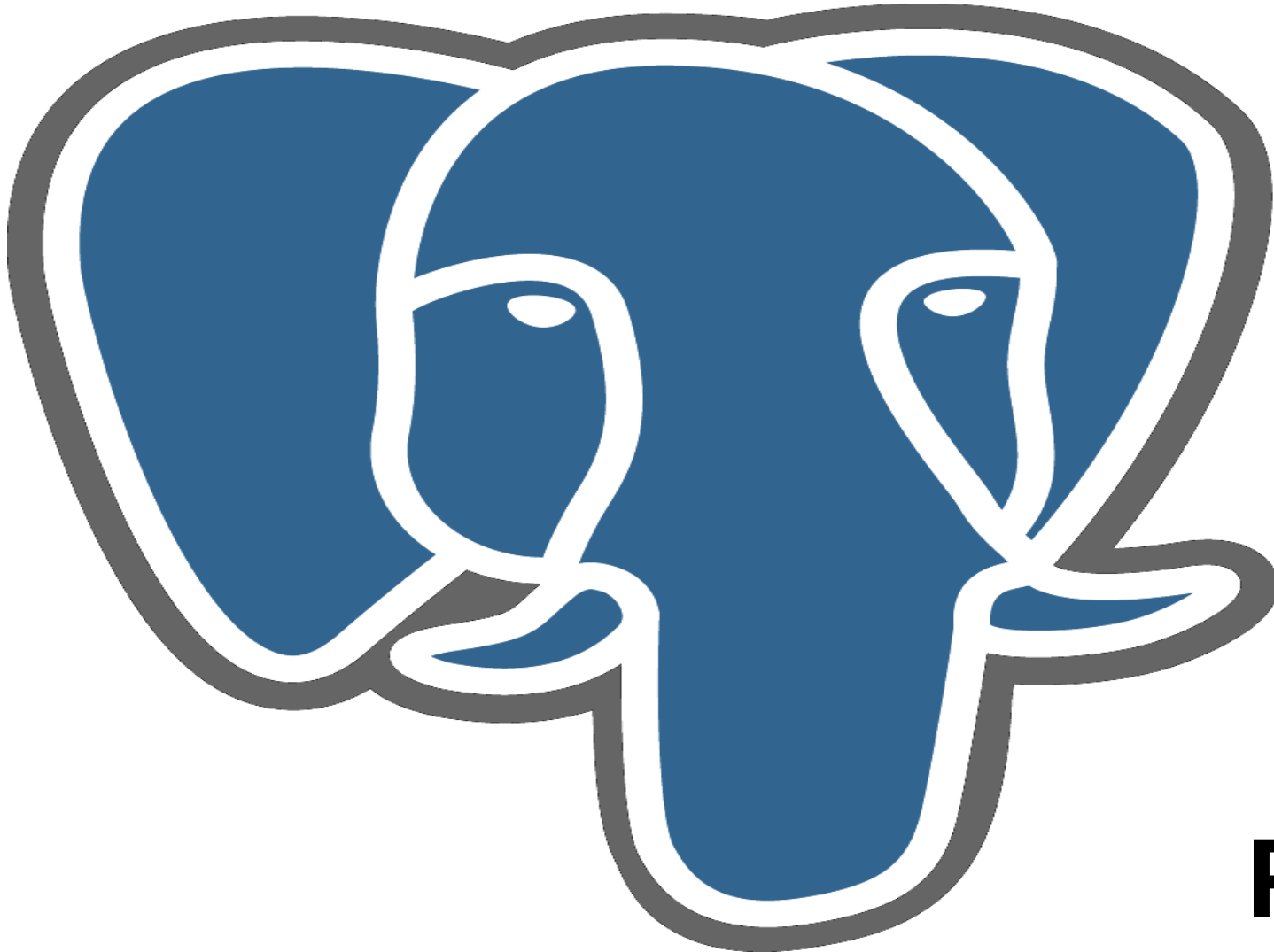- More flexible version of MySQL "speed-rather-than-robustness" feature
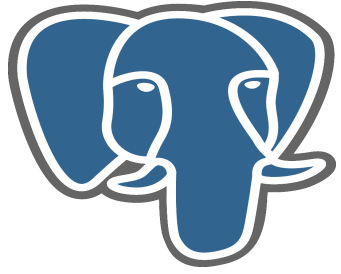
Scan Performance

- L2 Buffer Cache Recycling
  - Reuse small circle of buffers for SeqScan & VACUUM
  - Improves L2 cache hit ratio: +20% performance
- Synchronous Scans
  - Multiple sessions re-use the same buffers while scanning, providing a huge I/O reduction
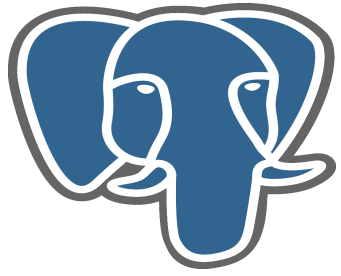
PostgreSQL 8.3

- Smaller
- Faster
- Smoother
- More scalable
- More tunable

2ndQuadrant +
Advanced PostgreSQL Professional Services

PostgreSQL