Bucardo

Postgres replication system
- Multi-master
- Master-slave
- Asynchronous

bucardo.org

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• Bucardo History
• Backcountry.com multi-master need
• Existing system (Bucardo 1) to push changes
• Very asynchronous
• Slaves with different tables
• Other places now using it (bytea)
• Bucardo Requirements
• Perl
• Moose
• PL/Perlu, PL/pgsql (swap and pushdelta only)
• Postgres 8 (8.3 is best)
  – HOT, replica hook, performance
• Bucardo Shortcomings
• Not widely used
• No smooth DDL handling
• Not for failover
• Bloat: pg_listener, q, bucardo_delta, bucardo_track
• One developer
• No locking of slaves
• Bucardo Strengths
• Perl
• Drop in, no changes needed at all
• Interface
• Hooks!
• Multi-master
• Async to the extreme
• No locking of slaves
- Bucardo setup
- Add the schema somewhere
- Add databases to db table
- Add tables to goat table
- Herds, dbggroup
- Create a sync
- Automatic validation, creation.
• Bucardo Flow
• Triggers
  – row-level: bucardo_delta
  – Statement-level: NOTIFY
• bucardo_delta: ID, txn_time. Insert only!
• bucardo_track: who's done what?
• MCP, CTL, KID
• NOTIFY vs. timeout vs. kick.
• Bucardo Flow
• Join bucardo_delta with actual table. DISTINCT.
• Both sides.
• Rules, triggers, hooks, upsert, conflicts, exceptions
• Update bucardo_track.
• Bucardo Flow
• NOTIFY (timeout, kick, trigger)
• MCP -> CTL
• CTL -> q table. Limits per targetdb, sourcedb
• KID -> q table. Keepalive
• Bucardo Syncs
• Fullcopy. Timeout/kick. truncate/COPY/done
• Pushdelta. Trigger. One way master-slave.
• Bucardo Anti-trigger
• ALTER TABLE DISABLE TRIGGER ALL;
• UPDATE pg_class..
• SET session_replication_role = 'replica';
  − Thanks Jan!
• Bucardo Hooks
• Customcode
• Conflict handlers
• Exception - try again
• Pre and post trigger drop
• Row information -hashref
• Live changes
• Returned value - bitmapped (both!)
• Affect the replication event
• Example: cache invalidation
• Bucardo Interface
• ./bucardo_ctl
• ./bucardo_ctl stop “Adding new table - Greg”
• ./bucardo_ctl start “Adding new table - Greg”
• (logged + email)
• ./bucardo_ctl status foobar
• ./bucardo_ctl add table sales sync=orders
• ./bucardo_ctl kick foobar 0
• Bucardo Interface
• ./bucardo_ctl  kick foobar 0
• [0s] ...
• [1s] alpha[1s] ...
• [2s] alpha[1s] gamma [2s] ...
• [4s] alpha [1s] gamma [2s] beta [4s] DONE!
• Bucardo Stuff
• Customselect (fullcopy)
  – SELECT max(col1), col2 FROM foo GROUP BY 2;
• Email alerts
• Logging++
• Serialization, deadlocks.
• Cleanup: vacuum, purge_delta
• **DBIx::Safe**

• Like Safe.pm, but for database handles.

• Define what it can and cannot do.

• No commit, no rollback.

• Deep view 'read-only'

• Regex-based control.
• Bucardo Development
• Jan idea: supercopy
• Greg idea: supertriggers
  – Automatic replication of new tables
• git.postgresql.org
• Win32 (fork, setsid)
• DDL and failover
• Master-master-master-master...
• Interface!
• Release early, release often
• Bucardo Questions?
• Mailing list at bucardo.org: regular and announce
• greg@endpoint.com