GOLCONDE

c'est n'est pas un système de réplication
GOLCONDE

René Magritte, 1953
GOLCONDE

- NOT REPLICATION*
- DATA DISTRIBUTION SYSTEM
- ONE CANONICAL SOURCE
- ANY NUMBER OF TARGET RELATIONS
- QUEUE BASED

* UNLESS YOU START FROM A CLEAN SLATE
FEATURES

- LIGHT-WEIGHT DAEMON
- "AUTOSQL" AND CUSTOM HANDLERS
- TWO METHODS OF OPERATION
- REAL-TIME VISUALIZATION
WHY GOLCONDE?

- Good replication tools exist
  - Slony, Longdiste, Bucardo, etc
- No "Golden Hammer"
- Current tools are resource intensive
  - Live on the database tier
  - Live in the database
WHY GOLCONDE?

- NEEDED A SCALE OUT SOLUTION
- CROSS DATA-CENTER IMPLEMENTATIONS
- MESSAGE BROKERS ARE MORE EFFICIENT FOR QUEUES
- DATABASE HARDWARE IS EXPENSIVE ($$$$)
- QUEUE AND CONSUMER GRADE HARDWARE ARE NOT
- NEED CUSTOMIZABLE WORKFLOW FOR DISPARATE RELATIONS
REQUIREMENTS

- STOMP SUPPORTING MESSAGE BROKER
- POSTGRESQL 8.3* OR HIGHER
- PYTHON 2.6
  - PYYAML
  - PSYCOPG2
  - STOMP.PY
HTTP://ACTIVEMQ.APACHE.ORG/
STOMP

- Streaming Text Oriented Message Protocol
- Interoperable Wire Format
- Supported by multiple brokers

HTTP://STOMP.CODEHAUS.ORG/
AMQP

- Advanced Message Queuing Protocol
- Open Standard Wire Protocol
- Emerging Standard Supported by Multiple Brokers

http://www.amqp.org/
RabbitMQ
Open Source Enterprise Messaging

OpenAMQP
QPID
RedHat Enterprise MRG
ARCHITECTURE

- START OF ACTION LIFECYCLE
  - CLIENT-BASED: ENQUEUE FROM APPLICATION
  - TRIGGER-BASED: ENQUEUE FROM POSTGRESQL
- MULTI-THREADED PYTHON Daemon
LEXICON

☐ DESTINATIONS ARE THE CANONICAL RELATIONS

☐ ARE ACTED UPON IN CLIENT-BASED WORKFLOWS

☐ ENQUEUES DATA IN TRIGGER-BASED WORKFLOWS

☐ TARGETS ARE THE DISTRIBUTED RELATIONS
ARCHITECTURE

- DATA IS PASSED IN JSON ENCODED PACKETS

- COMMANDS:
  - ADD (INSERT)
  - SET (UPsert)
  - DELETE
  - UPDATE
MESSAGE EXAMPLES

- {"ACTION": "ADD", "DATA": {"FRIEND_ID": 47, "USER_ID": 16, "STATUS_ID": 1}}

- {"ACTION": "DELETE", "RESTRICITION": {"FRIEND_ID": 11, "USER_ID": 126}}

- {"ACTION": "SET", "DATA": {"FRIEND_ID": 112, "USER_ID": 111, "TIMESTAMP": "WED APR 1 13:56:54 2009", "STATUS_ID": 1}}

- {"ACTION": "UPDATE", "RESTRICITION": {"FRIEND_ID": 5, "USER_ID": 41}, "DATA": {"TIMESTAMP": "WED APR 1 13:56:38 2009", "STATUS_ID": 3}}
AUTOSQL

- DEFAULT HANDLER TYPE FOR GOLCONDE
- EXAMINES PG_CATALOG DATA FOR SCHEMA
- CACHES SCHEMA
- GENERATES SQL
- REQUIRES SAME SCHEMA
CUSTOM HANDLERS

- Allows for different schemas for the same data
- Example:
  - Legacy schema vs new schema
  - Different focused target relations
- Warning: need to understand internal Golconde flow

Thar be dragons
CLIENT-BASED FLOW

- CLIENT APPLICATION ENQUEUES
- GOLCONDE PERFORMS TRANSACTION ON CANONICAL DESTINATION RELATION
- SERIALLY DISTRIBUTES TO TARGET QUEUES
CLIENT-BASED FLOW

- TARGET HANDLER DEQUES
- PERFORMS TRANSACTION ON TARGET RELATIONS
TRIGGER-BASED USAGE

- Requires PL/Python
- Trigger-util.py builds and installs triggers
- Trigger is installed on the canonical table
- No modification of client application required
TRIGGER-BASED FLOW

- **FIRES AFTER INSERT/UPDATE/DELETE**
- **ENQUEUES INTO TARGET QUEUES**
- **GOLCONDE PERFORMS TRANSACTIONS ON THE TARGET RELATIONS**
CONFIGURATION

☐ YAML BASED

☐ PARAMETERS FOR:
  ☐ LOGGING
  ☐ HTTP DAEMON FOR REALTIME MONITORING & VISUALIZATION
  ☐ DESTINATION / TARGET GROUPS

HTTP://WWW.YAML.ORG/
STATISTICS & VISUALIZATION

- BUILT-IN HTTP SERVER
- STATS REQUESTS RETURNS JSON
- USE WITH STAPLR, NAGIOS, ETC
- INTERNAL REAL-TIME VISUALIZATION
CURRENT STATUS

- 0.5 BETA RELEASE - 03/02
- 0.6 BETA COMING SOON
  - ADDS REAL-TIME STATS SERVER
  - BUG FIXES
ROADMAP

- Two-Phase Commit Like Behavior
- All transactions must commit or rollback
- Rollback is defined by rollback data packets in Autosql or handlers
- Additional queue servers and protocols
- “Native” client classes in PHP, Python
QUESTIONS?

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