

PostgreSQL Built Your Car

**Auto Industry Data Exchange
Using Open Source Solutions**

Aaron Thul
Autoweb Communications
<http://www.autoweb.net>

O'Reilly Open Source Convention
August 1 - 5, 2005

The 7th Annual

O'REILLY

**OPEN
SOURCE
CONVENTION**

Did PostgreSQL Really Build a Car?

- No not really
- Engineer and Designer likely used Autoweb
- ADXi (Autoweb Data eXchange internet)
- AGM (Autoweb Gateway Manager)
- Both built on free and open source solutions.

Autoweb and ADX at a Glance

- Presence in Over 38 Countries
- Over 20,000 users in 2,500 Companies
- Key Clients
 - General Motors
 - Ford Motor Company
 - DaimlerChrysler
 - Nissan
 - Mitsubishi
 - Honda

With PostgreSQL and other Open Source software Autoweb is

- Transferring thousands of transactions per day
- About 1.5 documents per transaction
- 75 Gigabytes per day of change
- Processing 221 Gigabytes of data
- Managing an average of 100 simultaneous users

ADX Data

- Very large engineering documents
- Files are stored on a shared NFS server
- All ADXi web servers use the standard shared NFS mount
- Data moves via an integrated routing module
- All metadata is stored in a database
- Each transaction supports multiple recipients

Metadata

- Who Sent the File?
- Who should get the File?
- File Type?
- Conversion Information?
- Transaction history?
- Did the file get delivered (Transaction Reports)?

Legacy Application

- IBM Servers
- AIX
- Oracle 8
- RSA SecureID
- Stronghold Web Server
- Compiled C CGI Scripts

Second Generation ADXi

- Lower Cost Comity Servers
- Easy Deployment of Additional Servers
- Reduced Management of Software Licenses
- Reduce Cost to Deploy Additional Boxes
- Remember there are other costs (Support)
- Improve application availability

ADXi Building Blocks

- Debian Stable (3.1)
- PostgreSQL (7.4)
- Slony-I (1.0.5)
- Apache (1.3)
- Perl (5.8)
- Mod_perl (1.29)
- NetApp and EMC Clarion NAS

AGM (Autoweb Gateway Manager) Building Blocks

- Low Cost x86 Server
- Debian Stable (3.1)
- PostgreSQL (7.4)
- Apache (1.3)
- Perl (5.8)
- Mod_perl (1.29)
- With AGMs Autoweb is pushing these open source solutions into many enterprise datacenters for the first time.
- Each AGM is deployed to a customers data center.

Updates

- We make our own Debian compliant debs
- Use our own APT repository for ADX
- PostgreSQL Perl and other dependencies are standard Debian versions
- All ADX servers only need to do:
apt-get update ; apt-get install adx
- Wrote custom scripts to handle detect and handle database schema changes with Slony-I

Why PostgreSQL?

- Evaluated MySQL and PostgreSQL to replace Oracle 8
- Required features for replacement database
 - Triggers
 - Foreign Keys
 - Sub-selects
 - Compatible Syntax

Why mod_perl?

- New application started in Perl
- Wanted better performance
- Needed database connection caching
- Majority of overhead is only paid once, first page load on a new apache processes.

Slony-I

- Relies on triggers in the database
- When a failed server is brought back online it will automatically start catching up
- Unfortunately when the master fails, clients need to reconnect to the new master and likely be reconfigured

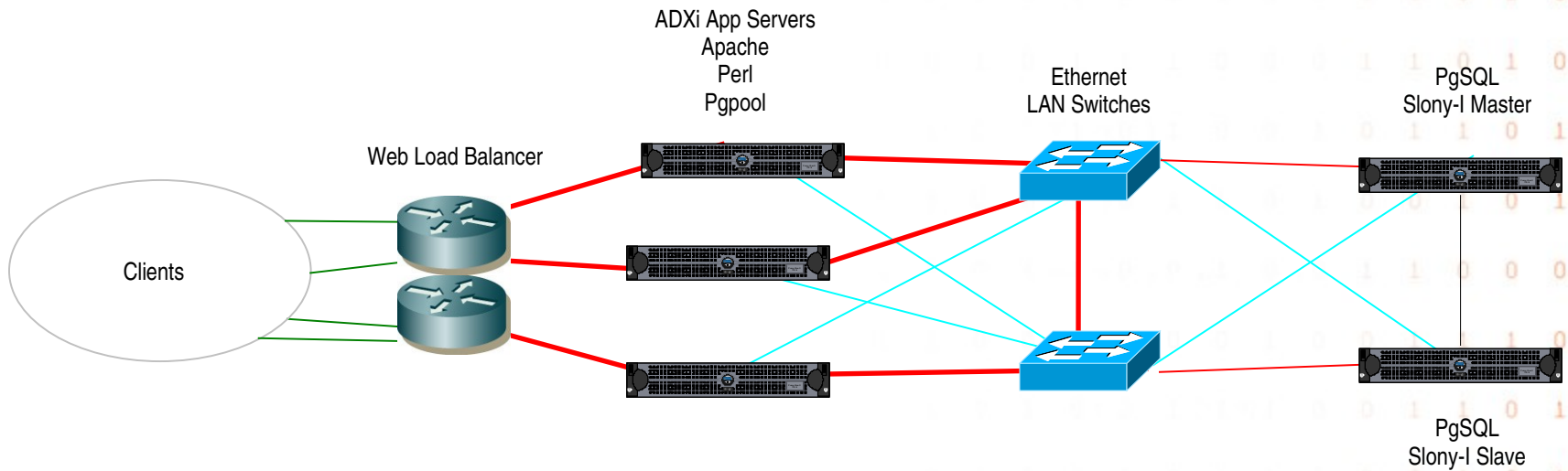
PgPool

- Pgpool can detect the failure of a server and failover automatically.
- Nodes can be added and removed for maintenance without effecting PostgreSQL.
- Can only manage 2 servers at most.
- Sends all commands to both databases.

Slony-I on the database servers and pgpool local on the web server

- All the features of Slony-I with auto fail over
- We monitor for server failure each database server does inserts into each other database to make sure they are alive.
- If slave can connect to web servers and can not connect to master, it makes promotes it self to master and knocks old master out of VLAN via SNMP.
- Helping to move ADXi to 99.999% availability

What does all this look like



Results

- This architecture has transferred
 - 522,000 Transactions
 - 815,000 Files
 - To 585,000 Receivers

Questions

- <http://www.mtu.net/~aaron>
- aaron@mtu.net
- MrPoke @ #postgresql on irc.freenode.org

The 7th Annual

O'REILLY® OPEN SOURCE CONVENTION

AUGUST 1-5 2005

