Speed Daemons
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Who am I?

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What Requirements?

Every Project Starts With Requirements
Technical Requirements

• Site Must Maintain 99.9% Uptime.

• Pages Load in 5-10 Seconds on Broadband Connections.

• Process User Registration in 15-20 Seconds on Broadband Connections.

• Must Support Between 5,000 and 50,000 Registered Users.

• Must Integrate With Existing Systems
Software Requirements

• Zope / Plone (Enterprise CMS)
• With RelStorage (MySQL Backed)
• Solr (Powered By Apache Lucene)
• Apache Tomcat Engine
Open Source Solutions!

Using FOSS To Solve The Puzzle
Web Proxy Chain

- Nginx - Web Server
- Light Weight
- Extremely Fast
- Varnish - Reverse Proxy Cache
- High Performance
- Extremely Flexible
- HAProxy - Load Balancer
- Session Aware
- Configurable
Application Servers

- Python 2.4
- Zope 2.10 - Python Application Server
- Plone 3.3.5 - Enterprise Content Management
- Apache Tomcat - Java Application Server
- Solr 1.4 - Enterprise Search Software
Database Servers

- MySQL 5.1 - Database Server
Network Technologies

Can’t Build a Cluster Without a Network
Network Technologies

- FreeBSD 8.1-Release AMD64
- PF - Enterprise Grade, FOSS Firewall
- CARP - Common Address Redundancy Protocol
- LAGG - Link Aggregation via LACP
- ifstated - Network Interface State Engine
Speed Daemons!
High Performance Clusters
Simplified Cluster

Proxy01
Simplified Cluster

Proxy01

Application01
Simplified Cluster

- Proxy01
- Application01
- Database01
Simplified Cluster

- Proxy01
- Application01
- Database01

- Nginx - 80/443
- Varnish - 3180
- HAProxy - 3380
Simplified Cluster

Proxy01
- Nginx - 80/443
- Varnish - 3180
- HAProxy - 3380

Application01
- Zope - 8080-8088
- Solr - 6080

Database01
- MySQL - 3306
Somebody Order a Double?
Let’s Kick This Cluster Into High Gear
Expanded Cluster

- Proxy01
- Application01
- Database01
- Proxy02
Expanded Cluster

- Proxy01
- Application01
- Database01
- Proxy02
- Application02
Expanded Cluster

Proxy01

Proxy02

Application01

Application02

Database01

Database02
Wire It Up

A Little Cable Never Hurt Anyone. Right?
Proxy Servers

Proxy01

Proxy02
Proxy Servers

• Each Proxy Server Has a Unique Public IP Address.
• Both Proxy Servers Share a Public IP Address via CARP
Proxy Servers

Proxy01

12.12.12.1

Proxy02

12.12.12.3

12.12.12.2

• `ifstated` - Runs On Both Servers
• Both Servers Constantly Monitor Each Other
Proxy Servers

- In the event of any service interruption if stated forces CARP to fail over making Proxy02 primary.
- This works bi-directionally.
Proxy Servers

- `12.12.12.1`
- `12.12.12.2`
- `12.12.12.3`

- pfsync Runs On Both Proxy Servers.
- This Keeps The Stateful Firewall In Sync Between The Two Servers.
Application Servers

Application01

Application02
Application Servers

- These Servers Only Have Private Addresses
- Zope Listens On All Addresses
- Solr is Configured To Listen On The Shared CARP Address
These Servers Share Solr Search Data

ifstated - Does Not Monitor These Servers
Database Servers

Database01

Database02
Database Servers

- These Servers Only Have Private Addresses
- MySQL Listens On All Addresses
- PF Is Used To Limit Access To MySQL
Database Servers

10.1.0.11  10.1.0.13  10.1.0.12

Database01  Database02

• `ifstated` - Runs Custom Scripts To Facilitate MySQL Master/Slave Replication State Changes
• Data Is Kept In Sync By MySQL Replication
Data Storage

Our Solutions For Storing and Shipping Data
Storage Solutions

- Hardware:
  - LSI MegaRaid - Raid Card Using JBOD
  - 2 OS Drives - Mirror
  - 2 Intel SSD Drives - Mirrored ZIL
  - 7 1TB Spindles - RaidZ2 (5TB)
Storage Solutions

- Configuration v1.0:
  - FreeBSD 8.0-Release
  - Several File Backed iSCSI Mounts
  - Numerous NFS Shares
  - Snapshots At 5m, 15m, 1h
  - Stor01 Primary
  - Stor02 Replication Target
• Problems Encountered:
  • iSCSI Performance Abysmal
  • Kernel Race Condition During Snapshot Replication
Storage Solutions

- Proxy01
- Application01
- Database01

- Proxy02
- Application02
- Database02

- Stor01
- Stor02

• Configuration v2.0:
  • OpenSolaris - 2008.11
  • Several File Backed iSCSI Mounts
  • Numerous NFS Shares
  • Snapshots At 5m, 15m, 1h
  • Stor01 Primary
  • Stor02 Replication Target
Storage Solutions

Future Configuration v3.0:
- FreeBSD 9.0-Release
- Several File Backed iSCSI Mounts
- Numerous NFS Shares
- Snapshots At 5m, 15m, 1h
- Stor01 Primary
- Stor02 Replication Target
Storage Solutions

- Future Configuration v3.0:
  - iet - iSCSI Target Replacement
  - zpool - v28
  - Kernel Race Conditions Fixed in 8.2
Does It Work?

A Quick Review
Quick Review

• Customer Requirements Have Been Met
• Over 1.5 Years Of Hosting 99.995% Uptime
• High Performance / High Availability Cluster Can Be Built Using All OpenSource Solutions
• FreeBSD Rocks!
Who is Six Feet Up?

- Web Development & Hosting Provider
- Focus on CMS, KMS, and Web Apps
- Located in Fortville, IN
- Major Player in Open Source Technologies such as:
  - Plone (CMS) - http://www.plone.org
  - KARL (KMS) - http://www.karlproject.org
Where Can You Find Us?

• HTTP://www.sixfeetup.com

• Twitter: @sixfeetup

• Conferences and Events
  • IndyPy - Indianapolis Meetup Group
  • PyCon - Atlanta, GA
  • BSDCan - Ottawa, Canada
  • KMWorld - Washington, DC
  • Plone Symposium East - State College, PA
  • Plone Conference 2011, San Francisco, CA
  • OSCON - Portland, OR
  • Ohio Linux Fest - Columbus, OH
Want To Work With Me?

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