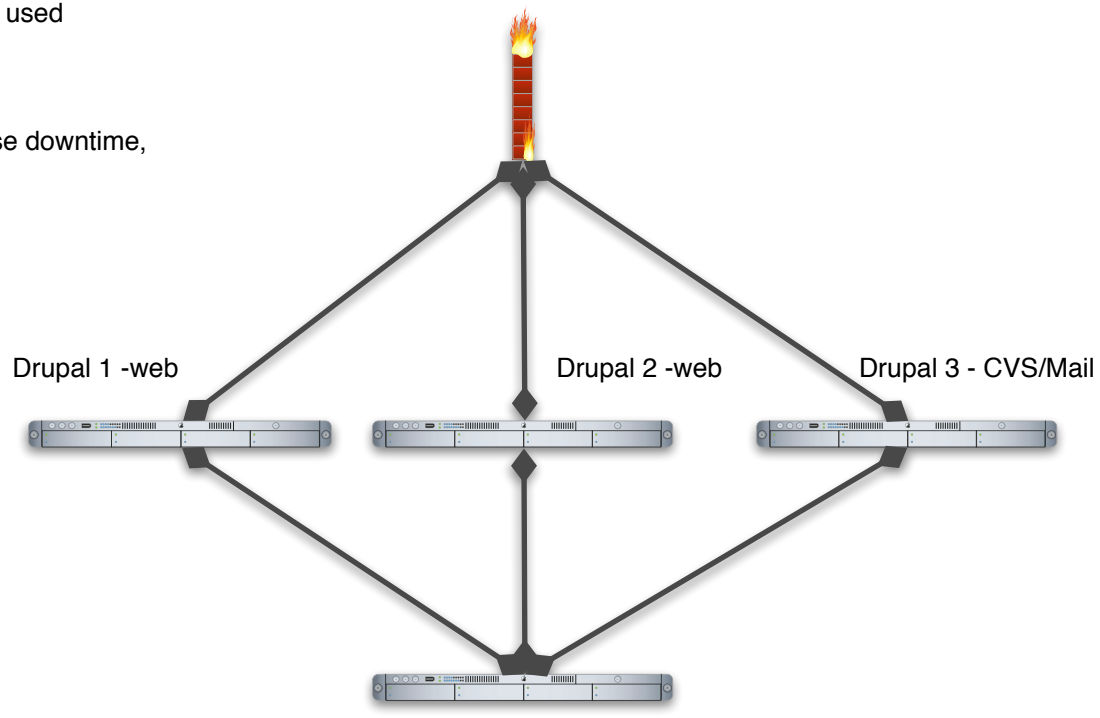
An overview of Drupal infrastructure and plans for future growth

prepared by Kieran Lal and Gerhard Killesreiter for the Drupal Association

Drupal.org Old Infrastructure

Problems:
Web servers not efficiently used
RAM upgrades needed
Database Bottleneck
Will not scale 250% /year
Performance, failures cause downtime, availability problems



Firewall uses round robin division of load. Does not check if web server died. Not efficient use of web serving capacity.

Load is not evenly distributed across servers. Not using maximum RAM capacity of servers.

Database is bottleneck in architecture. Need more RAM for MySQL. Could use second db slave for back-ups, high availability failover.

Drupal.org old infrastructure services

Problems:
Web servers not efficiently used
Database Bottleneck
Performance, failures cause downtime, availability problems

Firewall
Round Robin DNS
alternates queries between D1 & D2

Firewall uses round robin division of load. Does not check if web server died. Not efficient use of web serving capacity.

Drupal 1
Apache Web Server
PHP 4.4
APC PHP Cache
NFS client files dir
Rsync php drupal.org,.be

Drupal 2
Apache Web Server
PHP 4.4
APC PHP Cache
NFS client files dir
Rsync php drupal.org,.be
groups.d.o, scratch.d.o

Drupal 3
CVS
Mail
FTP
PHP 5.2.2

Load is not evenly distributed across servers. Not using maximum RAM capacity of servers.

Drupal DB
MySQL 4.0.x
NFS server

Database is bottleneck in architecture. Need more RAM for MySQL. Could use second db slave for back-ups, high availability failover.

Drupal.org Old Infrastructure Hardware

Drupal 1
Dell Poweredge 1850
RAM: 2 x 1 GB DDR-2 400 (6 slots total)
Storage: 2 x 73 GB U230 SCSI drives (RAID1)
Processor: 2 x Intel Xeon
Motherboard:
Dual power supplies

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http://www.dell.com/content/products/productdetails.aspx/pedge_1850

Dell's purchased in fundraising drive
http://drupal.org/node/26707

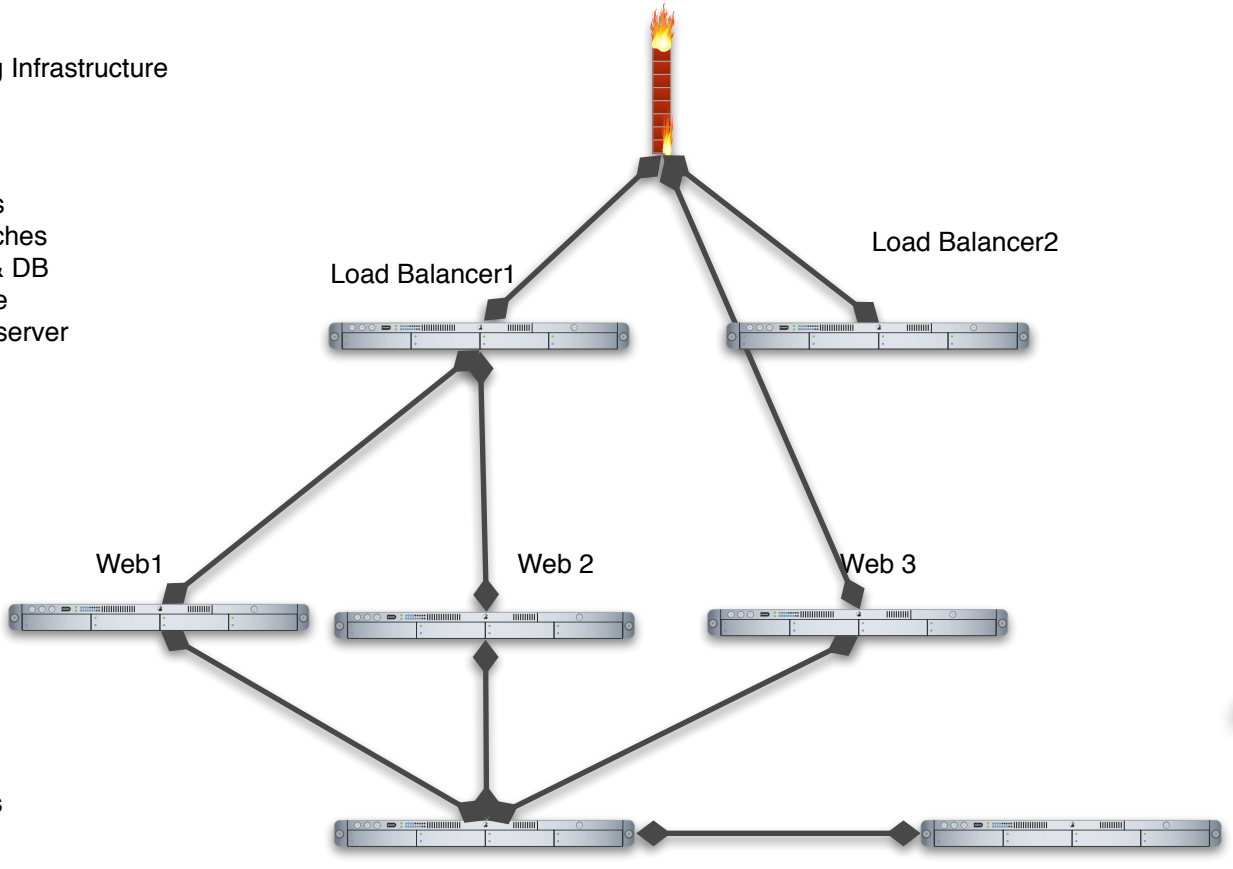
Drupal Database
SUN FIRE V20Z
RAM: 2GB
Storage: 2 x 73 GB U230 SCSI drives (RAID1)
Processor: 2 x AMD Opteron
Motherboard:

Donated by Sun Microsystems

http://www.sun.com/servers/entry/v20z/specs.jsp

Drupal.org Infrastructure

Improvements:
Load Balancers
Web server caches
RAM for Web & DB
Database Slave
Managed Mail server



RAM Upgrades
Web Server
Drupal DB

Load balancers provide higher availability and more efficient use of hardware, hardware growth.

Three web nodes allow for more web page serving capacity, more memory sharing, re-use of old DB server

More powerful DB server allows for more data growth, faster searching. Master-slave allows for higher availability if we have a hardware failure. Read only database could help scale.

Using professional managed mail server reduces volunteer admin overhead, frees up server resources

Drupal.org new infrastructure services

Improvements:
Load balancers more efficient, HA
Drupal DBs HA, data integrity

Firewall
MySQL 4.0.x

Load Balancer 1
Linux Virtual Server
High Availability

Load Balancer 2
Linux Virtual Server
High Availabiity

Load balancers evenly distribute work load and can survive a hardware failure.

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Rsync PHP *.drupal.*
CVS
FTP

Load is distributed evenly. More Drupal web properties can be supported.

Drupal DB1
MySQL 4.0.x
MySQL master
NFS server

Drupal DB2
MySQL 4.0.x
MySQL slave
MySQL backups

Database replication allows for High Availability, hardware failure, backups, less downtime for maintenance.

OSUOSL Mail
Mail

Professionally managed mail reduces service needed to be run. Free's hardware for web serving.

Drupal.org new infrastructure hardware

Load Balancer 1
Unknown server
RAM:
Storage:
Processor:
Motherboard:

Load Balancer 2
Unknown server
RAM:
Storage:
Processor:
Motherboard:

Load balancers donated by OSUOSL

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Drupal 2
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Drupal Database Master
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Motherboard:

Donated by Sun Microsystems

Drupal Database Slave
HP unknown
RAM:
Storage:
Processor:
Motherboard:

Loaned by OSUOSL

http://www.sun.com/servers/entry/v20z/specs.jsp

Mail services to be donated by OSUOSL

Drupal.org future infrastructure

Improvements:
Memory Cache
Read Only DBs
CVS Server
Development Server

Load Balancer1

Load Balancer2

High Availability and efficient web serving

Load to Web Network

Web1

Web 2

Web 3

Web N

Web N +1

Load balancers allow horizontal web server scaling to alive web servers. Cache may reduced load on web servers serving pages from memory. Memcache allows memory pooling so more content can be served from memory.

Web to DB Network

Drupal DB
SunFire VZ40
MySQL Master

DrupalDB2
MySQL Slave

DrupalDB N
MySQL Slave

DrupalDB N+1
MySQL Slave

Most web requests just want information and don't need to update* or delete information. By directing read only requests to read only databases we can scale databases horizontally.

CVS & Tools Server

Development Server

OSUOSL Mail Server

* Authenticated users require a session update which could be moved to memory with memcache

Drupal.org new infrastructure services

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Drupal DBs HA, data integrity

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MySQL read only*

Drupal DBN
MySQL 4.0.x
MySQL slave
MySQL read only*

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Drupal Development
Virtual DLAMP instances
Unit Testing
Performance Testing
Security devel services
Logging/Analytics

Drupal CVS
NFS client files dir
Rsync PHP *.drupal.*
Drupal Distributions
Drupal Tools

OSUOSL Mail
Mail

Dedicated hardware for unit, developer, security, performance testing. CVS server free's D3 for web serving.

*In order to scale databases horizontally with read only nodes, authenticated sessions must be moved to MemCache

Drupal infrastructure future hardware

Drupal Association fundraising is necessary and coordination with OSUOSL

Software development, software solutions, and virtualization services may make future hardware growth unnecessary

Additional Web Servers
more servers can pool more RAM for Memcache pool

Additional Databases slaves

Remote MySQL database slave

Dedicated CVS Server

Dedicated Development Server