

An overview of Drupal infrastructure and plans for future growth

prepared by Kieran Lal for the Drupal Association

Recommendations

More system administration resources, tuning
12GB Database RAM growth
42GB Web server RAM growth
Virtualization may support more dedicated services

Drupal.org old infrastructure services

Problems:

Web servers not efficiently used

Database Bottleneck

Performance, failures cause downtime,
availability problems

Firewall

Round Robin DNS

alternates requests 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

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.

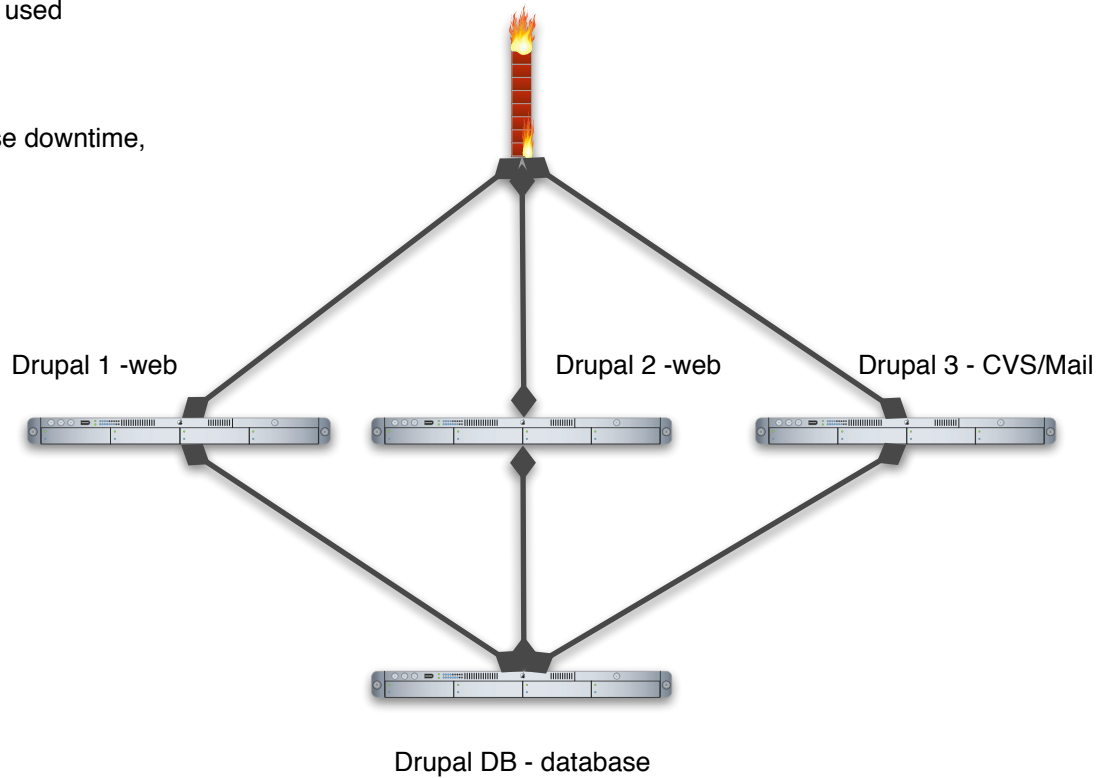
OSUOSL

FTP

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 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

Drupal 2
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

Drupal 3
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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: 4 x 1 GB DDR-2 400 RAM
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>

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

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CVS

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

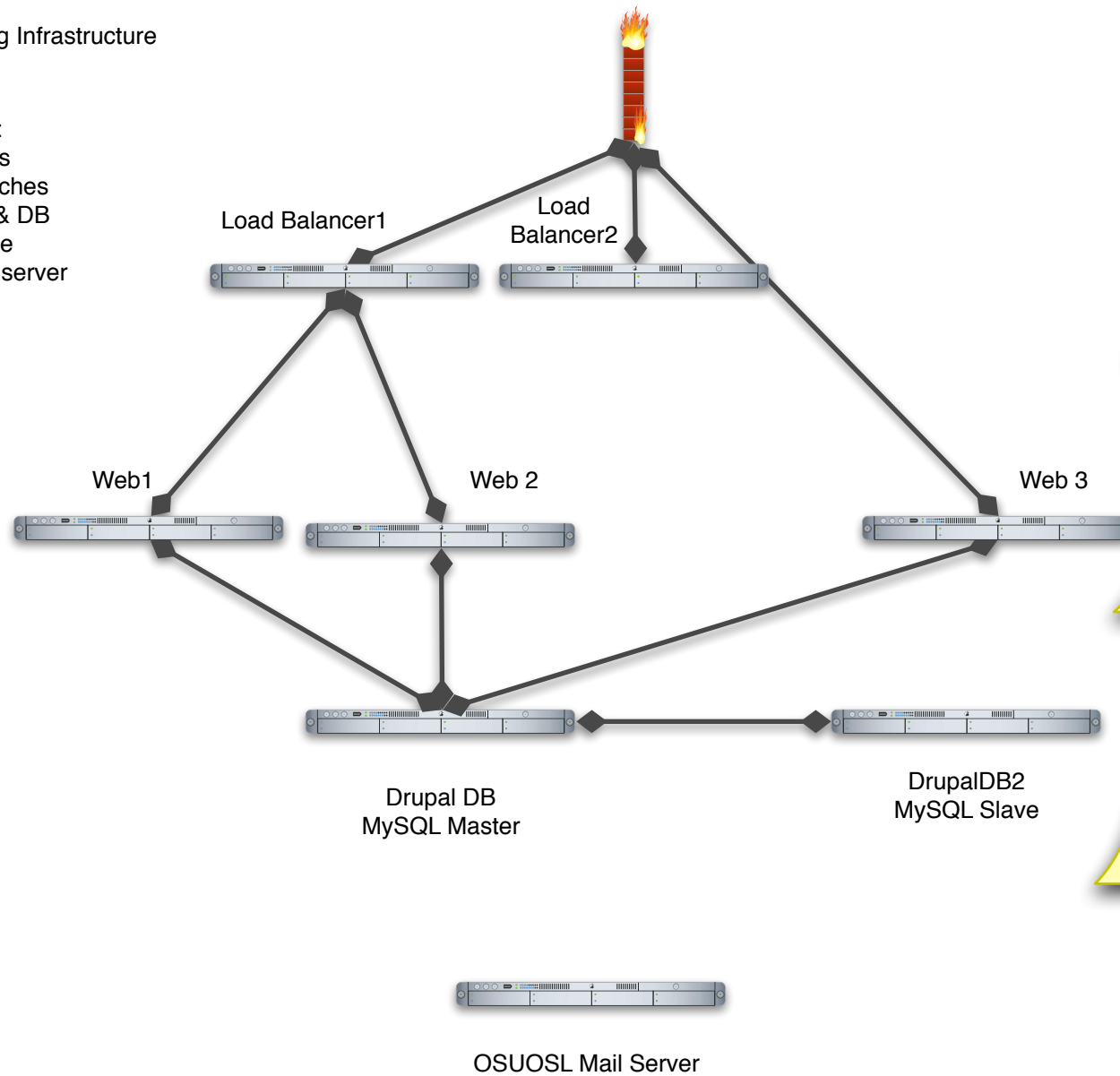
Database replication allows for High Availability, hardware failure, backups, less downtime for maintenance.

OSUOSL Mail
Mail

OSUOSL FTP
FTP

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

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



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.

Managed mail server reduces volunteer admin overhead, frees up server resources

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 Database Master
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Processor: 2 x AMD Opteron
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

Firewall

Improvements:

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

Load Balancer 1

Linux Virtual Server
High Availability
Squid Cache

Load Balancer 2

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MemCache Pool*

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Drupal N

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MySQL master
NFS server

Drupal DB2

MySQL 4.0.x
MySQL slave
MySQL backups

Drupal DB3

MySQL 4.0.x
MySQL slave
MySQL read only*

Drupal DBN

MySQL 4.0.x
MySQL slave
MySQL read only*

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

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

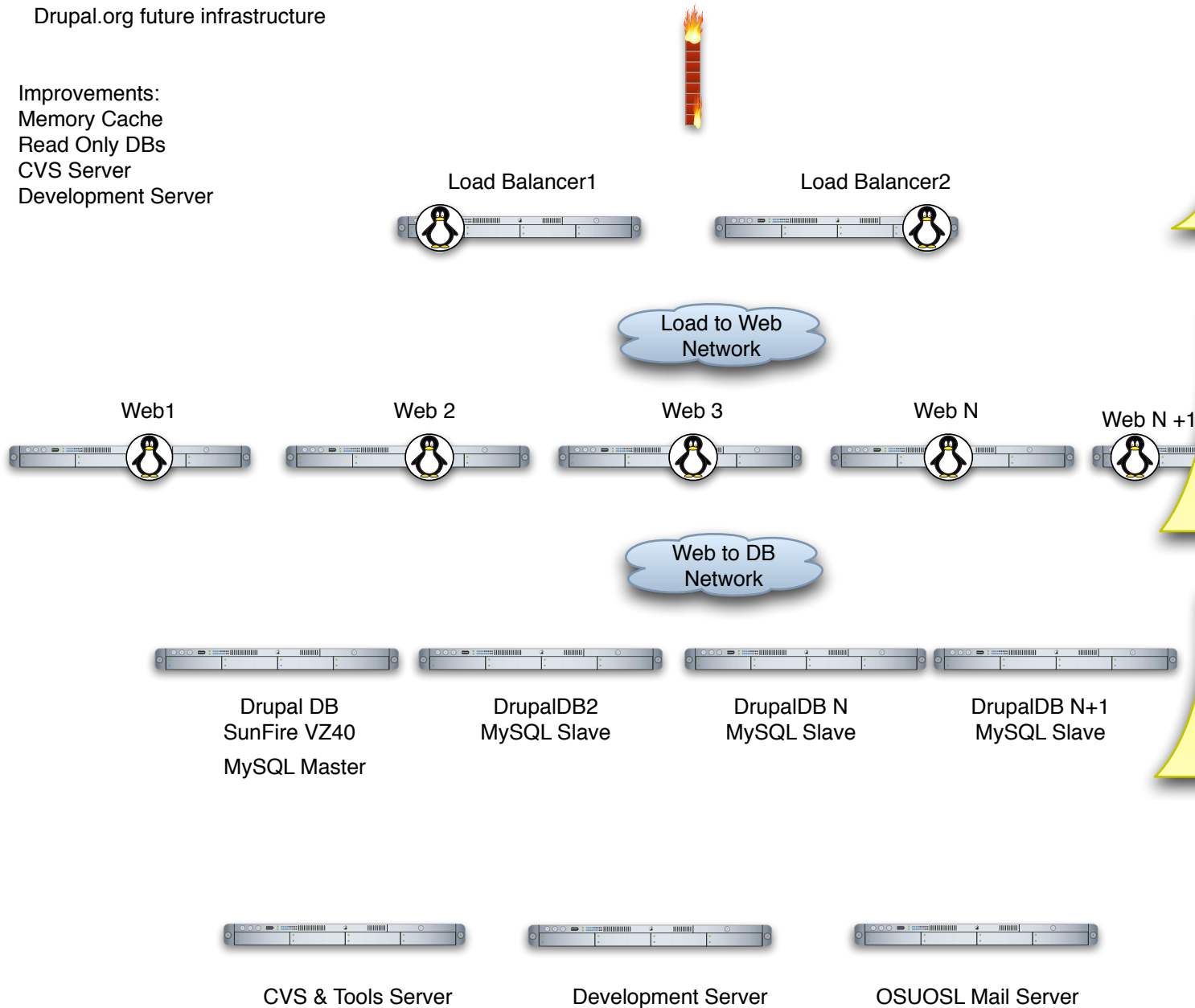
Mail

Dedicated servers 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.org future infrastructure

Improvements:
Memory Cache
Read Only DBs
CVS Server
Development Server



High Availability and efficient web serving

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.

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.

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

Web Servers
Support up to 16GB RAM each

Additional Web Servers

Drupal Association
fundraising is necessary
and coordination with
OSUOSL

Database master
Support up to 16GB RAM

MySQL database slave
Additional slaves servers

Dedicated CVS Server

Dedicated Development Server

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