A high level overview of Wikimedia Operations

Presented by: Rob Halsell

Wikimania 2009 - Buenos Aires, Argentina
August 26-28, 2009
• Pretty much everyone does some form of operations.
• 16 shell users, 10 of them with root.
• We are slowly moving into distinct development and operations roles, however we will probably never move into fully dev and ops roles only.
Datacenters

- Wikimedia currently actively occupies 4 different sites.
  - Two are in Amsterdam, Netherlands.
  - Two are in Tampa, FL, USA.
- New Primary DC soon in Ashburn, Virginia, USA.
DC Deployments

• The initial servers were in Tampa because that is where Jimmy lived.
• Tampa is not ideal for network transit or routing.
• Hurricanes!
• With new installs being mainly lights out manageable, on-site work is significantly reduced.
Overview

- Currently occupy two datacenters (PMTPA & SDTPA.)
- They are in the same building ;_;
- Each site has a router, and all traffic is routed out via PMTPA.
- SDTPA was deployed due to power and cooling restrictions in PMTPA.
Amsterdam DC Overview

- We have two locations in Amsterdam (KNAMS & ESAMS).
- KNAMS is strictly for peering and transit.
- ESAMS houses servers and associated kit.
- The majority of transit costs are donated via sponsorship and peering!
- We pay for some cross-connects and our fiber between KNAMS & ESAMS.
Daily Operations

- Operations is NOT software development.
- Site Requests: extensions, groups, configuration changes requiring shell access.
- Repair & Upgrade: broken hardware replacement.
- Deployment: new hardware allocation and setup.
- Tweaking: Adding new management tools, software...
- Inventory Management

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Site Requests

- Primarily handled in Bugzilla.
- bugzilla.wikimedia.org
- Sometimes handled by poking Rob in IRC and giving him the Bugzilla Ticket #.
- Changes such as logo, user groups, permissions for group assignments, extensions....
- Some things still get delayed, but overall more and more tickets are handled faster and faster.

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Repairs

- Most new servers are either Dell or Sun
- This makes ease of deployment and RMA repairs much easier.
- Repairs include any physical required access to the servers, such as hard disk replacement, memory upgrades, and the like.
- All new servers have remote management capabilities, so on-site hands are not required for day to day operations.
Deployment

• New deployments are FUN!
• They are also very time consuming to do it properly.
  • Designing takes time.
  • Implementing takes even more time.
• We label everything!
• Regular Occurrence: Faster hardware for demands.
Tweaking

- This includes new software testing for operations use.
- Testing internal software development.
- Changing settings in things such as OTRS or Bugzilla.
- Updating blog software and the like...

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Inventory Management

- We currently use Racktables to keep track of all our servers.
- We are also developing our own extensions to do this within Mediawiki. \o/
- If any extension developers want to work on this, we welcome it!
- Yearly audits require an accurate accounting for all hardware, software, and spending.
Cool Numbers

- Total # of servers:
- Requests per second at peak: 75,000 requests
- Comscore rates Wikipedia as #5 most visited site.
Traditional Web Server

- Two major components: Apache and MySQL
Wikimedia Web Server

• Squid > Apache > Memcached > MySQL

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Squid

• Caching Servers
• Currently deployed in both Tampa and Amsterdam
• Caching stores info so requested pages do not need to be recompiled by Apache.
Apache

- Does the heavy lifting.
- Currently deployed only in Tampa
- When a page changes, Apache pulls data from Memcached and MySQL to render the page for viewing.
Memcached

- Run on apache servers.
- Stores recently fetched database data in resident memory.
- No need to hit the database and pull lots of data if its in memory.
• Run out of Tampa datacenters.
• Sites are broken into Database clusters.
  • s1 for English Wikipedia, s2 for the 19 other largest wikis, s3 & s4 for remaining 750+ wikis
• Each cluster has a master and multiple replication servers.
Software

- Ubuntu 8.04
- We run our own netboot/PXE server, as well as our own apt-repository.
- We create some custom packages for ease of installation (our apache and squid servers are very simple to reinstall)
More Software

- Apache 2.2
- PHP5
- Memcached 1.2.8
- Squid Version: 2.7

Load balancing for squid and apache is handled on one of the 4 LVS servers. Each server runs pybal, which is written by our own Mark Bergsma.
MySQL

- There are multiple database roles within the cluster.
- Primary Databases contain revision data for every page and article of the projects.
- External Store databases contain the text data for every revision.
- Images are stored on an NFS server and apaches access it. Basically this stinks but we don’t have a better way... yet. (Not really MySQL related)
Neat Operations Tools

- Nagios
- Ganglia
- Torrus
- Racktables
- Mediawiki ;]
Nagios

- Shows all servers, and the services they are running.
- Shows downtime of various services.
- nagios.wikimedia.org

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Ganglia

- Distributed monitoring software, graphing, and reviewing tool for servers.
- Shows us how hard the servers are working.
- ganglia.wikimedia.org

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• SNMP monitoring and graphing software.
• We capture and display network usage, power and temperatures in our datacenters, squid performance, and other items.
• torrus.wikimedia.org

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Racktables

- No URL needed, its locked and no one can login unless we employ you ;]
- Keeps track of every server, purchase price, date of purchase, warranty information, location, etc...

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Wikitech (Mediawiki)

- Mediawiki Installation that we use to document setup, maintenance, recovery, etc...
- Exists outside the cluster, so if the cluster goes down, we still have notes on how to fix it.
- wikitech.wikimedia.org

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In Closing...

- Thanks for listening!
- Wikimania Rocks!
- Buenos Aires Rocks!
- Questions?
Questions from Presentation

• What is the hit rate on the caching servers?
• 98% on images, 90-95% on text.
• How much is WMF spending on new servers and associated kit this year?
• Not counting the new DC deployment, we will spend 1M USD just keeping up with growth trends (both use and software feature growth.)
• There were a number of others, I just do not recall them all, sorry =/