Linux and Configuration Support Section

Manuel GUIJARRO

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Section Members

BARRIENTOS ARIAS, Ignacio
BOUTSELIS, Aristeidis
HENCZ, Akos
LOBATO PARDAVILA, Lorena
MORENO GARCIA, David
OLEVEY, Thomas
POLOK, Jaroslaw
REGUERO, Ignacio
SCHWICKERATH, Ulrich
TOTEVA, Zhechka
TRAYLEN, Stephen Matthew
GUIJARRO, Juan Manuel
LCS Section Mandate

- Provide Linux Support and Configuration Management Infrastructure for CERN computing resources
- Taking care of 7 Functional Elements:
  - Linux OS
  - IT RPM building system
  - LXPLUS
  - Configuration Management
  - DNS Load Balancing
  - ElasticSearch
  - Acron
Linux OS

Provide a stable and long support version of the Linux operating system:

- Linux CERN 5, 6 and CERN CentOS 7
  - Strong community engagement working well
- RHEL 5, 6, 7 and RHEV (+600 licenses)
- linuxsoft.cern.ch (8 servers): Packages distribution server / aims2 / koji
- Over 1000 SNOW tickets in 2015
Linux OS (2016)

- Refactoring AIMS2 to support UEFI standard
- Quattor retirement to Masterless Puppet on the desktop
- Container and Docker support into production
- ARM64 pilot
- Prepare phase-out of SLC5/ Investigate CC8
IT RPM building system

- Koji based service that builds and distributes RPMs for the IT Agile Infrastructure Project.
- From source RPMs
- From Git
- From GitLab
- Closely related with Linux OS and CM FEs
IT RPM building system (2016)

- Koji 2.0
- Rewrite
- Namespace Support
- LDAP Integration
- More than one pkg version for external repos
- ....and more
LXPLUS

Central Linux-based Public Logon User Service.

- 80 VMs hosting sessions for 2000 users/day:
- 25 users/VM; 60 sessions/VM. Limits per user;
- Fair share CPU/I-O; Limits on Memory; Service Metrics
LXPLUS (2016)

- Collect and process per user accounting information from CGroups counters. Collect more Plus wide usage information.
- Investigate use of containers.
- Develop LXPLUS Puppet module to facilitate reuse of configuration in bi/inter/plus hostgroup. Eg. RootaaS
- Further deploy CC7 based service.
- Review Plus User Documentation (GitBook)
Configuration Management

- Provides development, support and maintenance of the range of tools and infrastructure needed to manage the configuration of machines hosted in the CERN Computer Centre
- + 600 SNOW tickets in 2015
Configuration Management

Linux and Configuration Support Section
CM Challenges

- Scaling
- Than 20K agents (physical and virtual)
  - 55 octocore Puppet masters (not 100% used; mco peaks)
- Administratively distinct admins that formally don't trust each other
- 207 environments
- 177 hostgroups (or "services")
- 312 modules (CERN and upstream)
Configuration Management

1. **Facts**
The node sends normalized data about itself to the Puppet Master.

2. **Catalog**
Puppet uses the Facts to compile a Catalog that specifies how the node should be configured.

3. **Report**
The node reports back to Puppet indicating the configuration is complete, which is visible in the Puppet Dashboard.

4. **Report Collector**
Puppet’s open API can also send data to third party tools.
CM (2016)

- Resources in Commercial Clouds
  - Initially virtual Worker Nodes
  - Later on Baremetal

- Upgrades
  - Puppet 4
  - Puppet DB 3
  - Foreman 1.9
  - Mcollective 2.8.7

- Migration to GitLab
- Service Splitting
- More Automation
- Finish up move to CC7
DNS Load Balancing

Load balance requests across several machines running the same service by using DNS.

- 394 LB aliased defined. Per alias history dashboards.
- Roger State aware
- Lemon Metrics
- User-defined scripts
- Policies
DNS Load Balancing

- New LBaaS self-service portal with fully automated alias CRUD (create/read/update/delete).

- Upgrade to CC7
Acron Service

Enables users to create crontab entries for Kerberos-authenticated cron jobs.

- Execution on a user-specified target machine, equipped with fresh Kerberos credentials of standard lifetime
- 100 jobs/day; 800 users; 7000 entries
- Dedicated LXPLUS-ACRON subcluster
Acron Service (2016)

- Just being Puppetised
- Finalise handover
- Understand what it is really used for
- Possible improvements:
  - Use constrained delegation instead of fully privileged KDC account to generate user tickets
  - Review the use of arc and replace it with SSH
  - Move the service to VMs (HWD about to expire)
ElasticSearch

- Consolidate proliferation of ES instances in a central service
- Being designed as I speak....
- See Ulrich’s presentation
Thanks !!!

- Questions?
- Suggestions?
- Comments?