DevOps Ignition to reach Galaxy continuous integration

Olivier Inizan, Mikael Loaec, Jonathan Kreplak and Hadi Quesneville.

INRA URGI,
RD 10 route de Saint Cyr
78026 Versailles Cedex
Mikael Loaec

Olivier Inizan
DevOps ignition ...

DevOps → Galaxy

URGI
DevOps

- « The DevOps is a software development movement that stresses a close relationship between software developers and netsys admins. »
- « The goal is to enhance and speed up the cycle of software production from the creation to the delivery to final users, with a special focus on quick resolution of users issues. »
DevOps

• Usually a **wall** between dev teams and operational (netsys) teams

> how to break the wall?

I suggest a new strategy, R2. Let the wookie win.

Grrr..
3 hammers to break the wall

- **Collaboration**: 
  - A collaborative approach: work together, talk together

- **Infrastructure as a code**: 
  - You manage your infrastructure as you manage a piece of code
  - Ex: creating a new image via a script/api execution

- **Continuous delivery**
  - «Continuous Delivery is a software development discipline where you build software in such a way that the software can be released to production at any time.» Martin Fowler.
The mission ...

- Objective: put quickly new releases in production
  - Tools, workflows
  - New Galaxy releases
- The problem:
  - Big differences between dev env and prod env
  - Galaxy instance difficult to update
  - Only netsys admin team can put in production
Design a dev workflow

- Virtualization tech are available

- A model for dev workflow:

Galaxy up to date release

Tools / Workflows integrations

Toolbox n° 1

Toolbox n° 2

Wkfl n°1

Wkfl n°2 v.m.

Release candidate

v.m. PROD-RC

Production

v.m. PROD
Fix the problems

• Differences dev/prod:
  – Dev image becomes production image

• Update problem:
  – A template with a fresh version of Galaxy

• Only netsys admin ...:
  – Ask the developers to “execute” the workflow!
Existing resources: the crew

Software developers team:

(i) working on TEs and mobile elements detection + workflows NGS

(ii) and organize itself according Agile:
Existing resources: the ship

« You’ve never heard of the Millennium Falcon? ... It’s the ship that made the Kessel run in less than 12 parsecs » H.S.

HPC Cluster:
Nodes: 78 Cores: 888
Powered by Rocks Cluster Linux and Sun Grid Engine

Netapp powered by DataOnTap
Cluster-Mode
Storage Capacity: 150To

Virtualization Server powered by Proxmox (KVM)
Mission stages

• Stage 1:
  - Build a VM image with one of URGI's workflow inside
  - Send a small crew for exploration: 1 netsys + 1 dev
  - One month later a prototype:
    • A machine image
    • A template for image creation

• Stage 2:
  - Improve the prototype with all URGI's workflows and toolboxes
  - All the crew for this mission
  - 3 months later: a new instance in production!
Highlight (i)

- template construction:
  - too huge for a single man (netsys admin)
  - skills transferred to the team …

Collaboration
Highlight (ii)

VM1
CentOS
+ Gridengine
+ Postgres
+ python virtualenv

VM2

VM3

VM...

Galaxy

Tools

Libraries and binaries
/share/apps

User data
files, tmp_files,
jobs_working directory

Jobs submission

Submission proxy node

Cluster compute nodes

Infrastructure a as code

CentOS

Kickstart file

+ 

Disk

Hard drives

Mount point

Jobs submission

Tools

Libraries and binaries
/share/apps

User data
files, tmp_files,
jobs_working directory

Infrastructure a as code
Summary

- Collaboration
- Infrastructure as a code
- Continuous Delivery
Summary

- Collaboration
- Infrastructure as a code
- Continuous Delivery
Summary

- Collaboration
  - ✔
- Infrastructure as a code
- Continuous Delivery
  - ❌
PXE

VM1
CentOS + python virtualenv

Tools

Libraries and binaries /share/apps

User data files, tmp_files, jobs_working directory

Cluster Nodes

Gridengine

Jobs submission

Infrastructure as code
Summary

- Collaboration ✔
- Infrastructure as a code 🔧
- Continuous Delivery ☐
Continuous Delivery applied to our code ...

- Today:
  - Source code repository: Tests: automatic
  - Packaging: manual
  - Packages: Tests: manual
  - Integration: manual
  - Tests: manual
Continuous Delivery applied to our code ...

- **Tomorrow:**
  - Source code repository
  - Packaging: automatic
  - Packages
  - Integration: automatic
  - Tests: automatic
  - Galaxy
  - Tests: automatic
A New Team is born ...

- Jonathan Kreplak
- Véronique Jamilloux
- Françoise Alfama
- Nicolas Lapalu
- Mark Moisette
- Claire Viseux
- Tina Alaeitabar
- Timothée Chaumier
- Hadi Quesneville
Thank you for your attention!

« May the Force be with you! »