sNow! New Features and Roadmap

Jordi Blasco (HPCNow!)
Agenda

1. About sNow!
   - What it Provides
   - How it Works

2. New Features & Roadmap
   - Key New Features
   - Cloud Bursting
   - Big Data & HPDA
   - Extensions

3. How to contribute
   - Get involved in beta-test program
   - Feedback and new feature request
   - Development contribution

4. Questions & Survey

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About sNow!

Jordi Blasco (HPCNow!)
sNow! is a suite based on Open Source software designed to manage HPC infrastructures. sNow! is an easy to use and it installs software that provides all the necessary tools to deploy and operate a computing cluster such as OS, monitoring tools, cluster filesystem, batch queue system or parallel and mathematical libraries.
Deploy & Cloning System

sNow! uses native tools to deploy Linux distributions (Debian, SLES, RHEL and CentOS) and System Imager for cloning via torrent.

Configuration Manager

sNow! relies on CFEngine for configuration management which includes pre-build tuned OS setup for each role and usage HPC, HTC and Big Data (HPDA).
About sNow!

Critical Services

All critical services are **isolated** in VMs (Para-virtualization) under **HA + LB** layer.

Development & Scientific Software

sNow! relies on **EasyBuild** for building development and scientific software.
Strengths

**Focused on Performance & Efficiency**

All the software is tuned for the HPC solution (architecture, hardware setup, etc.)

**Designed for Mission Critical Environments**

sNow! is bullet-proof by design and it also provides strategies to minimize downtime.

**Designed for Large Scale Systems**

sNow! can easily scale by adding more physical nodes to allocate more critical services.
**Strengths**

**Enhances Security & Privacy in HPC Environments**
sNow! includes network segmentation capabilities and proactive security on DMZ services.

**Minimizes time for production**
sNow! minimizes the efforts on building, designing, managing and administrating HPC facilities.

**Manages Production, Pre-Production and Testing Environment**
sNow! allows to migrate new features or software updates from testing or pre-production environment to production.
Is sNow! Suitable for Dummies?
About sNow!

New Features & Roadmap

How to contribute

Questions & Survey
sNow! requires more than Click and Double-Click “skills” :-}
About sNow!

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How it Works

DMZ switch Ly2 -> CFS switch Ly2 -> Cluster switch Ly2

Scheduler
login
LDAP
monitor
syslog
admin
mysql
deploy
proxy
FlexLM

eth0

v1an01
v1an02
v1an03
v1an04
v1an05
v1an06
v1an07
v1an08
v1an10

STONITH (IPMI)
Heartbeat2
Pacemaker
Corosync

High Availability

All VMs based on NFS_ROOT

External fault-tolerant CFS or internal replicated FS (i.e. GlusterFS+AFR or DRBD)

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About sNow!

CLI

The Command Line Interface allows to control complex operations with simple instructions.

EasyBuild integration

EasyBuild is a software build and installation framework that allows you to manage (scientific) software on HPC systems in an efficient way.

Configuration Manager

We decided in favor of CFEngine due to performance reasons. CFEngine has a dramatically small memory footprint, it runs really fast and it has few dependencies.
sNow! Roadmap
sNow! Roadmap

Roadmap 2015

1Q 2015
- Cloud Bursting (Native)
- OSSEC + pfSense Integration
- Open Code via BitBucket
- User Guide
- Data Transfer Network
- Issue Tracking (Service)
- Datasheet

2Q 2015
- Remote Backup (Service)
- Big Data Extension

3Q 2015
- sNow! Dashboard / Web Interface
- ARM "partial" Support

4Q 2015

1Q 2016

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Cloud Bursting

Extending Compute Capacity on the Cloud

With Cloud Bursting, sNow! is able to extend the compute capacity in order to cover pics of need.

Native Cloud Bursting

sNow! uses bare-metal (IaaS) in order to avoid performance issues and to improve privacy control.

Badged Aware Scheduling

If the local cluster has enough capacity to run the jobs allocated in the cloud, sNow! will try to migrate the jobs back to the local facility. Obviously, it relies on application-level checkpointing.
## Big Data & HPDA Extensions

### Complete Data Analytics Stack Integration by 3Q 2015

#### Data Processing

**Spark, Spark Streaming, MLbase, Shark, HIVE, Hadoop, Pig, Storm,**

#### Data Mgmt

**Cassandra, HDFS, Tachyon,**

#### Resource Mgmt

**Mesos**
Get involved in beta-test program

The code will be public available via BitBucket on 2Q 2015, but are providing limited access under beta-test program agreement.

Feedback and new feature request

Your feedback and suggestions are more than welcome! Please, share with us what is missing.
How to contribute

Development contribution

1. Register to BitBucket
2. Clone **snow-tools** and **snow-configspace**
   - 1. https://bitbucket.org/hpcnow/snow-tools
3. Upload your contributions
4. Create a Pull Request
Questions & Survey