Dynamic PROOF clusters with PoD. Status report and future plans

Anar Manafov, GSI Darmstadt

ALICE offline week,
2010-07-08

What is PoD?

<u>PROOF on Demand</u> (PoD) is a tool-set, which sets up a PROOF cluster on any resource management system.

***

PoD is NOT a substitution of PROOF!
It is rather a helper tool for PROOF.
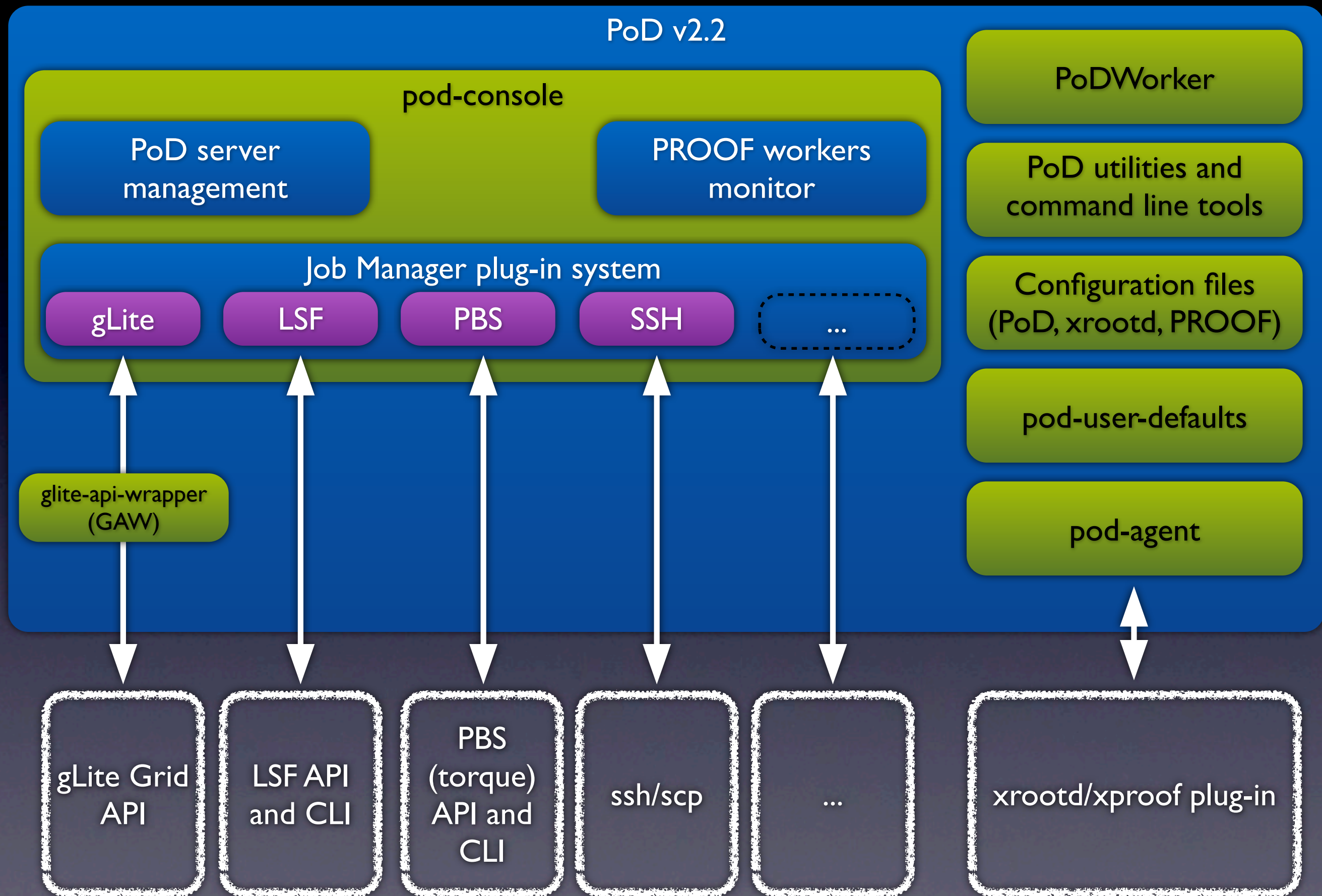
***

"static"/pre-installed PROOF cluster

- One user can disturb other users.

- From time to time admin. interventions are needed.

- There is only one ROOT/xrootd version for PROOF services.

- There is a master node limitation.

3

PROOF via PoD

User

- can entirely control his/her dynamic cluster,

- can setup and use it on demand,

- can dynamically change an amount of workers,

- can select a preferable master host,

- doesn't need admins to take an action,

- doesn't disturb other users,

- is free to choose a ROOT version for services.

PoD v2.2

pod-console

PoD server management

PROOF workers monitor

Job Manager plug-in system

gLite LSF PBS SSH ...

glite-api-wrapper (GAW)

PoDWorker

PoD utilities and command line tools

Configuration files (PoD, xrootd, PROOF)

pod-user-defaults

pod-agent

gLite Grid API

LSF API and CLI

PBS (torque) API and CLI

ssh/scp

...

xrootd/xproof plug-in

5

Key features

- Easy to use

- GUI & Command-line

- Different job managers (gLite, LSF, PBS, SSH)

- Multiuser/-core environment

- Native PROOF connections

- Packet-forwarding

- User defaults - configuration

6

Current status

v2.1.4 has been released (2010-05-26)

v2.2 - under development

As the product matures, the support of previous versions is extending...

7

Improved build-system

- The project has been consolidated and cmake is now the only build system of it.

- A much easier/smarter installation procedure has been released.

- Implemented fully automated builds of releases, nightly and specific binary packages.

- Since years the buildbot serves as a continues integration system.

New version numbers

Old:

maintained manually in VCS and in build config. files.

Old schema: "vX.Y.Z" (X - major, Y - minor, Z - patch).

New:

only set a tag ("v.X.Y") in VCS (we use Git) and the rest is done automatically, using Git canonical ver. numbers.

"vX.Y" - for a release build

"vX.Y.NN.SSSS" (vX.Y - the latest tag, NN - a number of commits since the tag, and SSSS - object's hash) - for any patch and nightly.

CLI

- pod-server

- pod-info

- pod-submit

- pod-user-defaults

- pod-prep-worker

CLI

- pod-server

- pod-info

- pod-submit

- pod-user-defaults

- pod-prep-worker

Example
$ pod-server start *(status)*
$ pod-submit -r lsf -q queue -n 150
$ pod-info -n *(-l)*
$ pod-server stop

CLI

- pod-server

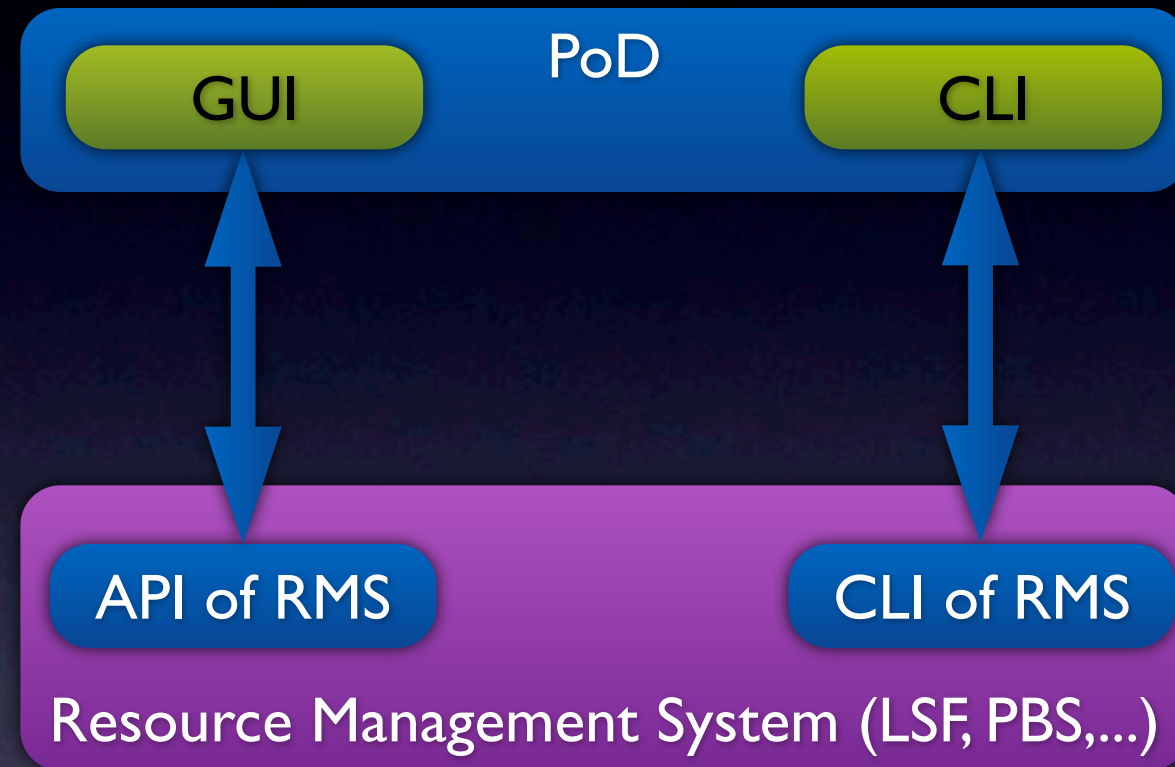- pod-info

- pod-submit

- pod-user-defaults

- pod-prep-worker

Example
$ pod-server start *(status)*
$ pod-submit -r lsf -q queue -n 150
$ pod-info -n *(-l)*
$ pod-server stop

can be used in the PROOF script

TProof::Open(gSystem->GetFromPipe("pod-info -c"))

GUI vs CLI

This strategy helps to be more flexible and better integrated into different setups and environments.

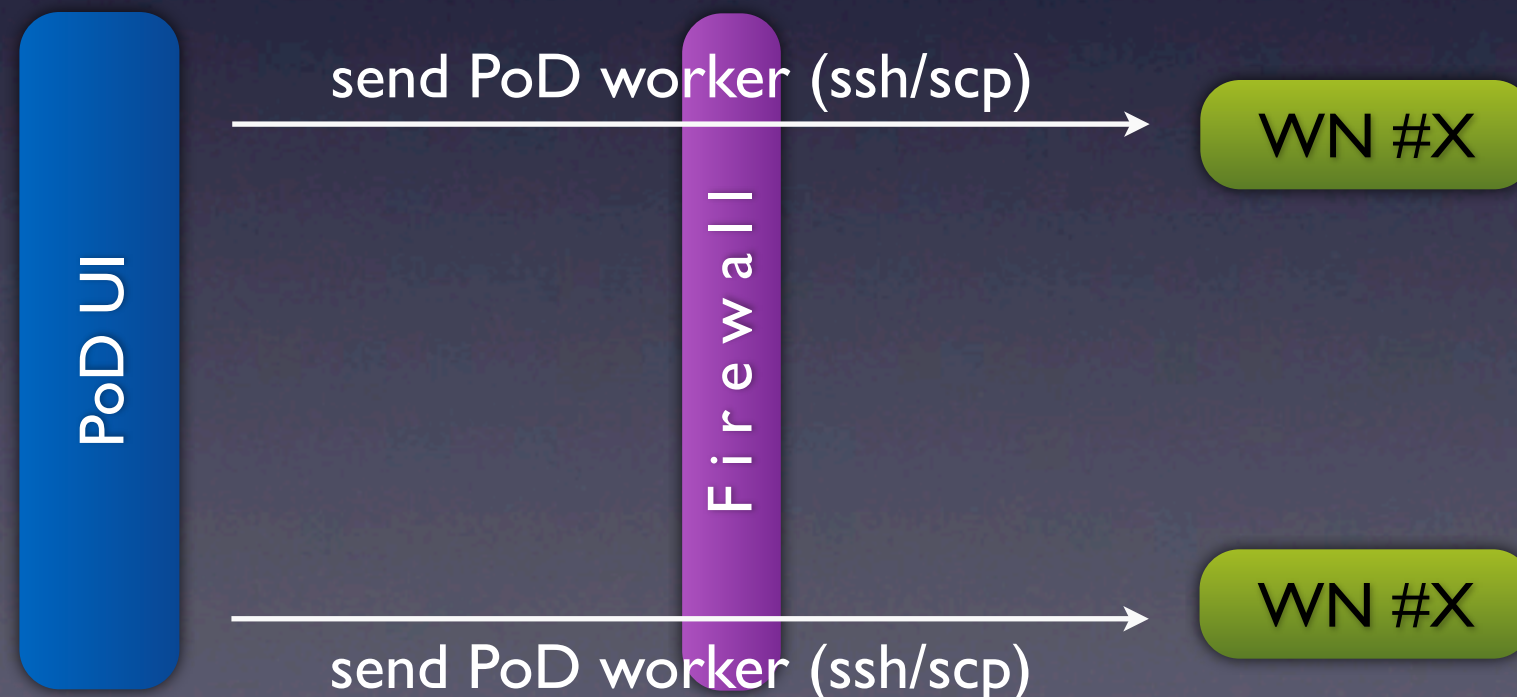# gLite plug-in

Updated to support gLite UI 3.2

PBS plug-in

Supports

- PBS Pro and Torque,

- shared and not shared file systems.

SSH plug-in

a simple CSV file as an input to the plug-in:

```
id  , login@host              , ssh_params , wn_dir      , num_of_workers

r1  , anar@lxg27.gsi.de , -p24            , /tmp/test , 10
a2  , user@lxi001            ,                  , ~/pod_wn  , 8
125 , doom@host.my        , -p22            , /opt/pod   , 16
```

send PoD worker (ssh/scp)

WN #X

PoD UI

Firewall

send PoD worker (ssh/scp)

WN #X

SSH plug-in & tunnel

PoD will optionally create ssh tunnels for nodes behind a firewall.

PoD UI

Firewall

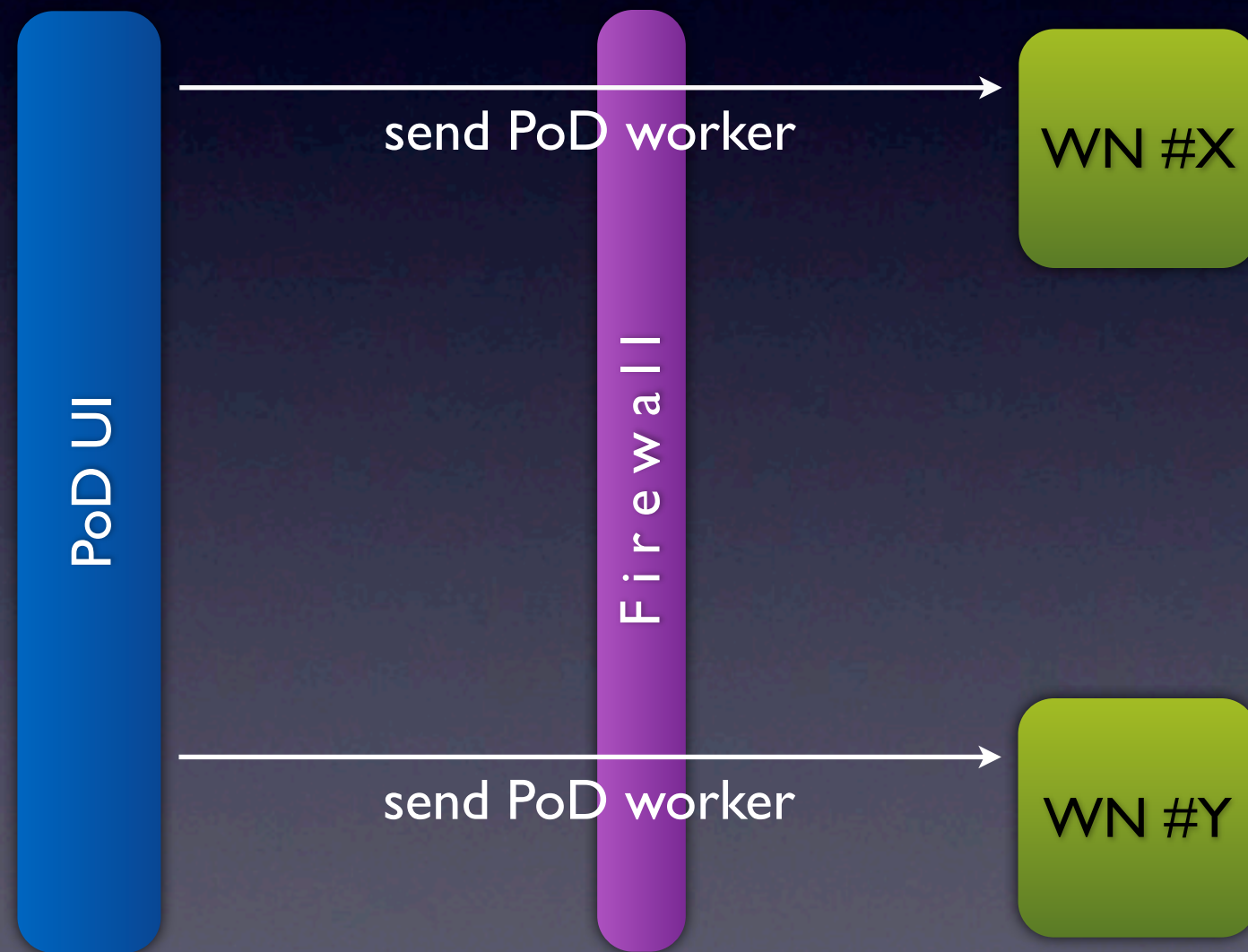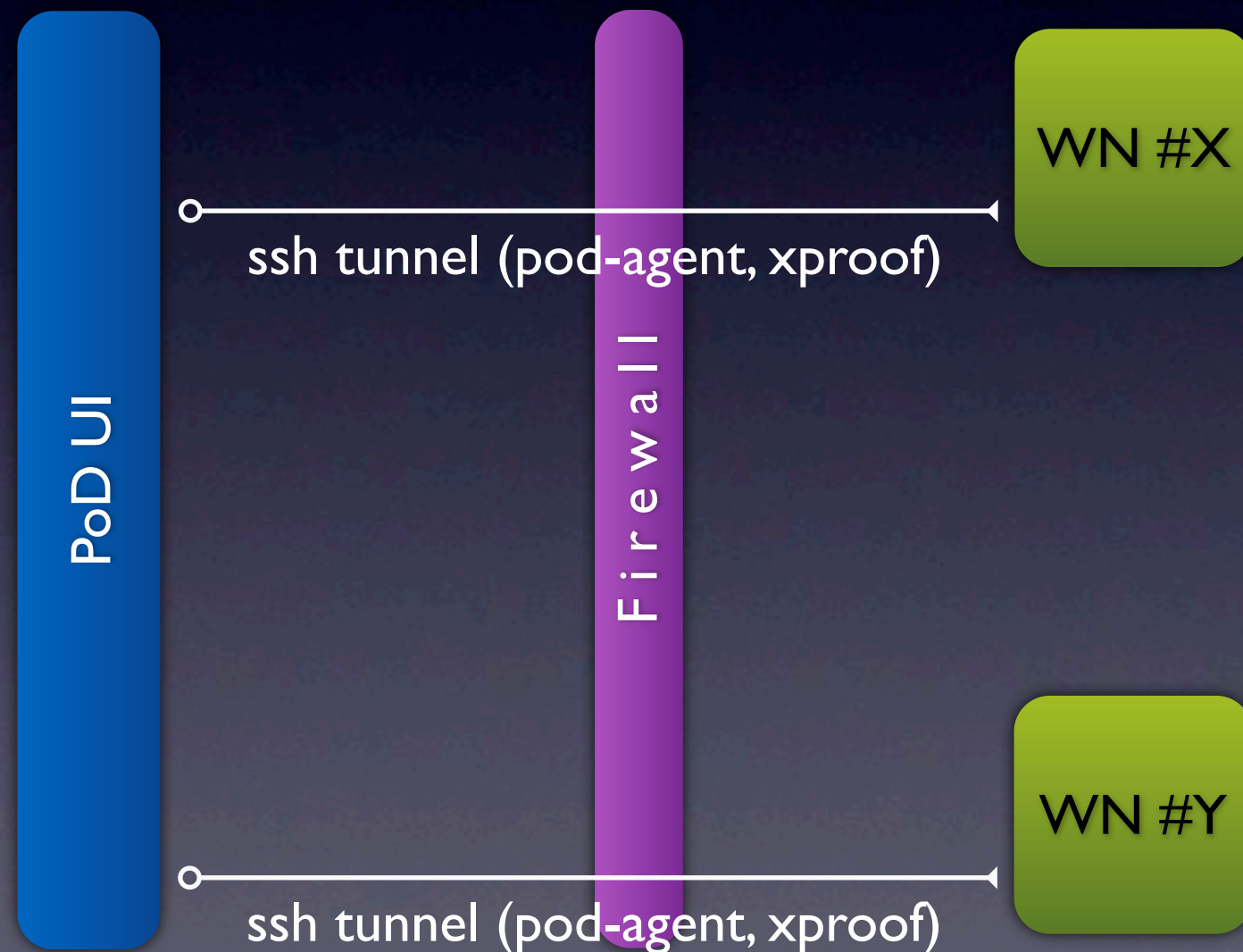WN #X

WN #Y

15
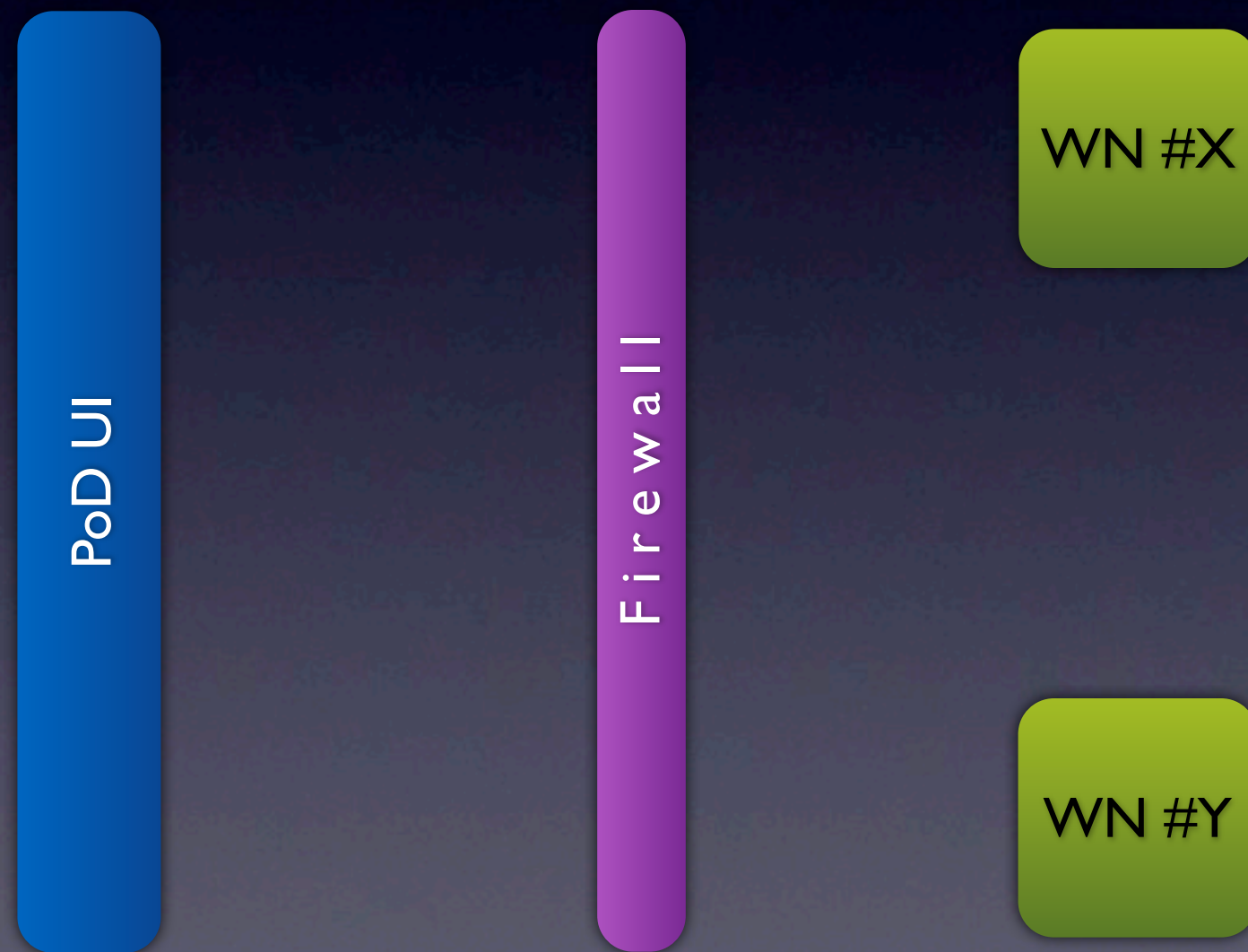
SSH plug-in & tunnel

PoD will optionally create ssh tunnels for nodes behind a firewall.

SSH plug-in & tunnel

PoD will optionally create ssh tunnels for nodes behind a firewall.

PoD UI

Firewall

WN #X

WN #Y

ssh tunnel (pod-agent, xproof)

ssh tunnel (pod-agent, xproof)

15

SSH plug-in & cloud

Possible workflow:

- distribute data files,

- prepare an OS image, which includes PoD's worker package (made by pod-prep-worker),

- send the image to a cloud provider, requesting an ssh access to nodes,

- pass the list of workers to PoD ssh plug-in.

Enjoy your cloud based PROOF cluster.

ToDo

- "out of server" UI,

- a native Mac OS X implementation of UI,

- an AliEn plug-in,

- a Condor plug-in.

http://pod.gsi.de

ALICE offline week,
2010-07-08