Dynamic PROOF clusters with PoD: status report and future plans

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What is PoD?

PROOF on Demand (PoD) is a tool-set developed at GSI, which sets up a PROOF cluster on any resource management system.

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

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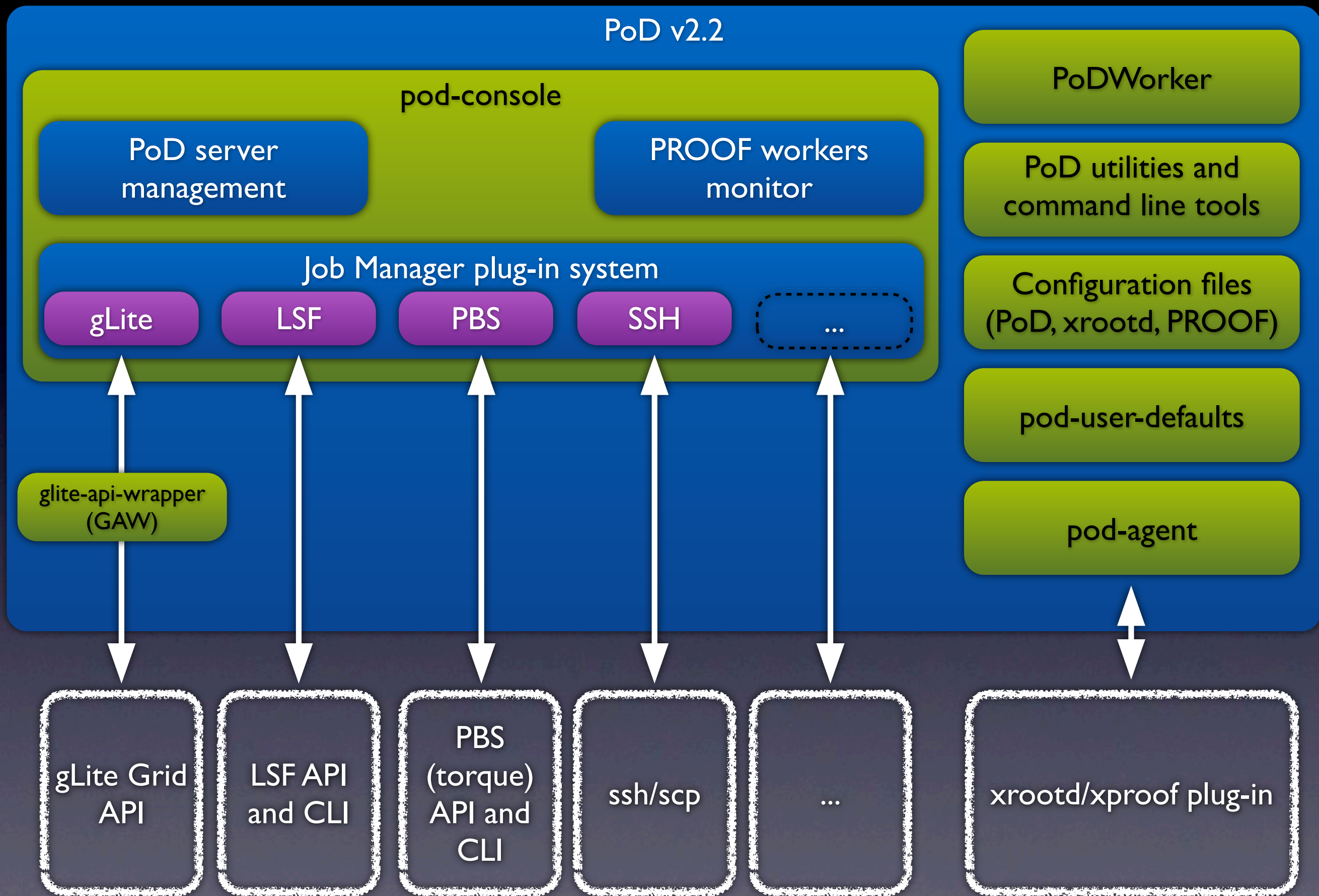
"static"/preinstalled PROOF cluster

- one user can disturb other users,

- time to time admin. interventions are needed,

- only one ROOT version for PROOF services,

- a master node limitation.

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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 chose a ROOT version for services.

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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

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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

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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...

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Improved build-system

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

- A much easer installation procedure has been implemented.

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

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

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New version numbers

Old:

a version number had to be changed manually in VCS and in special build configuration files.
Old schema: "vX.Y.Z" (X - major, Y - minor, Z - patch).

New:

it is just enough to set a tag ("v.X.Y") in VCS (we use Git) and the rest will be 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).

CLI

- pod-server

- pod-info

- pod-submit

- pod-user-defaults

- pod-prep-worker

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

CLI

- pod-server

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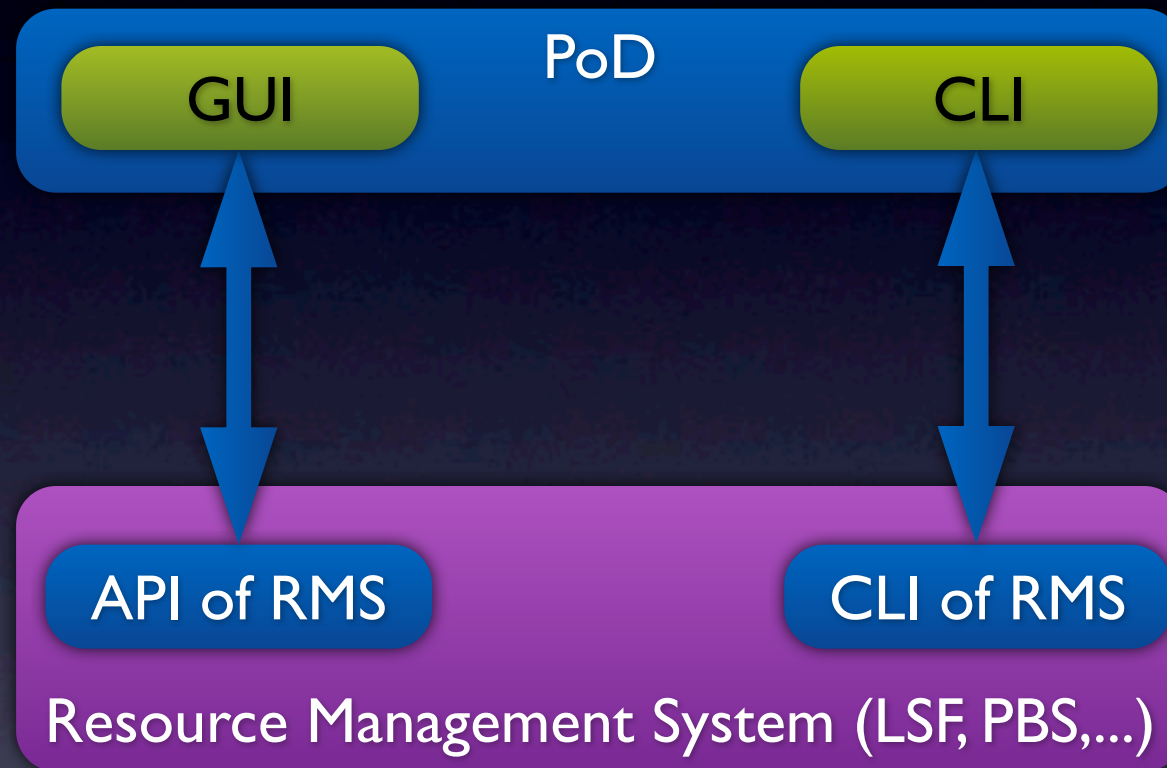
Example
$ pod-server start *(status)*
$ pod-submit -r lsf -q queue -n 150
$ pod-info -n *(-l)*
$ pod-server stop

can be used in the PROOF script

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

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gLite plug-in

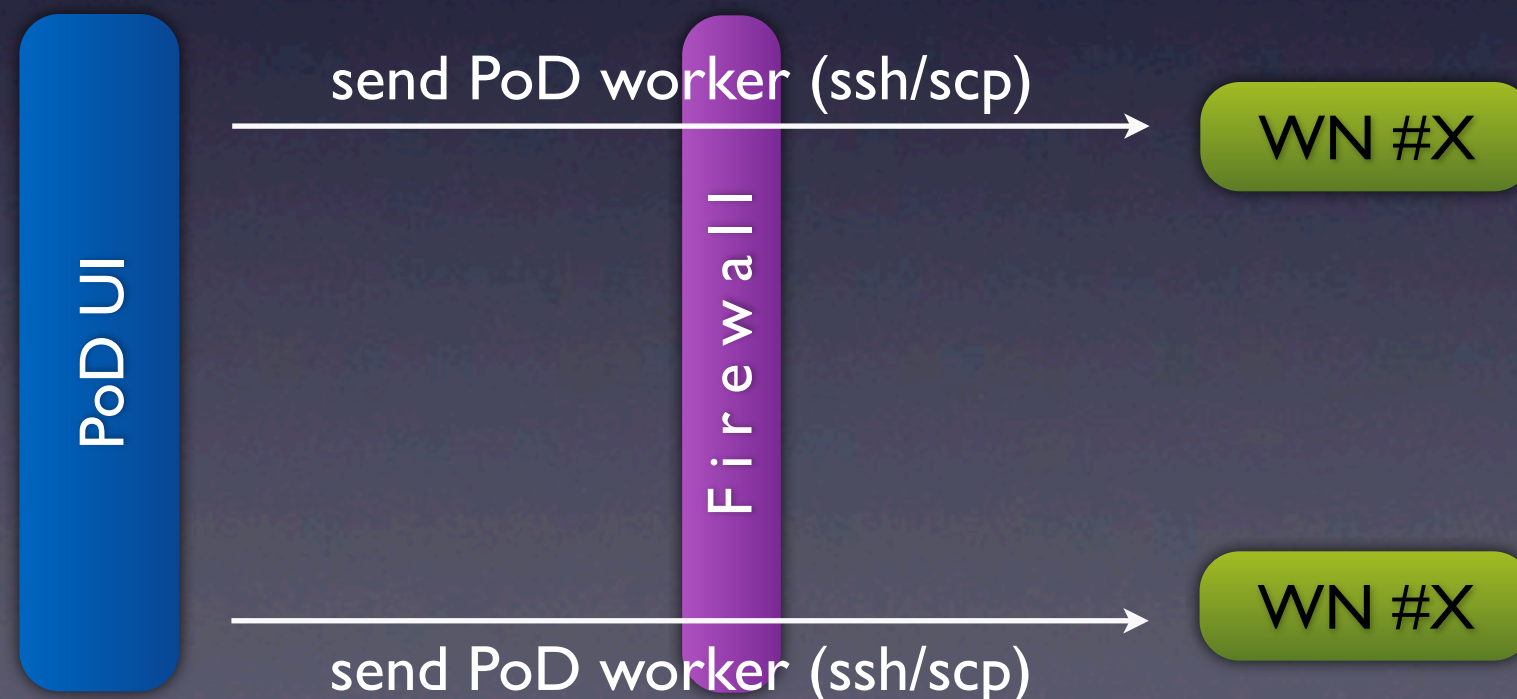Updated to support gLite UI 3.2

PBS plug-in

Supports

- PBS Pro and Torque,

- shared and not shared file systems.

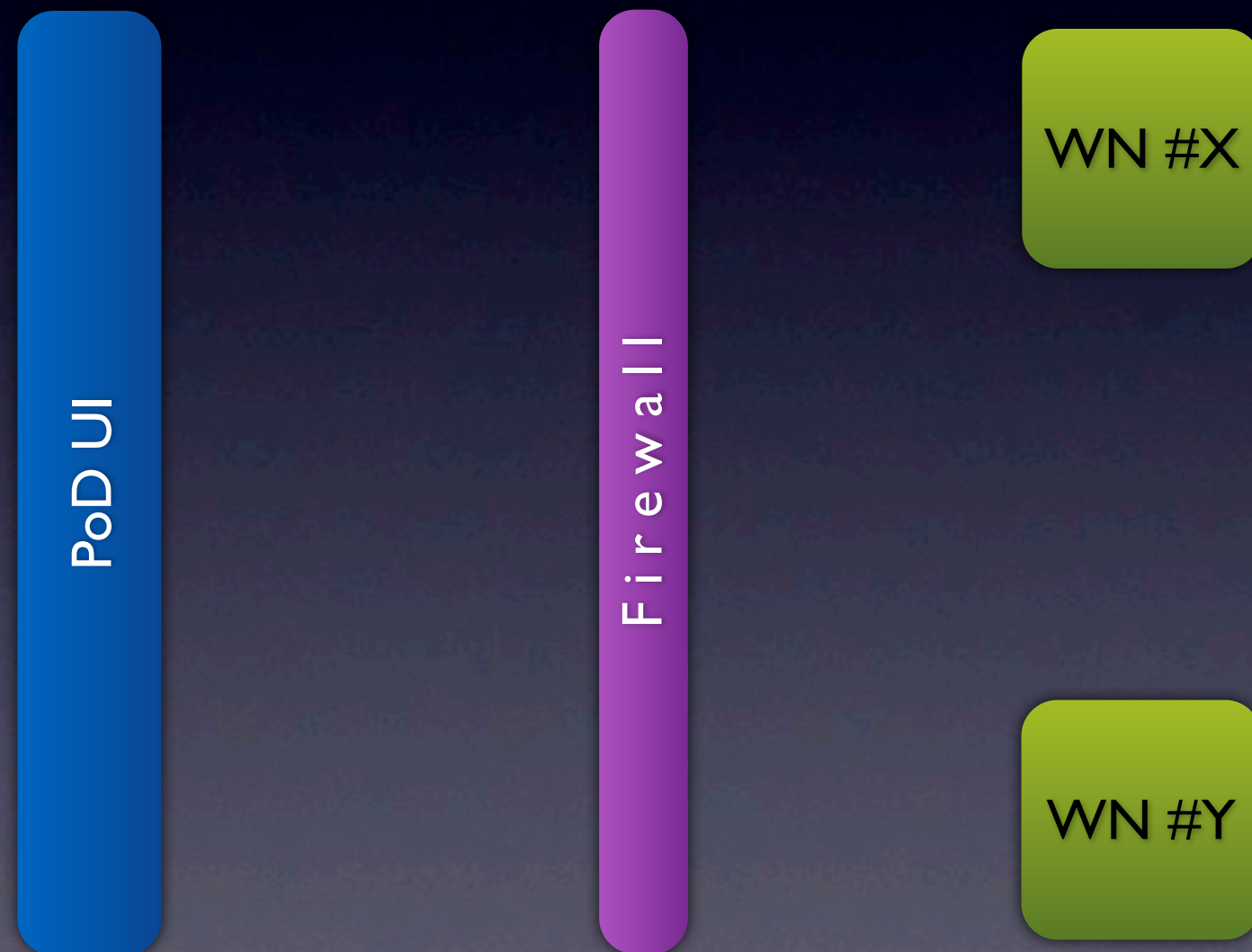# SSH plug-in

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

```
# id, login@host.fqdn, ssh params, remote working dir, number of workers

r1, anar@lxg0527.gsi.de, -p24, /tmp/test, 10
a2, testuser@lxi001.gsi.de, , /tmp/test, 8
125, doom@lxg0055.gsi.de, -p22, /tmp/test, 16
```

PoD UI

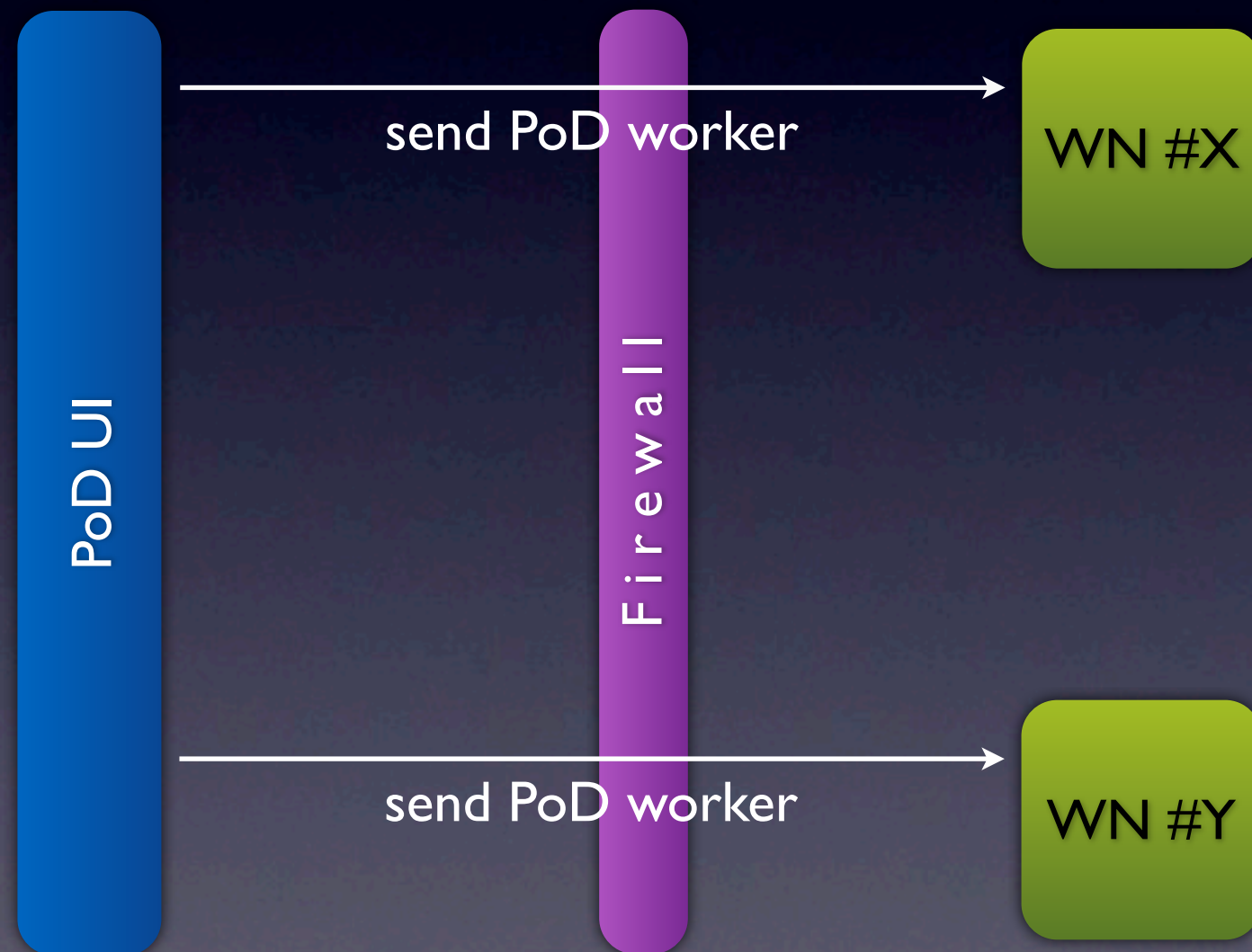send PoD worker (ssh/scp) →

Firewall

WN #X

send PoD worker (ssh/scp) →

WN #X

SSH plug-in

Optionally PoD will create an ssh tunnels for nodes behind a firewall.

PoD UI

Firewall

WN #X

WN #Y

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SSH plug-in

Optionally PoD will create an ssh tunnels for nodes behind a firewall.

PoD UI

Firewall

send PoD worker → WN #X

send PoD worker → WN #Y

SSH plug-in

Optionally PoD will create an ssh tunnels for nodes behind a firewall.

PoD UI

Firewall

WN #X

ssh tunnel (pod-agent, xproof)

WN #Y

ssh tunnel (pod-agent, xproof)
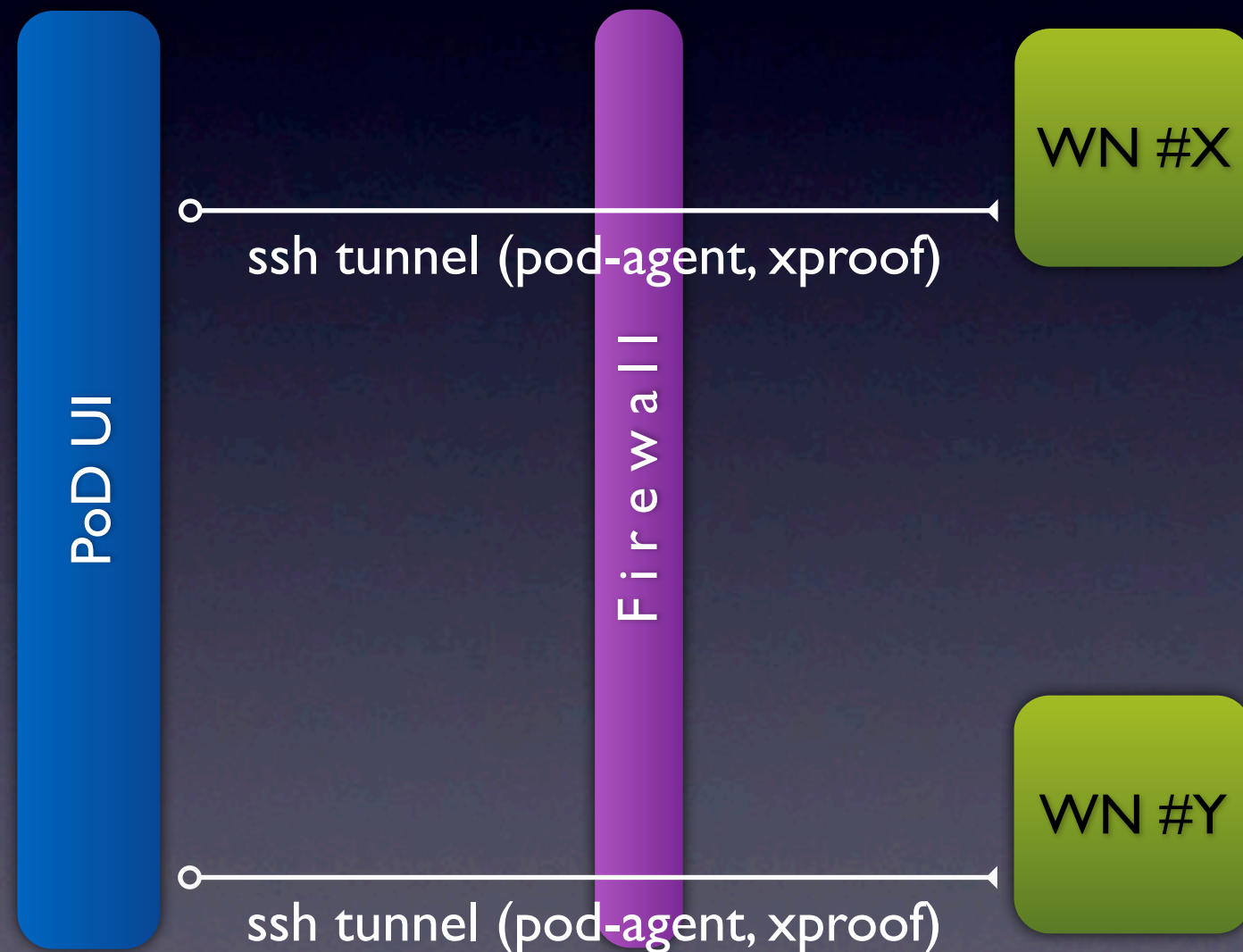
SSH plug-in & cloud

- 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 (can be used privately or by a group)...

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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