

POD

PROOF on Demand
ПРОВОДОНДМЕНД

Anar Manafov, GSI Darmstadt

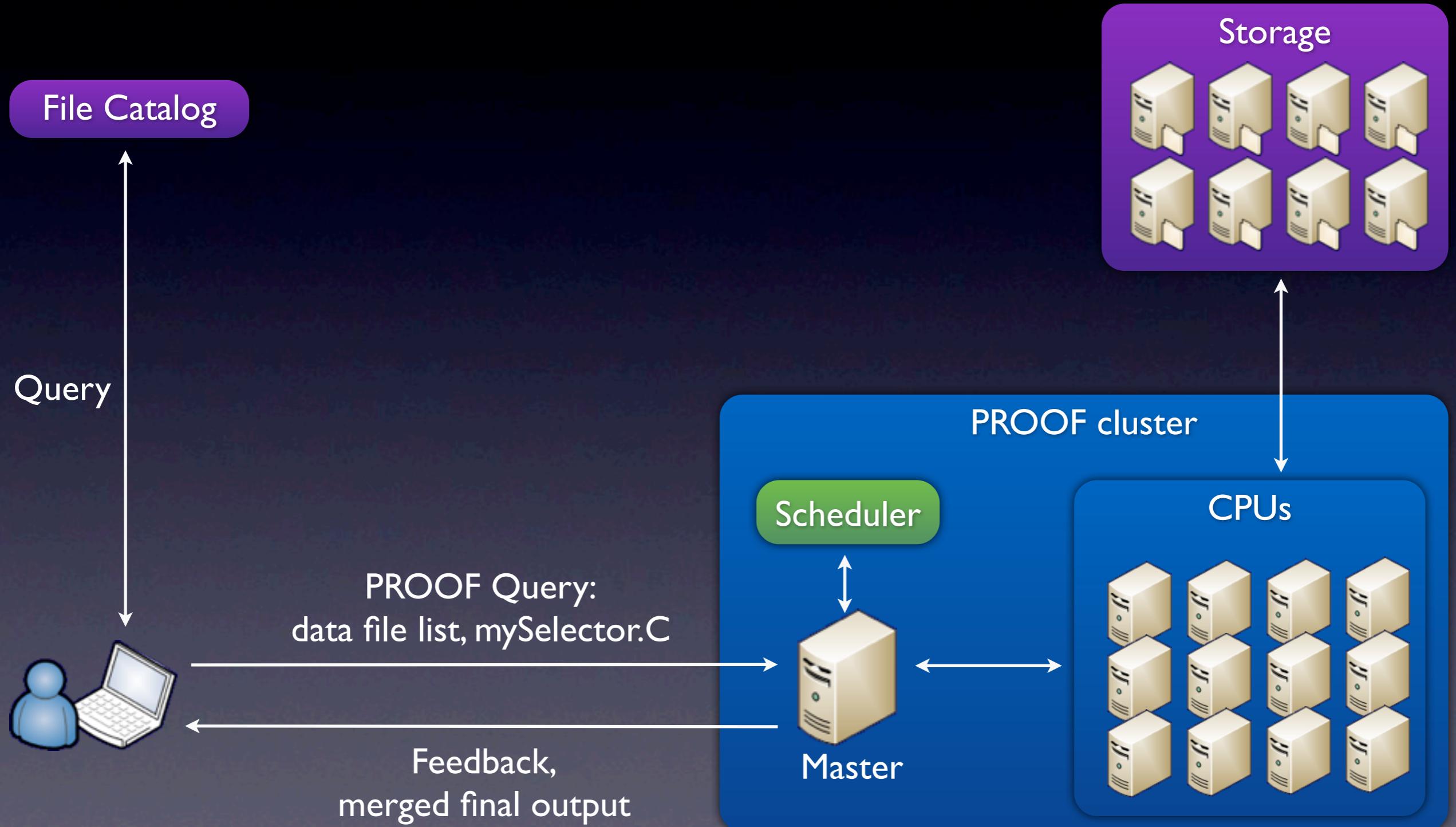
2010-Sep

HEP Data Analysis



Typical HEP analysis needs a continuous algorithm refinement cycle

PROOF



What is PoD?

PROOF on Demand (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

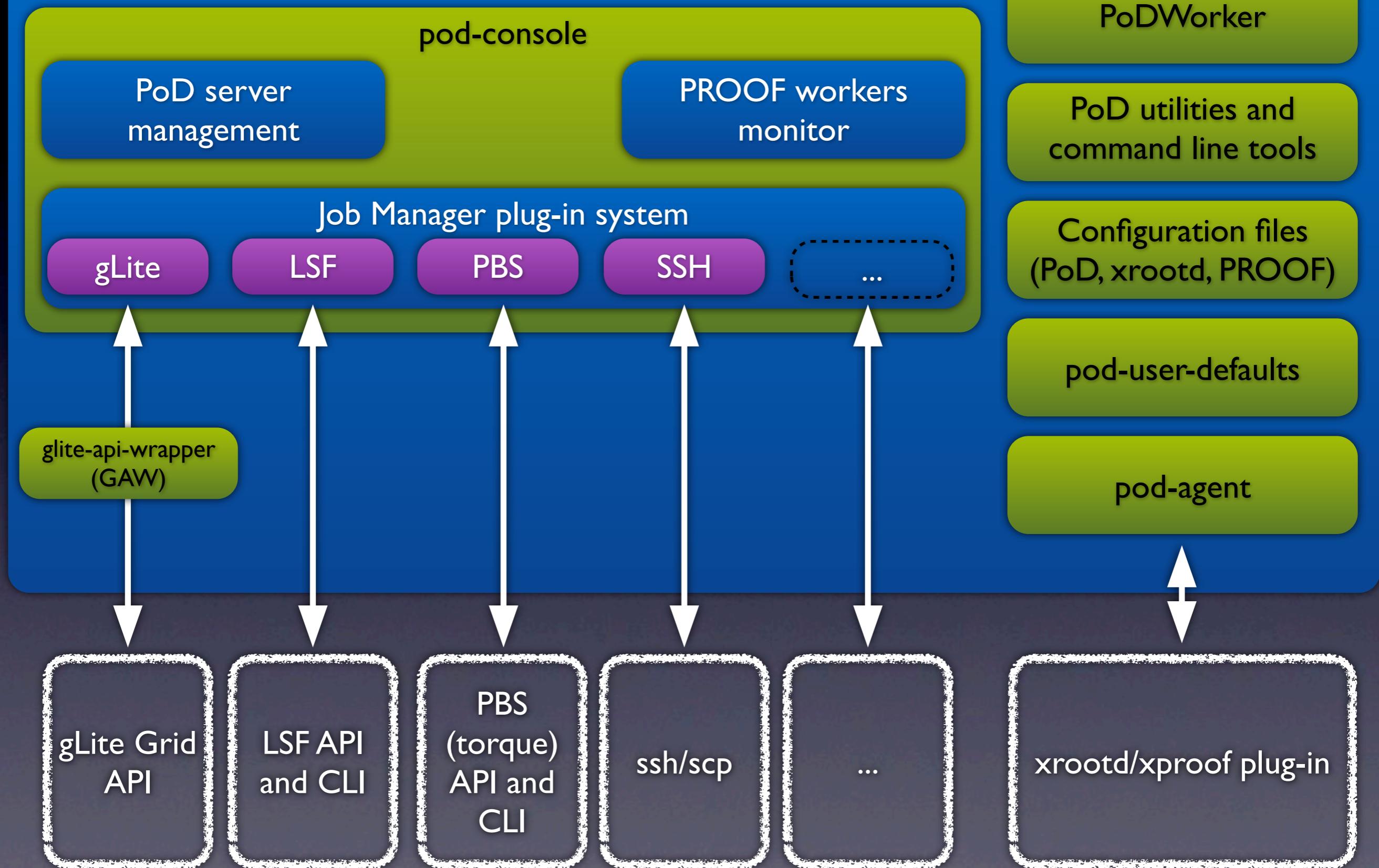
- One user can disturb other users.
- From time to time admin. interventions are needed.
- There is only one ROOT/xrootd version for PROOF services.
- There is a master node limitation.

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

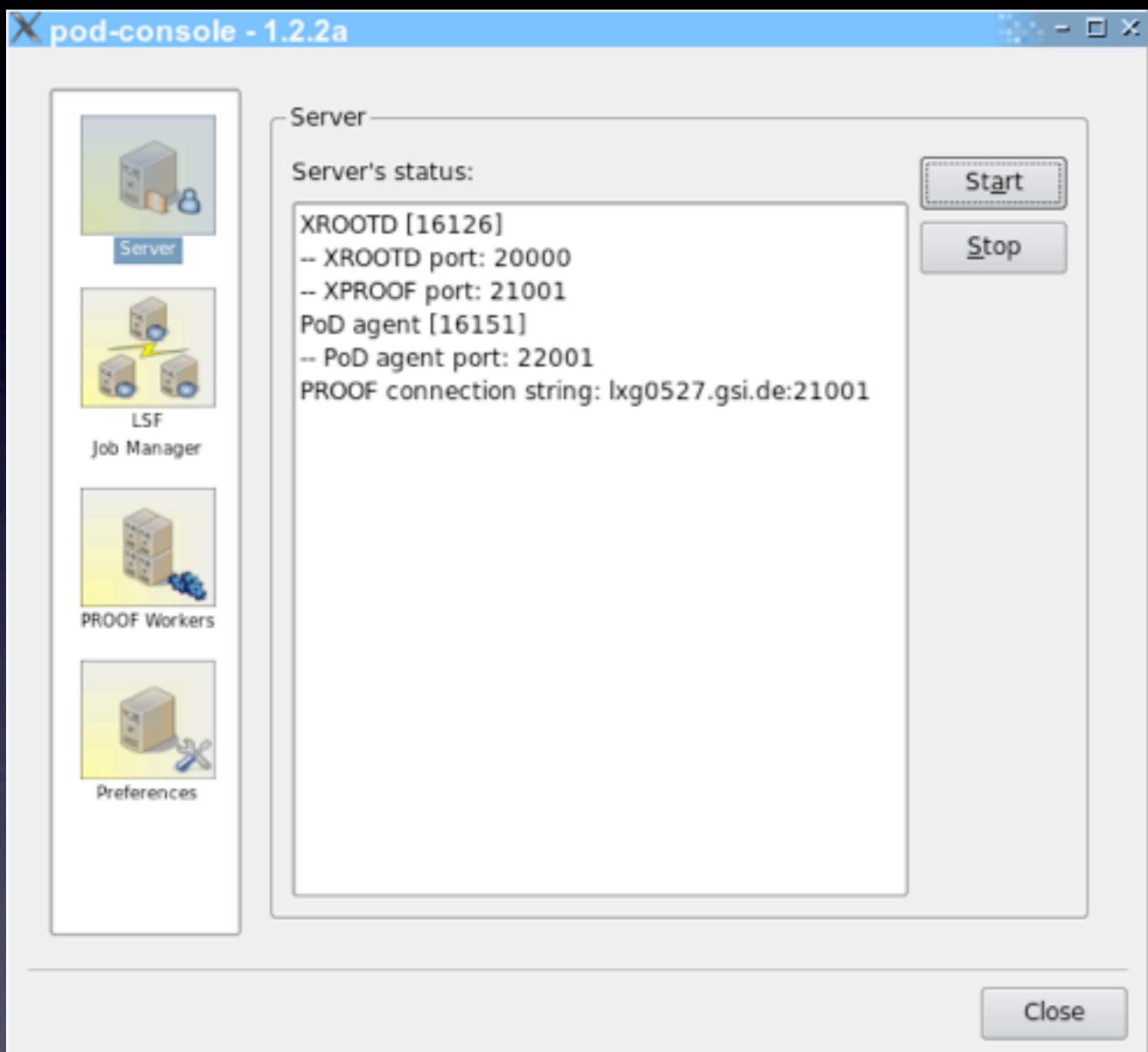


Key features

- Easy to use
- GUI & Command-line
- Different job managers (gLITE, LSF, PBS, SSH)
- Multiuser/-core environment
- Native PROOF connections
- Packet-forwarding
- User defaults - configuration

3 steps to set your private PROOF cluster up

PoD server

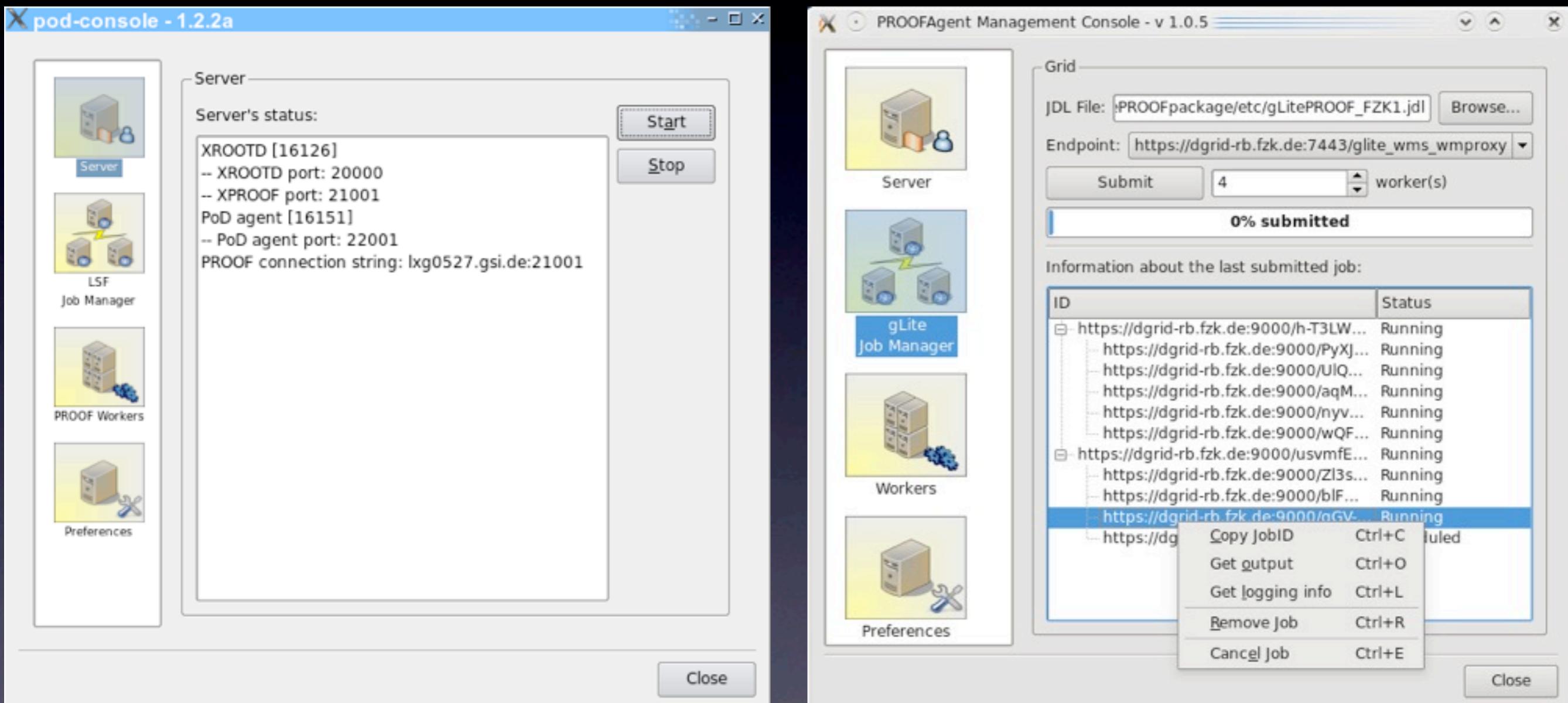


3 steps to set your private PROOF cluster up

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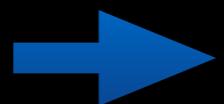


Job Manager (gLITE, PBS, LSF)

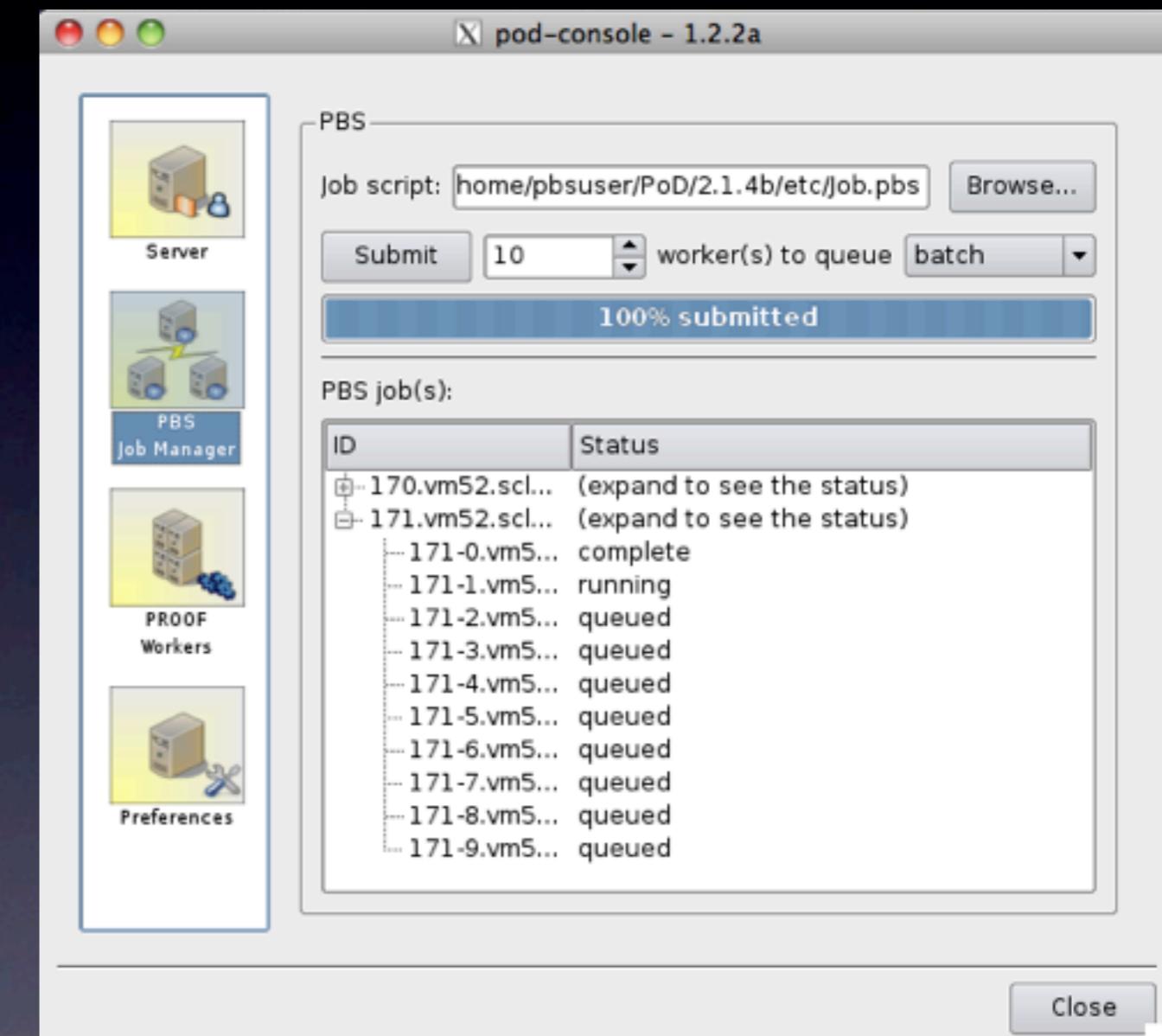
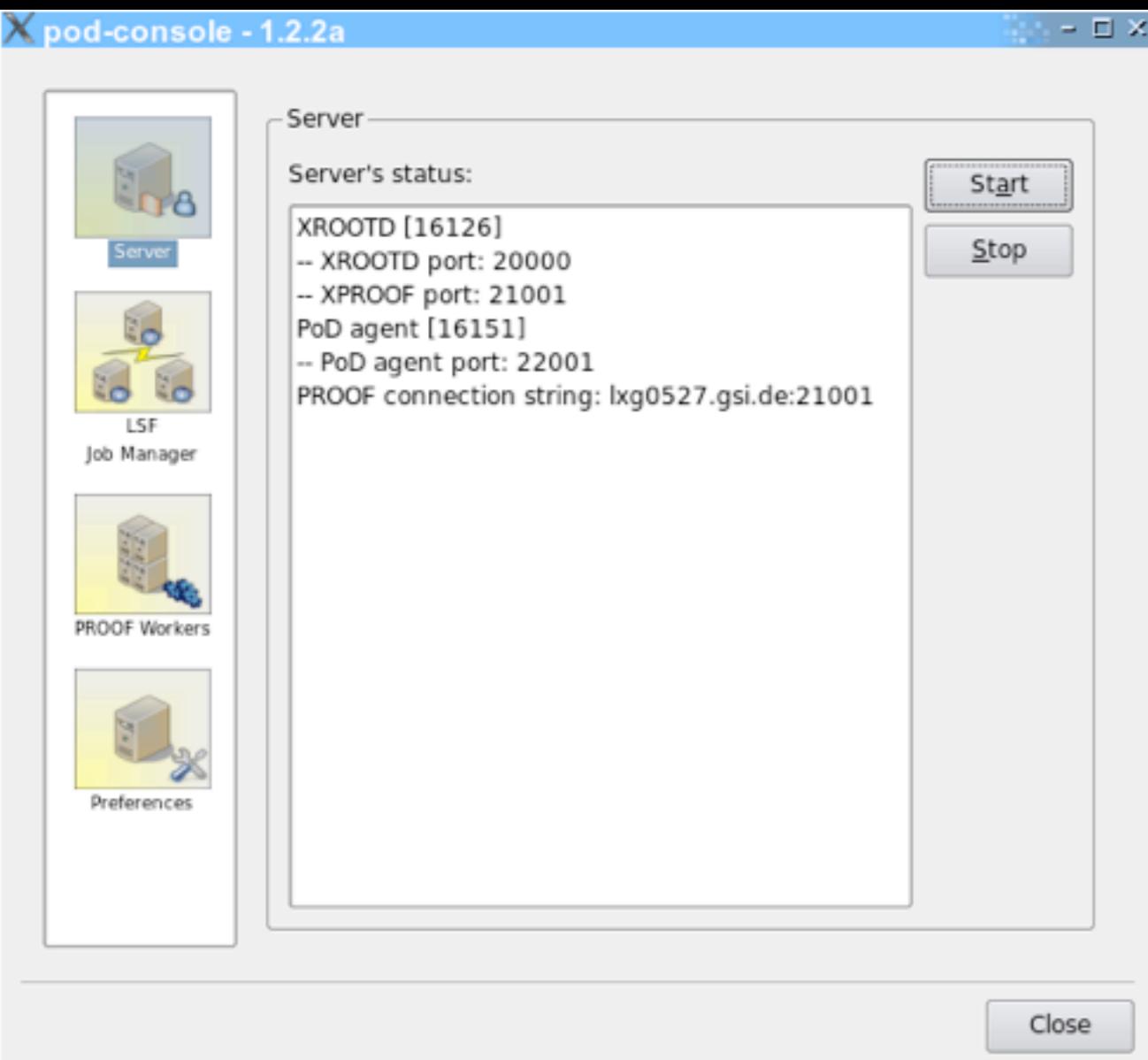


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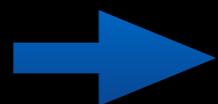


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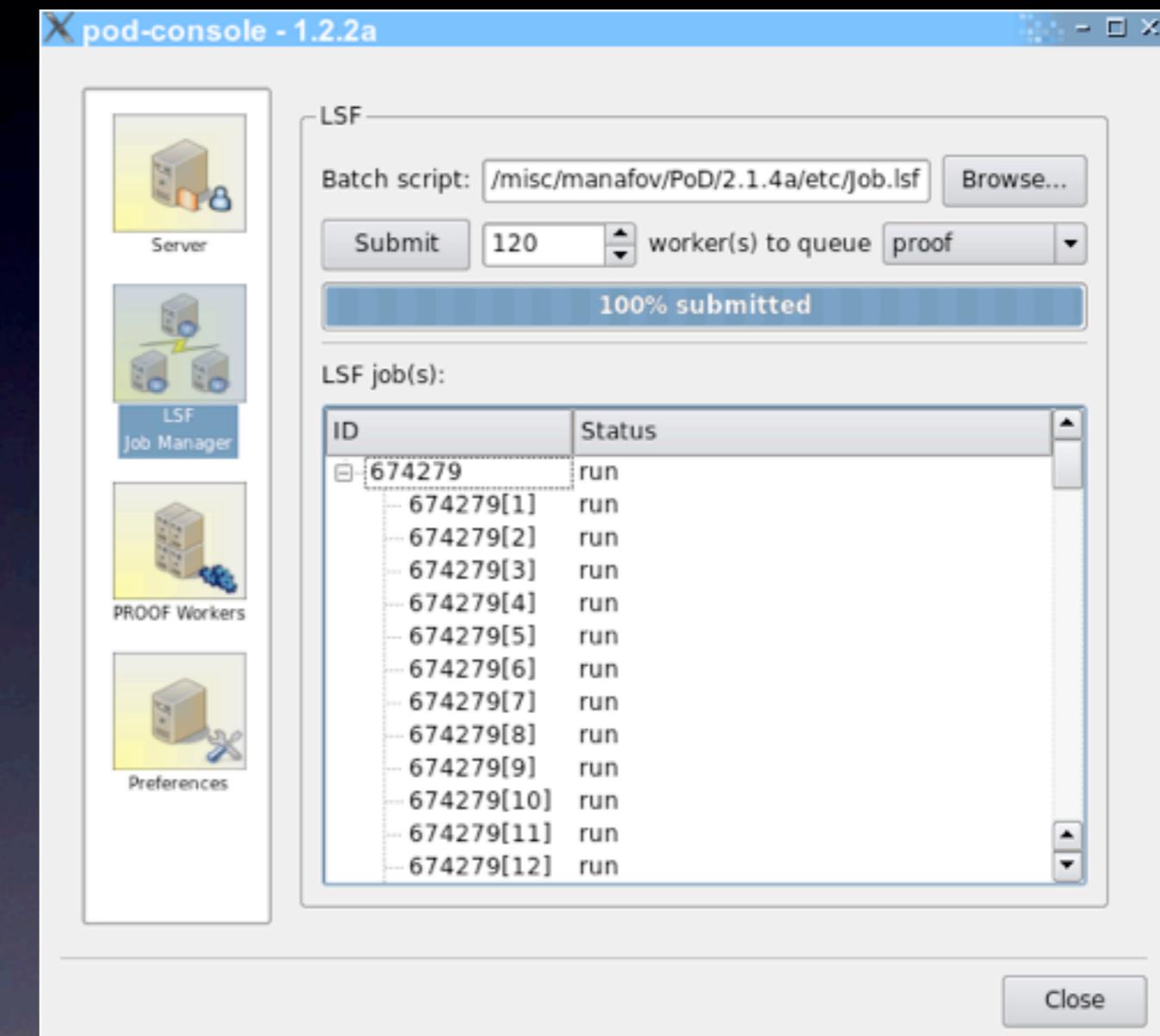
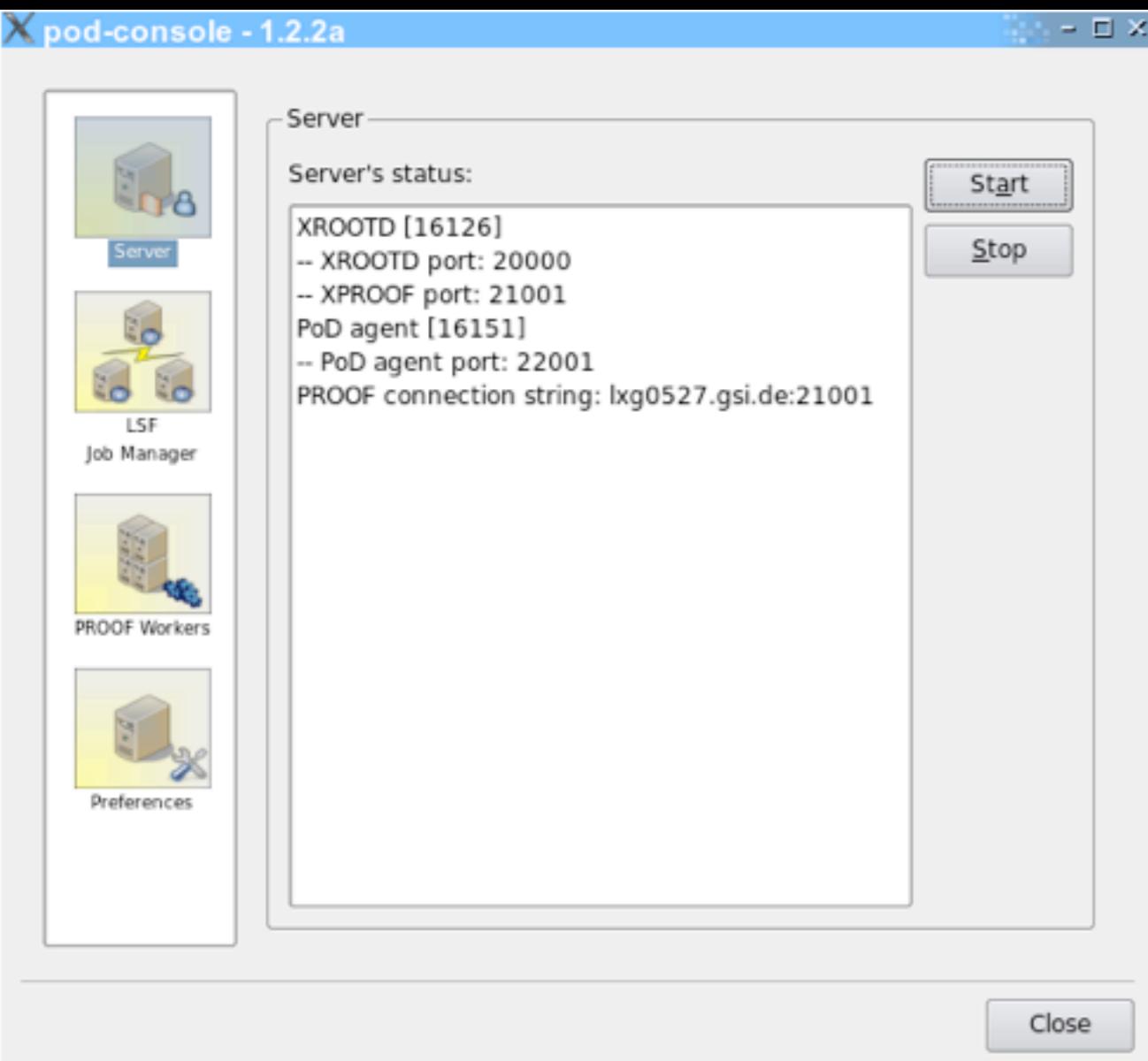


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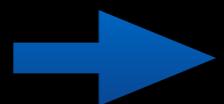


Job Manager (gLITE, PBS, LSF)



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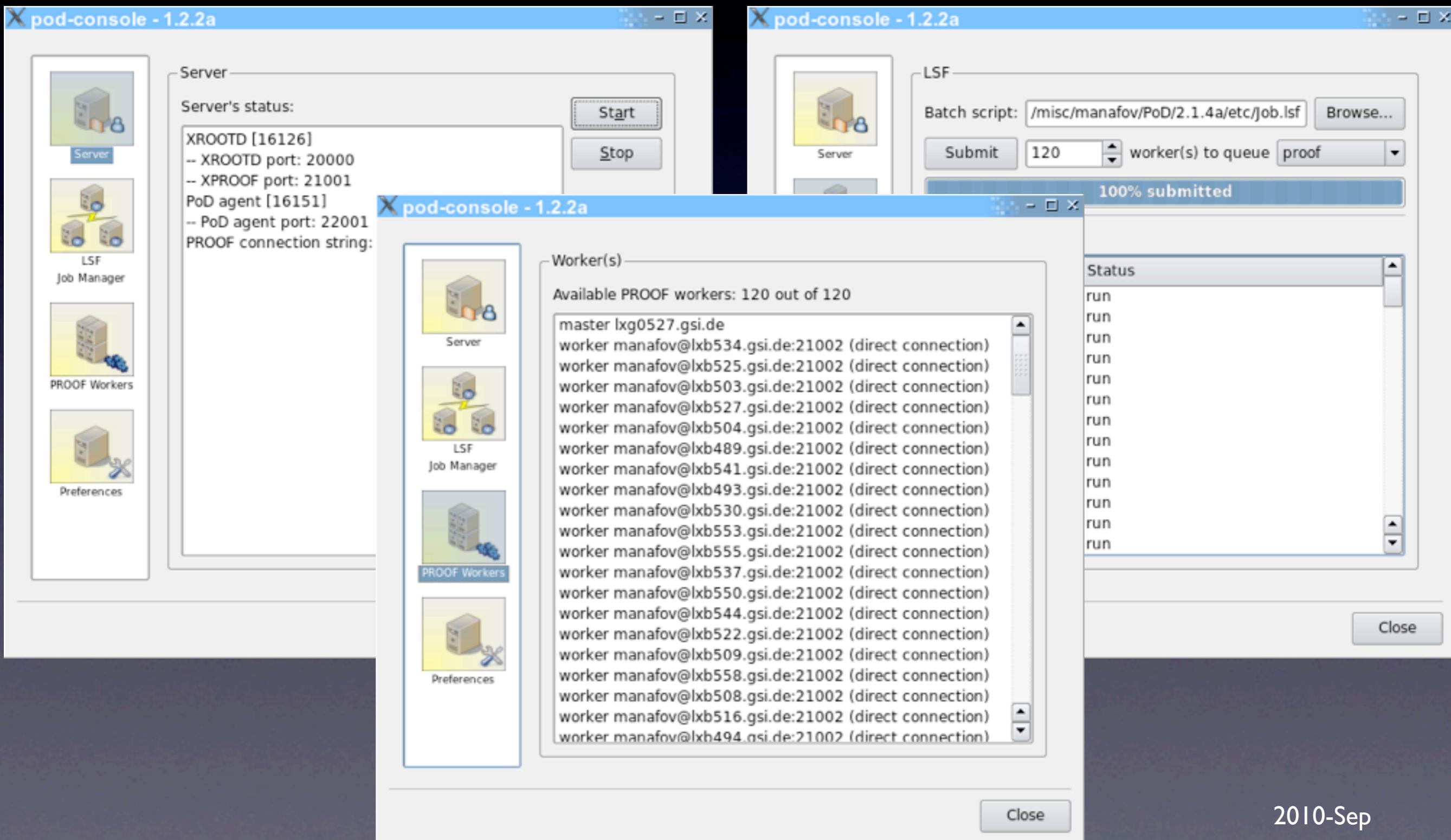
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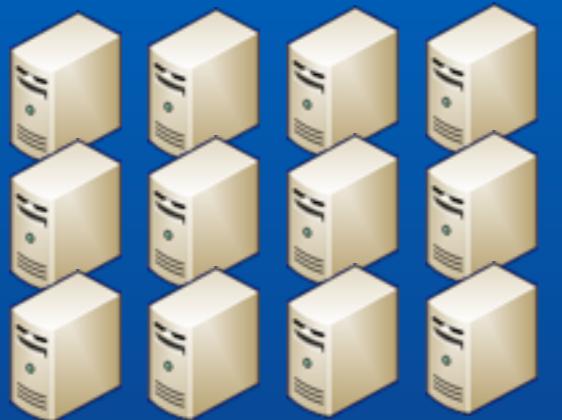
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your
PROOF
cluster



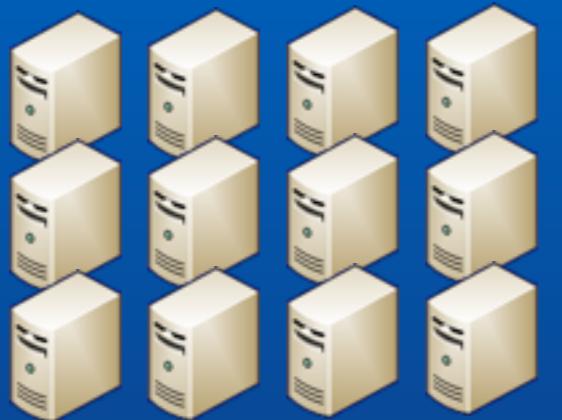
Resource management system



User workspace



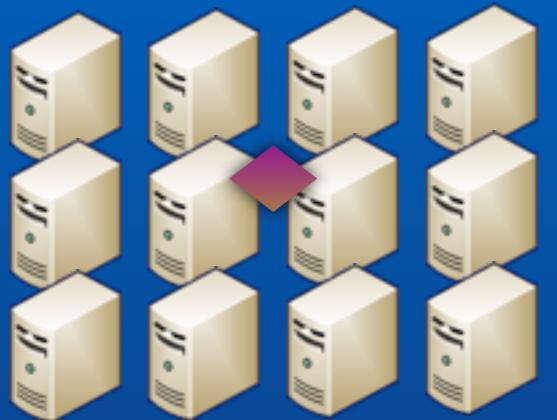
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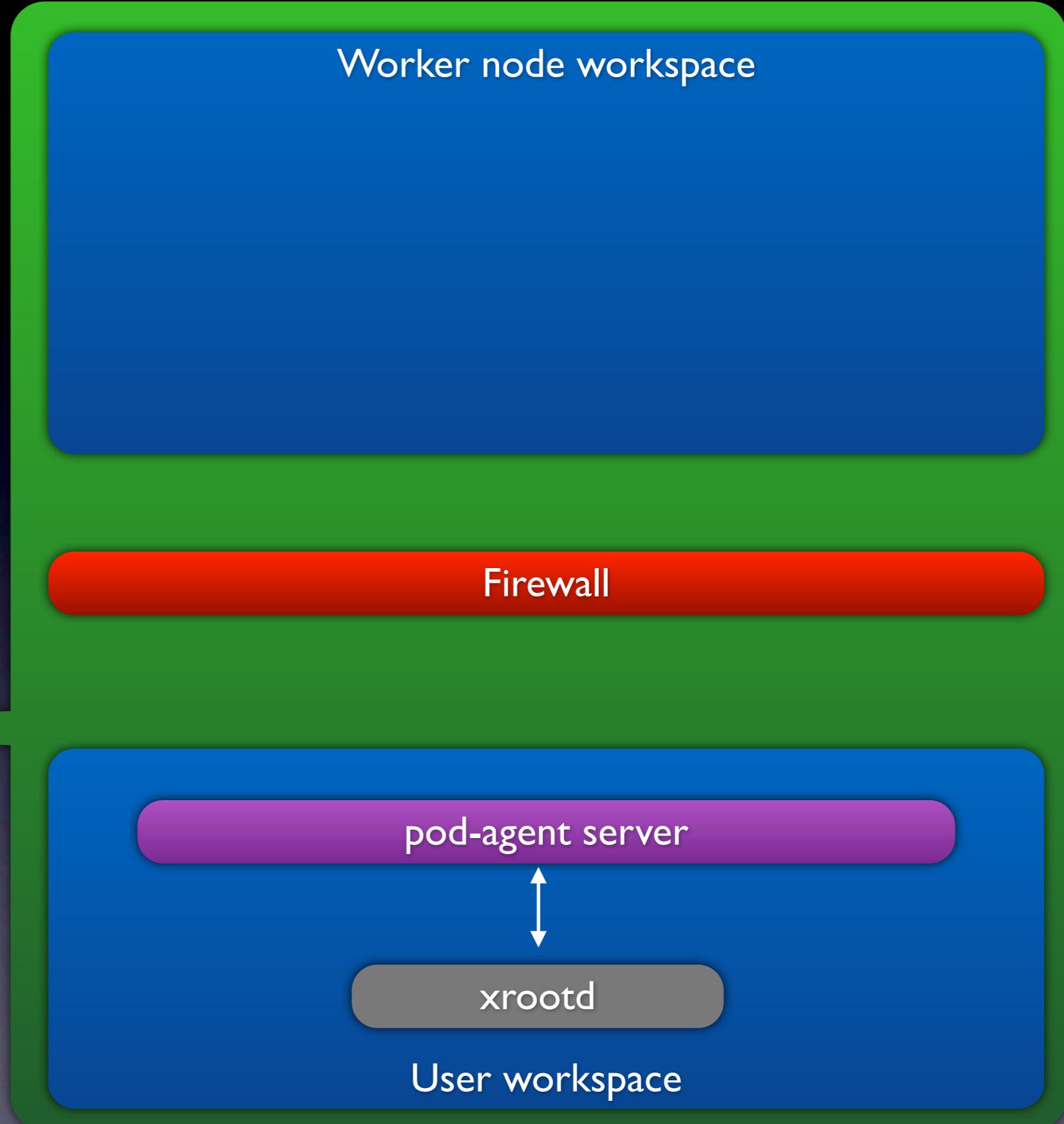
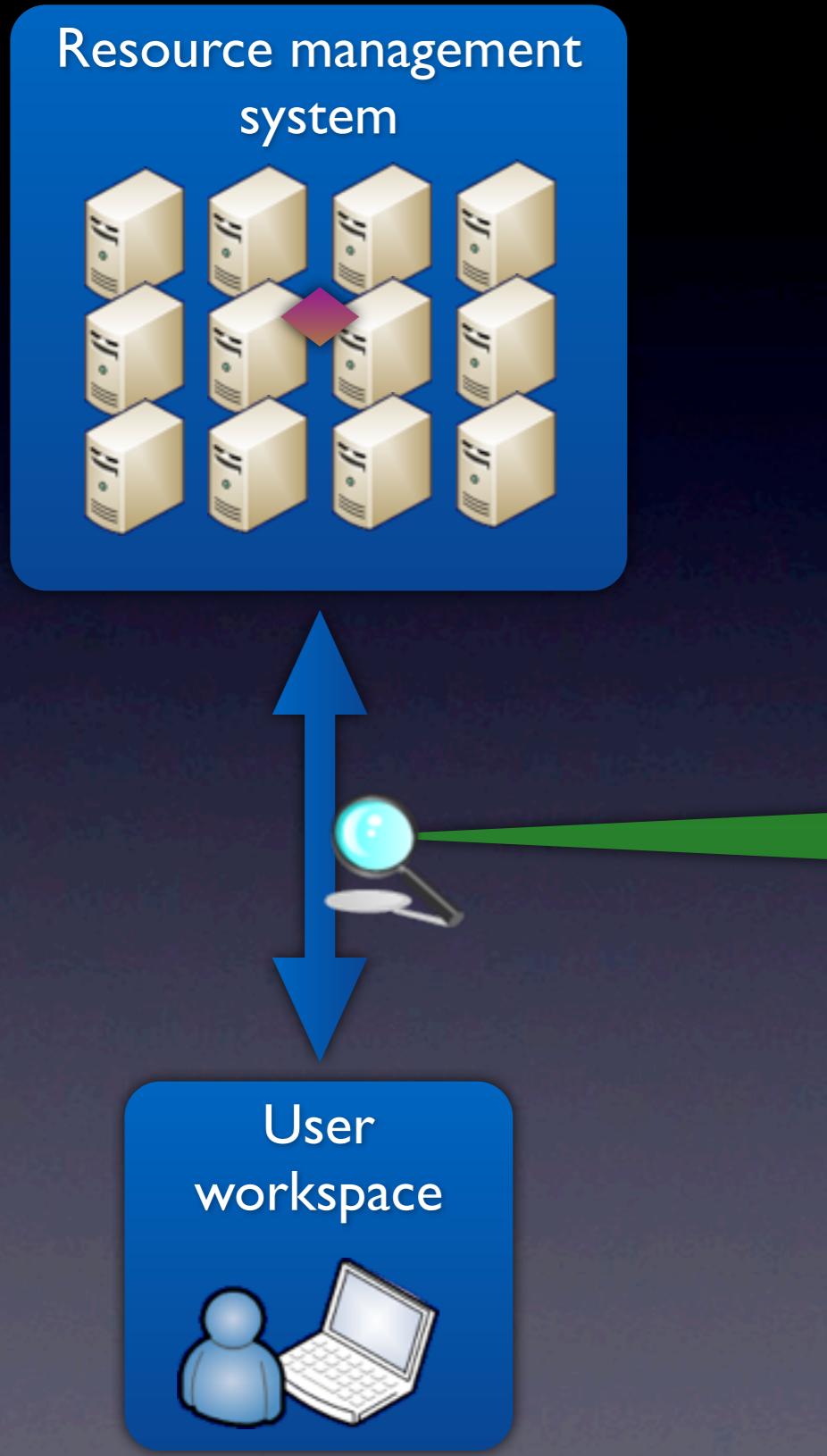
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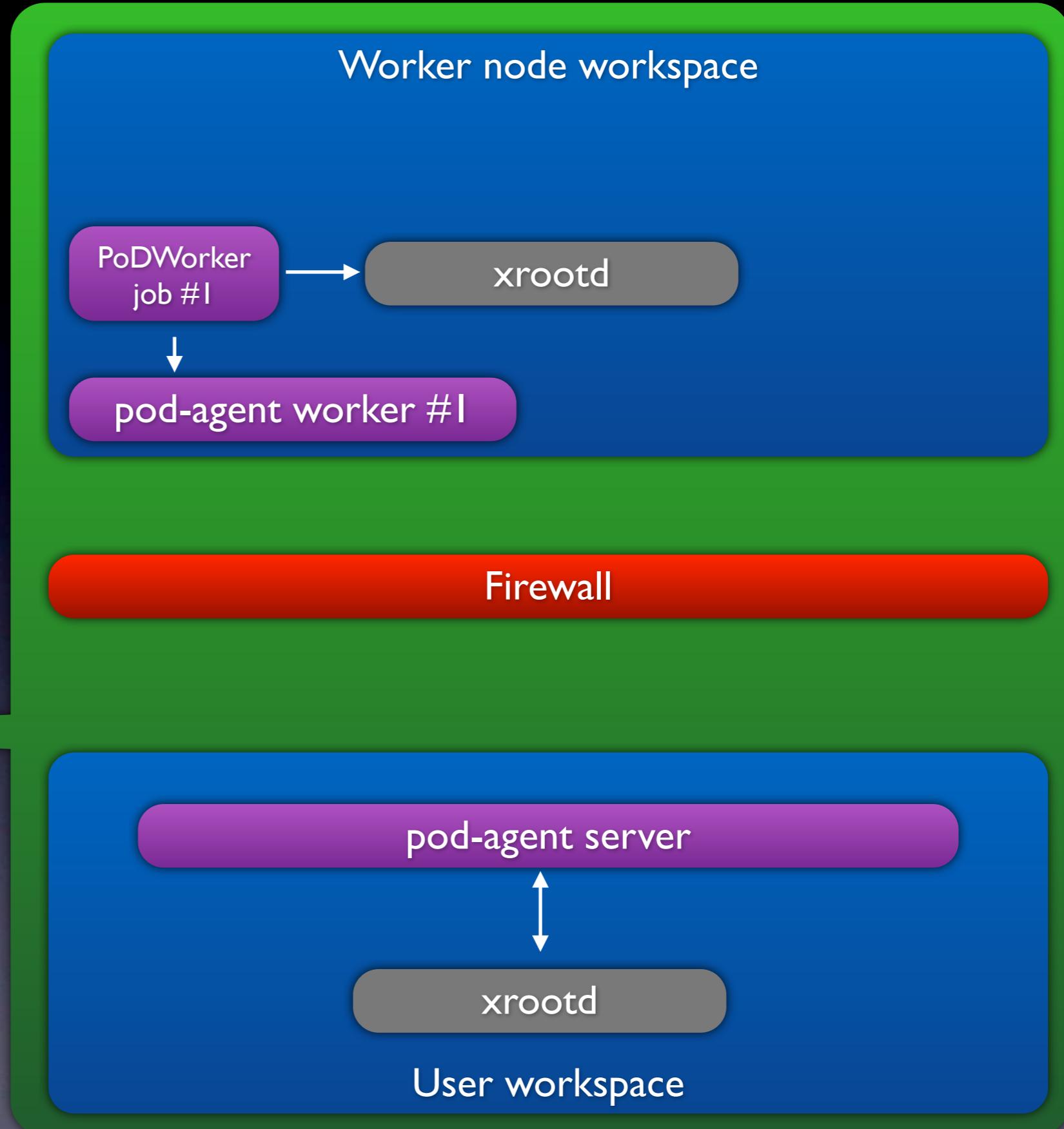
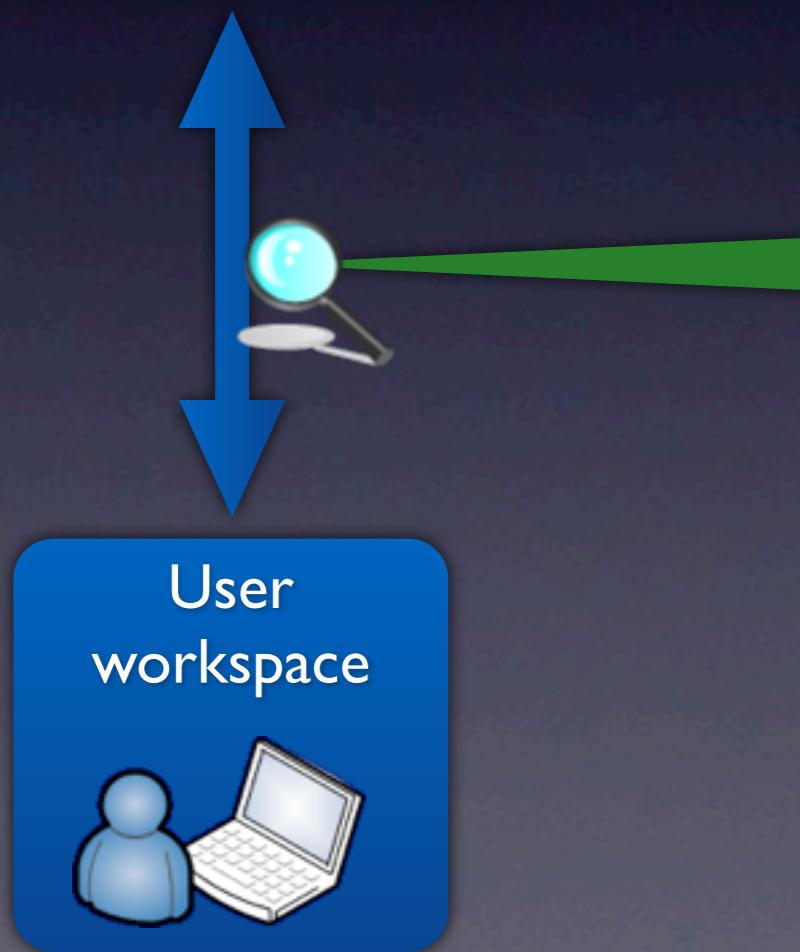
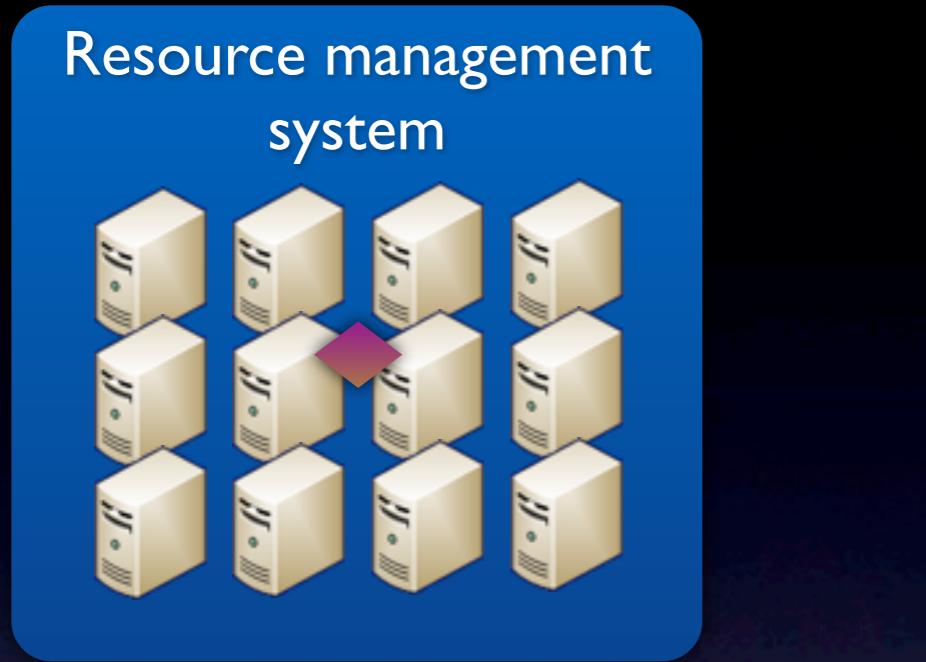


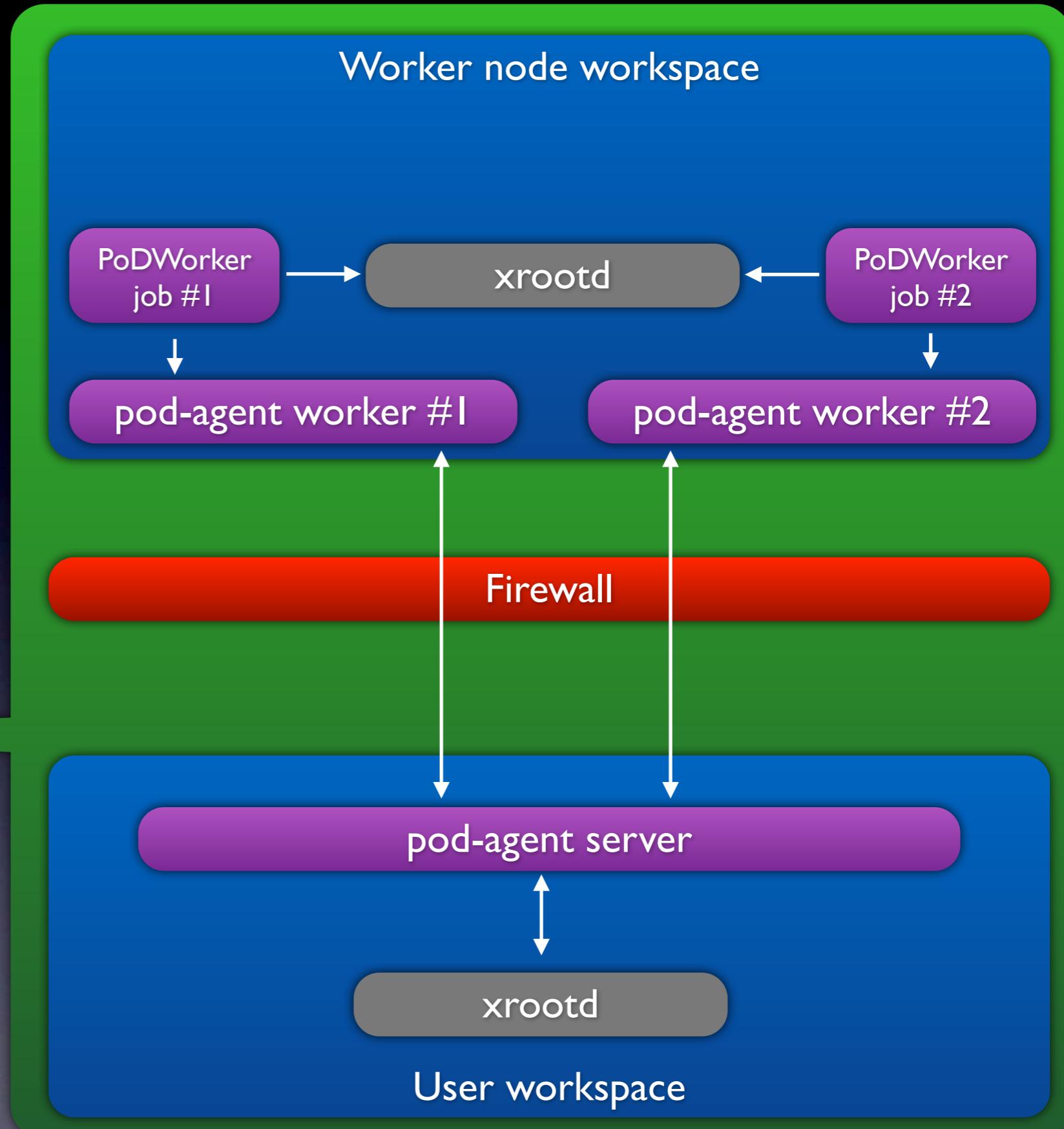
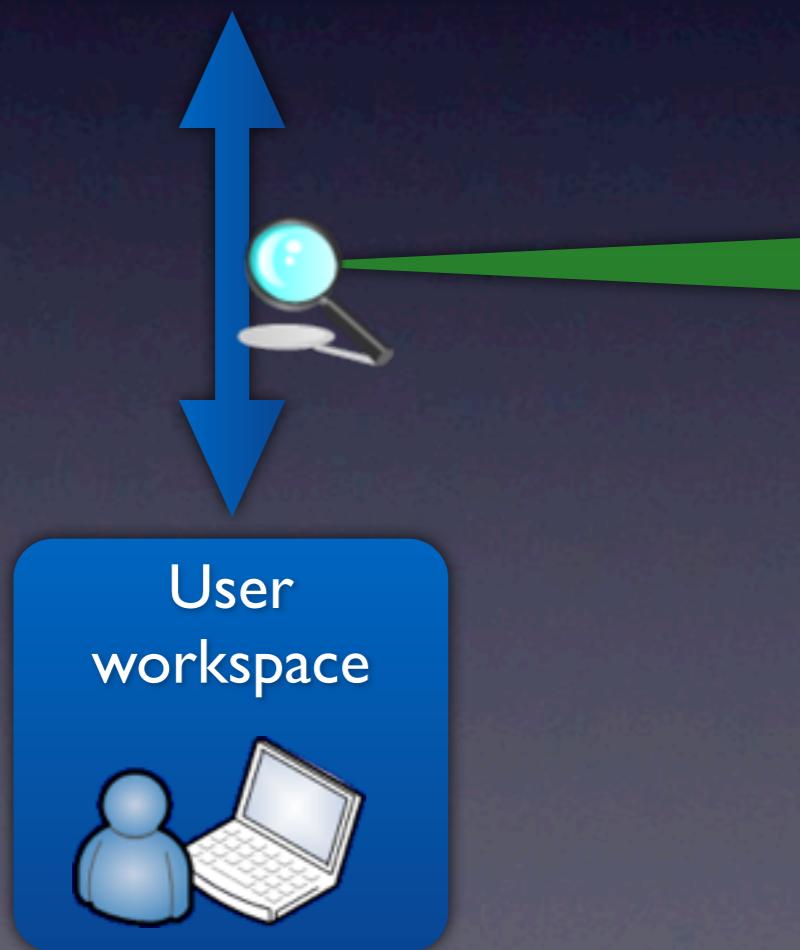
Worker node workspace

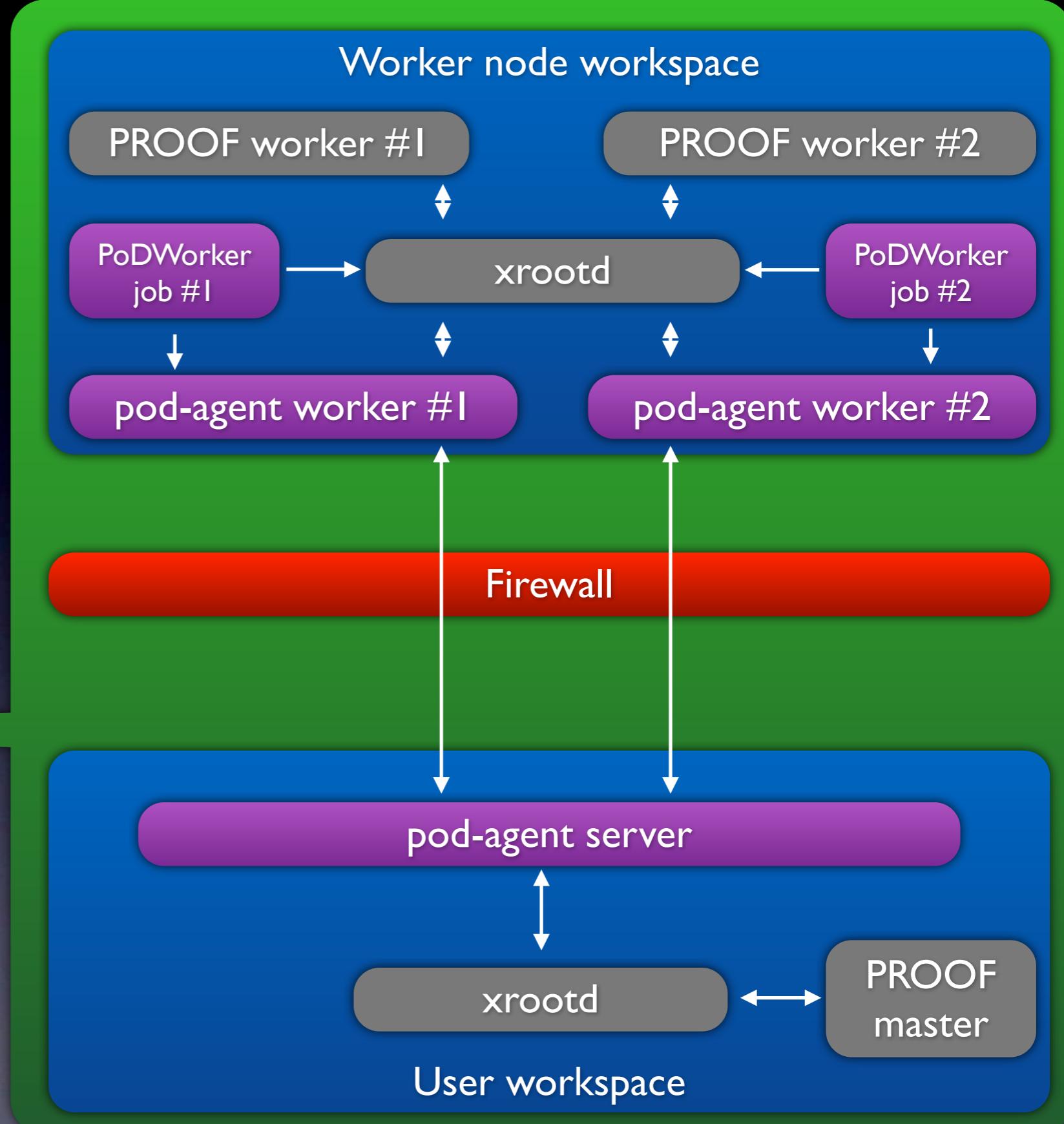
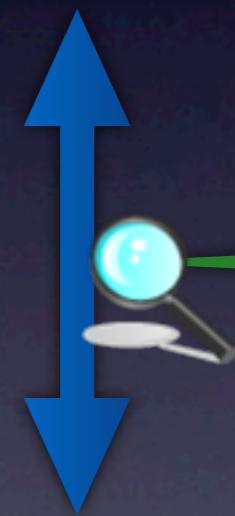
Firewall

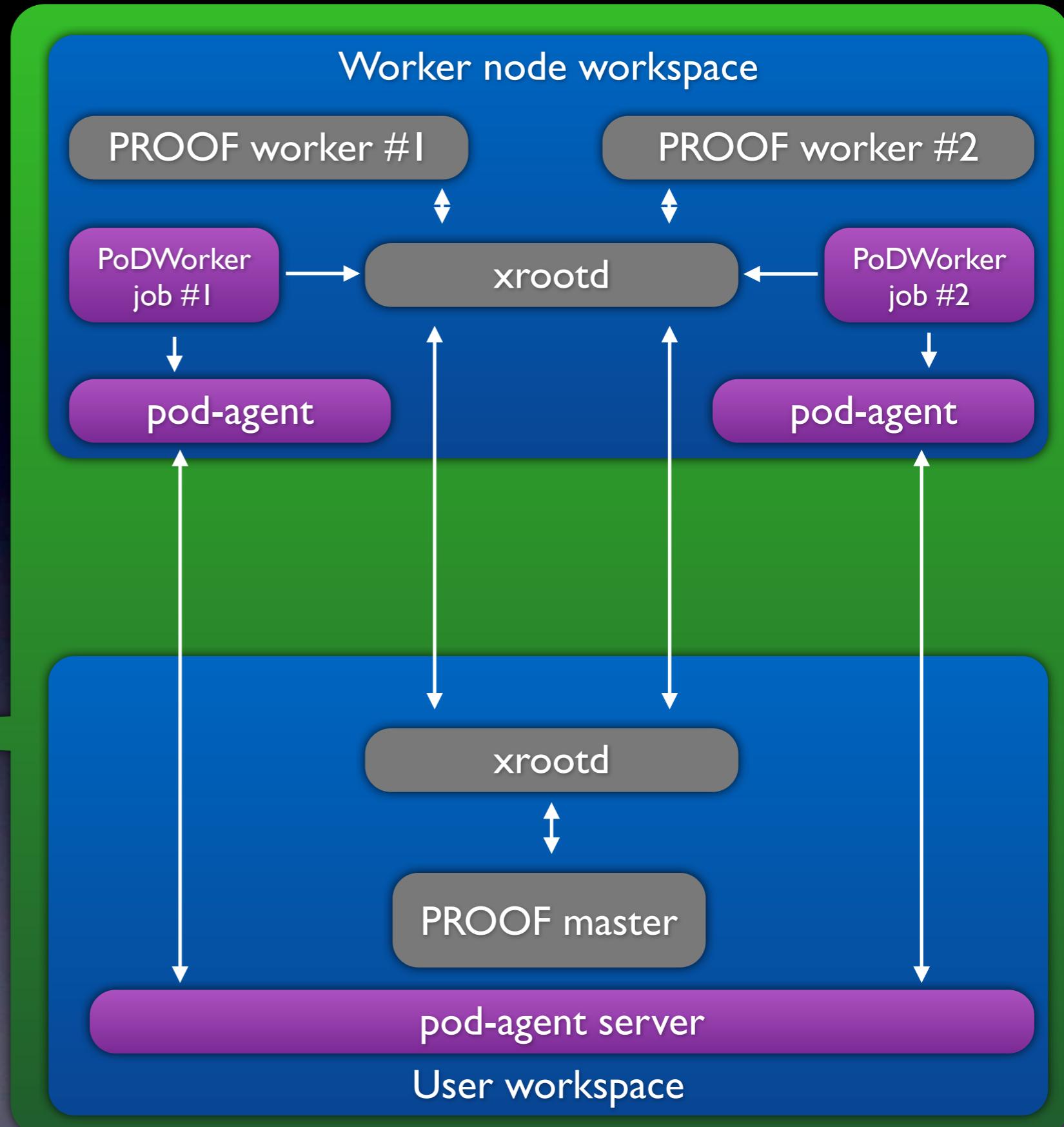
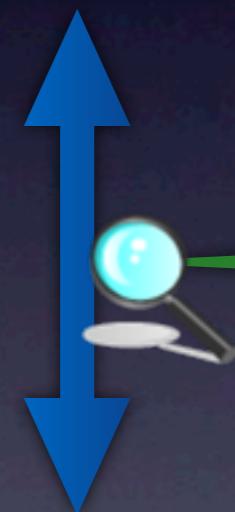
User workspace











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
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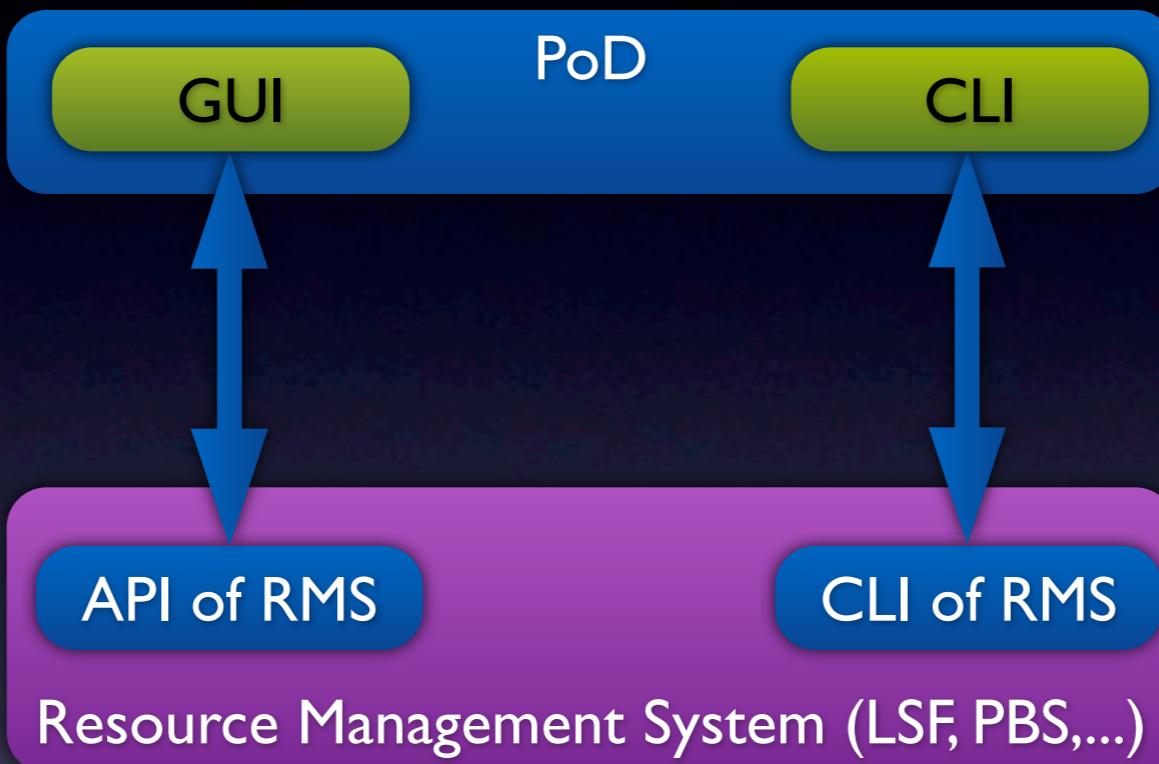
Example

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```

can be used in a PROOF script

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

GUI vs CLI

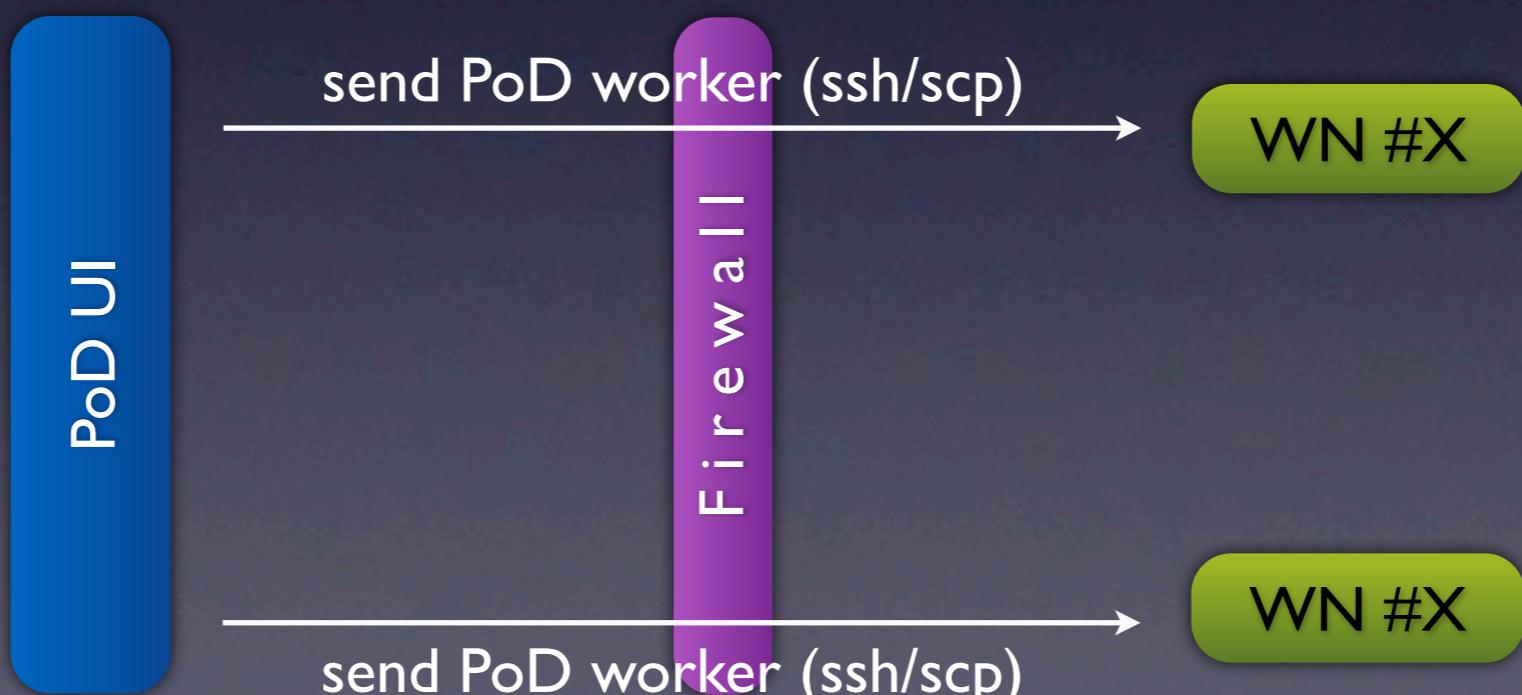


This strategy helps to be more flexible and better integrated into different setups and environments.

SSH plug-in

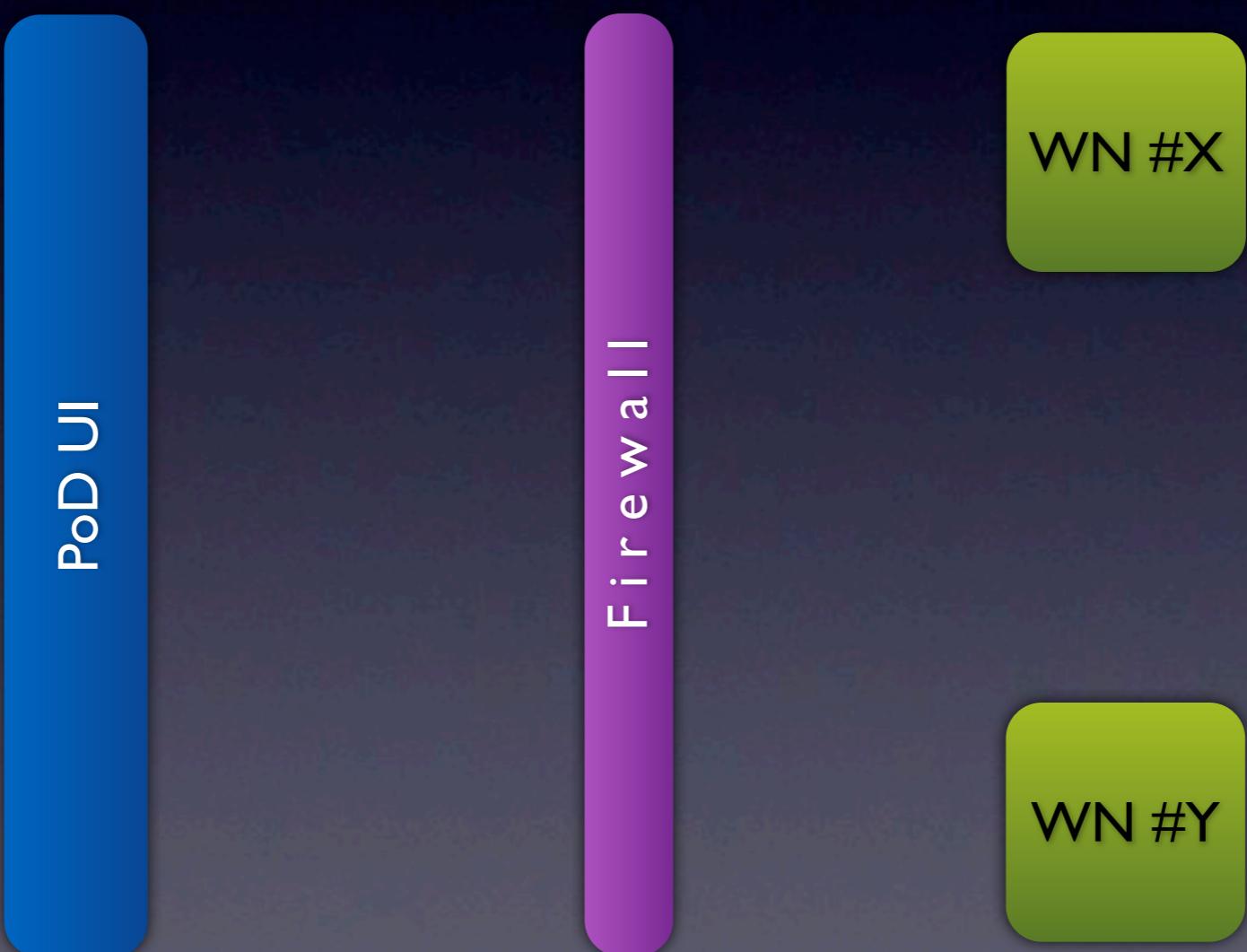
a simple CSV file as an input to the plug-in:

| <i>id</i> | <i>login@host</i> | <i>ssh_params</i> | <i>wn_dir</i> | <i>num_of_workers</i> |
|-----------|-------------------|-------------------|---------------|-----------------------|
| r1 | anar@lxg27.gsi.de | -p24 | /tmp/test | 10 |
| a2 | user@lx1i001 | , | ~/pod_wn | 8 |
| 125 | doom@host.my | , -p22 | /opt/pod | 16 |



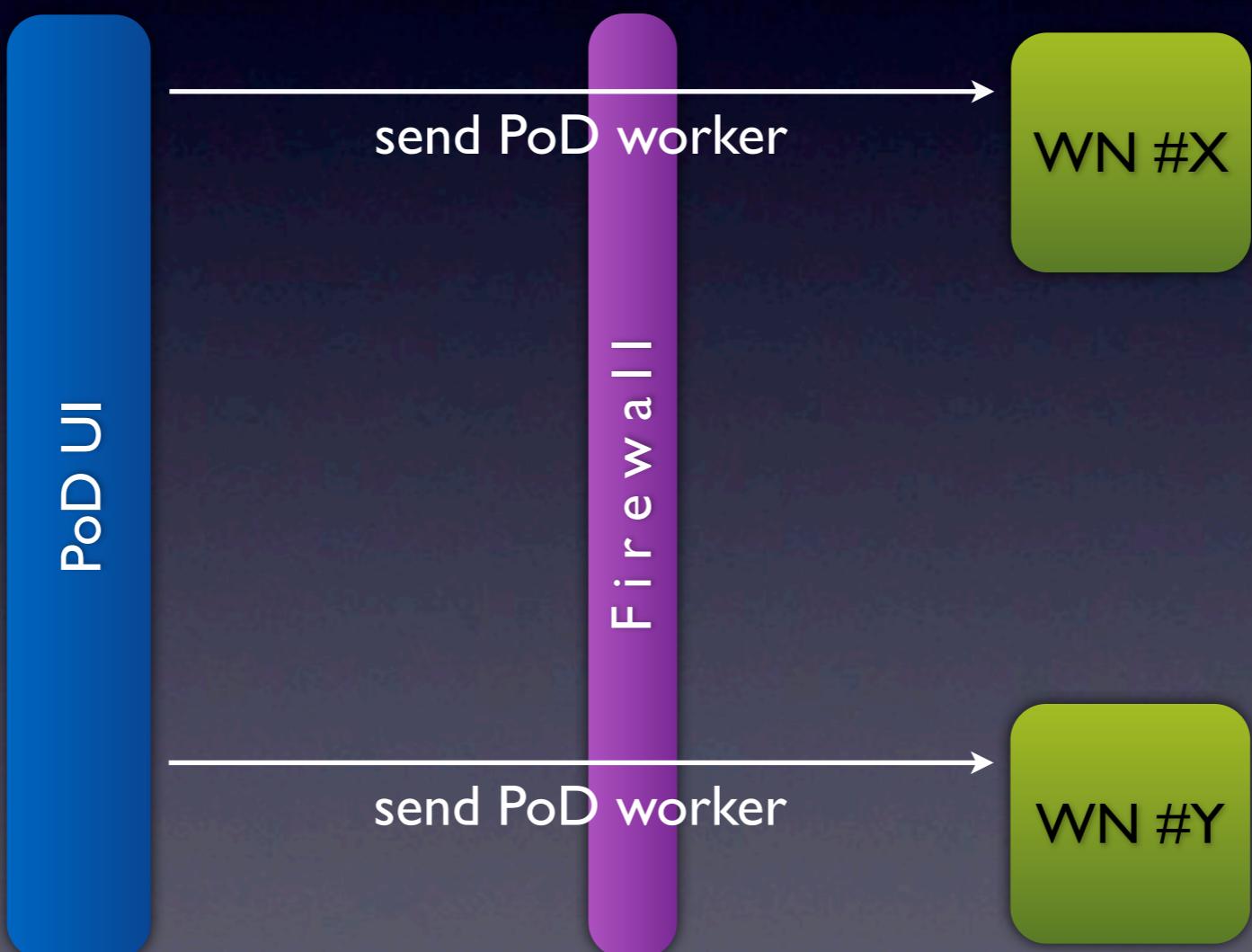
SSH plug-in & tunnel

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



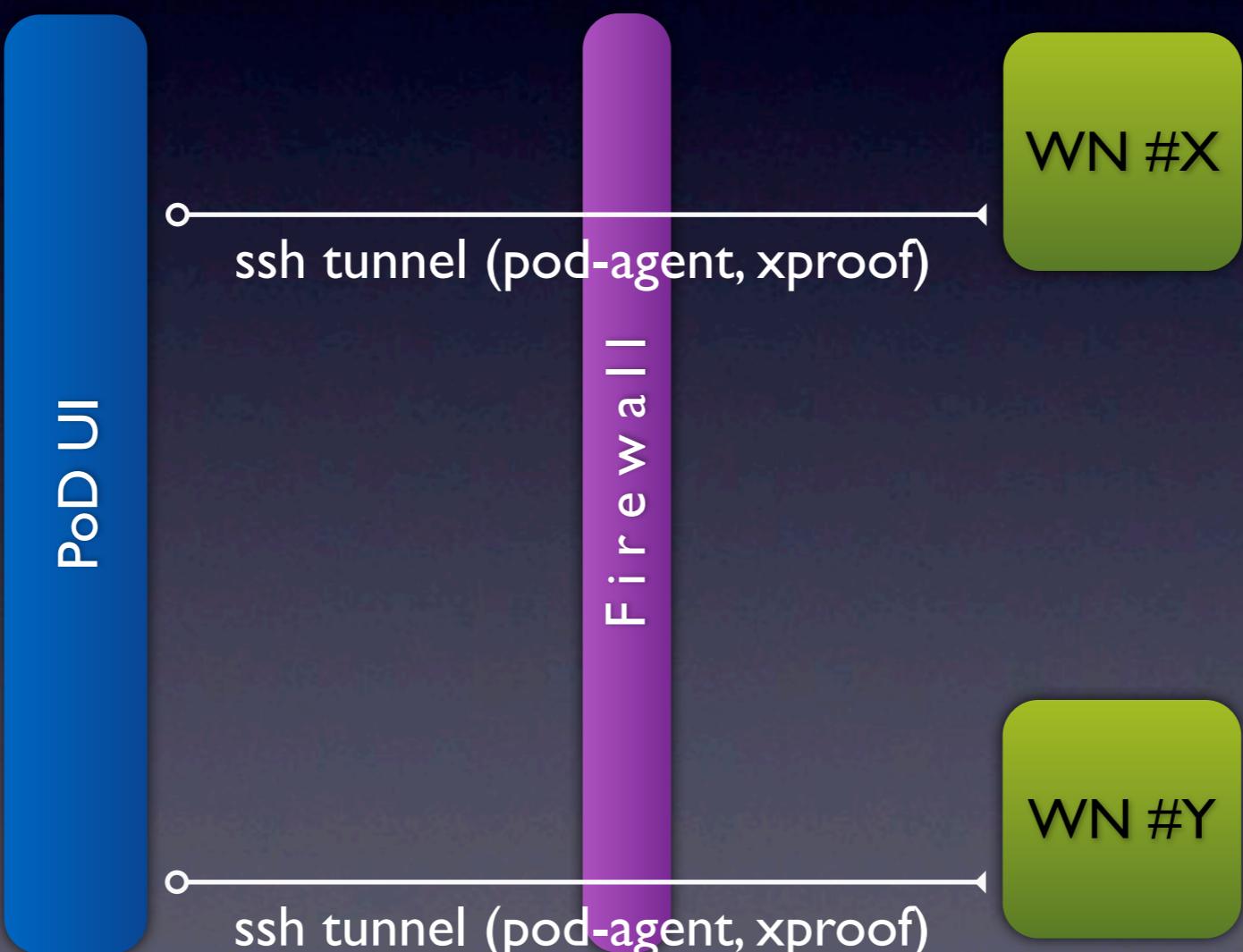
SSH plug-in & tunnel

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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>