PoD Development Status Report

Anar Manafov, GSI Darmstadt

ALICE offline week,
2010-11-18

Propaganda

What is PoD?

PROOF on Demand (PoD) is a tool-set, 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"/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.

Key features

- Easy to use

- GUI & Command-line

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

- Multiuser/-core environment

- Native PROOF connections

- Packet-forwarding

- User defaults - configuration
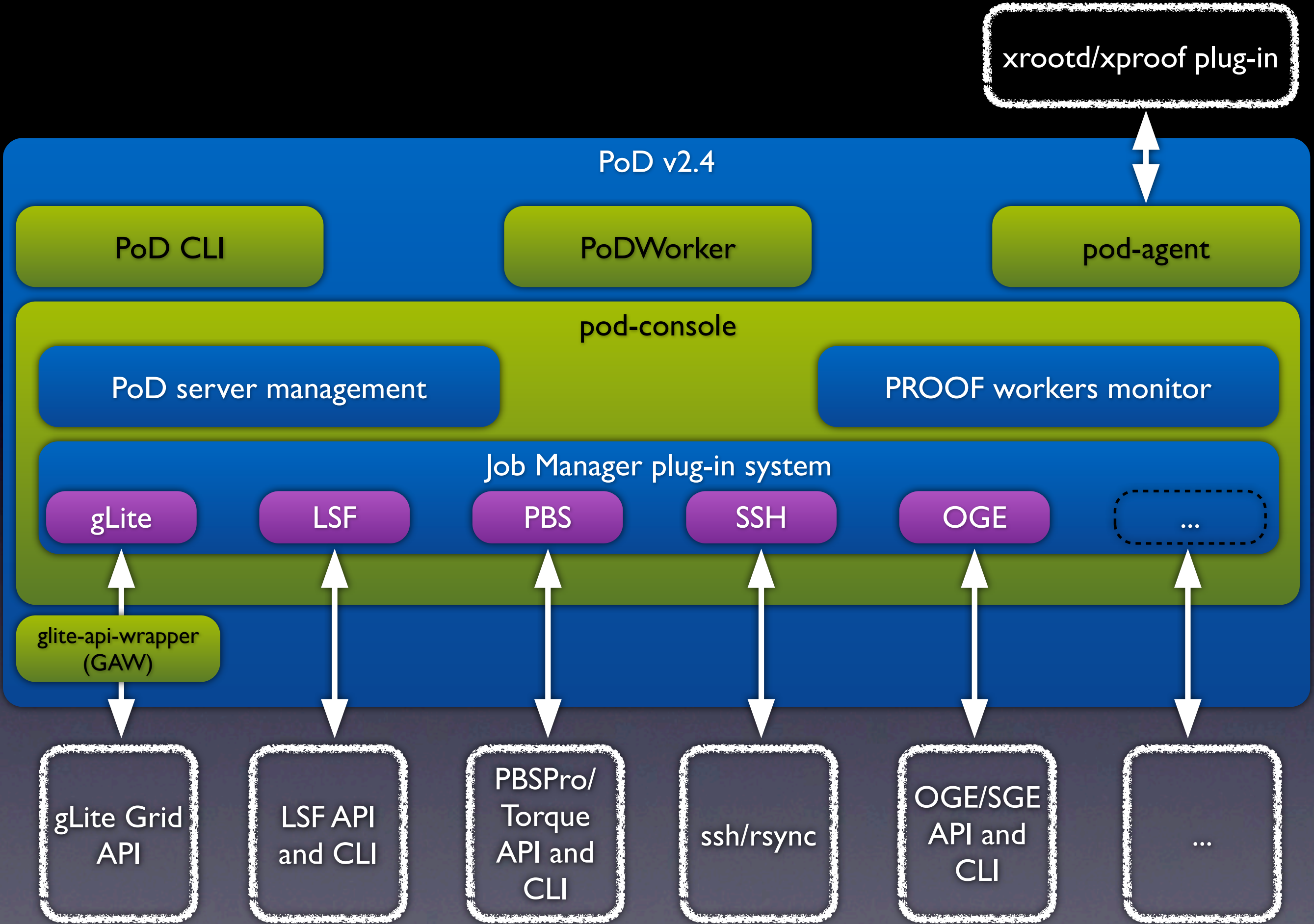
Current status

v2.2 was released (2010-09-17)
v2.3 was released (2010-10-03)
v2.4 was released (2010-11-14)

v3.x - is under development

CHEP 2010 was a very successful event for PoD

PoD was a leader in its field :)

- *there was obvious attention on PoD,*

- *big interest in SSH, OGE and Condor plug-ins.*

- *I've shown more than 20 life demos,*

- *during CHEP's week PoD download counts raised,*

- *we got a number of new customers (not single users, but institutions),*

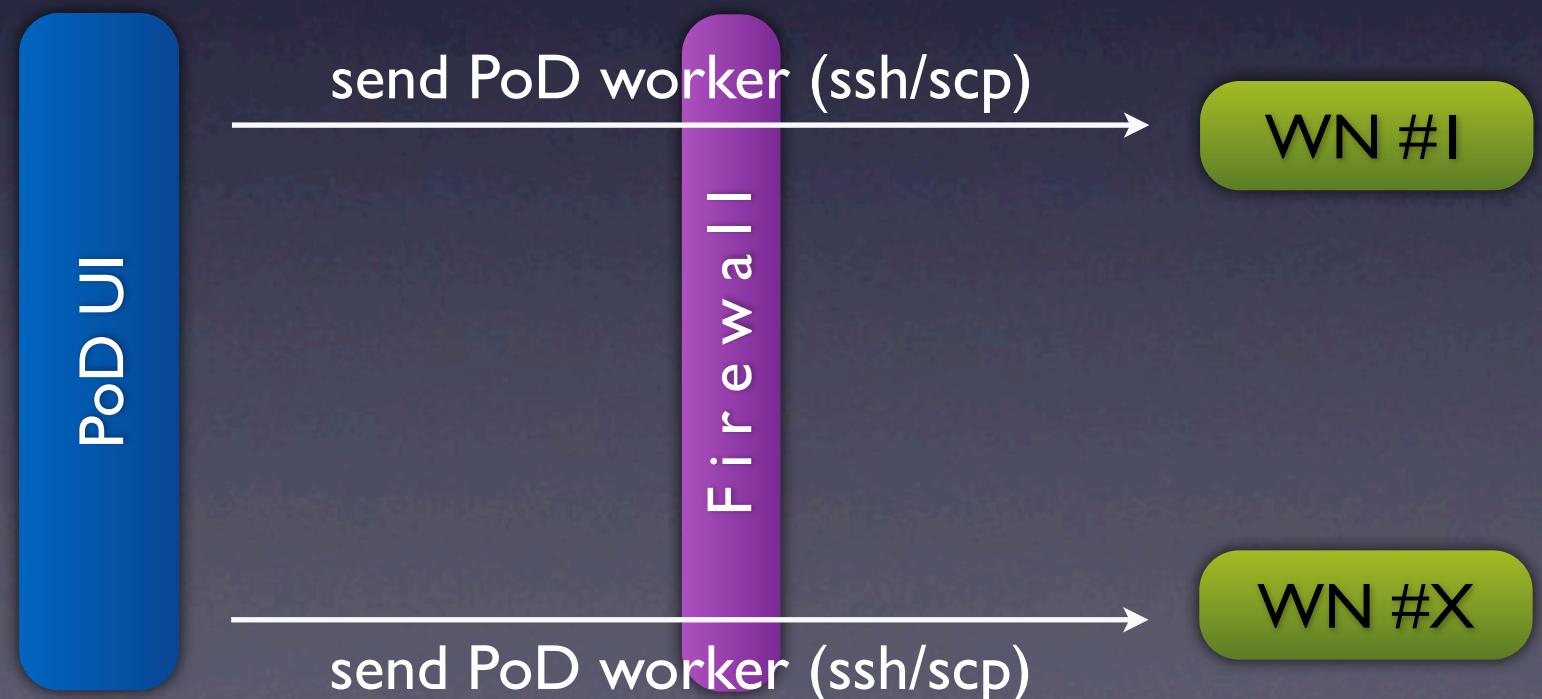- *there were many new suggestions, feature requests.*
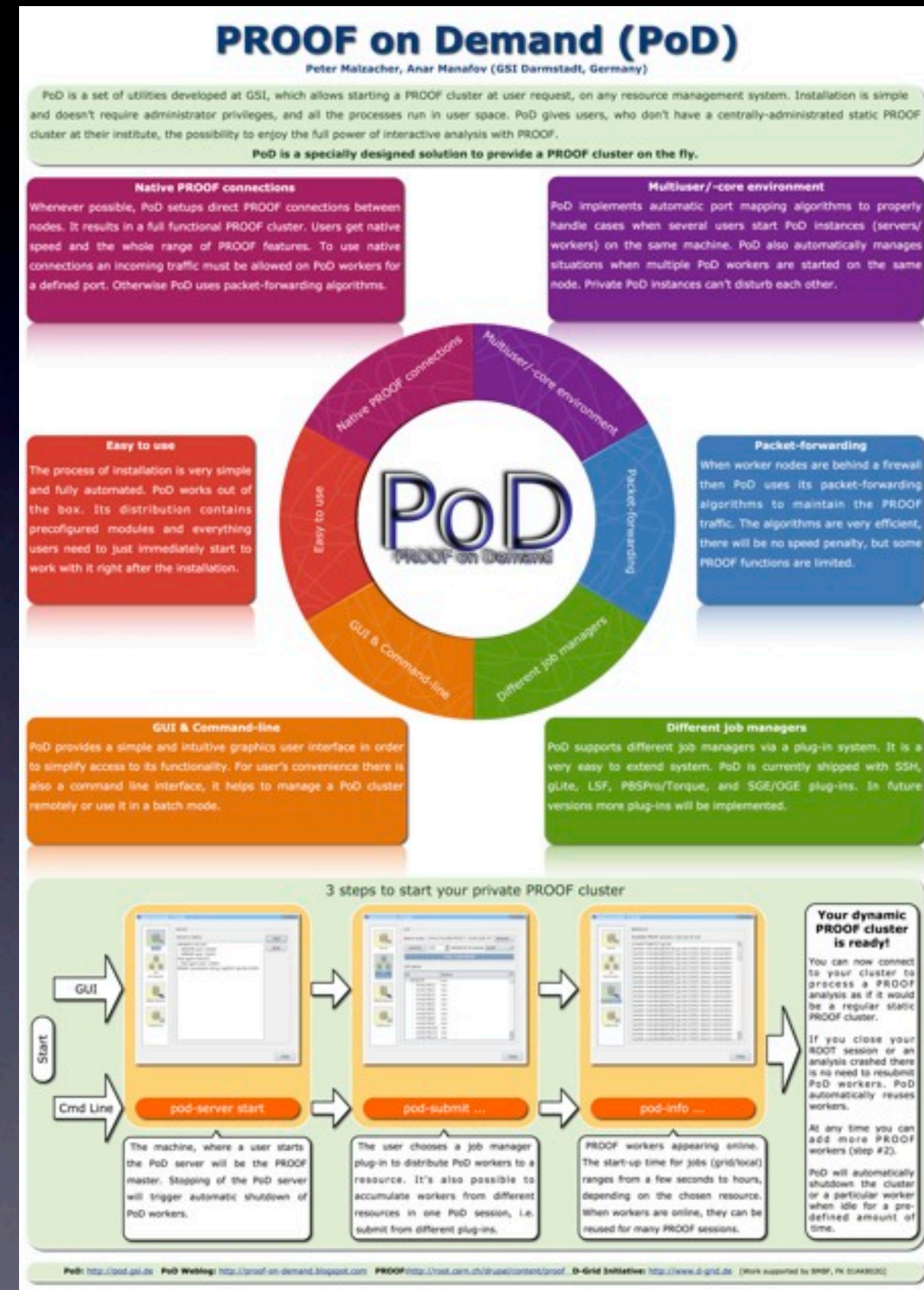
SSH plug-in

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
```

the plug-in is in PoD
CLI only, so-far

PoD UI

Firewall

send PoD worker (ssh/scp)

WN #1

send PoD worker (ssh/scp)

WN #X

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.

OGE plug-in

- supports OGE v6.0 or higher,

- uses DRMAA v1,

- is implemented in PoD GUI (DRMAA),

- is implemented in PoD CLI (OGE CLI),

- supports so far only a shared home FS.

PoD WNs

- Dependencies have been revised in order to lighten WNs.
  Removed dependencies on perl modules and python.

- Now PoD supports a custom user environment script.

PoD WNs

- WNs don't download PoD pre-compiled binaries anymore.

- Automatically detect of a shared home FS.

- Improved start-up time of the workers.

Mac OS X

PoD UI/Server supports Mac OS X

xproofd

PoD uses now xproofd instead of xrootd.

It helps users to run PoD and xrootd (for data) on the same machines.

PoD plug-in system

The CLI plug-in system was slightly updated in order to make it much easer to extend with new plug-ins and to support old ones.
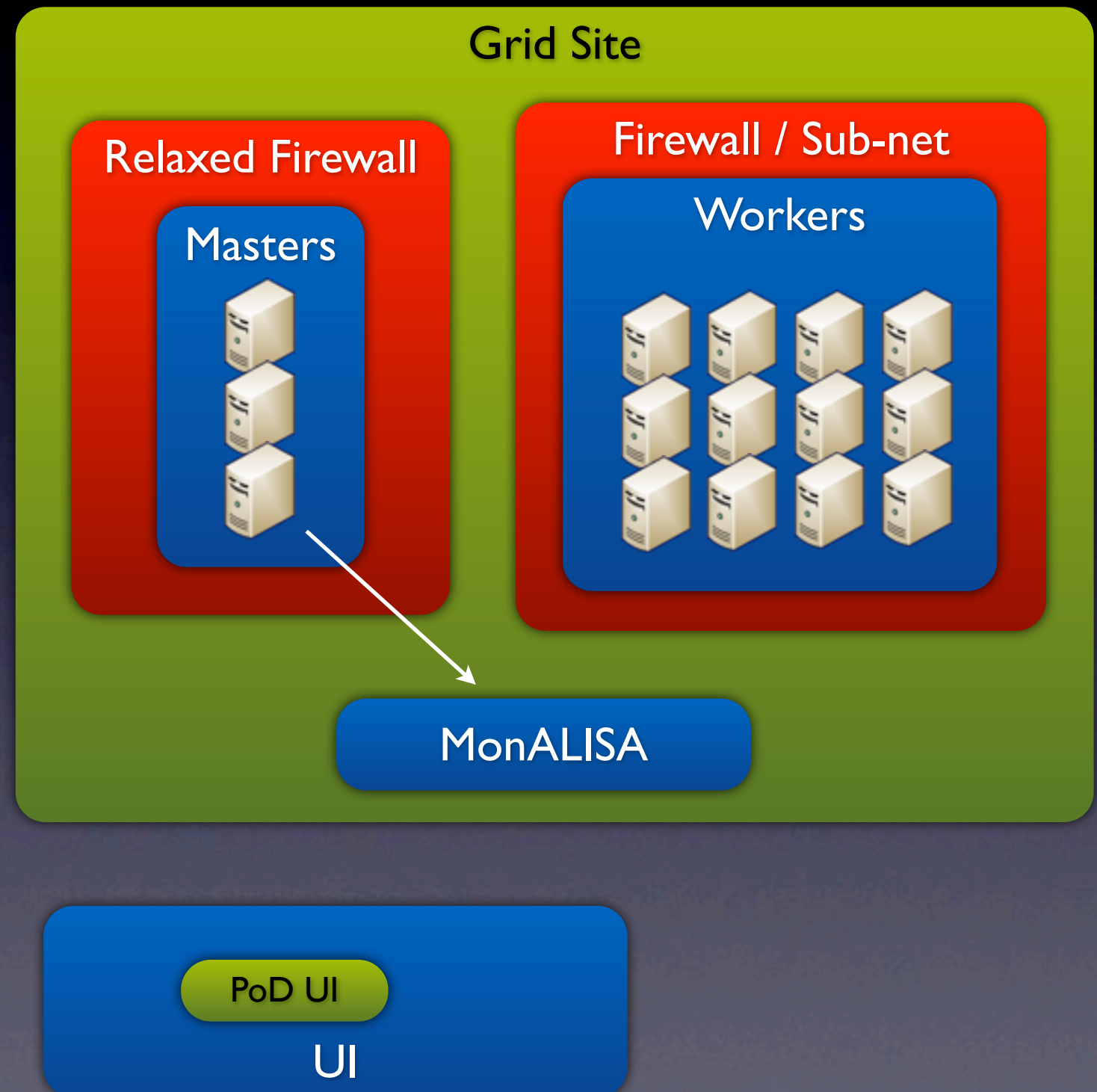
AliEn integration

Step #1 User request a PoD server

• User's request is only a configuration file for PoD server. No binaries are transferred.

• AliEn using master queue starts a PoD server on the PoD-aware master machines, using user's config file.

• User could specify, a minimum and a maximum number of workers and for how long (s)he can wait for the max. number of workers.

Grid Site

Relaxed Firewall

Masters

Firewall / Sub-net
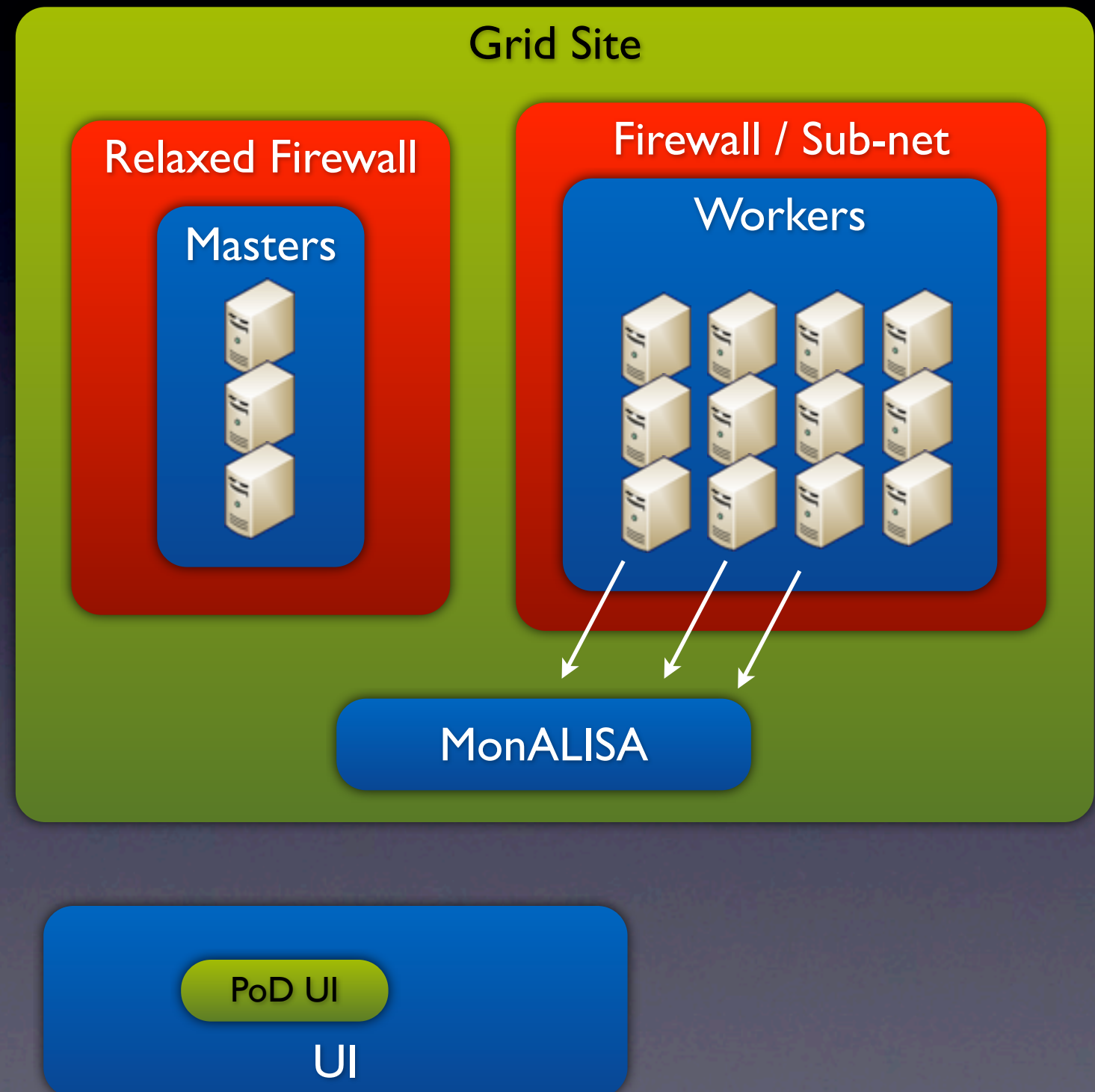
Workers

MonALISA

PoD UI

UI
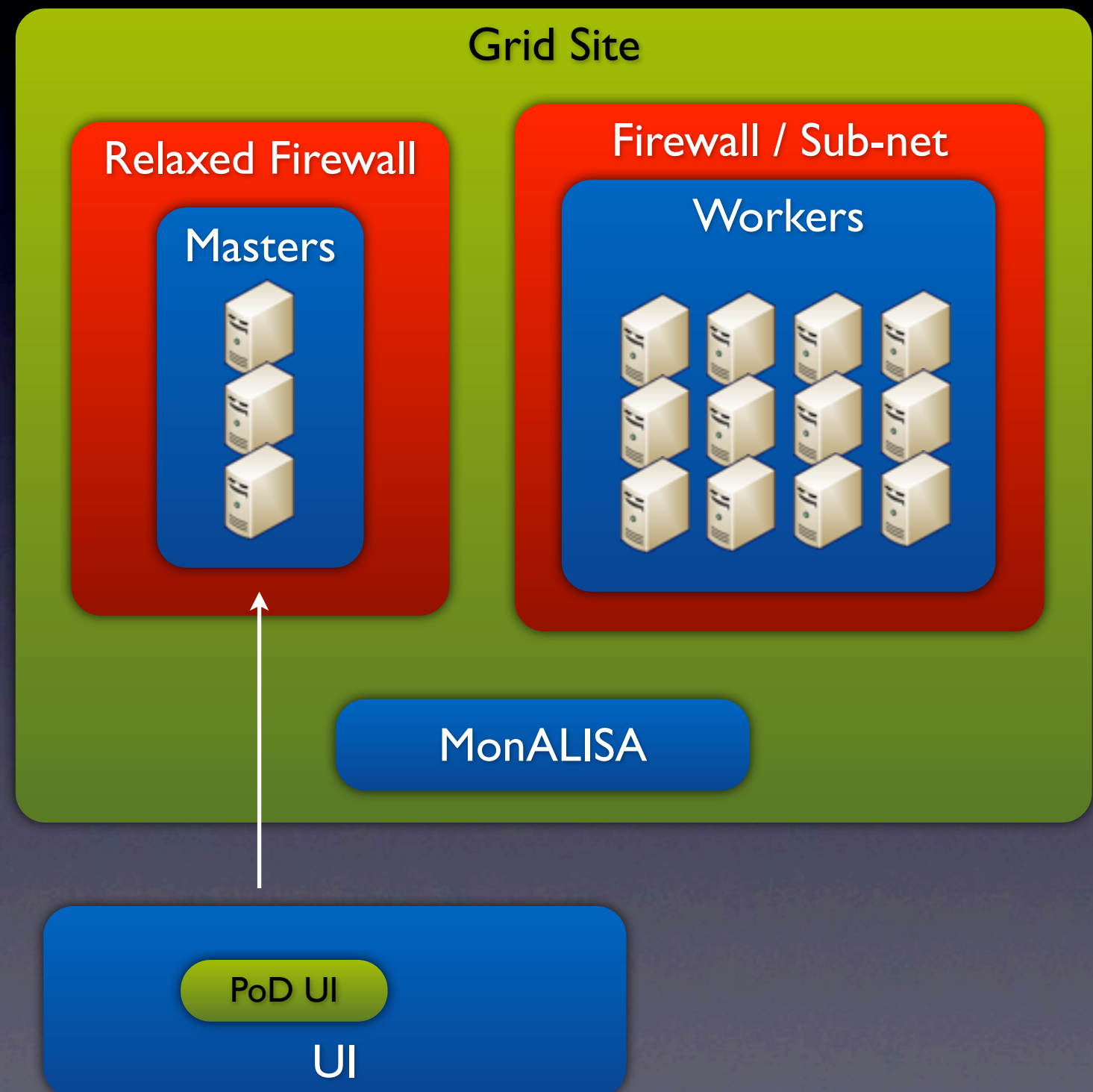
Step #2 PoD server registers in MonALISA

- Server sends info to MonALISA every X sec.

- Server stops sending info, if it:
  - got enough workers or
  - can't wait longer (as user requested) or
  - shut down.

Grid Site

Relaxed Firewall

Masters

Firewall / Sub-net

Workers

MonALISA

PoD UI

UI

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Step #3 AliEn constantly starts PoD workers whenever there are free job slots

- This is a constant process.

- Before starting a regular job on a free slot, AliEn starts a PoD worker.

- PoD worker checks MonALISA for available PoD servers.

- If there is no servers, PoD worker exits after a define amount of time, so that AliEn job slot could take a normal job.

Grid Site

Relaxed Firewall

Masters

Firewall / Sub-net

Workers

MonALISA

PoD UI

UI

Step #4 PoD workers connect to available PoD servers

• As soon as a PoD server got enough workers, it will stop publishing to MonALISA and will stop to except anymore workers.

Grid Site

Relaxed Firewall

Masters

Firewall / Sub-net

Workers

MonALISA

PoD UI

UI

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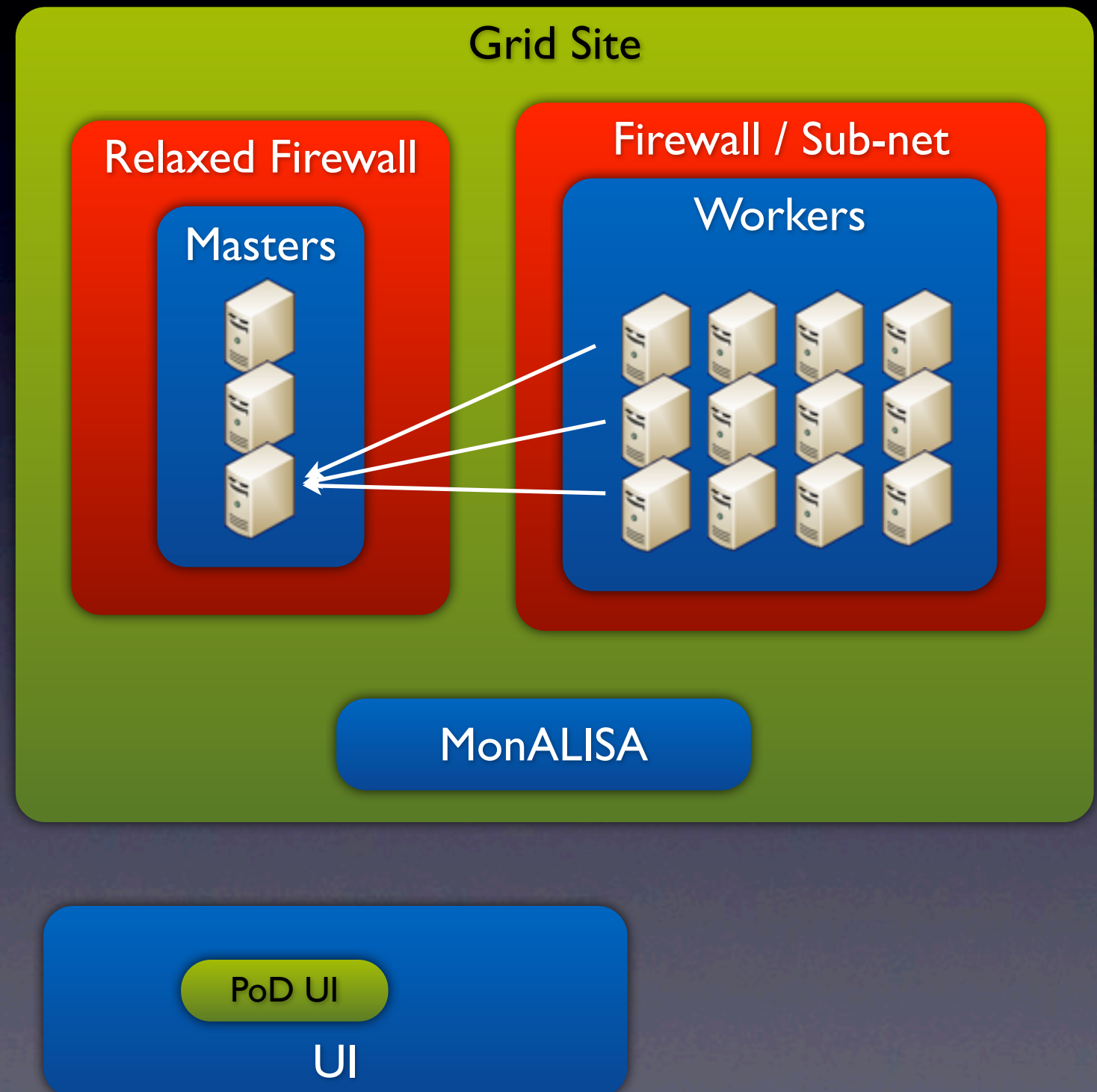
Step #5 PoD will process its usual routines in order to setup PROOF

Site Requirements

TCP Ports (small ranges):

1. WNs: incoming from Masters (required only for native PROOF connections, otherwise PoD will use packet-forwarding),
2. WNs: outgoing to Masters,

3. Ms: incoming from WNs,
4. Ms: outgoing to UI,
5. Ms: incoming from UI on PROOF ports.

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Questions to AliEn

Server: Is it possible to fork PoD server under individual users accounts?

WN: Is it possible to start PoD processes under individual users accounts?

AliEn integration: steps for PoD to accomplish

- implement a central installation feature,

- disentangle PoD UI and PoD Server,

- teach PoD WN and Server to understand PoD's user defaults configuration via PoD protocol,

- teach PoD Server and WNs to talk to MonALISA.

Short-term ToDo

• a "central installation" feature,

• a Condor plug-in,

• PoD UI and Server disentangling.

http://pod.gsi.de