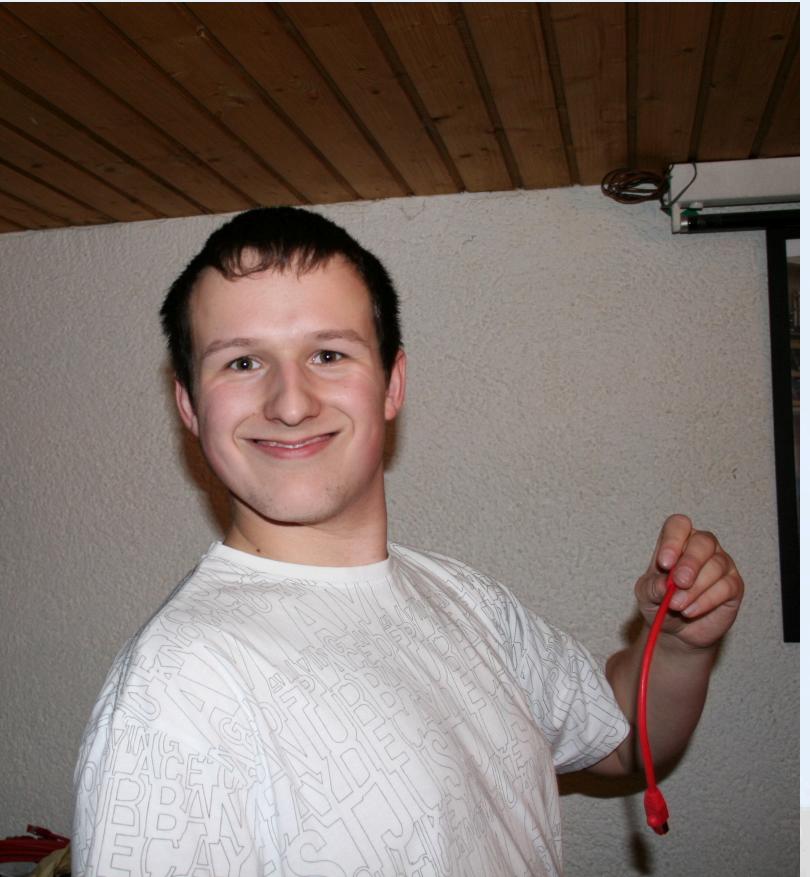


Doing mass PE upgrades in
highly restricted environments

\$ whoami

- Tim 'bastelfreak' Meusel
- Puppet Contributor since 2012
- Merging stuff on [Vox Pupuli](#) (Puppet Community) since 2015
- Vox Pupuli Project Management Committee member
- Senior IT Automation Consultant at [betadots](#)



Bolt

Tasks & Plans

Bolt

Tasks?!

- Runs tasks via ssh or WinRM on remote systems
 - CLI only



Bolt

Tasks?!

- Runs tasks via ssh or WinRM on remote systems
 - CLI only
- A task is a executable binary/script + json file

```
{  
  "puppet_task_version": 1,  
  "supports_noop": false,  
  "description": "Rename branch",  
  "parameters": {  
    "control_repo_branch": {  
      "description": "Control-repo branch",  
      "type": "String"  
    }  
  }  
}
```

```
#!/bin/bash  
  
pushd /tmp/control-repo || exit  
git branch -m production old_prod  
git branch -m "$PT_control_repo_branch" production
```



Bolt

Tasks?!

- Runs tasks via ssh or WinRM on remote systems
 - CLI only
- A task is a executable binary/script + json file
- Input and output of each task is JSON
 - makes parsing, scripting and concatenating easy



Bolt

Tasks?!

Plans?!

- Bolt Plans are written in Puppet DSL (or [YAML](#))
- Plans apply puppet code, execute Bolt or Puppet functions, start tasks or other plans

```
# @param message the string we want to paste to STDOUT
plan test::foo (
  String[1] $message = 'Hi CfgMgmtCamp!',
) {
  out::message($message)
  run_task('puppet_agent::install', get_targets('all'))
}
```



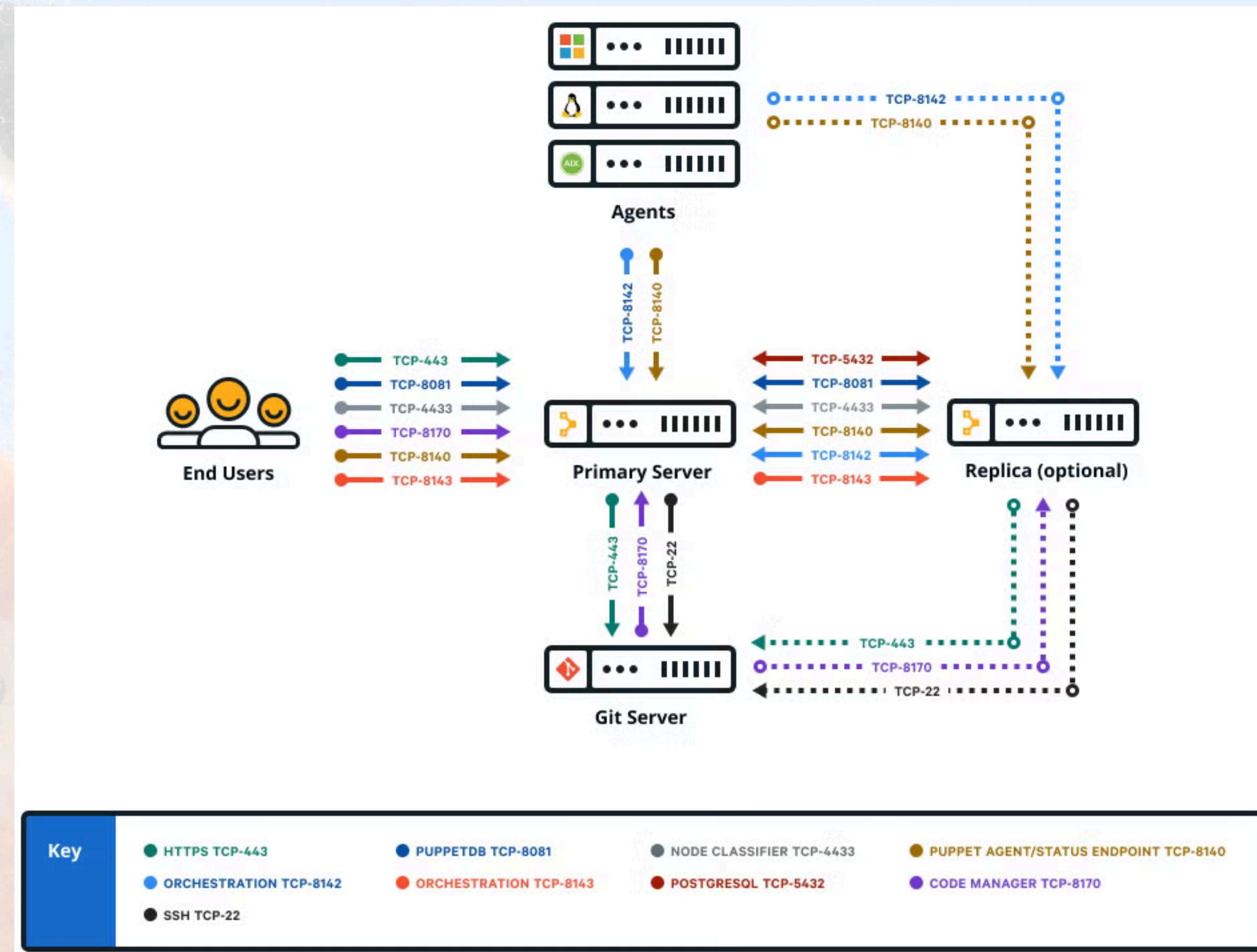
Bolt is the missing part in the ecosystem for imperative workflows and orchestration

It combines scripts and Puppet code

Puppet
Enterprise

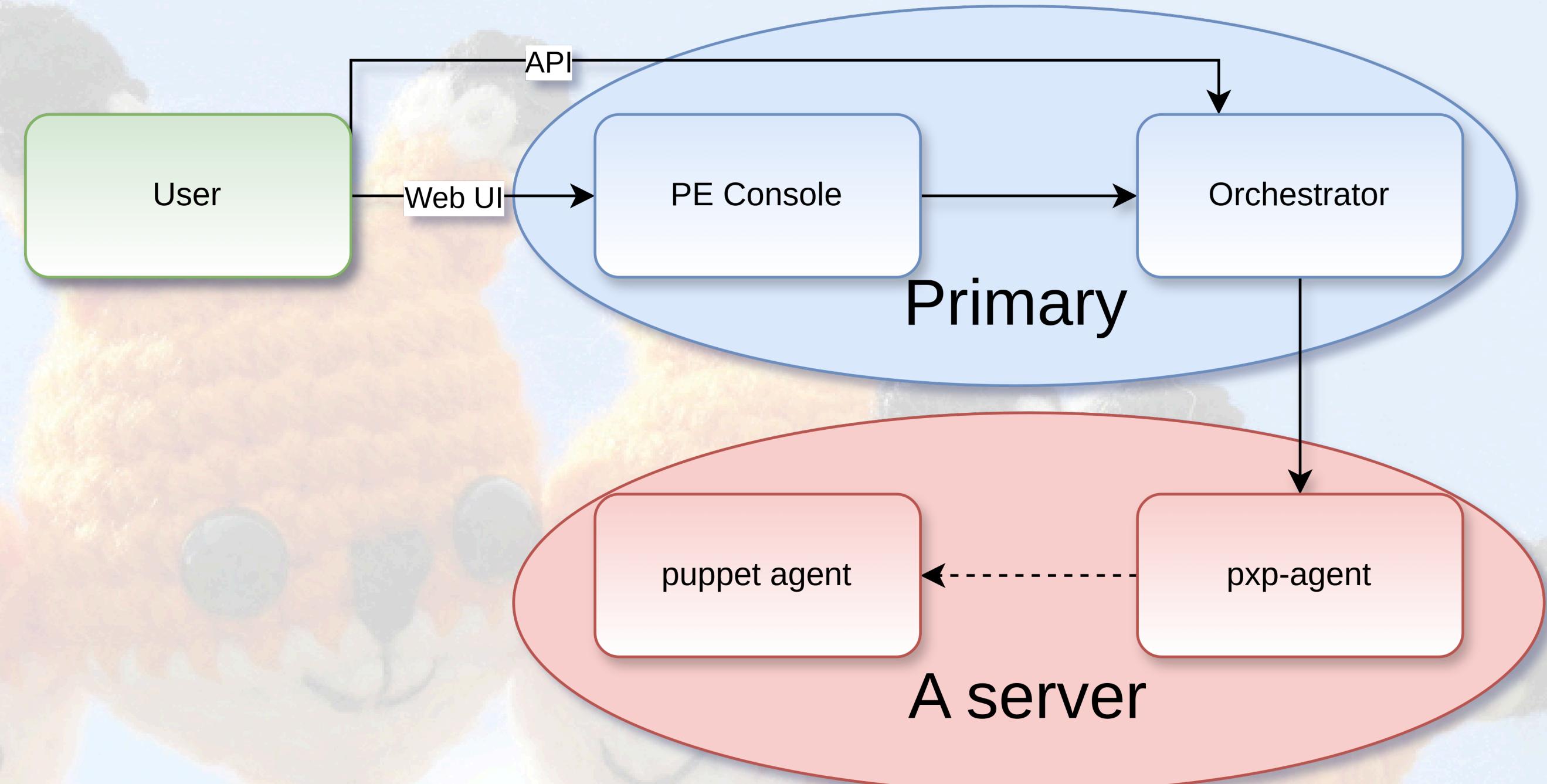
PE

What?



PE

What?



- Orchestrator can run Puppet tasks and Plans
- Basically an API & Web UI for bolt



PE

What?

Puppet Plans

- What are Puppet tasks & Plans?
- Like bolt task & Plans
- Use the PXP agent as transport



PE

What?

Puppet Plans

- What are Puppet tasks & Plans?
- Like bolt task & Plans
- Use the PXP agent as transport
- Orchestrator is closed source, PXP agent is open source
- There are subtle differences between Bolt plans and Plans in PE
 - Plans in PE have less features?! https://www.puppet.com/docs/pe/2025.0/plans_limitations.html



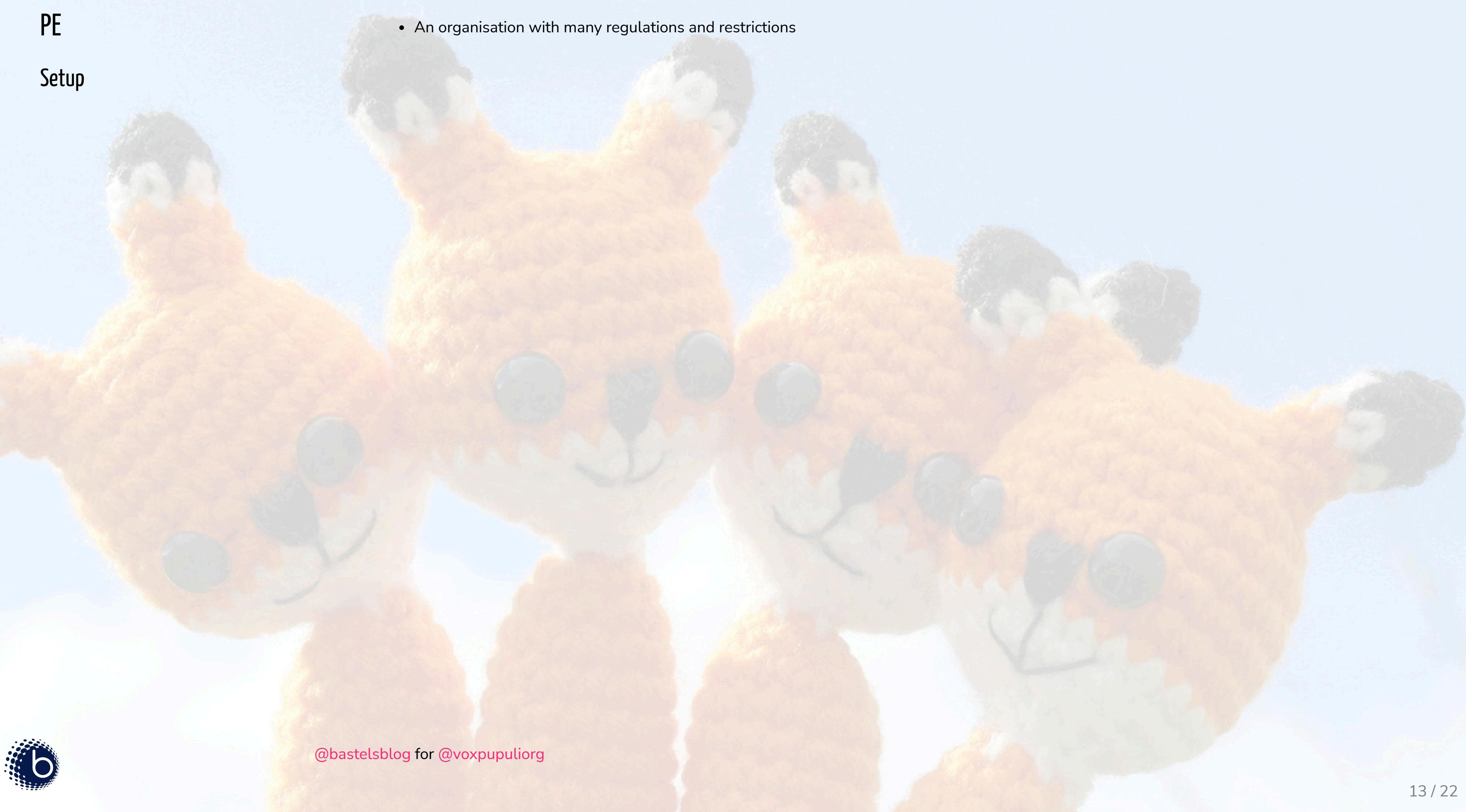
PE in highly restricted environments

A user story

PE

- An organisation with many regulations and restrictions

Setup



PE

Setup

- An organisation with many regulations and restrictions
- Runs 3000 different services

Each service:

- consists of a couple of virtual machines



PE

Setup

- An organisation with many regulations and restrictions
- Runs 3000 different services

Each service:

- consists of a couple of virtual machines
- needs to be isolated from each other



PE

Setup

- An organisation with many regulations and restrictions
- Runs 3000 different services

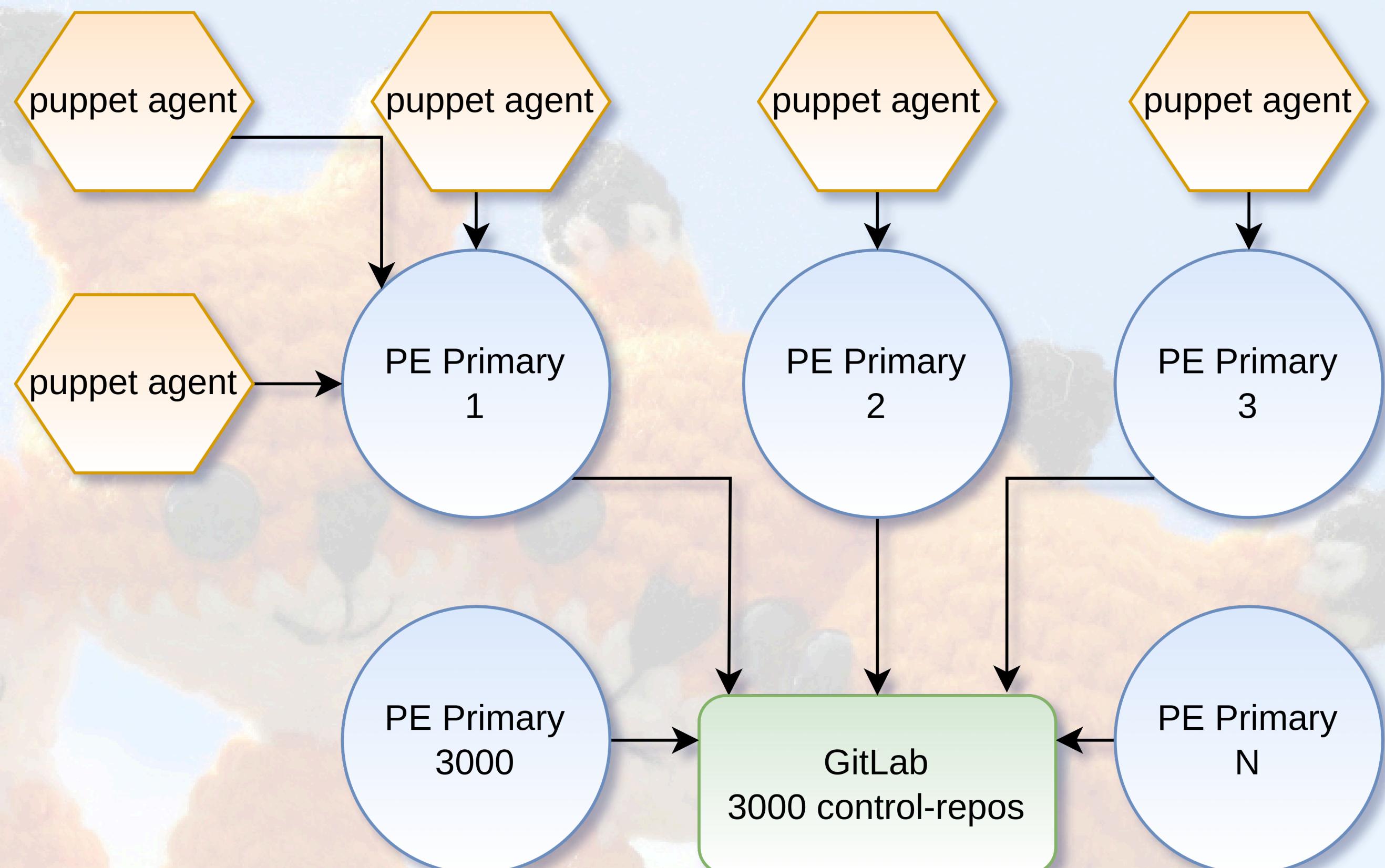
Each service:

- consists of a couple of virtual machines
- needs to be isolated from each other
- Has to be managed by Puppet



PE

Setup



Setup

- 1 central GitLab
 - contains all puppet modules
 - contains 3000 control repos
- 3000 individual primaries
- 5-40 agents per primary



PE

Setup

Constraints

"security" constraints:

- No ssh access to a service



PE

Setup

Constraints

"security" constraints:

- No ssh access to a service
 - The PE APIs are available



PE

Setup

Constraints

"security" constraints:

- No ssh access to a service
 - The PE APIs are available
- No code changes for running services allowed
 - Architects wanted "immutable" services



PE

Setup

Constraints

"security" constraints:

- No ssh access to a service
 - The PE APIs are available
- No code changes for running services allowed
 - Architects wanted "immutable" services
- Of course no internet access
 - Everything needs to be mirrored internally
 - No HTTP proxy available



PE

- Update 3000 PE 2019 (Puppet 6) & PE 2021 (Puppet 7) services to PE 2023 (Puppet 8)

Setup

Constraints

Job



PE

- Update 3000 PE 2019 (Puppet 6) & PE 2021 (Puppet 7) services to PE 2023 (Puppet 8)
- Don't use ssh

Setup

Constraints

Job



PE

- Update 3000 PE 2019 (Puppet 6) & PE 2021 (Puppet 7) services to PE 2023 (Puppet 8)
- Don't use ssh
- Fully automated

Setup

Constraints

Job



PE

- Update 3000 PE 2019 (Puppet 6) & PE 2021 (Puppet 7) services to PE 2023 (Puppet 8)
- Don't use ssh
- Fully automated
- Please don't break anything

Setup

Constraints

Job



PE

- I mentioned this to Perforce employees

Setup

Constraints

Job



PE

Setup

Constraints

Job

- I mentioned this to Perforce employees
- Perforce reached out to me for a collaboration

The idea:

- I implement the upgrade somehow
- Perforce assists, helps to review PRs quickly
- Perforce can publish a whitepaper
- We publish the solution



PE

Setup

Constraints

Job

- I mentioned this to Perforce employees
- Perforce reached out to me for a collaboration

The idea:

- I implement the upgrade somehow
- Perforce assists, helps to review PRs quickly
- Perforce can publish a whitepaper
- We publish the solution
- Perforce stopped responding to all emails



Upgrading Puppet Enterprise

Upgrade your PE installation as new versions become available.

- [Upgrade PE using the installer tarball](#)

Upgrade PE infrastructure components to get the latest features and fixes. Follow the upgrade instructions for your installation type to ensure you upgrade components in the correct order. Coordinate upgrades to ensure all infrastructure nodes are upgraded in a timely manner, because agent runs and replication fail if infrastructure nodes are running a different agent version than the primary server.



Setup

Constraints

Job

Upgrade

Upgrading Puppet Enterprise

Upgrade your PE installation as new versions become available.

- [Upgrade PE using the installer tarball](#)

Upgrade PE infrastructure components to get the latest features and fixes. Follow the upgrade instructions for your installation type to ensure you upgrade components in the correct order. Coordinate upgrades to ensure all infrastructure nodes are upgraded in a timely manner, because agent runs and replication fail if infrastructure nodes are running a different agent version than the primary server.

- TL;DR: "ssh to the Primary and download a tarball"



PE

What's in the tarball?

- Free to download for everybody

Setup

Constraints

Job

Upgrade



PE

Setup

Constraints

Job

Upgrade

What's in the tarball?

- Free to download for everybody
- for example `puppet-enterprise-2021.7.8-el-8-x86_64.tar.gz`
 - PE version specific
 - OS specific



PE

Setup

Constraints

Job

Upgrade

What's in the tarball?

- Free to download for everybody
- for example `puppet-enterprise-2021.7.8-el-8-x86_64.tar.gz`
 - PE version specific
 - OS specific
- contains a yum repo with some rpms and a long bash script



PE

Setup

Constraints

Job

Upgrade

What's in the tarball?

- Free to download for everybody
- for example `puppet-enterprise-2021.7.8-el-8-x86_64.tar.gz`
 - PE version specific
 - OS specific
- contains a yum repo with some rpms and a long bash script
- one package contains puppet modules



PE

Setup

Constraints

Job

Upgrade

What's in the tarball?

- Free to download for everybody
- for example `puppet-enterprise-2021.7.8-el-8-x86_64.tar.gz`
 - PE version specific
 - OS specific
- contains a yum repo with some rpms and a long bash script
- one package contains puppet modules
- bash script runs puppet apply



PE

- License prohibits putting the puppet modules into my GitLab
- License prohibits putting the rpms on my local mirror

Setup

Constraints

Job

Upgrade



- Puppet is very flexible and suitable for different usecases
- There are many hidden gems and extensions available
- More docs from Puppet/Perforce for edgecases & advanced users would be awesome!
- For feedback: `bastelfreak` on slack.puppet.com/Libera.Chat IRC or tim@bastelfreak.de
- This talk and previous ones: github.com/bastelfreak/talks

Thanks for your attention!

]



@bastelsblog for @voxpupuliorg