Using Puppet to Manage Linux

(and nearly everything else)

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The Life of a typical svsadmin

Debian

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apt-get install openssh-server
vi /etc/ssh/sshd_config
/etc/init.d/ssh start
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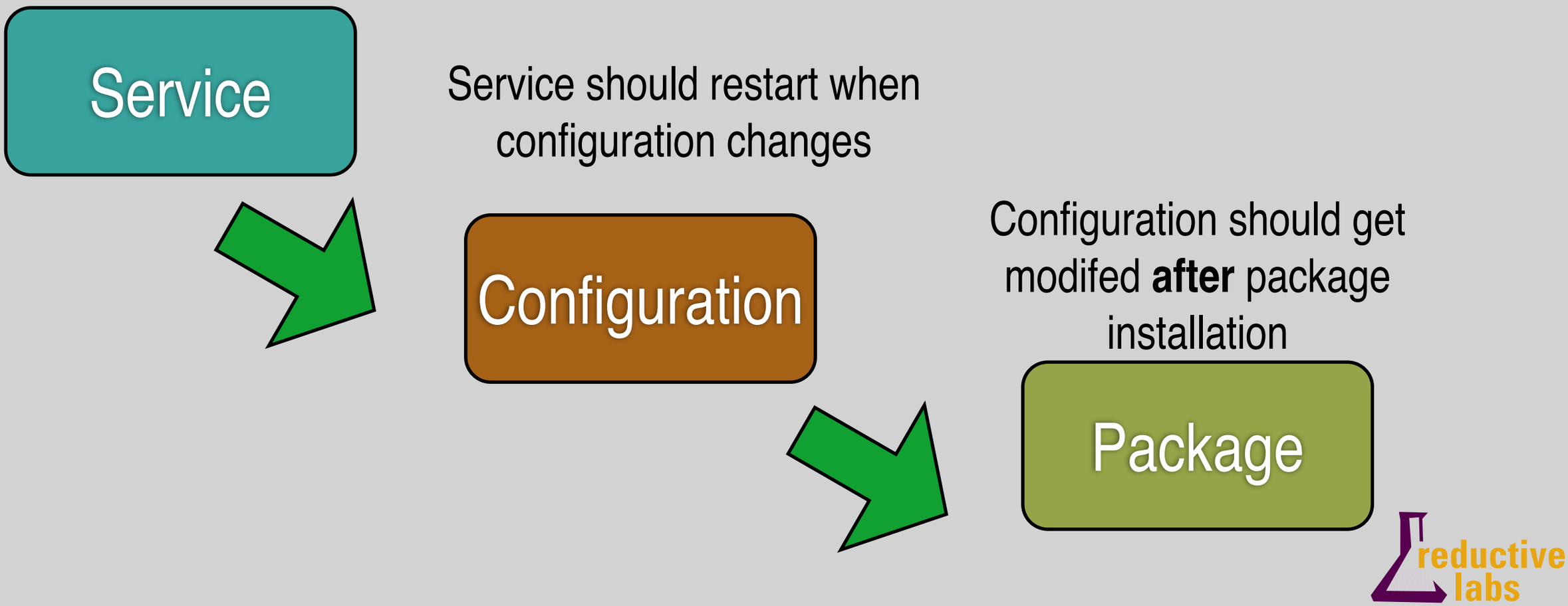

Most of what we manage fits this model

Packages

Users

Groups

Services

FS Mounts

Cron Jobs

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Puppet's primary advance is its Resource Abstraction Layer (RAL)

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An Analogy

	Programming	**SysAdmin**
Low-level	Assembly	commands and files
Abstract	C	Resources

Better tools are about higher quality, not less effort

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Resource Abstraction Layer

Resource Types

Package

User

Service

apt

dpkg

useradd

init.d

SMF

yum

ports

netinfo

Providers

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Portable Abstractions

- 23 package types
- Users in NetInfo, useradd, pw
- Support for Debian, Ubuntu, Red Hat, Solaris, OS X, Gentoo, SuSE, FreeBSD, and more

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It's an Operating System API

```
luke@culain(0) $ ralsh user luke
user { 'luke':
     uid => '100',
     gid => '1000',
     shell => '/bin/bash',
     home => '/home/luke',
     ensure => 'present',
     groups => ['sysadmin','audio','video','puppet'],
     comment => 'Luke Kanies'
}
luke@culain(0) $
```

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Everything's Explicit

```
class ssh {
    package { ssh: ensure => installed }
    file { sshd_config:
        name => "/etc/ssh/sshd_config",
        owner => root,
        group => root,
        source => "puppet://server/apps/ssh/sshd_config
        before => Package[ssh]
    }
    service { sshd:
        ensure => running,
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    }
}
```

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It has a few other goals

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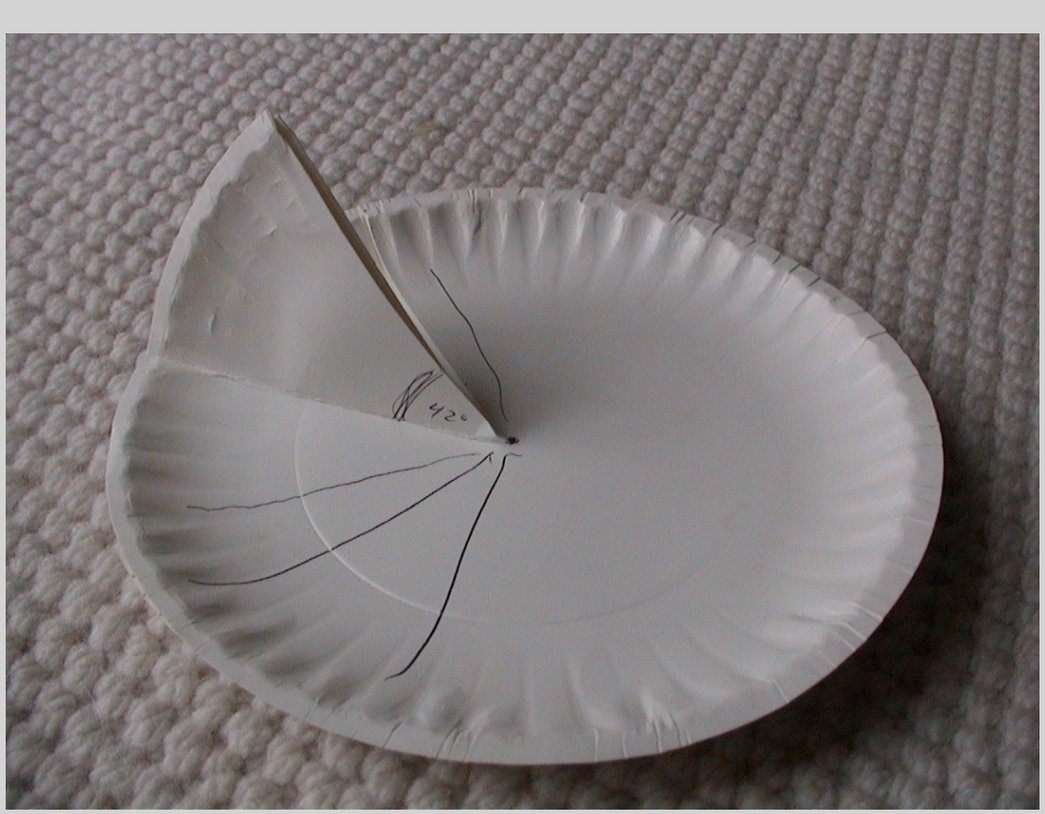
SSH and a *for* loop is not a solution



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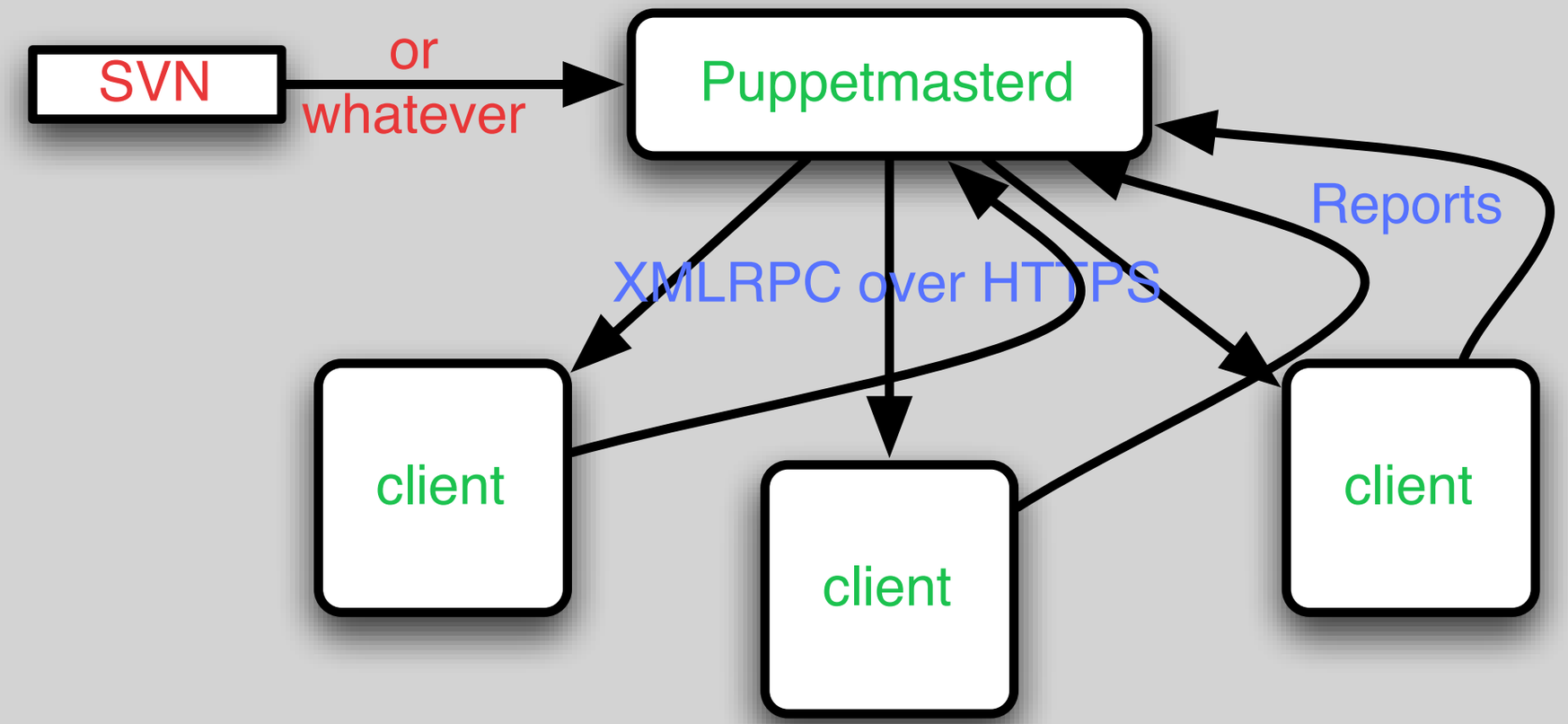
Centralized Management



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An open development community

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If the product sucks, I don't eat

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Revisiting Abstraction

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Resources are high-level abstractions for managing systems

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Via **specifying** and **applying** resource catalogs

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What resources are you managing?

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How are they related?

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What resource classes is the given host a member of?

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A simple example

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Portability and Naming

```
file { sshd_config:
    name => $operatingsystem ? {
        darwin => "/etc/sshd_config",
        default => "/etc/ssh/sshd_config",
    },
    owner => root,
    group => root,
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Associating Classes with Nodes

```
node culain inherits basenode {
    include puppet::server, mailserver
    include webserver, webserver::mail
}

node rh3a inherits basenode {
    include os::redhat
}

node laeg inherits basenode {
    include yum::repository, puppet::server
    include webserver, webserver::trac
}
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So You've Got a Resource Catalog

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The Configuration Process

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2. Do a topological sort based on resource dependencies
3. Iterate across each resource in turn, fixing any resources that are out of sync
4. This process repeats every 30 mins by default

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Configuration Retrieval is via XMLRPC over HTTPS

And moving to REST
over HTTPS

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Puppet has its own Certificate Authority

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Resource sorting is done via dependencies

In this context, I sometimes call the Resource Catalog the ‘Resource Graph’

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2. Compare to desired state
3. If there are any discrepancies, fix them (or log)

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A Simple Transaction

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file { "/tmp/testing":
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```
debug: //File[/tmp/testing]: Changing mode
debug: //File[/tmp/testing]: 1 change(s)
notice: //File[/tmp/testing]/mode:
     mode changed '644' to '755'
debug: Finishing transaction 10644270 with 1 changes
```

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idempotent

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Logs go to syslog (by default)

You can configure clients to send simple reports to the server

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An Irony

Puppet exposes **Change Management** as your next biggest problem

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About the implementation

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Written in Ruby

- 1 to 1 test code to real code (and pretty good coverage)
- Plugins are nearly always drop-in (resource types, providers, reports, etc.)

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It's in production usage around the world right now

- Two sites managing more than 6,000 hosts
- Tens of other known sites
- Very active user community

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Working toward 1.0

- Refactoring the network APIs so they're stable and maintainable
- Refactoring the Resource Abstraction Layer
- A few other tweaks here and there

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Using Modules

```
luke@laeg(0) $ find . | grep -v .bzr
.
./templates
./templates/tracconfig.erb
./templates/tracsite.erb
./manifests
./manifests/init.pp
./manifests/tracsite.pp
./files
luke@laeg(0) $
```

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- Open Source Software Startup
- Consulting, training, custom development, and support
- Other projects in process, e.g., change management and visualization
- My full-time job since 2005, two part time partners

Questions?

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