

Cobbler and Puppet

Controlling your server builds

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Agenda

- Introductions
- The Saga of Server Builds
- Cobbler
- Puppet
- The Ease of Server Builds
- The Business Benefits
- Questions/Discussion

Brief Introduction of Us

- Eric Mandel, BlackMesh
- Jason Ford, BlackMesh

- Managed Hosting Service Provider located in Northern Virginia outside of Washington, DC
- BlackMesh works with development companies, ASPs, SaaS providers, small businesses, large corporations

Brief Introduction of You

- System Administrators?
- Developers?
- Currently use Cobbler?
- Currently use Puppet?

The Saga of Server Builds

- We found ourselves always building new servers
- Most used the same applications, but configured differently



The Saga of Server Builds

- A time consuming, repetitive, tedious task
- Time is money



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- Lots of shell scripts were written



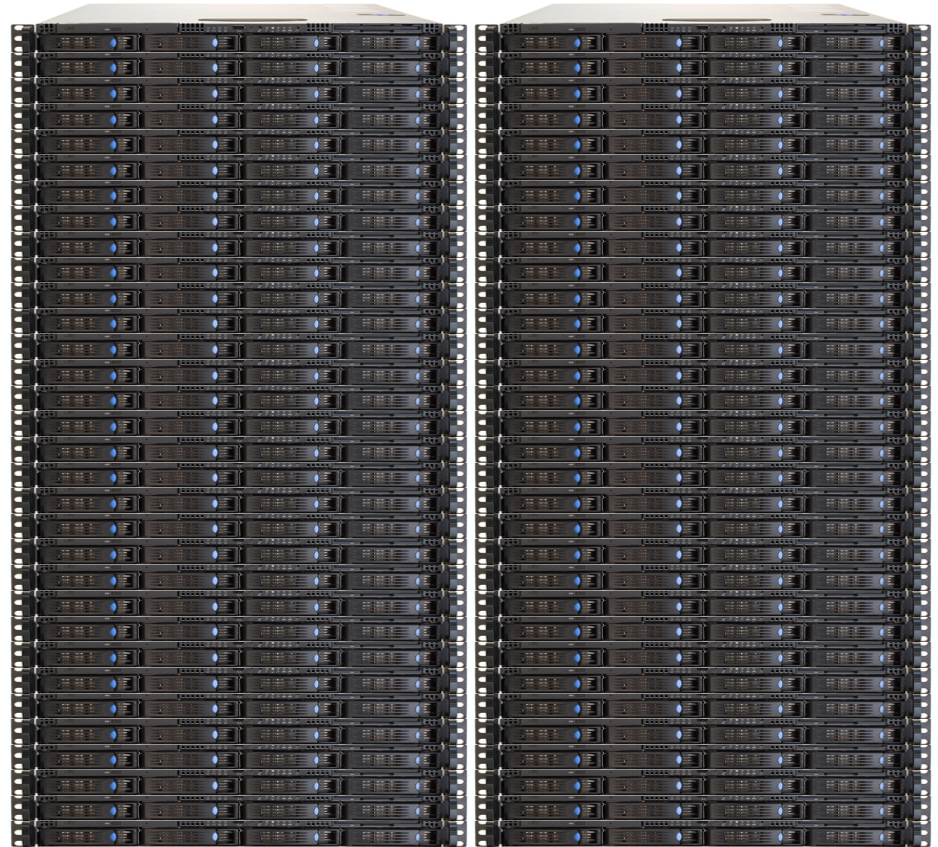
The Saga of Server Builds

- A time consuming, repetitive, tedious task
- Time is money
- Lots of shell scripts were written
- Temporary is permanent

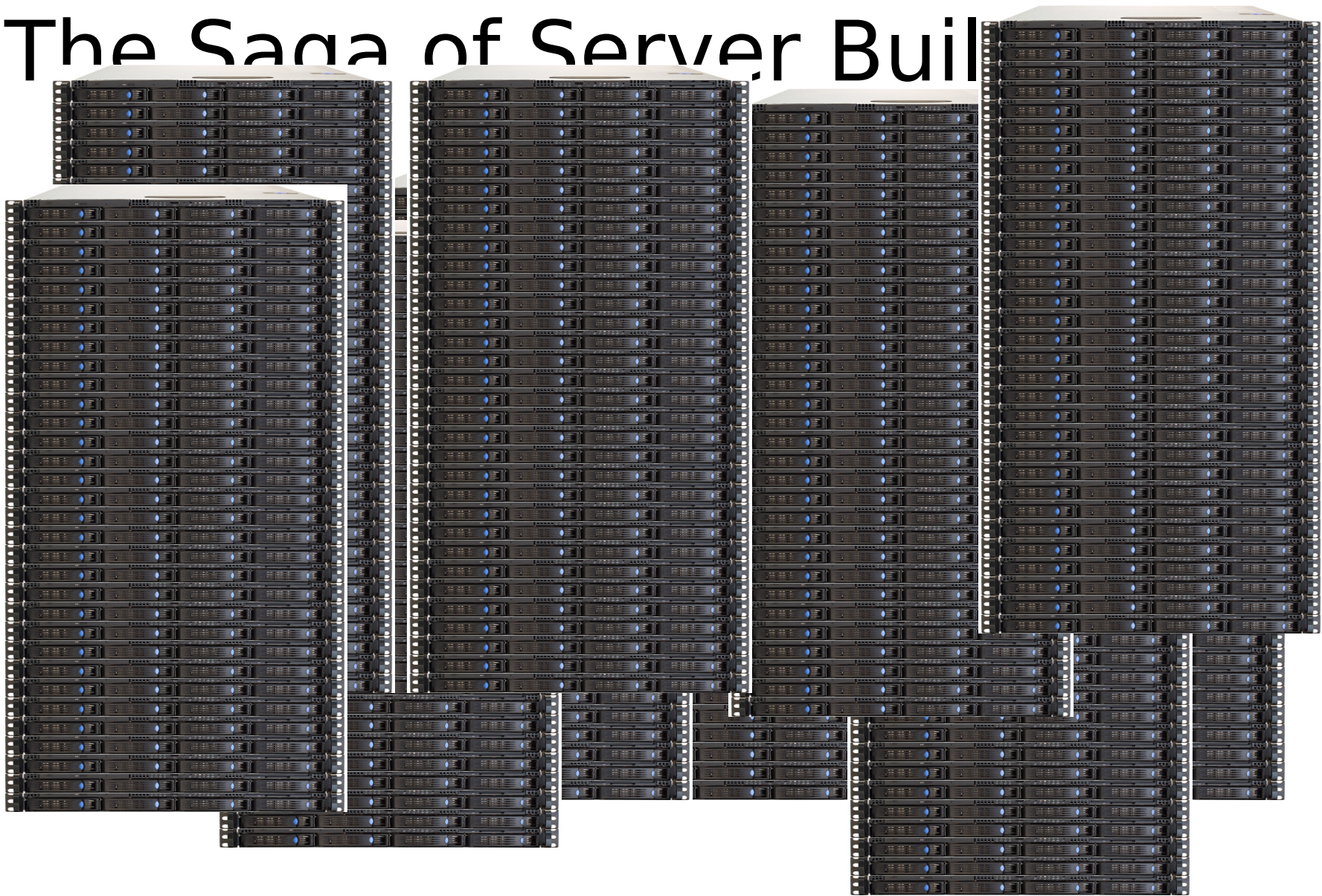


The Saga of Server Builds

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The Saga of Server Build



OSCON, July 2009

The Saga of Server Builds

- New server deployments can be time-critical
- Ensuring that all of the packages are the latest versions
- We did not want to reinvent the wheel
- Need to know what we are deploying is same as what is out there

Maintenance

- Over time, things happen
- Undocumented changes are put in place to resolve a urgent problem
- Users get added

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- Users get added, and then deleted

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- Applications get installed, get upgraded

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- Configuration files change

Cobbler & Puppet to the rescue



Cobbler

- Disk imager on steroids
 - Red Hat's Kickstart
 - Sun's Jumpstart
 - Norton's Ghost
- Admin interface to Kickstart
- Hardware aware
- <https://fedorahosted.org/cobbler/>



Cobbler

- Brings efficiencies to our process:
 - no longer have a three step process of install OS, install repositories, and then yum update
 - Local repository, kept up to date with custom drivers
 - Automatically installs the standard applications (Apache, MySQL, PHP, etc.)
 - Automatically applies our security procedures (users, services, etc.)

Cobbler

- You must connect the new server to the Cobbler server
 - This can be over network
 - Or with direct CAT5 cable
- Configure server to boot from Cobbler via PXE or static IP
- Builds server to point where Puppet can take over with Kickstart

Puppet

- From the Puppet Wiki:

“Puppet is a **declarative language** for expressing system configuration, a **client and server** for distributing it, and a **library** for realizing the configuration.”

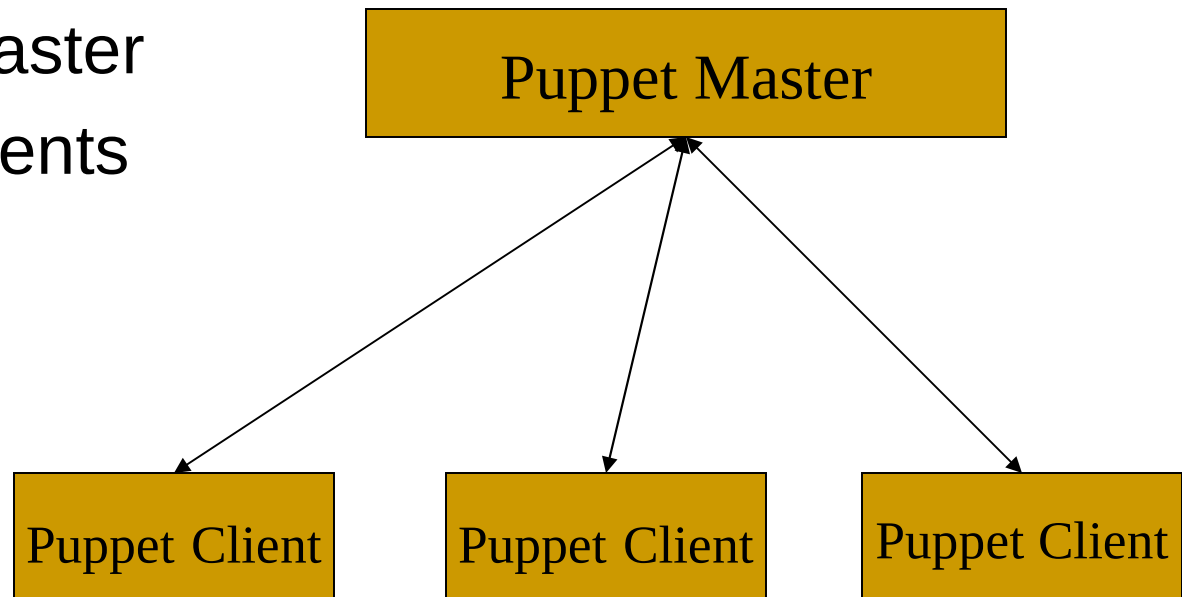
- <http://reductivelabs.com/trac/puppet>

Puppet

- Written in Ruby
 - Very OO
 - Also uses **Facter**, a Ruby program to determine system information and parameters
- Active community
 - FOSS
 - Shared modules (Recipes from the Cookbook)
 - Community is growing

Puppet

- Client/Server
 - Puppet Master
 - Puppet clients



Puppet

- Three main pieces:
 - declarative language
 - client and server
 - library

- Main concept:
 - idempotent

Puppet

- Three layers
- Each responsible for separate aspects of the system
- Providers

Configuration Language

Transaction Layer

Resource Allocation Layer

Puppet

- Base unit is a resource
- Resource types are:
 - File
 - User
 - Package
 - Service
 - Cron
 - Mount (file system)
 - The “exec” resource allows you to create your own resources

Puppet

■ File resource type:

```
# Make sure the modes on the passwd file  
are correct  
file { "/etc/passwd":  
    owner => "root",  
    group => "root",  
    mode => 644  
}
```

Puppet

■ User resource type:

```
# Make sure the user blackmesh is on the
server
user { "blackmesh":
    ensure => present,
    password => "secretpass"
}
```

Puppet

■ Package resource type:

```
# Make sure the httpd package is
installed
package { "httpd.${architecture}" :
  alias => "httpd",
  provider => "yum",
  ensure => "present",
  require => Exec["remi-enabled"]
}
```

Puppet

- Resources are combined together in classes:

```
class httpd {
  package { "httpd.${architecture}" :
    alias => "httpd",
    provider => "yum",
    ensure => "present",
    require => Exec["remi-enabled"]
  }
  service { "httpd":
    ensure => running,
    hasstatus => true,
    require => Package["httpd"]
  }
  exec { "chkconfig_httpd":
    command => "/sbin/chkconfig --level 2345 httpd on",
    require => Package["httpd"]
  }
}
```

Puppet

■ Classes can be combined together:

```
class base {  
    include sudo,  
            yum_exclude_kernel,  
            epel_enabled,  
            remi_enabled,  
            yum-updatesd,  
            denyhosts,  
            sshd_config,  
            sshd,  
            bestyum,  
            yum_update,  
            ntpd,  
            user_blackmesh,  
}
```

Puppet

- **Nodes apply classes:**

```
node cust115_webserver {  
    include base, httpd  
}
```

Puppet

- Providers implement resources on a local level
 - Red Hat-based: `useradd`
 - BSD-based: `adduser`
- Actions can cause new actions based on `notify` and `subscribe` properties
- Logs everything, so have a record, but not transactional

Puppet

- Not transactional
- The run files are not processed sequentially
- Require statements very, very important
- Does not guarantee state at end of any run

Puppet Implementation

- Install PuppetMasterd
- Configure sites for the Puppet config
- Install Puppet on client
- Create the puppet certificate on the client
- Sign the puppet certificate on the master
- Run puppet

The Ease of Server Builds

- Entirely scripted
- New hardware to server on network in 10 minutes
- All servers built the same no matter who builds them



The Ease of Maintenance

- Ensure consistency across servers:
 - User exists
 - Apache configuration
 - MySQL configuration
 - Security rules (who can ssh, etc.)
 - Watch for new accounts
 - Verify cron jobs are running; warn us about failures
 - Verify backups are running
 - Verify logrotate is working
 - Watch for excessively large files

The Business Benefits

- Proactive maintenance
- Confidence knowing things are routinely verified
- Time
- Lower costs
- Repeatable
- Documented
- Ease of maintenance

Web resources

- Cobbler

- <https://fedorahosted.org/cobbler/>

- Puppet

- <http://reductivelabs.com/trac/puppet>

Summary

Cobbler and Puppet Rock

Questions

?

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