The Rise of Configuration Management
We have a problem
Here’s a hint
Cabling?
Infrastructure
Items of manipulation

- Nodes
- Networking
- Files
- Directories
- Symlinks
- Mounts
- Routes
- Users
- Groups
- Tasks
- Packages
- Software
- Services
- Ruby Gems
- Python Modules
- Java Artifacts
- Disks
- Volumes
- Filesystems
- Firewall Rules
Application

Application Database
See Nodes Grow

Application

App Databases
See Nodes Grow

App Servers

App Databases
See Nodes Grow

App LB

App Servers

App Databases
See Nodes Grow

App LBs

App Servers

App Databases
See Nodes Grow

- App LBs
- App Servers
- App DB Cache
- App DBs
Infrastructures have topology

- App LBs
- App Servers
- App DB Cache
- App DBs
Your Infrastructure is a snow flake
Complexity increases quickly

- App LBs
- Cache
- App Servers
- NoSQL
- DB Cache
- DB slaves
- DBs
Complexity increases very quickly.
Operations
The buck stops here
Sysadmins

We took the hostages, secured the building, and cut the communication lines like you said.

But then this guy climbed up the ventilation ducts and walked across broken glass, killing anyone we sent to stop him.

No, he ignored them. He just reconnected the cables we cut, muttering something about "uptime."

AND HE RESCUED THE HOSTAGES?

EXCELLENT.

SHIT, WE'RE DEALING WITH A SYSADMIN.
Availability
Efficiency
Metrics and Monitoring
Configuration Management

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AUTOMATE ALL THE THINGS!
The Past
Manual Configuration

- Labor intensive
- Error prone
- Hard to reproduce
- Unsustainable
Typically very brittle
Throw away, one off scripts
grep sed awk perl
curl | bash

http://www.flickr.com/photos/40389360@N00/2428706650/
- NFS mounts
- rdist
- scp-on-a-for-loop
- rsync on cron
Execution Management

- Cluster SSH
- Golden Images
- ISConf
for i in `cat servers.txt` ;
do scp ntp.conf root@$i:/etc/ntpd.conf ; done

for i in `cat servers.txt` ;
do ssh root@$i /etc/init.d/ntpd restart ; done

for i in `cat servers.txt` ;
do ssh root@$i chkconfig ntpd on ; done

• ^ does not scale

This used to be awesome.

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Push vs Pull
Define policy
Say what, not how
Executable documentation
Long History

Declarative Policy Interface
This is not a new idea

- 1993 - CFEngine
- 1994 - LCFG
- 1998 - CFEngine 2
- 2004 - Bcfg2
- 2005 - Puppet
- 2008 - CFEngine 3
- 2008 - Chef

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Convergence

http://www.flickr.com/photos/dalbera/3009070876
System of Operators

http://www.flickr.com/photos/mil8/419244630/
Loops

http://www.flickr.com/photos/sundazed/2908150761/

Thursday, April 12, 12
file "/etc/shadow" do
  owner "root"
  mode "0600"
end
package "ntp" do
  action :install
end

template "/etc/ntpd.conf" do
  owner "root"
  mode "0644"
  notifies :restart, "service[ntpd]"
end

service "ntpd" do
  action [::enable, :start]
end
Larger Constructs

http://www.flickr.com/photos/63056612@N00/18428735/
package "ntp" do
  action :install
end

template "/etc/ntpd.conf" do
  owner "root"
  mode "0644"
  notifies :restart, "service[ntpd]"
end

service "ntpd" do
  action [:enable, :start]
end

Thursday, April 12, 12
directory "/var/log" package "java" user "ntp"
service "ntpd" user "httpd" template "pghba.conf"
template "/etc/logrotate.conf" package "python"
link "/usr/bin/java" cron "run-logrotate"
template "/etc/httpd.conf" service "postgresql-server"

service "httpd" package "ntp" package "postgresql"
directory "/srv/mahprogram" cron "dump-mahtables"

package "httpd" deploy "mahcoderepo" user "postgres"

file "/etc/shadow" template "/etc/ntpd.conf"
SCIENCE!

http://www.flickr.com/photos/windows_on_the_continuum/5724448340/
The Present
State of the Art

http://www.flickr.com/photos/couchetard/6811826154

Thursday, April 12, 12
Internal DSL
Search

- Search for nodes with Roles
- Find topology data
- IP addresses
- Hostnames
- FQDNs

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Augmentation

Graphite

Nagios

Application

Memcache

Postgres Slaves

Postgres Master
Count the resources

- Load balancer config
- Nagios host ping
- Nagios host ssh
- Nagios host HTTP
- Nagios host app health
- Graphite CPU
- Graphite Memory
- Graphite Disk
- Graphite SNMP
- Memcache firewall
- Postgres firewall
- Postgres authZ config

12+ resource changes for 1 node addition


```json
{
    "id": "bob",
    "ssh_keys": "ssh-rsa AAAADEADBEEF",
    "groups": "sysadmin",
    "uid": 2001,
    "shell": "/bin/bash",
    "comment": "Praise Bob",
    "nagios": {
        "pager": "8005551212@txt.att.net",
        "email": "bob@opscode.com"
    }
}
```
Rapid Adoption
Competition
Community
The Future
Pattern Encoding

http://www.flickr.com/photos/largerich/2787454868/
Closures

http://www.flickr.com/photos/bluedino/392705560/
Sets of Acceptable States

(a) 

(b) 

idempotent (accepted) state 
assured state
Change the world
HELP US!!

http://www.flickr.com/photos/devenlaney/5767271943/
Thank You!

someara@opscode.com
www.opscode.com
@someara