Puppet Configuration Management

Streamlining cluster installation and maintenance

Mark Sallee, NCAR

What is Puppet?

- A tool for automating system administration tasks across multiple computers
- Brings computers to a desired configuration
- Works on UNIX OS variants
- Central repository of master files is distributed from puppetmaster to clients

Why use Puppet?

- Puppet maintains a desired configuration without the SA having to remember every detail.
- Puppet works nicely with kickstart post-install items
- Use Puppet to manage files that may change, such as:
  - fstab, ldconfig, passwd/shadow/group, changes to /etc/dsh, sudoers
  - .bash_profile, sshd_config, syslog.conf

  Puppet maintains configuration files by pulling from the puppetmaster server.

  - Only runs if a file does not exist, or changed.

Puppet's main files: site.pp

```
# /etc/puppet/manifests/site.pp
include sudo
include ntp

import "nodes.pp"
import "classes/*"

# The filebucket option allows for file backups before modification
filebucket { main: server => puppet }

----------------------------------------------------
# Master files are stored in /etc/puppet/files
```

nodes.pp

```
#  Define system roles and their inherited templates
# /etc/puppet/manifests/nodes.pp
import "classes/*"
## Base Nodes
node default {
      include ldconfig
      include hosts
      include ntp
      }
node compute inherits default {
      include compute_exports
      include compute_fstab
      include compute_sudo }
```

nodes.pp continued

Define specific nodes by group

- node ‘cluster1', ’cluster2' inherits cluster_admin { }
- node ’cluster3', ’cluster4' inherits cluster_analysis { }
- node 'node1', 'node2', 'node3', 'node4', 'node5' inherits compute { }…

Use puppetrun to push sync

- puppetrun tells puppet clients to sync now
- Requires puppet.conf listen=true on each client
  - puppetrun --host puppetserver

  and the output is: “Triggered run: Finished”

  Or, wait the default sync time, usually 30 minutes

Restore changed files from the filebucket

Files are archived on clients in:

– /var/lib/puppet/bucket

- Recover and extract file with script:

– extract_files.pl syslog.conf bucketindex

and restore the file manually.

Example classes

```
#/etc/puppet/manifests/classes/ntp.pp:
class ntp {
 file { “ntp.conf”:
 name => “/etc/ntp.conf”,
 mode => 644,
 owner => “root”,
 source => “puppet:///files/ntp.conf”,
 }
package { “ntp”: ensure => installed }
service { “ntpd”:
 subscribe => File[“ntp.conf”],
 require => File[“/etc/ntp.conf”],
 restart => true,
 ensure => running,
 }
}
```

ldconfig class

```
# /etc/puppet/manifests/classes/ldconfig.pp

class ldconfig {

file { "/etc/ld.so.conf":
 owner => root,
 group => root,
 mode => 644,
 source => "puppet:///files/ld.so.conf",
 }
 # rerun ldconfig if the .conf file has changed

 exec { ldlibcfg: command => "/sbin/ldconfig",
  subscribe => File["/etc/ld.so.conf"],
  refreshonly => true
  }
}
```

Adding users with Puppet

```
#/etc/puppet/manifests/groups/virt_groups.pp:
class virt_groups {
        @group { "administration":
             gid => "1000",
             ensure => present
             }
        }
        #/etc/puppet/manifests/users/virt_users.pp
        class virt_users {
         @user { "jbond":
        ensure => "present",
        uid => "1001",
        gid => "1000",
        comment => "Shaken, not stirred",
        home => "/home/jbond",
        managehome => true,
        password => '$1$syYkvOHY$ZxAabcdEFG1'
        }
```

Add users to group and site.pp

```
#/etc/puppet/manifests/classes/administrators.pp:
class administrators inherits virt_users {
 realize (
  Group["administration"],
  User["jbond"],
  User["drno"],
  )
 }
# Add all these to site.pp:

node default {
  include administrators
 }
 import "groups/*”
 import "users/*"
 import "classes/*"
```

Example use of Puppet

- You have a new network-attached storage device that needs to be mounted across all of your 30 cluster nodes.
- Add the customizations to /etc/puppet/files/fstab, restart puppetmaster service, and leave the rest to Puppet.
- The file will be deployed within your configured time period, and you can have it run the mount command as well

References

- Puppet's wiki: http://projects.puppetlabs.com
- Mark's blog: http://marksallee.wordpress.com/2010/08/25/create-a-puppet-test-network-with-virtualbox/
- Pulling Strings with Puppet, by James Turnbull (book)

Summary

- Puppet can greatly assist your process with keeping servers consistently configured.
- Worth the learning curve required