

# Capitoul – La gestion de configuration

## PUPPET

# Contexte

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- \* Jusqu'en 2009 : Terminaux X / Ordinateurs portables
  - \* A partir de 2009 : PC fixes sous Linux / Ordinateurs Portables
- => Nécessité de conserver le même niveau de services sur des postes individuels co-administrés.

# Enjeux Techniques

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- ✳ Rapporter la charge de travail de gestion à un volume acceptable pour l'équipe informatique.
  
- ✳ *Tâches identifiées*
  - ✳ Déployer facilement de nouvelles machines
  - ✳ Déployer facilement des applis sur l'ensemble du parc
  - ✳ gérer les applis critiques automatiquement
  - ✳ gérer les configurations critiques automatiquement
  - ✳ gérer les MAJ sécurité
  - ✳ Visibilité rapide des statuts machine

# Solution : Puppet

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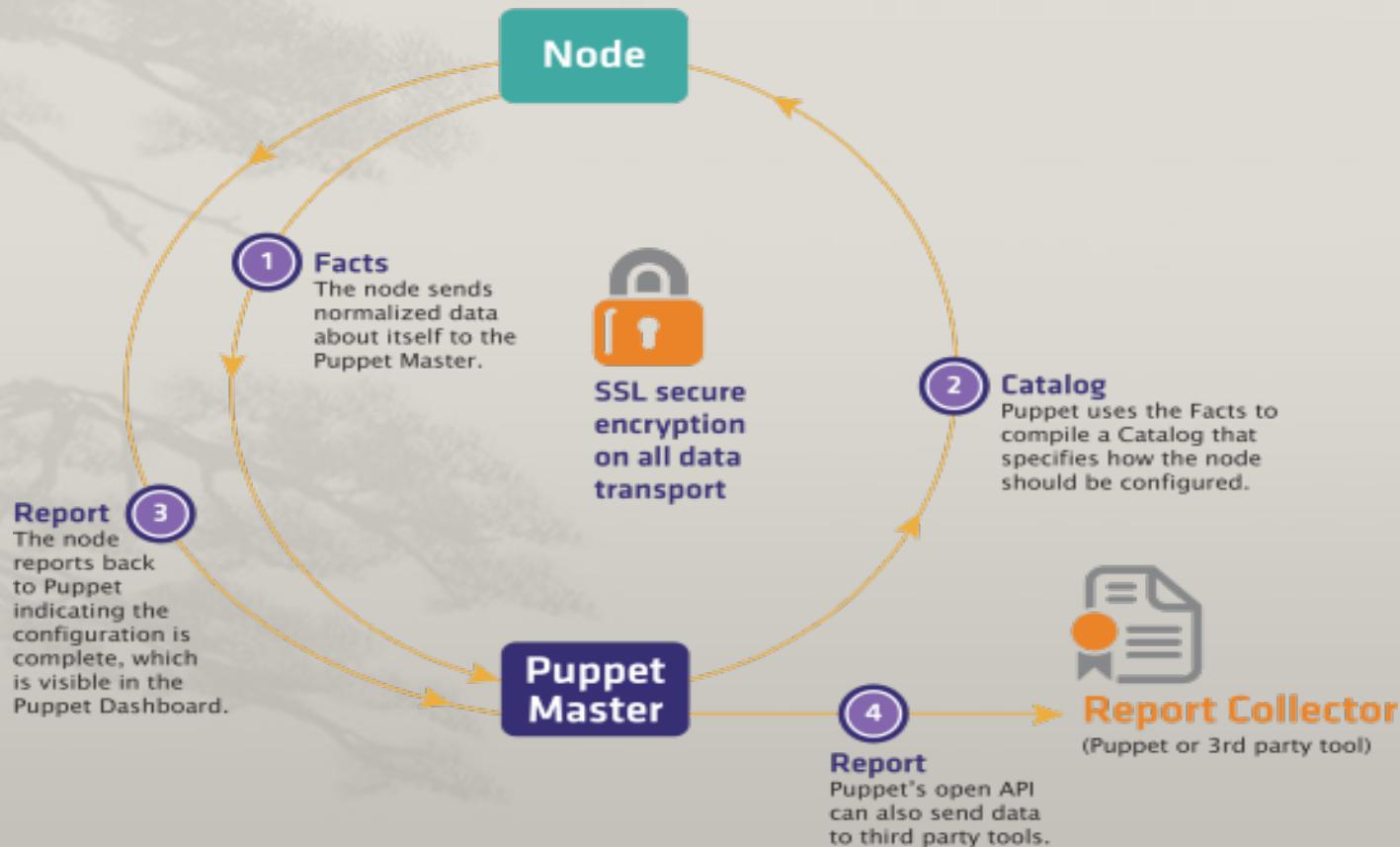
- ✿ Développé par Puppet Labs depuis 2005, Open Source (Licence Apache 2.0)
  
- ✿ Disponible sur une grande majorité de plateforme (\*BSD, Linux, Windows, MAC OS X, Unix propriétaire - même AIX -....)
  
- ✿ Communauté importante et vivante

# Composants Puppet

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- ✳ Un serveur : Puppet Master
  - ✳ Existe en « standalone » - serveur Webrick - ou en module apache
- ✳ Un client par machine
  - ✳ Processus Ruby
- ✳ Une interface de supervision : Puppet Dashboard
  - ✳ Interface Web Ruby
  - ✳ S'appuie sur une base de données MySQL pour stocker l'historique

# Principe de fonctionnement



# Configuration Serveur

<root\_config\_dir>/puppet

| -files

| -manifest

|-----*site.pp*

| -modules

|-----<mon\_module\_1>

|-----<mon\_module\_n>

| -templates

# Configuration Serveur

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my\_module — Le nom du module.

|---manifests/

|----init.pp — contient la définition de la classe. **Le nom de la classe doit reprendre le nom du module.**

|----other\_class.pp — la classe my\_module::other\_class.

|---files/ — fichiers statiques, téléchargeables par les postes clients..

|---templates/ — contient des templates, utilisables par le(s) manifest(s)

# Configuration : Langage

- ✳ Manipulation de « ressources »
- ✳ Syntaxe Ruby
  - ✳ Expressions régulières
  - ✳ Boucles conditionnelles
  - ✳ Chainage de ressources
  - ✳ Héritage
  - ✳ Mots clés définissant des comportements de ressources (subscribe, require ....)
  - ✳ Fonctions réutilisables
  - ✳ ....

# Configuration : Ressources

- ✿ Différents types de ressources
  - ✿ Fichier

```
file { 'sshdconfig':  
    path => $operatingsystem ? {  
        solaris => '/usr/local/etc/ssh/sshd_config',  
        default  => '/etc/ssh/sshd_config',  
    },  
    owner  => 'root',  
    group  => 'root',  
    mode   => '0644',  
}
```

# Configuration : Ressources

- Différents types de ressources

- Package

```
package {  
    "openssh-server":  
        ensure => installed,  
        provider => apt,  
}
```

- Service

```
service { 'sshd':  
    ensure      => running,  
    enable      => true,  
    hasrestart  => true,  
    hasstatus   => true,  
    subscribe  => File['sshdconfig'],  
}
```

# Configuration : Ressources

## • Fonctions réutilisables

```
define apt::key($ensure, $apt_key_url = "http://www.math.univ-toulouse.fr/~sysadmin/IMT/IMT.key") {  
    case $ensure {  
        "present": {  
            exec { "apt-key present $name":  
                command => "/usr/bin/wget -q $apt_key_url -O -l/usr/bin/apt-key add -",  
                unless => "/usr/bin/apt-key list | /bin/grep -c $name",  
            }  
        }  
        "absent": {  
            exec { "apt-key absent $name":  
                command => "/usr/bin/apt-key del $name",  
                onlyif => "/usr/bin/apt-key list | /bin/grep -c $name",  
            }  
        }  
        default: {  
            fail "Invalid 'ensure' value '$ensure' for apt::key"  
        }  
    }  
}
```

# Configuration : Ressources

- Comportement sur changement d'un fichier

```
File['/etc/ntp.conf'] -> Service['ntpd']
```

- Chainage

```
file {'/tmp/test1':  
    ensure  => present,  
    content => "Hi.",  
}
```

```
notify {'after':  
    message => '/tmp/test1 has already been synced.',  
}
```

```
File['/tmp/test1'] -> Notify['after']
```

# Configuration : Ressources

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- \* Aggregation de ressources : les classes

```
class unix {  
    file { '/etc/passwd':  
        owner => 'root',  
        group => 'root',  
        mode  => '0644',  
    }  
    file { '/etc/shadow':  
        owner => 'root',  
        group => 'root',  
        mode  => '0440',  
    }  
}
```

# Configuration : Ressources

## ⌘ Héritage

```
class freebsd inherits unix {  
    File['/etc/passwd'] { group => 'wheel' }  
    File['/etc/shadow'] { group => 'wheel' }  
}
```

## ⌘ Noeuds

```
node 'serveurs_sysadmin' inherits 'serveurs_base' {  
    include init_systeme::resolver  
    include insertion-domaine::motd_serveur  
    include insertion-domaine::limit_access_to_sysadmin  
    include insertion-domaine::install_nfs_v3  
    include insertion-domaine::install_ldap  
    include insertion-domaine::install_autoofs_ldap_v3  
    include insertion-domaine::install_krb5  
    include insertion-domaine::pam-serveur  
    include insertion-domaine::sudo-ldap-serveur  
}
```

# Exemple de configuration

```

node 'membres_ldap' {
  apt::key { "DC3BAF35":
    ensure => present,
  }
  apt::key { "BA684223":
    ensure => present,
  }
  include init_système::debian
  include init_système::ps-watcher
  include init_système::mise-a-jour
  include insertion-domaine::ntp
  include insertion-domaine::print
  include insertion-domaine::sudoers_postes-ldap
  include insertion-domaine::pam-client
  include insertion-domaine::install_nfs
  include insertion-domaine::install_krb5_nfsv4
  include insertion-domaine::install_automount
  include insertion-domaine::install_ldap
  include insertion-domaine::install_cleaners
  include insertion-domaine::ocsinventory
  include insertion-domaine::vino
  include insertion-domaine::puppet_conf
  include insertion-domaine::ssh-server
}

```

```

class install_krb5 {
  file {
    [...]
  }
  package {
    "heimdal-clients":
      ensure => installed,
      provider => apt,
  }
  package {
    "libpam-krb5":
      ensure => absent,
      provider => apt,
  }
  package {
    "libpam-heimdal":
      ensure => installed,
      provider => apt,
  }
}

```

# Exemple de configuration

```
class install_krb5_nfsv4 inherits install_krb5 {  
  package {  
    "librpcsecgss3":  
      ensure => installed,  
      provider => apt,  
  }  
  File["/etc/krb5.conf"] {  
    source=>$lsbdistrelease ? {  
      "5.0.4" =>"puppet://monserveur/baselayout/debian/identiques/etc/krb5.conf.nfsv4",  
      "10.04" =>"puppet://monserveur/baselayout/debian/lucid/etc/krb5.conf.nfsv4",  
      "11.04" =>"puppet://monserveur/baselayout/debian/natty/etc/krb5.conf.nfsv4",  
      "12.10" =>"puppet://monserveur/baselayout/debian/precise/etc/krb5.conf.nfsv4",  
      "6.0.7" =>"puppet://monserveur/baselayout/debian/squeeze/etc/krb5.conf.nfsv4",  
    },  
  }  
  file {  
    "/etc/krb5.keytab":  
      owner => "root",  
      group => "root",  
      mode => 600,  
      source => "puppet://monserveur/files/tickets/${hostname}.krb5.keytab",  
      require => Package[krb5-config],  
  }  
}
```

# Suivi : Puppet Dashboard

Puppet Node Manager

[lagrange.ups-tlse.fr:3000](#)

Conference... Conferencin... attachment... (software) ... Labs – Wiki... rtr-1r2.univ... Enterprise: I... Node Manager RT en un co... puppetlabs/...

[puppet dashboard](#) 1.2.0 • Home • Nodes • Groups • Classes • Reports • File Search

**Background Tasks**

All systems go

**Nodes**

- 100 Unresponsive
- 0 Failed
- 0 Pending
- 1 Changed
- 130 Unchanged
- 0 Unreported
- 231 All**

Add node

**Group**

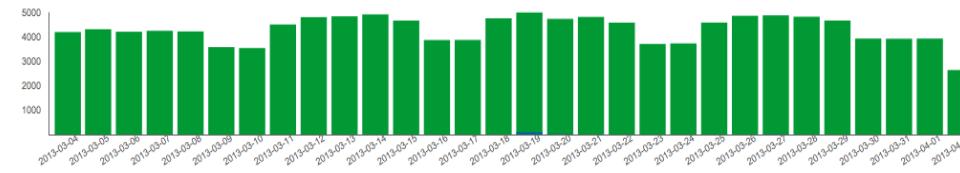
Add group

**Class**

Add class

**Daily run status**

Number and status of runs during the last 30 days:



Date	Runs
2013-03-04	4200
2013-03-05	4200
2013-03-06	4200
2013-03-07	4200
2013-03-08	3500
2013-03-09	3200
2013-03-10	3200
2013-03-11	4500
2013-03-12	4500
2013-03-13	4500
2013-03-14	4500
2013-03-15	4500
2013-03-16	3800
2013-03-17	3800
2013-03-18	4500
2013-03-19	4500
2013-03-20	4500
2013-03-21	4500
2013-03-22	4500
2013-03-23	3800
2013-03-24	3800
2013-03-25	4500
2013-03-26	4500
2013-03-27	4500
2013-03-28	4500
2013-03-29	4500
2013-03-30	3800
2013-03-31	3800
2013-04-01	3200
2013-04-02	3200

**All** **Unresponsive** **Failed** **Pending** **Changed** **Unchanged**

Export nodes as CSV

Node	Latest report	Total	Failed	Pending	Changed	Unchanged
abigail.ups-tlse.fr	2013-04-02 13:06 UTC	81	0	0	0	81
synapse.math.univ-toulouse.fr	2013-04-02 13:06 UTC	78	0	0	0	78
tarbes.ups-tlse.fr	2013-04-02 13:05 UTC	127	0	0	0	127
leibniz.math.ups-tlse.fr	2013-04-02 13:05 UTC	78	0	0	0	78
sauterelle.ups-tlse.fr	2013-04-02 13:05 UTC	130	0	0	0	0
marguerite.ups-tlse.fr	2013-04-02 13:05 UTC	128	0	0	0	128
hubble.math.ups-tlse.fr	2013-04-02 13:05 UTC	77	0	0	0	77
bolzano.math.ups-tlse.fr	2013-04-02 13:05 UTC	78	0	0	0	78
decaillon.math.ups-tlse.fr	2013-04-02 13:04 UTC	29	0	0	0	29
houx.ups-tlse.fr	2013-04-02 13:04 UTC	130	0	0	0	0
nephila.math.ups-tlse.fr	2013-04-02 13:04 UTC	80	0	0	0	80
perso.math.ups-tlse.fr	2013-04-02 13:04 UTC	80	0	0	0	80
pivoine.ups-tlse.fr	2013-04-02 13:03 UTC	130	0	0	0	0
moustique.ups-tlse.fr	2013-04-02 13:03 UTC	130	0	0	0	0
robinier.ups-tlse.fr	2013-04-02 13:02 UTC	130	0	0	0	0
ldap3.math.ups-tlse.fr	2013-04-02 13:02 UTC	29	0	0	0	29
harmonium.ups-tlse.fr	2013-04-02 13:02 UTC	130	0	0	0	0
archive.math.ups-tlse.fr	2013-04-02 13:02 UTC	80	0	0	0	80
iris.ups-tlse.fr	2013-04-02 13:02 UTC	135	0	0	0	135
chardon.ups-tlse.fr	2013-04-02 13:01 UTC	130	0	0	0	0

211 More...

# Suivi : Puppet Dashboard

Puppet Node Manager

lagrange.ups-tlse.fr:3000/nodes/198

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**puppet dashboard** 1.2.0 » Home • Nodes • Groups • Classes • Reports • File Search

**Background Tasks**  
All systems go

**Nodes**  
107 Unresponsive  
0 Failed  
0 Pending  
0 Changed  
124 Unchanged  
0 Unreported  
**231 All**

Add node

**Group**  
Add group

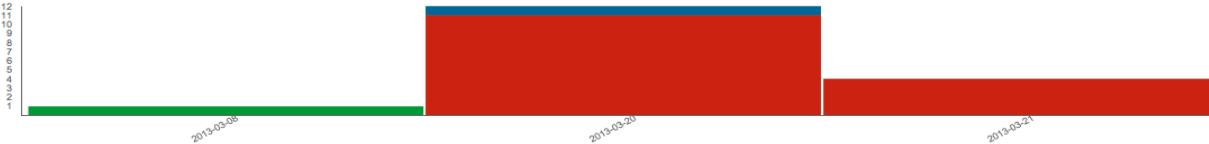
**Class**  
Add class

**Node: geastré.ups-tlse.fr**

**Parameters**  
— No parameters —

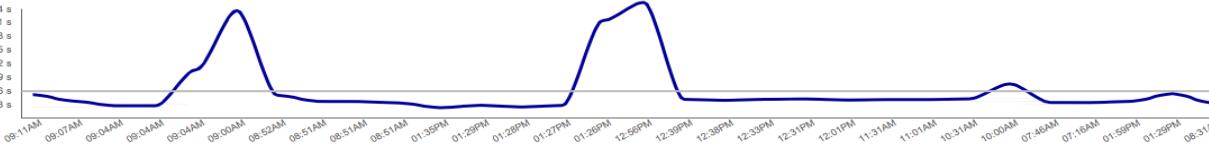
**Groups**  
— No groups —

**Daily run status**  
Number and status of runs during the last 30 days:



**Classes**  
— No classes —

**Run Time**  
The elapsed time in seconds for each of the last 30 Puppet runs:



**Recent reports (213)**

Reported at	Total	Failed	Changed	Unchanged	Pending	Skipped	Failed restarts	Config retrieval	Runtime
2013-03-21 07:51 UTC	128	2	0	126	0	6	0	0.52 s	3.34 s
2013-03-21 07:49 UTC	128	2	0	126	0	6	0	0.58 s	3.31 s
2013-03-21 07:44 UTC	128	2	0	126	0	6	0	0.52 s	3.91 s
2013-03-21 07:43 UTC	128	2	9	117	0	6	0	0.67 s	30.79 s
2013-03-20 14:18 UTC	130	2	5	0	0	0	0	0.83 s	4.18 s
2013-03-20 12:59 UTC	126	2	0	124	0	6	0	0.49 s	4.15 s
2013-03-20 12:29 UTC	126	2	0	124	0	6	0	0.49 s	6.36 s
2013-03-20 12:27 UTC	125	8	74	43	0	7	0	0.79 s	-2435.49 s

# Suivi : Puppet Dashboard

Puppet Node Manager

lagrange.ups-tlse.fr:3000/reports/1954148

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**puppet dashboard** 1.2.0 » Home · Nodes · Groups · Classes · Reports · File Search

**Background Tasks**

All systems go

**Nodes**

- 107 Unresponsive**
  - 0 Failed**
  - 0 Pending**
  - 0 Changed**
- 124 Unchanged**
- 0 Unreported**
- 231 All**

Add node

**Group**

Add group

**Class**

Add class

**Report: 2013-03-21 07:51 UTC for geastre.ups-tlse.fr**

**Metrics** Log Events

**Log**

Level	Message	Source	File	Line	Time
err	change from purged to present failed: Execution of '/usr/bin/apt-get -q -y -o Dpkg::Options=:--force-confold install ff-cleaner' returned 100: Reading package lists... Building dependency tree... Reading state information... E: Unable to locate package ff-cleaner	/Stage[main]/Insertion-domaine::Install_cleaners/Package[ff-cleaner]/ensure	/etc/puppet/modules/baselayout/manifests/init.pp	1293	2013-03-21 07:51 UTC
err	change from purged to present failed: Execution of '/usr/bin/apt-get -q -y -o Dpkg::Options=:--force-confold install th-cleaner' returned 100: Reading package lists... Building dependency tree... Reading state information... E: Unable to locate package th-cleaner	/Stage[main]/Insertion-domaine::Install_cleaners/Package[th-cleaner]/ensure	/etc/puppet/modules/baselayout/manifests/init.pp	1298	2013-03-21 07:51 UTC
notice	Finished catalog run in 3.41 seconds	Puppet			2013-03-21 07:51 UTC
info	Applying configuration version '1363846684'	Puppet			2013-03-21 07:51 UTC
info	Caching catalog for geastre.ups-tlse.fr	Puppet			2013-03-21 07:51 UTC

Delete

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# Gain à posteriori

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- ✿ Gain de temps sur le déploiement des serveurs
- ✿ Détection des changements « sauvages » de versions
- ✿ Détection des versions de distribution plus maintenues

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Merci pour votre attention