

# *Puppet: automate OpenStack deployment*

//////////////////////////////////// Alessandro Italiano - Cloud Computing School - Bari | 1/2014 //////////////////////////////////////

# *Automate, why it is really important*

*Save time avoiding repetitive action*

*Synchronisation*

*Replication*

*Optimisation*

*IT infrastructure under control*

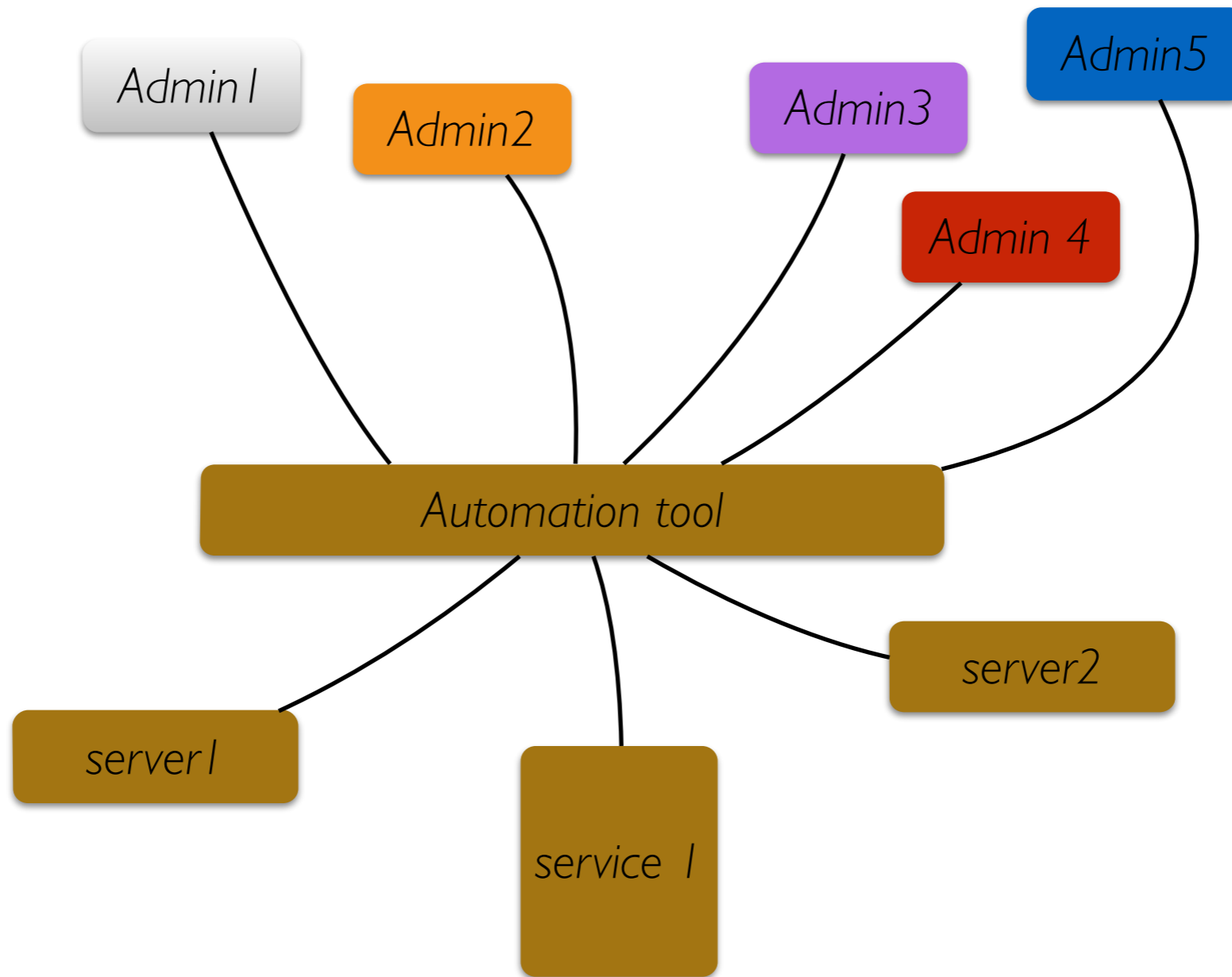
*Contextualisation*

*Recovery*

*High level definition*

*Configuration language*

# Automate, why it is really important



# *Puppet, one solution !*

Available free of charge

Server configuration defined at high level

Resources, classes and modules

Master/Agent, Masterless deployment

Node definition, manifest/site.pp

puppetAgent as daemon, cronJob or onDemand

Catalog compilation

Reports

# Organise configuration using “hiera”

Hiera is a key/value lookup tool  
Split configuration from puppet logic  
Hierarchical config  
Fine or macro

```
:hierarchy:  
- "node/%{::fqdn}"  
- "%{::environment}"  
- "%{::osfamily}"  
- common  
- zabbix
```

# Deploy Openstack cloud infrastructure step 1, install puppet

*Install puppet master:*

```
.rpm -ivh http://yum.puppetlabs.com/puppetlabs-release-el-6.noarch.rpm  
.yum install puppet-server
```

*configure puppet master:*

```
./etc/puppet/puppet.conf  
./etc/puppet/hiera.yaml  
./etc/puppet/autosign.conf
```

*Run puppet master:*

```
.service puppetmaster start  
.service puppetmaster status  
telnet localhost 8140
```

# Deploy Openstack cloud infrastructure step 2, install Openstack module

Install OpenStack module  
`. puppet module install puppetlabs-openstack`

```
root@puppet:~# puppet module list --environment cloud --tree
/etc/puppet/environments/cloud/modules
├── puppetlabs-openstack (v4.1.0)
│   ├── puppetlabs-keystone (v4.1.0)
│   │   ├── puppetlabs-apache (v1.1.0)
│   │   ├── puppetlabs-stdlib (v4.3.2)
│   │   └── puppetlabs-concat (v1.1.0)
│   ├── puppetlabs-inifile (v1.1.3)
│   ├── puppetlabs-mysql (v2.3.0)
│   ├── puppetlabs-swift (v4.1.0)
│   ├── puppetlabs-rsync (v0.3.1)
│   ├── puppetlabs-xinetd (v1.3.1)
│   ├── saz-memcached (v2.5.0)
│   ├── puppetlabs-firewall (v1.1.3)
│   └── saz-ssh (v1.4.0)
├── puppetlabs-cinder (v4.1.0)
│   ├── dprince-qpuid (v1.0.2)
│   ├── puppetlabs-rabbitmq (v3.1.0)
│   ├── puppetlabs-apt (v1.5.1)
│   ├── GarethR-erlang (v0.3.0)
│   └── stahnma-epel (v0.1.0)
├── puppetlabs-glance (v4.1.0)
├── puppetlabs-neutron (v4.2.0)
│   ├── puppetlabs-nova (v4.1.0)
│   ├── duritong-sysctl (v0.0.1)
│   └── puppetlabs-vswitch (v0.3.0)
├── puppetlabs-heat (v4.1.0)
├── puppetlabs-ceilometer (v4.1.0)
├── puppetlabs-horizon (v4.1.0)
├── puppetlabs-tempest (v3.0.0)
├── puppetlabs-vcsrepo (v0.2.0)
├── puppetlabs-ntp (v3.1.2)
└── puppetlabs-mongodb (v0.8.0)
```

# Deploy Openstack cloud infrastructure step 3, configure your deployment

Define general configuration:  
`./etc/puppet/hieradata/cloud.yaml`

Define node configuration:  
`./etc/puppet/hieradata/nodes/cloud01.ba.infn.it.yaml`

Define node:  
`./etc/puppet/manifest/nodes/cloud01.ba.infn.it.pp`



# back cloud infrastructure ure your deployment

```
italiano@puppet:~$ cat puppet/environments/cloud/hieradata/cloud.yaml
password: 'openstack_condor'
openstack::region: 'regionOne'

##### Networks
openstack::network::api: '172.16.0.0/16'
openstack::network::external: '172.16.0.0/16'
openstack::network::management: '172.16.0.0/16'
openstack::network::data: '172.16.0.0/16'

openstack::network::address::api: '172.16.0.11'
openstack::network::address::management: '172.16.0.11'

openstack::controller::address::api: '172.16.0.11'
openstack::controller::address::management: '172.16.0.11'

openstack::rabbitmq::user: 'condor'
openstack::rabbitmq::password: "%{hiera('password')}}"

openstack::mysql::root_password: 'condor'
openstack::mysql::service_password: "%{hiera('password')}}"
openstack::mysql::allowed_hosts: ['localhost', '127.0.0.1', '%']

openstack::keystone::admin_token: 'd50ff4a17e606aa38e38'
openstack::keystone::admin_email: 'vincenzo.spinoso@ba.infn.it'
openstack::keystone::admin_password: "%{hiera('password')}}"

openstack::storage::address::api: '172.16.0.11'
openstack::storage::address::management: '172.16.0.11'

openstack::glance::password: "%{hiera('password')}}"

##### Cinder

openstack::cinder::password: "%{hiera('password')}}"
openstack::cinder::volume_size: '500G'

openstack::tenants:
  "Condor":
    description: "tenant for test condor"
  "test":
    description: "tenant for test"

openstack::users:
  "condor":
    password: "%{hiera('password')}}"
    tenant: "Condor"
    email: "vincenzo.spinoso@ba.infn.it"
    admin: true

openstack::network::external::ippool::start: 172.16.1.1
openstack::network::external::ippool::end: 172.16.10.253
openstack::network::external::gateway: 172.16.0.1
openstack::network::external::dns: 90.147.66.84
openstack::network::neutron::private: '10.0.1.0/24'
openstack::network::neutron::enable_lb: 'True'

##### Log levels
openstack::verbose: 'True'
openstack::debug: 'True'

mysql::params::root_password: "%{hiera('password')}}"
mysql::params::old_root_password: "%{hiera('password')}}"

openstack::neutron::password: "%{hiera('password')}}"
openstack::nova::password: "%{hiera('password')}}"
openstack::neutron::shared_secret: "%{hiera('password')}}"
openstack::ceilometer::mongo::password: "%{hiera('password')}}"
openstack::ceilometer::meteringsecret: "%{hiera('password')}}"
openstack::ceilometer::password: "%{hiera('password')}}"
openstack::heat::password: "%{hiera('password')}}"
openstack::heat::encryption_key: "33a9b28012844552468d4207cfa87afc"
openstack::horizon::secret_key: "33a9b28012844552468d4207cfa87afc"
openstack::tempest::username_admin: 'condor'
openstack::tempest::username: 'condor'
openstack::tempest::username_alt: 'condor'
openstack::tempest::public_network_name: 'condor'
openstack::tempest::cinder_available: 'True'
openstack::tempest::glance_available: 'True'
openstack::tempest::heat_available: 'True'
openstack::tempest::horizon_available: 'True'
openstack::tempest::nova_available: 'True'
openstack::tempest::neutron_available: 'True'
openstack::tempest::swift_available: 'True'
openstack::tempest::configure_images: 'False'
openstack::tempest::image_name: 'condor'
openstack::tempest::image_name_alt: 'condor_alt'
openstack::tempest::configure_network: 'True'
openstack::tempest::public_network_name: 'condor'
```

Define node configuration:  
hieradata/nodes/cloud01.ba.infn.it.yaml

Define node:  
./etc/puppet/manifest/nodes/cloud01.ba.infn.it.pp

# Deploy Openstack cloud infrastructure step 3, configure your deployment

Define general configuration:  
`./etc/puppet/hieradata/cloud.yaml`

Define node configuration:  
`./etc/puppet/hieradata/nodes/cloud01.ba.infn.it.yaml`

Define node:  
`./etc/puppet/manifest/nodes/cloud01.ba.infn.it.pp`

# Deploy Openstack cloud infrastructure step 3, configure your deployment

Define general configuration:  
`./etc/puppet/hieradata/cloud.yaml`

```
italiano@puppet:~$ cat puppet/environments/cloud/hieradata/node/condor-  
test-01.ba.infn.it.yaml  
---  
classes:  
  - openstack::role::allinone  
  
openstack::nova::libvirt_type: kvm  
  
neutron::agents::dhcp::dnsmasq_config_file: '/etc/neutron/dnsmasq-  
neutron.conf'  
  
horizon::neutron_options:  
  enable_lb: True  
  enable_firewall: True  
  enable_vpn: True  
  
override_options:  
  mysqld:  
    bind_address: openstack::controller::address::management  
    default-storage-engine: innodb  
    max_connections: 300
```

Define node:  
`./etc/puppet/manifest/nodes/cloud01.ba.infn.it.pp`

# Deploy Openstack cloud infrastructure step 3, configure your deployment

Define general configuration:  
`./etc/puppet/hieradata/cloud.yaml`

Define node configuration:  
`./etc/puppet/hieradata/nodes/cloud01.ba.infn.it.yaml`

Define node:  
`./etc/puppet/manifest/nodes/cloud01.ba.infn.it.pp`

# Deploy Openstack cloud infrastructure step 3, configure your deployment

Define general configuration:  
`./etc/puppet/hieradata/cloud.yaml`

Define node configuration:  
`./etc/puppet/hieradata/nodes/cloud01.ba.infn.it.yaml`

Define node:  
`./etc/puppet/manifest/nodes/cloud01.ba.infn.it.pp`

```
italiano@puppet:~$ cat puppet/environments/cloud/manifest/  
nodes/condor-test-01.ba.infn.it.pp  
node 'condor-test-01.ba.infn.it' {  
  hiera_include('classes')  
}  
italiano@puppet:~$
```

# Deploy Openstack cloud infrastructure step 3, configure your deployment

Define general configuration:  
`./etc/puppet/hieradata/cloud.yaml`

Define node configuration:  
`./etc/puppet/hieradata/nodes/cloud01.ba.infn.it.yaml`

Define node:  
`./etc/puppet/manifest/nodes/cloud01.ba.infn.it.pp`

# Deploy Openstack cloud infrastructure step 4, run the puppet Agent

```
root@condor-test-01:~# puppet agent --server puppet --onetime --no-daemonize --verbose --environment cloud
Notice: Ignoring --listen on onetime run
Info: Retrieving pluginfacts
Info: Retrieving plugin
Info: Loading facts in /var/lib/puppet/lib/facter/ip6tables_version.rb
Info: Loading facts in /var/lib/puppet/lib/facter/os_maj_version.rb
Info: Loading facts in /var/lib/puppet/lib/facter/cvmfspartsize.rb
Info: Loading facts in /var/lib/puppet/lib/facter/concat_basedir.rb
Info: Loading facts in /var/lib/puppet/lib/facter/etckeeper_puppet.rb
Info: Loading facts in /var/lib/puppet/lib/facter/cvmfsversion.rb
Info: Loading facts in /var/lib/puppet/lib/facter/root_home.rb
Info: Loading facts in /var/lib/puppet/lib/facter/iptables_persistent_version.rb
Info: Loading facts in /var/lib/puppet/lib/facter/puppet_vardir.rb
Info: Loading facts in /var/lib/puppet/lib/facter/rabbitmq_erlang_cookie.rb
Info: Loading facts in /var/lib/puppet/lib/facter/iptables_version.rb
Info: Loading facts in /var/lib/puppet/lib/facter/pe_version.rb
Info: Loading facts in /var/lib/puppet/lib/facter/facter_dot_d.rb
Info: Caching catalog for condor-test-01.ba.infn.it
Warning: Found multiple default providers for vcsrepo: svn, bzd, dummy, git, hg, cvs; using svn
Info: Applying configuration version '1416903915'
Notice: WARNING: The cluster_disk_nodes is deprecated.
      Use cluster_nodes instead.
Notice: /Stage[main]/Rabbitmq::Config/Notify[cluster_disk_nodes]/message: defined 'message' as 'WARNING: The cluster_disk_nodes is deprecated.
      Use cluster_nodes instead.'
Notice: /Stage[main]/Neutron::Agents::Vpnaas/Package[neutron-vpnaas-agent]/ensure: created
Notice: /Stage[main]/Cinder::Volume/Package[cinder-volume]/ensure: ensure changed '1:2014.1.3-0ubuntu1.1' to 'true'
Notice: /Stage[main]/Openstack::Profile::Ceilometer::Api/Mongodb_database[ceilometer]/ensure: created
Info: Class[Rabbitmq::Config]: Scheduling refresh of Class[Rabbitmq::Service]
Info: Class[Rabbitmq::Service]: Scheduling refresh of Service[rabbitmq-server]
Notice: /Stage[main]/Rabbitmq::Service/Service[rabbitmq-server]: Triggered 'refresh' from 1 events
Notice: /Stage[main]/Ceilometer::Keystone::Auth/Keystone_user_role[ceilometer@services]/roles: roles changed ['ResellerAdmin', 'admin'] to 'admin
ResellerAdmin'
Info: /Stage[main]/Ceilometer::Keystone::Auth/Keystone_user_role[ceilometer@services]: Scheduling refresh of Service[ceilometer-api]
Notice: /Stage[main]/Ceilometer::Api/Service[ceilometer-api]: Triggered 'refresh' from 1 events
Notice: /Stage[main]/Neutron::Agents::L3/Service[neutron-l3]/ensure: ensure changed 'stopped' to 'running'
Info: /Stage[main]/Neutron::Agents::L3/Service[neutron-l3]: Unscheduling refresh on Service[neutron-l3]
Notice: /Stage[main]/Neutron::Server::Notifications/Nova_admin_tenant_id_setter[nova_admin_tenant_id]/ensure: created
Notice: /Stage[main]/Nova::Compute/Nova::Generic_service[compute]/Service[nova-compute]/ensure: ensure changed 'stopped' to 'running'
Info: /Stage[main]/Nova::Compute/Nova::Generic_service[compute]/Service[nova-compute]: Unscheduling refresh on Service[nova-compute]
Notice: Finished catalog run in 117.88 seconds
root@condor-test-01:~#
```