Puppet Declarative config management

Facts facter on the node → sent to server → **Catalog** compiled from manifests + Hiera → agent fetches → **Agent** compares to real state → fixes drift → **Report** changes and failures

CONCEPTS

Puppet is declarative: you describe the end state and it only changes what differs, so runs are safe to repeat.

Always --noop first: it prints what would change without touching the system.

APPLY AND AGENT

`puppet apply <file.pp>`
Apply a manifest locally

`puppet apply --noop <file.pp>`
Dry run, show changes only

`puppet apply -e '<code>'`
Run a one-line snippet

`puppet apply --test <file.pp>`
Verbose, diffs, detailed exit codes

`puppet apply --detailed-exitcodes <file.pp>`
Exit code reports changes

`puppet apply --modulepath <dir> <file.pp>`
Use modules from a directory

APPLY AND AGENT (cont.)

`puppet apply --debug <file.pp>`
Full debug output

`puppet agent -t`
One foreground run, verbose

`puppet agent -t --noop`
Preview what the server would change

`puppet agent --onetime --no-daemonize`
Single run, stay in terminal

`puppet agent -t --environment <env>`
Run against another environment

`puppet agent --server <host> -t`
Point at a specific server

`puppet agent --disable "<reason>"`
Pause runs on this node

`puppet agent --enable`
Resume runs

INSPECT AND CHANGE

`puppet resource <type>`
List all resources of a type

INSPECT AND CHANGE (cont.)

`puppet resource <type> <name>`
Show one resource as code

`puppet resource <type> <name> <attr>=<value>`
Change a resource now

`puppet describe <type>`
Docs for a resource type

`puppet help <subcommand>`
Help for a subcommand

`puppet --version`
Print Puppet version

FACTS AND CONFIG

`facter`
Print all facts

`facter <fact>`
One fact, e.g. os.family

`facter --json`
All facts as JSON

`puppet config print`
All settings and values

`puppet config print <setting>`
One setting, e.g. modulepath

HIERA AND LOOKUP

`puppet lookup <key>`
Look up a data value

`puppet lookup <key> --explain`
Show where the value came from

`puppet lookup <key> --node <node>`
Look up as another node

MODULES

`puppet module install <author-name>`
Install from the Forge

`puppet module install <author-name> --version <ver>`
Pin a version

`puppet module list`
Installed modules

CHECK AND LINT

`puppet parser validate <file.pp>`
Syntax check only

`puppet-lint <file.pp>`
Style problems

`puppet-lint --fix <file.pp>`
Auto-fix what it can

MANIFEST SYNTAX

Resource

```
package { 'nginx':
  ensure => installed,
}
```

Service and file

```
service { 'nginx':
  ensure => running,
  enable => true,
}
file { '/etc/motd':
  ensure  => file,
  content => "Managed by Puppet\n",
}
```

Class

```
class web (
  String $port = '80',
) {
  package { 'nginx': ensure => installed }
}
include web
```

Ordering

```
package { 'nginx': ensure => installed }
-> service { 'nginx': ensure => running }
# or: require => Package['nginx']
```

Notify on change

```
file { '/etc/nginx/nginx.conf':
  source => 'puppet:///modules/web/nginx.conf',
  notify => Service['nginx'],
}
```