One of the most important aspects of any configuration management system is reporting. Reporting is critical for providing information on accuracy, performance, and compliance to policy and standards, and it can provide graphical representations of the overall state of your configuration. Indeed, we’ve already seen some examples of how to display Puppet reports (i.e., via a management console) in Chapter 7, when we looked at Puppet Dashboard and Foreman.

Puppet’s reporting engine has undergone a lot of development in recent releases, especially with the new and more detailed reporting format first introduced in version 2.6.0. In this chapter, we explain what command-line and data-based reports are available, how to configure reporting and reports, and how to work with them, then we look at graphing our reporting data and discuss how to build custom reports.

Getting Started

Puppet agents can be configured to return data at the end of each configuration run. Puppet calls this data a “transaction report.” The transaction reports are sent to the master server where a number of report processors exist that can utilize this data and present it in a variety of forms. You can also develop your own report processors to customize the reporting output.

The default transaction report comes in the form of a YAML file. As mentioned in earlier chapters, YAML is a recursive acronym for “YAML Ain’t Markup Language.” YAML is a human-readable data serialization format that draws heavily from concepts in XML and the Python and C programming languages.

The transaction reports contain all events and log messages generated by the transaction and some additional metrics. The metrics fall into three general types: time, resource and change metrics. Within each of these metrics there are one or more values. They include the time taken for the transaction, the number of resources and changes in the transaction and the success or failure of those resources.

In Listing 9-1 you can see an example of a portion of a YAML Puppet transaction report.

Listing 9-1. A partial Puppet transaction report

```ruby
--- !ruby/object:Puppet::Transaction::Report
  external_times:
    !ruby/sym config_retrieval: 0.280263900756836
  host: mail.example.com
  logs:
    - !ruby/object:Puppet::Util::Log
      level: !ruby/sym info
      message: Caching catalog for mail.example.com
      source: //mail.example.com/Puppet
      tags:
```
- info
time: 2010-12-18 08:41:19.252599 -08:00
version: &id001 2.6.4
- !ruby/object:Puppet::Util::Log
  level: !ruby/sym info
  message: Applying configuration version '1292690479'
  source: //mail.example.com/Puppet
  tags:
    - info
time: 2010-12-18 08:41:19.330582 -08:00
version: *id001
- !ruby/object:Puppet::Util::Log
  level: !ruby/sym info
  message: "FileBucket adding /etc/sudoers as {md5}49085c571a7ec7ff54270c7a53a79146"
  source: //mail.example.com/Puppet
  tags:
    - info
time: 2010-12-18 08:41:19.429069 -08:00
version: *id001

... resources: !ruby/object:Puppet::Util::Metric
  label: Resources
  name: resources
  values:
    - - !ruby/sym out_of_sync
      - Out of sync
      - 1
    - - !ruby/sym changed
      - Changed
      - 1
    - - !ruby/sym total
      - Total
      - 8
changes: !ruby/object:Puppet::Util::Metric
  label: Changes
  name: changes
  values:
    - - !ruby/sym total
      - Total
      - 2
events: !ruby/object:Puppet::Util::Metric
  label: Events
  name: events
  values:
    - - success
      - Success
      - 2
    - - !ruby/sym total
      - Total
      - 2
time: 2010-12-18 08:41:15.515624 -08:00