CFEngine 3.x
Large-scale configuration mgmt.

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How, Why?

My needs:

- Increasing number of machines
- Pro-active monitoring
- Parallel deployment
- Repetitive administration

CFEngine design:

- Scalability
- Promise theory
- Anomaly detection
- Change management
- Heterogenous adm.

CFEngine (academic) concepts

- Mark Burgess, creator, original author, prof. of Network and System Administration
- scientific approach, 90's
- Promise theory (declarative lang. of states)
- Change Management
- References, today's usage

Community vs. Enterprize

Community edition:

- Core components: cf-agent, server, monitord
- Design Center (console-only)

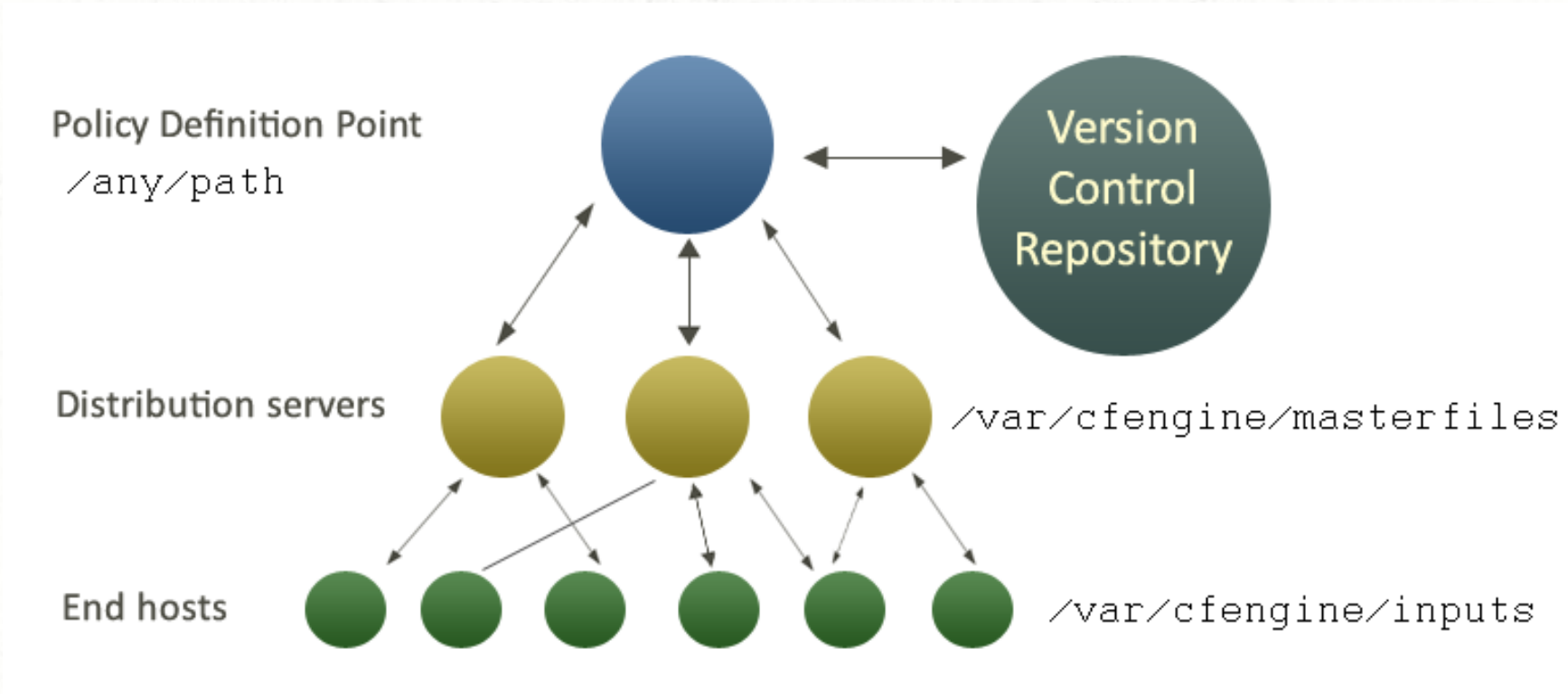
Enterprise edition:

- Knowledge management
- Web-interface
- Statistics, Graphs, feedback

Core components

- Written in C, standalone binaries (as root)
  - cf-agent
  - cf-serverd
  - cf-monitord
  - cf-execd, cf-key, cf-runagent, cf-promises
- Masterfiles, input files
- /var/cfengine/...
- **git** (down to policy server)

Policy flow


Policy Definition Point
/any/path
Version Control Repository
Distribution servers
/var/cfengine/masterfiles
End hosts
/var/cfengine/inputs

Promise theory, syntax

- Promises, declarative language
- Bundles (CFEngine 3)
- classes
- variables, actions (time-based, constraints)

```
bundle agent hello_world
{
  reports:
    any::
      "Hello World! I am $(sys.fqhost) and it is $(sys.date)"
        comment => "Prints a message, including hostname";
}
```

Agent promises

- files
  - copy
  - check
  - delete
  - perms
- commands
- methods
- processes
- packages
  - RPMs, DEBs etc.
- services
- storage

  (disk space, %)
- reports (logging)
- databases (?)

A file promise

```
files:
  Mageia::
    "/etc/ntp/step-tickers"
       handle=> "ntp_setup_tickers",
       copy_from=> remote_cp("$(def.dir_masterfiles)/Mageia/
                              ntp-step-tickers", "$(sys.policy_hub)"),
       perms=> m("go+r"),
       action=>if_elapsed_day;
```

Result?

- Many (different) machines on “auto pilot”
- 4 different setups, desktop machines!
- Alerts + rich forensics
- Tamper-proof
- Provisioning
- Continuous convergence to peace-of-mind

Zoom-out

(enterprise edition only?)

- Virtual environments
- Testing (Jenkins)
- Deployment, Risk management
- Multiple “branch” configurations