Lightweight inventory management with Pallet Jack

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Karl-Johan Karlsson

Problem statement

- Inventory management for system administrators
- Store system information
  - IP addresses, locations, serial numbers, …
- Generate service configuration
  - DHCP, DNS, configuration management, …
- Search for static information
  - Location, service contracts, ...

Goals

- Single source of truth for system administration
- Version controlled together with configuration management
- Easily interoperable
- Reasonably scaleable
- Decomposable database

Data store

- “Warehouse” with “pallets” (objects)
- Objects are directories
- Keys and values stored in YAML files
- Inheritance by symlinks and directory hierarchy

```
system
├── testvm
│   ├── architecture.yaml
│   ├── domain -> ../../domain/example.com/
│   ├── machine -> ../../machine/testvm/
│   ├── netinstall -> ../../netinstall/CentOS-7.2.1511-x86_64/Kickstart_vda/
│   └── role.yaml
```

```
system:
  role:
    - kvm-server
    - ssh-server
```

Transformations

- Synthesize new values from existing information
- Value substitution and regular expressions

```
- net.dns.fqdn:
  - synthesize: "#[net.dns.name].#[net.dns.domain]"
- host.pxelinux.kernel:
  - synthesize: "/boot/#[system.os]/vmlinuz"
```

Database tools

- **create_system** --warehouse examples/warehouse/ --system **vmhost1** --domain example.com --os CentOS-7.2.1511-x86_64

- **dump_pallet** --position --warehouse examples/warehouse/ --type system **vmhost1**

```
[...]
system:
  os: CentOS-7.2.1511-x86_64  # transforms.yaml
                              # (line 175, column 15)
  role:
  - kvm-server  # system/vmhost1/role.yaml (line 3, column 4)
  - ssh-server  # system/vmhost1/role.yaml (line 4, column 0)
  architecture: x86_64  # system/vmhost1/architecture.yaml
                        # (line 2, column 0)
  name: vmhost1  # transforms.yaml (line 165, column 15)
[...]
```

Data export tools

```
palletjack2kea --warehouse examples/warehouse/ --service example-com

## Automatically generated by palletjack2kea from
## Repository: /home/creideiki/src/palletjack/
## Branch: refs/heads/master
[...]
    "subnet4": [
      {
        "subnet": "192.168.0.0/24",
        "reservations": [
          {
            "hw-address": "14:18:77:ab:cd:ef",
            "ip-address": "192.168.0.1",
            "hostname": "vmhost1.example.com",
[...]
```

Current integrations

- Configuration management: Salt
- System installation: PXELINUX and Kickstart
- DHCP server: Kea
- Authoritative DNS: Knot
- Recursing DNS: Unbound
- (Directory service: FreeIPA)

API

```
> require 'palletjack'
> jack = PalletJack.load('examples/warehouse')
> vmhost1 = jack.fetch(kind:'system',
name:'vmhost1')
> vmhost1['system.role']
➔ ["kvm-server", "ssh-server"]
> jack.each(kind:'system') { |s|
 puts s['system.name'] }
➔ vmhost1
➔ testvm
```

```
gem install palletjack-tools
```

https://github.com/saab-simc-admin/palletjack

(or search GitHub for “palletjack”)