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Deploying UNICORE

With One Click

7. September 2015 | Sander Apweiler and Benedikt von St. Vieth

Motivation

Use software to define your infrastructure and services

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Reasons

- reproducability
- easier deployments
- automated updates
- faster failovers

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Technologies

- Ansible, Chef, `puppet`, ...
- `docker`

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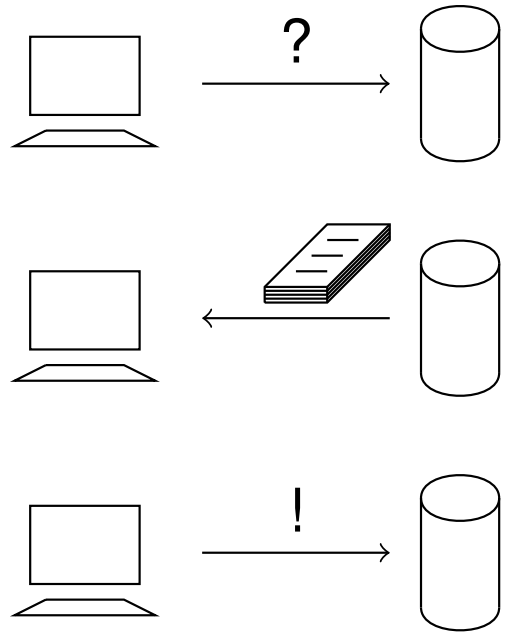
puppet

about puppet

- configuration management tool
- declarative definition of resources
  - packages
  - services
  - configuration files
- operating system agnostic
- public-private-key infrastructure for communication

about puppet – client-server

- node asks puppetmaster about his resources
- puppetmaster sends catalog to node
- node enforces the configuration, does necessary corrections and reports to puppetmaster



about puppet – declarative definition

```
node myhost.example.com {
  class { 'mysql::server':
    root_password => 'password'
  }
  mysql::db { 'mydb':
    user     => 'myuser',
    password => 'mypass',
    host     => 'localhost',
    grant    => ['SELECT', 'UPDATE'],
  }
}
```

deploying UNICORE

- install required Java
- creat necessary directories
- load .tar.gz-file to server
- extract .tar.gz-file
- modify configure.properties
- run configuration script
- run install script
- start server components

deploying UNICORE – with puppet

Steps required when using puppet:

- add UNICORE class to server definition

```
node myhost.example.com {
  include ::unicore
}
```

Minimal set of variables:

- unicore_hostname: mydns.example.com ($::fqdn)
- unicore_servers_version: 7.4.0

`puppet` resources used

- user
- package
  - install Java for current operating system
- file
  - copy archive to server
  - create configuration from template
- exec
  - extract archive
  - run configure step
  - run installation
  - start service

puppet

pro puppet:

- controls operating system and services
- uses same code for N deployments

con puppet:

- you need a server or VM
- operating system already is a overhead
- no atomic updates

docker

about `docker`

Lightweight virtualization using technologies like `cgroups`, `namespaces`, `libcontainer` and `AuFS`

build

... a `image` containing your application

ship

... your `image` using a `registry` or the central `docker` Hub

run

... the application by starting a `container` from the `image`

build – Dockerfile

```
FROM centos:latest
MAINTAINER Benedikt von St. Vieth

# install dependencies and clean-up afterwards
RUN yum -y update && yum install -y wget java-1.8.0-
    openjdk-headless && yum clean all && rm -rf /var/
    lib/{rpm,yum}

RUN wget -q -O '/unicore.tgz' '<...>/...tgz' && \
    mkdir '/opt/unicore' && \
    tar -xzf /unicore.tgz -C /opt/unicore && \
    rm -rf /unicore.tgz /opt/unicore/docs && \
    cd /opt/unicore && \
    sed -i ... configure.properties

ADD entrypoint.sh /entrypoint.sh
ENTRYPOINT /entrypoint.sh
EXPOSE 8080
```

deploying UNICORE – docker run

```
docker run -d -p 8082:8082
           -e WSRFLITEURL=hostname
           -e GATEWAYPORT=8082 benedicere/unicore
```

docker

pro docker:

- run UNICORE deployment with one command
- use same images for N deployments
- start on every Linux, virtualized on Windows/OSX

con docker:

- increase complexity when using volumes and links

conclusion and outlook

conclusion

puppet

- well suited for reproducible operations

docker

- more complex integration testing
- good alternative for Live-CD
- ease operations

conclusion

puppet

- well suited for reproducible operations

docker

- more complex integration testing
- good alternative for Live-CD
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- x509 authentication makes it very complex
- too many and to complex configuration files

outlook

puppet

- introduce `puppet` class per service
- implement update procedure

docker

- build images per service
- use `docker`–compose
- move persistence to external volumes

- use `UNICORE` packages