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Using docker and docker-compose

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## Using docker and docker-compose

### Time line

- 2014-2015 Initial experiments with Docker
- 2015-2016 Custom shell scripts for building and running services
- 2017-2018 Compose for building and running services

## Custom virtual machine image to host docker services

- Minimal install of Fedora, with docker, docker-compose and admin tools



- Automated build using RedHat kickstarter  
[fedora-docker-base.txt](#)



- ~30sec to create and launch a new VM using Libvirt scripts



- Compatible with the university OpenStack system  
[Eleanor Researcher Cloud Service](#)



## Secrets and passwords

Shell script function that looks up a secret :

`secret <key>`

Implemented using a combination of `ssh` and `sed` :

```
secret()
{
  local key=${1:?}
  ssh -o 'VisualHostKey=no' "${secrethost:?}" "
    sed -n '
      s/^[[:space:]]*${key}=\\(. *\\)/\\1/p
      ' \"${secretfile:?}\"
  "
}
```

Server side text file contains name value pairs :

```
toad=Brown Toad
frog=Green Frog
fish=Blue Sea
```

## Basic Firethorn components

Main TAP and JSON/REST webservice



OGSA-DAI data handling webservice



PostgreSQL database



Python client



Using human names for the services avoids duplication and hard coded values.

Worst case, and all too common :

```
hostname = postgres,
database = postgres
username = postgres
password = ...
```

## 2015-2016 Shell scripts for building and running the services

```
# Start our Firethorn webservice container.  
docker run \  
  --detach \  
  --publish 8080:8080 \  
  --name "${firename}" \  
  --link "${ogsaname}" \  
  --link "${metaname}" \  
  --link "${dataname}" \  
  --link "${username}" \  
  --volume "${properties}:/etc/firethorn.properties" \  
  --volume /etc/localtime:/etc/localtime:ro \  
  "firethorn/firethorn:${version}"
```

2017-2018 Compose for building and running the services

Single compose.yml configuration file for a set of services

```
bethany:
  image:
    "firethorn/postgres:${buildtag}"
  ....

jarmila:
  image:
    "firethorn/ogsadai:${buildtag}"
  ....

gillian:
  image:
    "firethorn/firethorn:${buildtag}"
  ....
  depends_on:
    bethany:
      condition: service_started
    jarmila:
      condition: service_healthy
```



Debian physical machine



Fedora virtual machine



Firethorn  
webservice



OGSA-DAI  
webservice



PostgreSQL  
database



Python  
client