

DEPLOYING CLOWDER



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RUNNING CLOWDER IS EASY

- Install MongoDB (3.6 not more)
- Install RabbitMQ (which requires erlang)
- Install Java
- Download zip file with clowder
 - Unzip the file to correct location
 - Create service file
 - Configure MongoDB and RabbitMQ
- Install python 2.7 and 3.7
- Create a virtual env for each extractor
- Download code
 - Install required libraries
 - Create a service file
 - Connect to RabbitMQ

~~RELAX AND ENJOY~~ OOPS A FEW MORE STEPS

- Install webserver
- Open ports in a firewall (you run a firewall right?)
- Setup certificates for SSL
- Configure the webserver to proxy clowder

- Oh and you didn't want elasticsearch, correct?

LET'S SIMPLIFY

- We could ship a single VM
 - All pieces are pre installed, just run it
 - Difficult to upgrade
- Can we split the application?
 - Enter docker and docker-compose
 - Leverage of existing components (containers)
 - Allow to upgrade a single container

WHAT IS DOCKER?

- **Docker** is an application build and deployment tool. It is based on the idea of that you can package your code with dependencies into a deployable unit called a container.
- Think of many virtual machines, each that do only one task
 - But don't have the overhead of running anything else
 - Each container ideally only runs one process
 - All dependencies are inside the container
- Containers run on one (or more) machines
- Can upgrade a single container
 - Don't have to worry about new dependencies breaking other components

CONNECTING CONTAINERS

- Clowder depends on many components
 - MongoDB, RabbitMQ, Elasticsearch, Extractors, Webserver
- Leverage of docker-compose to connect containers
 - Can order startup sequence of containers
 - Isolation of other applications
 - Single command to bring up a complete system

GROWING CLOWDER

- Everything runs nicely on a single machine.
 - How do I scale to more extractors?
 - How do I make sure things keep running?
 - How can I scale clowder?
 - How can I combine multiple machines to create a cluster?
- We need orchestration, Kubernetes!
 - Kubernetes is hard!
- I want something simple like docker-compose
 - Enter Helm

KUBERNETES AND HELM

- What is Kubernetes
 - Kubernetes is an open-source system for automating deployment, scaling, and management of containerized applications across multiple machines running Docker.
 - Will do self healing
 - a container crashes? It restarts
 - A machine crashes? Move container to another machine
- What is Helm
 - Helm is a package manager for Kubernetes.

USING HELM TO INSTALL/UPGRADE

- Install clowder using helm
 - helm repo add ncsa <https://opensource.ncsa.illinois.edu/charts/>
 - helm install clowder ncsa/clowder
- Upgrading clowder
 - helm repo update
 - helm upgrade clowder ncsa/clowder

CLOWDER IN KUBERNETES

clowder	clowder	2/2	2	3w
clowder-elasticsearch-elas...	clowder	1/1	1	3w
clowder-extractors-audio-p...	clowder	1/1	1	6w
clowder-extractors-clamav	clowder	1/1	1	6w
clowder-extractors-file-dige...	clowder	1/1	1	6w
clowder-extractors-image-...	clowder	1/1	1	6w
clowder-extractors-image-...	clowder	1/1	1	6w
clowder-extractors-pdf-pre...	clowder	1/1	1	6w
clowder-extractors-video-pr...	clowder	1/1	1	6w
clowder-mongodb	clowder	1/1	1	3w
clowder-monitor	clowder	1/1	1	6w

CONFIGURING CLOWDER WITH HELM USE COMMAND LINE

- `helm install clowder ncsa/clowder \`
`--set replicaCount=2 \`
`--set commKey=itsasecret \`
`--set idleTimeoutInMinutes=10080 \`
`--set ingress.enabled=true \`
`--set ingress.hosts[0]=earthcube.clowderframework.org`

CONFIGURING CLOWDER WITH HELM USE A CONFIGURATION FILE

commKey: itsasecret

replicaCount: 2

ingress:

enabled: true

hosts:

- earthcube.clowderframework.org

users:

- email: kooper@illinois.edu

firstname: Rob

lastname: Kooper

admin: true

password: somethingsecret

CONFIGURING CLOWDER WITH HELM

MORE EXAMPLES

ADD EXTRACTORS

extractors:

awesome:

image: kooper/awesome:2.1.4

replicaCount: 5

ADD S3

storage:

s3:

bucket: clowder

region: ncsa

endpoint: <https://ncsa.osn.xsede.org/>

access_key: access

secret_key: itsasecret

CONFIGURING CLOWDER WITH HELM

ADD CILOGON

extraPlugins:

- 10098:services.CILogonProvider

extraConfig:

- securesocial.cilogon.clientId="myproxy:oa4mp,2012:/client_id/somenumbers"
- securesocial.cilogon.clientSecret="sssh-big-secret"
- securesocial.cilogon.authorizationUrl=https://cilogon.org/authorize
- securesocial.cilogon.accessTokenUrl=https://cilogon.org/oauth2/token
- securesocial.cilogon.userInfoUrl=https://cilogon.org/oauth2/userinfo
- securesocial.cilogon.scope="openid profile email org.cilogon.userinfo"
- securesocial.cilogon.groups=["cn=clowder,ou=Groups,dc=ncsa,dc=illinois,dc=edu"]

RUNNING CLOWDER IS EASY

- Create file with all configuration options
 - vi values.yaml
- Add helm charts
 - helm repo add ncsa <https://opensource.ncsa.illinois.edu/charts/>
- Update helm repo
 - helm repo update
- Install/Upgrade clowder
 - helm upgrade --install clowder ncsa/clowder \
--create-namespace --namespace clowder \
--values values.yaml

QUESTIONS

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