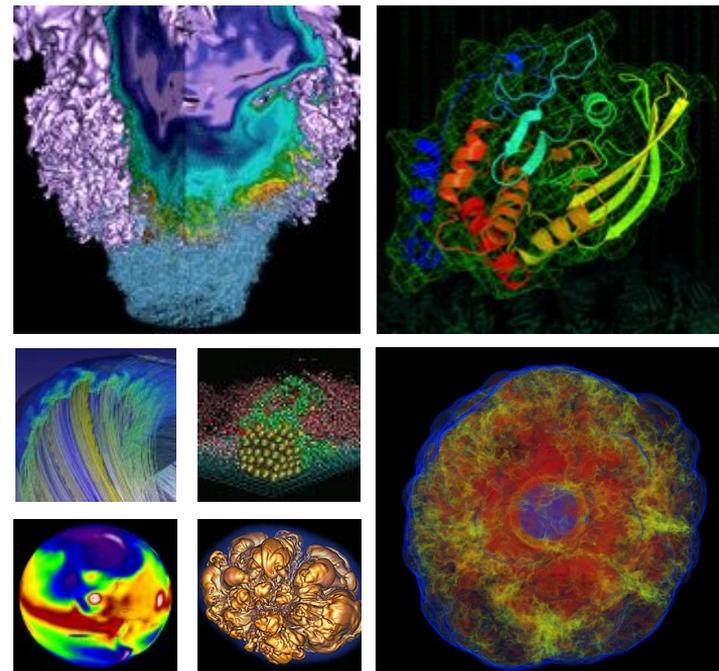


Spin:

A Docker-based System at NERSC
for Deploying Science Gateways



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Gateways 2018

What is Spin?



Spin^{*} is a CaaS[†] system that lets users **build science gateways, web services, databases, and more** using Docker containers.

It is designed to be **flexible, scalable, and integrated** with NERSC resources:

- **Develop custom applications** on your laptop or **use pre-prepared ones.**
- **Deploy in minutes** and **scale out** for performance.
- Access **HPC networks and file systems.**
- **No VMs or Kubernetes clusters to manage.** NERSC handles it all!

* Scalable Platform Infrastructure at NERSC

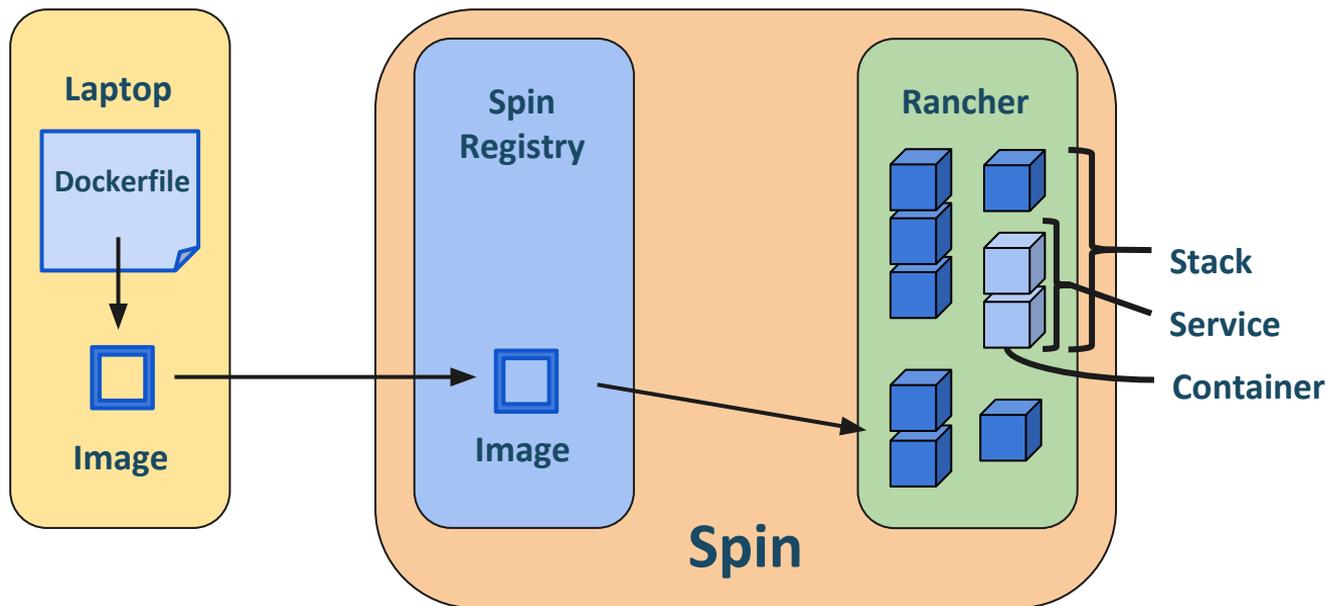
† Containers-as-a-Service

How does Spin work?

Build
*custom images
(or use managed ones)*

Ship
*your custom images to
Spin's Docker registry*

Run
*containers on our
managed platform*



using



docker

and



RANCHER

Declare each image and service...



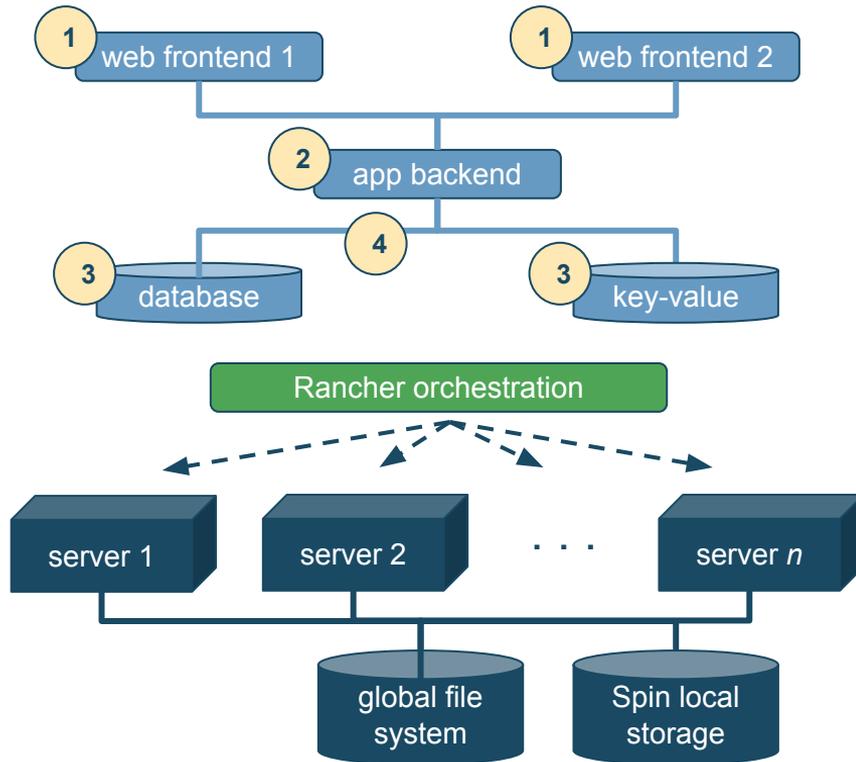
Dockerfile

```
FROM ubuntu:18.04
RUN apt-get update --quiet -y && \
    apt-get install --quiet -y \
    python-flask
WORKDIR /app
COPY app.py /app
ENTRYPOINT ["python"]
CMD ["app.py"]
```

docker-compose.yml

```
version: '2'
services:
  web:
    image: nginx-proxy:v1
    ports: 8080:80/tcp
    volumes:
      - ../../fruitfly/web/images : /srv : ro
  db:
    image: mongo:4
    environment:
      MONGO_INITDB_USERNAME: mongouser
    volumes:
      - db.fruitfly : /data/db
```

...to create your science gateway...



A typical example:

1. multiple nginx frontends
2. custom Flask backend
3. database or key-value store (dedicated, not shared)

automatically plumbed into

4. private overlay network.

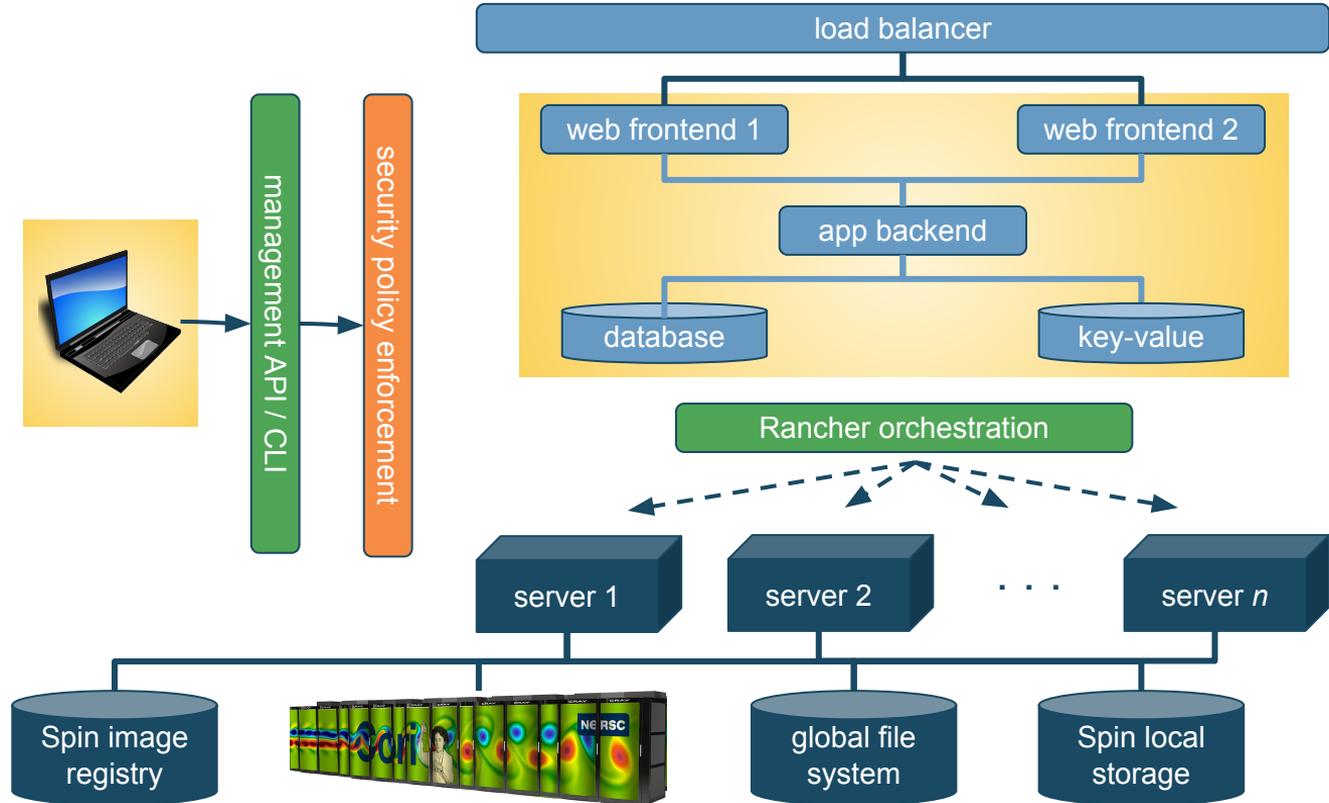
Best of all, Rancher orchestration starts the containers in $O(\text{seconds})$.

...within NERSC infrastructure.

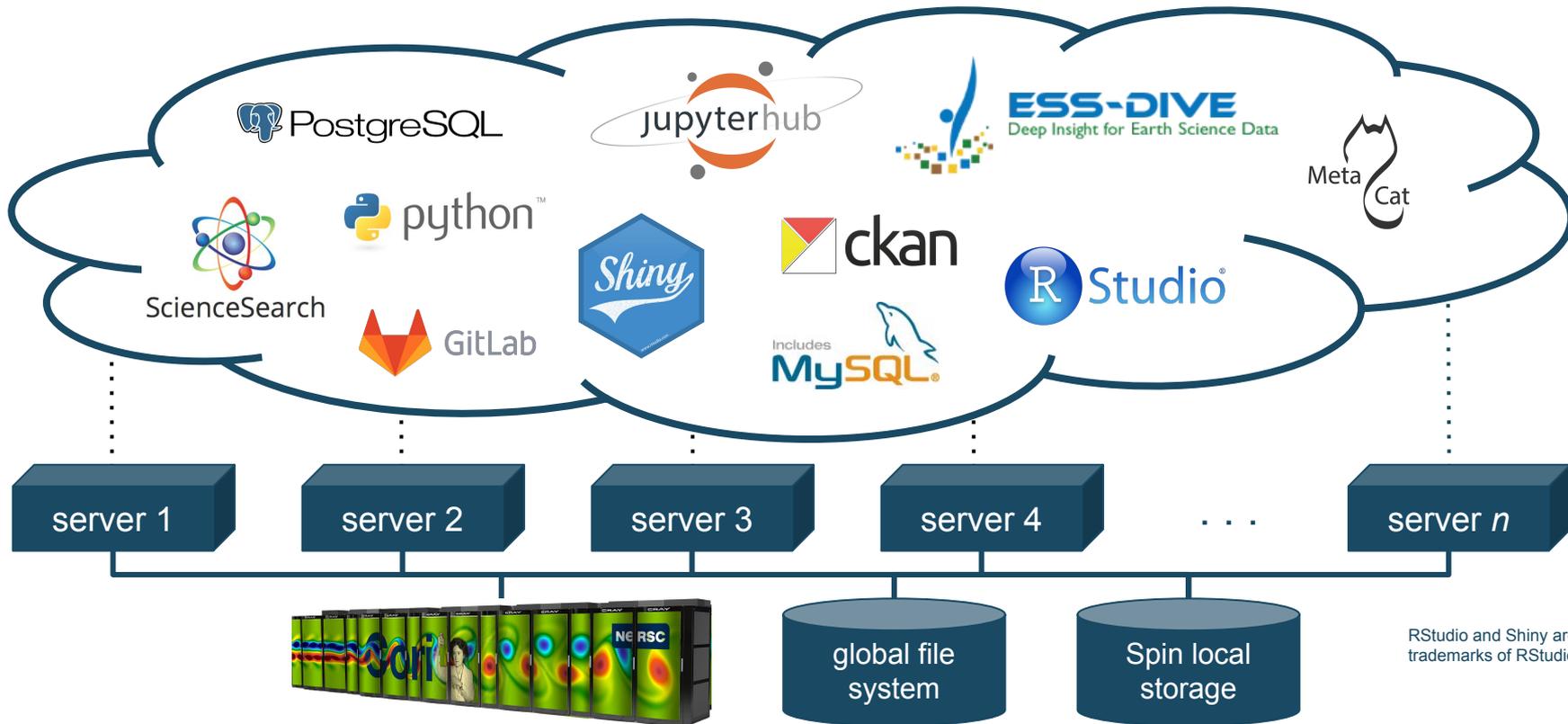


User-managed

NERSC handles the rest!



Currently running in Spin...



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