



# PaaS for web applications with OpenShift Origin

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## Goals

### Modernize web central hosting:

- Support modern development frameworks
- Provide more flexibility
- Reduce the need for "locally managed" web servers

### Improve offering of tools to developers:

- Make it easier to get started
- Automate application deployment
- Integration with code hosting (GitLab)
- CI/CD pipelines (GitLab/Jenkins)

### Facilitate deployment & operation of web applications:

- Fast prototyping
- Hosting of central services
- Self-service templates for application instances
- Save application manager from maintaining OS

### CERN Web Frameworks strategy:

Use containers to host everything and widen service options. OpenShift to orchestrate all.

## Implementation

### Deployment:

- RedHat's PaaS solution based on Docker and Kubernetes: OpenShift v3
- Open source version: OpenShift Origin
- Puppet-managed Openstack VMs
- Considering deployment on top of Openstack Magnum

### Present Infrastructure (October 2016):

- 27 VMs (2 clusters)
- 9TB of app volume storage (Cinder, NFS)

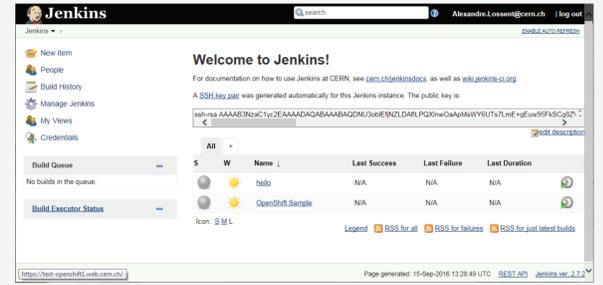
### Integration:

- CERN WebServices:
  - name allocation
  - management of project ownership and lifecycle
  - quota management
- SSO authentication
- E-group authorization
- GitLab for code hosting and CI/CD pipelines
- CVMFS storage
- EOS storage

## Use cases

### Jenkins CI:

- Self-service instances
- Dynamically provisioned container slaves
- More flexibility, better resource efficiency than VMs



### Deploy 3rd party applications:

- Off the shelf Docker images or CERN customized
- CERN Central services

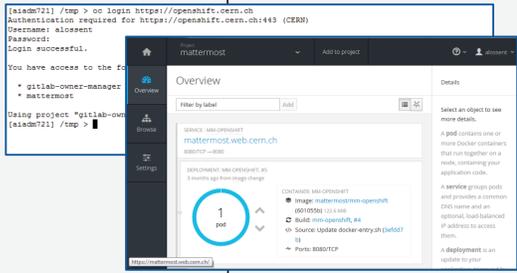


- Self-service per-team application instances



## Architecture

Application owner



Templates for 3rd party apps

Web app1 user

Web app2 user

Web app3 user

SDN (virtual network)

Router node

HAProxy container

Master

OpenShift master

Kubernetes master

Node

Web app1 container

Web app2 container

Web app3 container

Docker

Kubelet

Node

Web app1 container

...

Node

Web app4 container

...

Network storage

Database-on-demand

### Custom web application hosting:

- Automated build & deployment from sources in GitLab
- Development, staging and prod environments
- DBoD service provides databases as needed
- Support for multiple frameworks



## Future

### Generic web site hosting:

- Serve static & CGI content from shared EOS filesystem
- OpenShift to enable more dynamic scaling, load spread and flexibility than VMs
- 4000+ sites currently on AFS
- 1000+ Drupal websites

