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CERN Web Frameworks strategy:
"use containers to host everything and to allow widen service options;
use OpenShift to orchestrate all."

Motivation and Goals

- Modernize web central hosting:
  - Support modern development frameworks
  - Provide more service 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 and operation of web applications:
  - Fast prototyping
  - Hosting of central services
  - Self-service templates for application instances
  - Save application manager from having to maintain OS as well

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

- Infrastructure:
  - 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
  - CVMFS storage, EOS storage
  - GitLab for code hosting and CI/CD pipelines

Use Cases

- Jenkins CI:
  - Self-service instances, Dynamically provisioned container slaves, better flexibility & resource efficiency than VMs

- Deploy 3rd party applications:
  - Off the shelf Docker images or customized for CERN use
  - CERN Central services

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

Future:

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