

Oracle Weblogic on Kubernetes

Rationale

CERN IT-DB group: WebLogic Domains as a Service

- Over 40 domains
- ~ 500 Oracle WebLogic Servers
- ~ 350 web URL served

From...

...towards

VMs provisioning: Openstack Iaas

openstack.

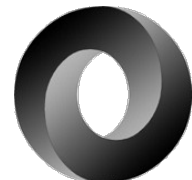
Software deployment: CERN RPMs

ORACLE FUSION MIDDLEWARE WEBLOGIC SERVER rpm

Configuration management: Puppet

puppet

Service configuration definition: JSON



Configuration deployment: JYTHON

Jython ORACLE WebLogic Scripting Tool (WLST)

openstack.

K8s cluster provisioning: Openstack
Magnum PaaSContinues integration
and deployment,
configuration and
orchestration:GitLab +
Docker images +
Kubernetes

Service configuration definition: JSON

Why WLS on Kubernetes?

Recoverable

Faster delivery

Industry standard

Easier patching



Kubernetes

Repeatable

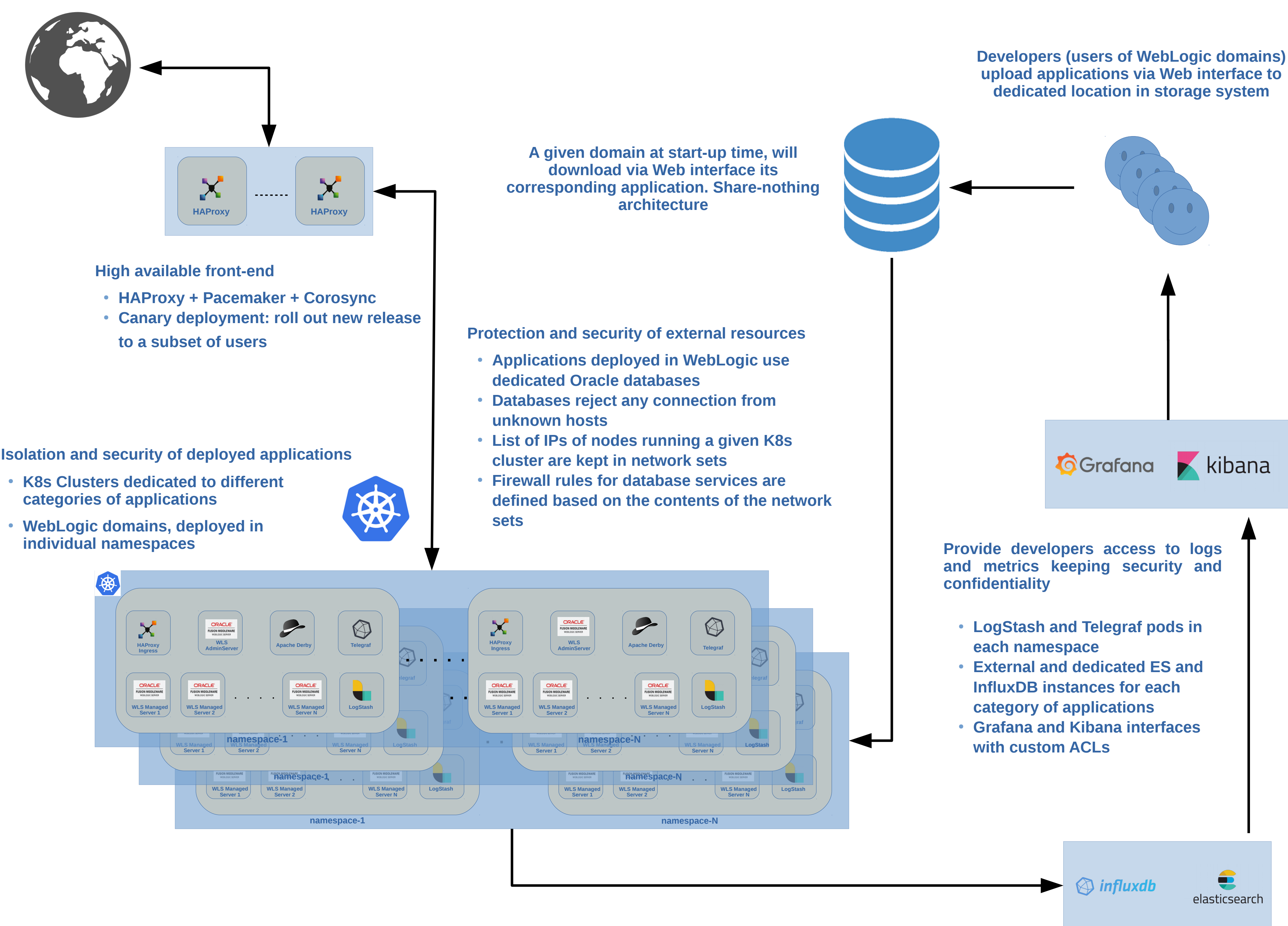
Plug-able

Portable

Version controlled

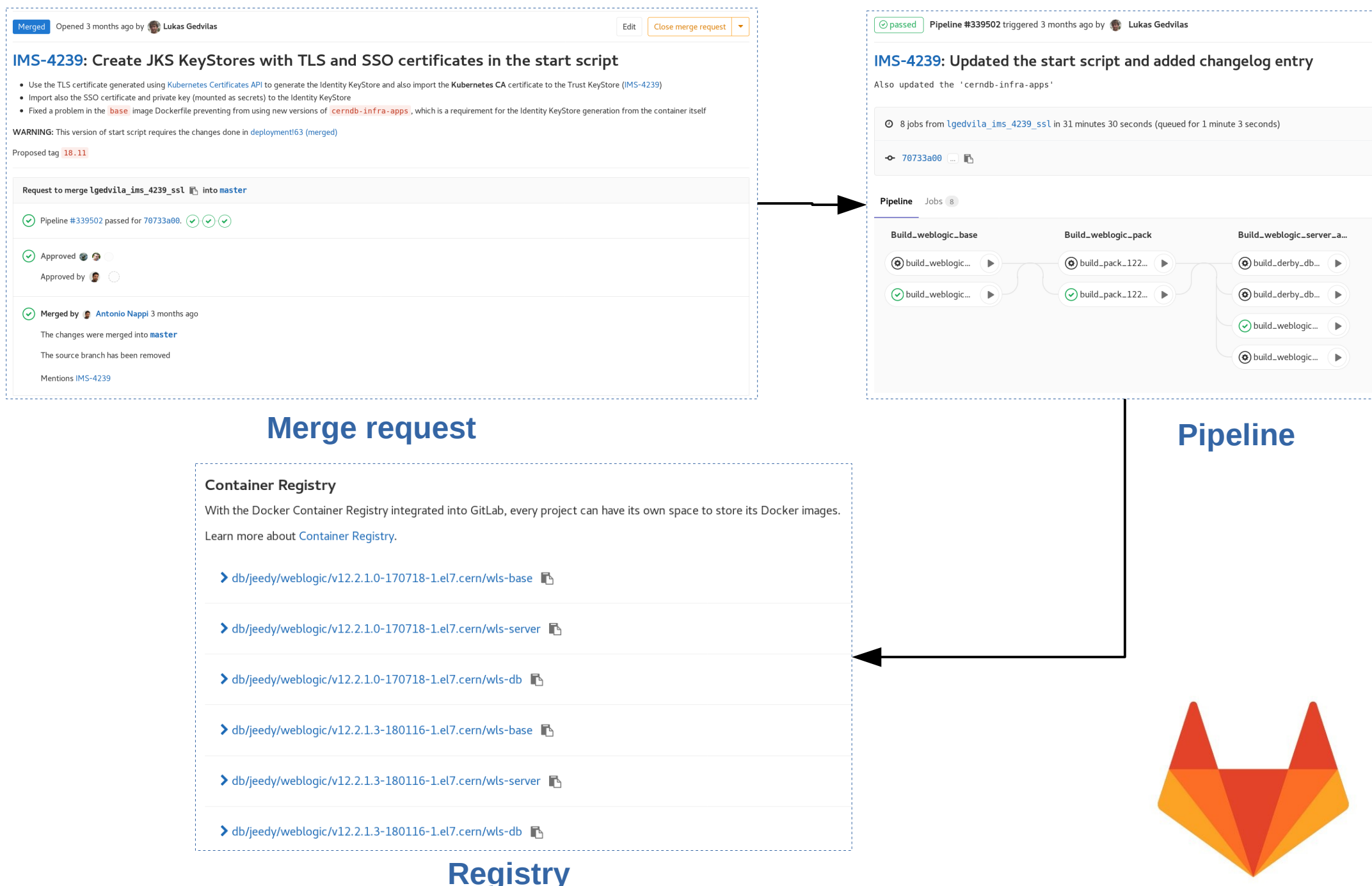
Architecture

Deployment model



Streamlined production of images with GitLab

- Changes are moderated, controlled and driven by code using merge requests
- Automated build of development, staging and production images
- Maintenance of several versions in parallel
- Storage in the GitLab's integrated image registry



CLI tools for WebLogic domains deployment

- Set of scripted tools to interface with the infrastructure
- Consume from external sources, information like configurations of WebLogic domains and front-end endpoints in JSON format
- Generate description of K8s objects and connect to appropriate Magnum clusters to create/destroy/modify

Future plans

- Evaluate Helm [https://helm.sh/] and GitLab Auto DevOps [https://docs.gitlab.com/ee/topics/autodevops/] for operations and deployment
- Evaluate Traefik [https://traefik.io/] as alternative to HAProxy ingress
- Kubernetes RBAC Authorization [http://cern.ch/go/L96r] to delegate operator role to application developers

Challenges

- Cloud provider independent
- Portable deployment
- Pre-configured WebLogic domains included in the Docker images
- Persist specific WebLogic domain configuration in Kubernetes objects
- WebLogic to download deployed application from WebService at start-up time
- Cultural change of containers ecosystem
- No access to particular hosts
- Logging
- Debugging

References

- Antonio Nappi (September 2017, CERN Openlab Open Day) [http://cern.ch/go/WW7B]
- Antonio Nappi & Luis Rodríguez (August 2017, Oracle Bristol Workshop). Oracle on Kubernetes [http://cern.ch/go/SMC8]

- WebLogic on Docker images [http://cern.ch/go/8Spk]
- GitLab CI [https://about.gitlab.com/features/gitlab-ci-cd/]