OpenShift/OpenStack experiences @ Proximus

RedHat BeNeLux Forum - Breda 2017
• Largest Belgium’s telco operator providing fixed lines, mobile, internet & TV services. *Telindus* (ICT Services) and *BICS* are also part of Proximus group

• > 13 000 employees

• 5,8 Billion € revenue in 2016

• Several hundreds of applications with at least 600 running in Websphere/WebLogic/JBoss

• 3 mains datacenters (one mostly for housing)
Chapter 1 - The story
4 years ago ....

• µservices development started

• 1 µservice – 1 JBoss EAP instance – 1 RHEL VM
  - Resource waste
  - Lot of provisioning required
  - Management activities increasing
  - Shifting to SpringBoot/FatJar

• Could we use Linux containers ?
  - No because not secure enough
2 years ago ....

• SDN Network project starting with OpenStack as main IaaS

• Additional security guarantees given for container workload
  - No process running as root
  - OpenSCAP container scanning
  - PROD vs NON-PROD segregation
  - Image template validation

• RedHat CloudSuite offering
  - Matching our R&R : OpenStack managed by infrastructure team
    OpenShift managed by middleware team
  - Subscriptions also includes Jboss Web Server, RHEL & CloudForms
Last year

Project was approved thanks to the following expected returns

- Provisioning effort savings
- Patching time savings
- Delivery time (weeks->min)
- CI/CD enabler
- DevOps enabler
- More efficient hardware usage
- First time right improvement
- Software stack standardization
- Easy scale in/out
- Ready for Hybrid cloud
- Chargeback model possible
- Easy on-boarding of new technologies
Why RedHat?

- Affinity for OS (RHEL) & Java Application Server (JBoss EAP)
- Leader on the Private Cloud market (Forrester 2016 report)
- Stack based on the more commonly used open source components (docker, kubernetes, …)
- Also chosen by other big companies like Bpost
- Ability to combine OpenShift (PaaS) & OpenStack (IaaS)
- Good support from vendor to achieve our targets (experience with Jboss EAP & DataGrid)
High Level Setup - 2017
OpenShift combined with OpenStack

What we are going to build this year
High Level Setup - 2018
OpenShift combined with OpenStack

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Future setup will require full re-install

Source: Microsoft.
Chapter 2 - OpenStack @Proximus
Network modernization project

- Migration to SDN fabrics
  - Internal corporate network
  - Telco network
- Telco Cloud - NFV
  - SDN
  - OpenStack
  - Orchestration
Telco Cloud high-level design

• Cisco ACI leaf-spine network
• RedHat OpenStack
• Neutron is “master”
• VxLAN based
• ACI agents OpFlex<>OpenFlow
• Split datacenters
OpenShift IaaS layer – why OpenStack

• Move beyond “only” virtualisation

• Potential for additional services / APIs
  • Network integration, inc. LBaaS, DNSaaS, …
  • Storage integration (Cinder, Swift)
  • Easy, orchestrated setup(s) of OpenShift
  • (auto)scaling and self-healing
  • Databases ?
OCP-on-OSP reference design

- https://github.com/redhat-openstack/openshift-on-openstack

NAT – do we need this?

Double encap – we don’t want this
OCP-on-OSP reference design

Current status

- Uses Heat / Ansible for deployment
- Heat-stack uses OpenStack telemetry services – scaling, healing
- Cinder block storage

…but

- Heat-based deployment EOL (OSP10/OCP3.4)
- … Ansible-installer incomplete
“IaaS” next steps

• Kuryr network integration
  • docker -> Neutron -> ACI
  • https://github.com/openstack/kuryr

• Storage integration
  • Currently cinder-on-ceph and gluster-on-cinder-on-ceph
  • What about Manila, CephFS, … ?
“IaaS” next steps

• Security considerations
  • External firewalls, external loadbalancers?
  • “Monolithic” or in-tenant?

• Extend scope – OpenShift for NFV “light”
  • https://builders.intel.com/docs/networkbuilders/enabling_new_features_in_kubernetes_for_NFV.pdf
  • Multi-NIC CNI, SRIOV CNI, core manager..
Chapter 3 - OpenShift @Proximus
Storage

- Started with Cinder and NFS

- Cinder -> No sharing between containers
- NFS -> No dynamic storage provisioning

- Gluster CNS -> provides everything
  - Installation can be challenging
  - « Two days of pain or how I deployed GlusterFS cluster to Kubernetes »

http://blog.lwolf.org/post/how-i-deployed-glusterfs-cluster-to-kubernetes/
CI/CD flows

- OpenShift offers S2I
  - Big images (>2GB JBoss)

- Splitting build/run stage
  - More flexibility
  - Better fit for current build process

- Internal image community
PaaS = Self-Service

• Installing it isn’t!
  • Firewalls
  • Subscriptions
  • HEAT templates

• Involve other teams early (Yes, also security teams!)
  • They can help resolving issues
  • Visibility

• You will encounter resistance
Backup slides
OpenShift

Source: Microsoft.
Forrester – Private Cloud Q1 2016 report

FIGURE 3 Forrester Wave™: Private Cloud Software Suites, Q1 ’16

[Diagram showing vendor positioning with a matrix for current offering and market presence, highlighting VMware, Red Hat, IBM, Microsoft, HPE, BMC, Huawei, and Citrix.]

Go to Forrester.com to download the Forrester Wave tool for more detailed product evaluations, feature comparisons, and customizable rankings.
OpenShift (RedHat PaaS) Overview