RED HAT FORUM 2018 ZURICH

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OPENSHIFT OPTIMIZED BY INTEGRATING SOFTWARE DEFINED INFRASTRUCTURE

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NETCLOUD
ICT PROFESSIONALS

Über Netcloud

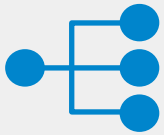
NETCLOUD
ICT PROFESSIONALS

Niederlassungen	Winterthur, Basel, Bern
Service Operations-Center	Winterthur, Bern
Gründungsjahr	1998
Mitarbeiter	164
Red Hat	CCSP Advanced Partner
Cisco Partner Level	Gold
NetApp Partner Level	Platinum
AVI	Premium Partner
Besitzverhältnisse	Zu 100% in Besitz des Managements

Cisco ACI CNI für OpenShift

Enhanced OpenShift Networking

Unified networking: Containers, VMs, and bare-metal



Hardware-accelerated: Integrated load balancing

Flexible policy: Native platform policy API and ACI policies

Visibility: Live statistics in APIC per container and health metrics

Enhanced Multitenancy and unified networking for containers, VMs, bare metal

Fast, easy, secure and scalable networing for your Application Container Platform

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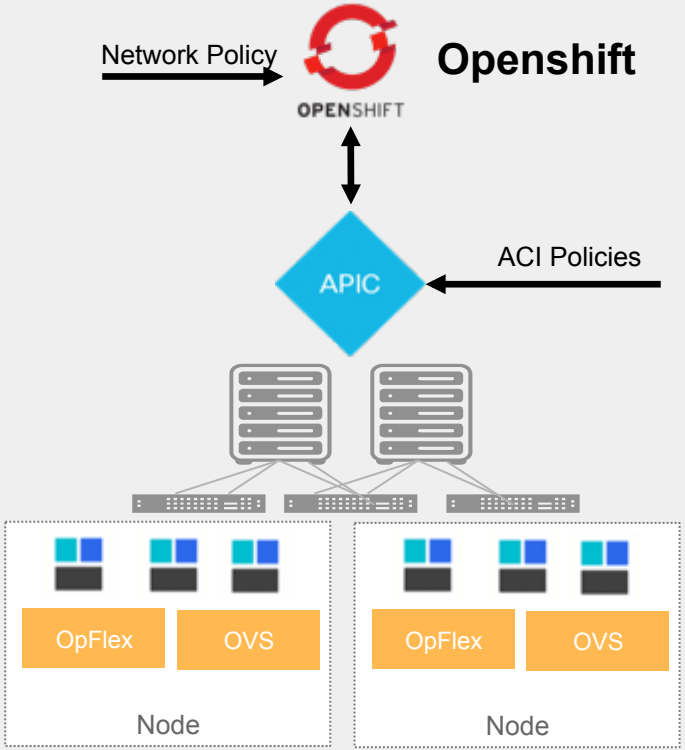
Solution Overview



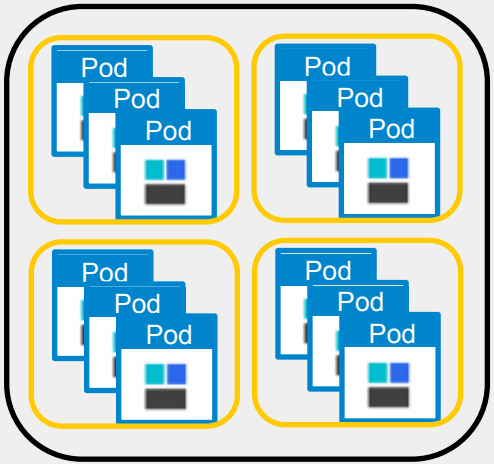
- Network policies of Kubernetes supported using standard upstream format but enforced through OpFlex / OVS using APIC Host Protection Profiles
- Openshift apps can be moved without modification to/from ACI and non-ACI environments
- Embedded fabric and virtual switch load balancing
  - PBR in fabric for external service load balancing
  - OVS used for internal service load balancing
- VMM Domain for Openshift
  - Stats per namespace, deployment, service, pod
  - Physical to container correlation

EPG

Network Policy

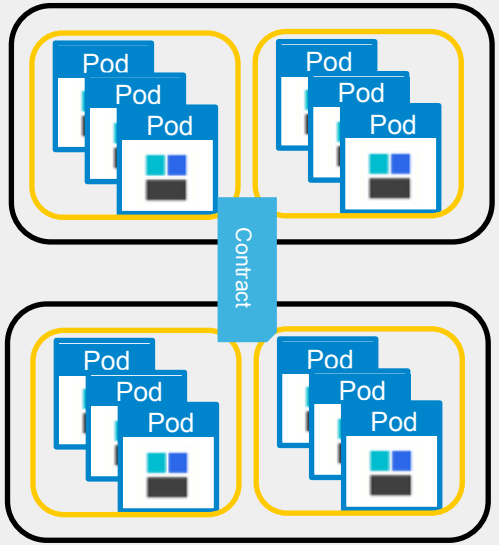
Flexible Definition of EPG Boundaries

Cluster Isolation



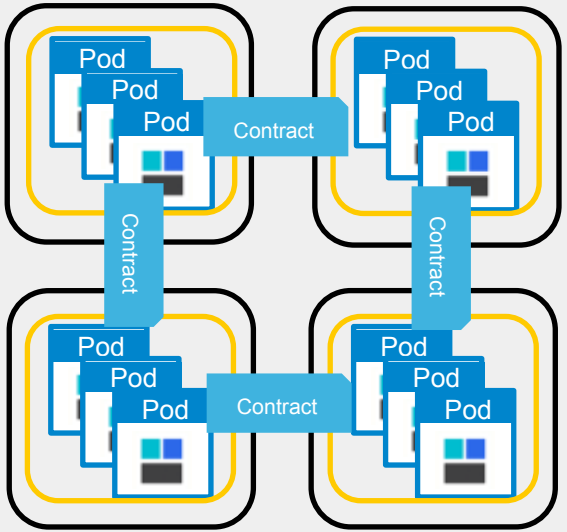
- Single EPG for entire cluster, default behavior
- No need for any internal contracts

Namespace Isolation



- Each namespace is mapped to its own EPG
- Contracts for inter-namespace traffic

Deployment Isolation



- Each deployment mapped to an EPG
- Contracts tightly control service traffic

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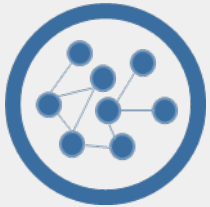
AVI Elastic Service Mesh für OpenShift

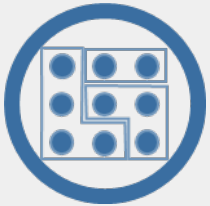
Was ist AVI ESM

Application
Perf. Monitoring



Application
Maps

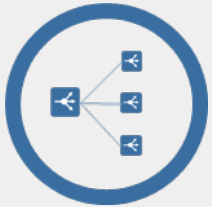
Service
Discovery



Security /
Microsegmentation

AVI Networks

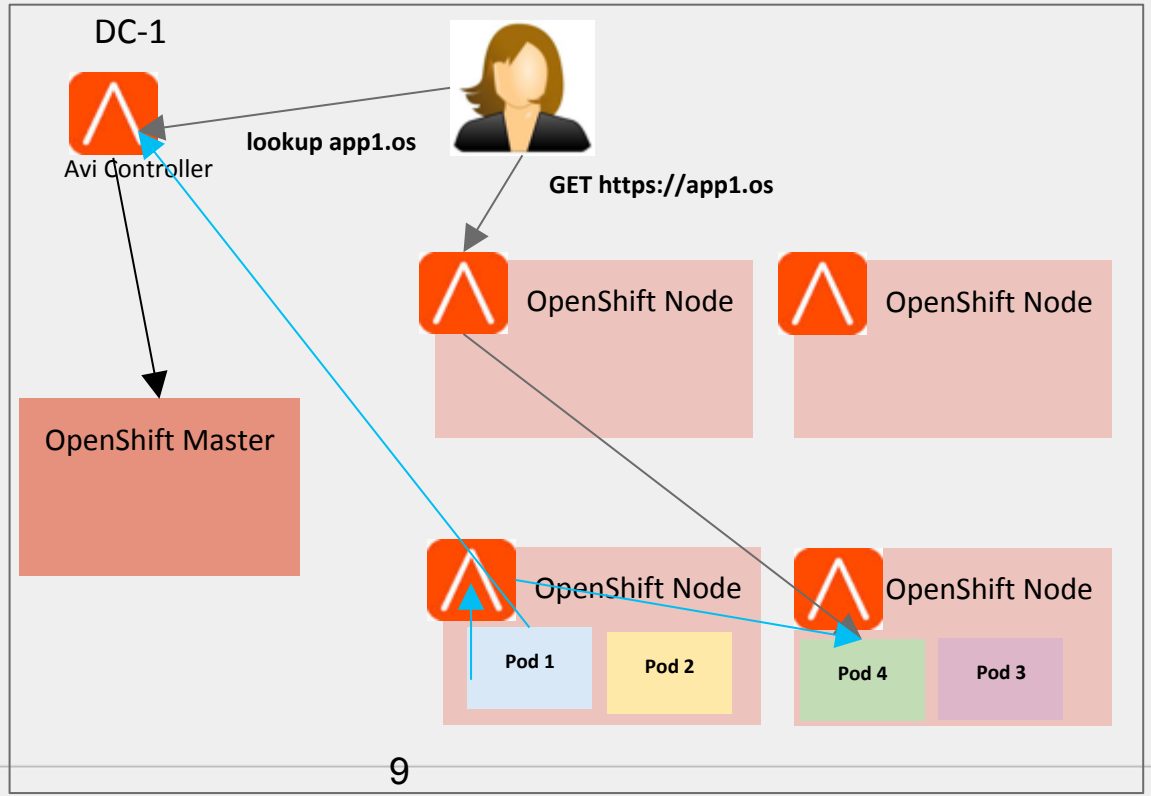
Elastic Service Mesh



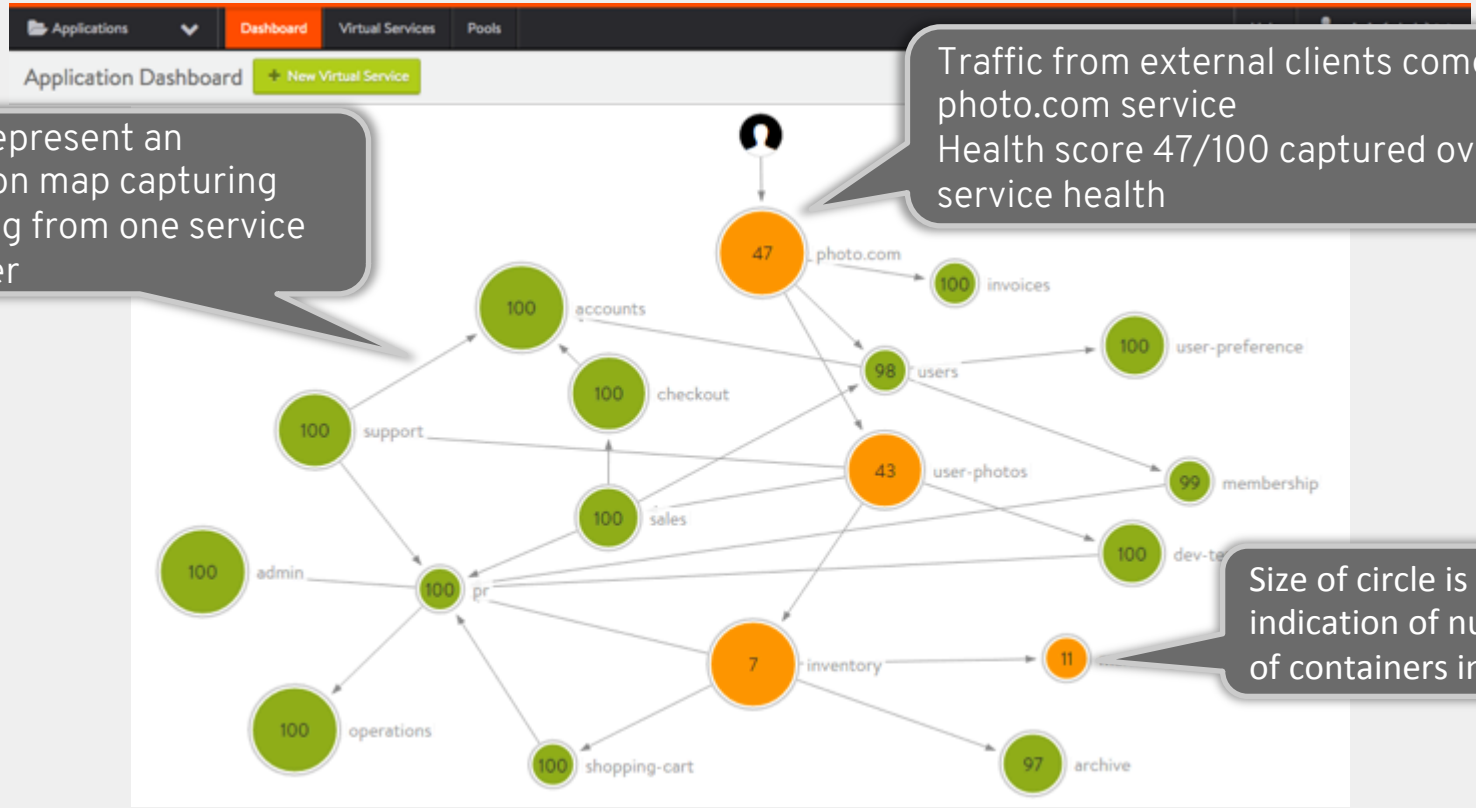
Global / Local
Load Balancing

Traffic Flow

North/ South Traffic
East/ West Traffic



Service Map



Benefit of AVI ESM

- Load Balancing
  - L4-7 Load Balancing with Auto-Scale
  - L4-7 Traffic Management
- Microsegmentation/firewalling for containers
- Integrated IPAM + DNS - service discovery
- Fully automated proxy + service creation
- App Upgrades and Blue/Green App Deployments
- Works in any enviroment
  - DC, AWS, Azure, GCP, etc.
- Monitoring
  - Real-time visibility into application health
  - Application End-to-End latency tracking
- Management
  - Centralized Monitoring und managemnet

Kubernetes Persistent Volume Framework

Persistent Volumes (PVs)

- Storage which has been introduced to Kubernetes by an administrator
- Configured for backing storage device like NFS, iSCSI, Cinder, AWS EBS, GCE, Azure, …
- Abstracts the physical storage volume into an allocatable unit for applications
- Includes connection information for the storage volume

```
apiVersion: v1
kind: PersistentVolume
metadata:
  name: pv0003
spec:
  capacity:
    storage: 5Gi
  accessModes:
    - ReadWriteMany
  nfs:
    path: /tmp
    server: 172.17.0.2
```

Persistent Volumes Claims (PVCs)

- Created by a user to request storage
- Specifies desired capacity and access mode, along with labels to aid with selection
- Kubernetes assigns a PV to meet the requirements requested in the PVC

```
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: rhforum2018
spec:
  accessModes:
    - ReadWriteOnce
  resources:
    requests:
      storage: 5Gi
```

Storage Classes

- Describes a storage offering and associates a provisioner
- Parameters are used to provide additional information to the provisioner
- Parameters are opaque to Kubernetes
- PVCs specify storage classes, storage classes specify provisioners, and provisioners map storage classes to PVs
- Storage Classes can also be used with statically provisioned PVs

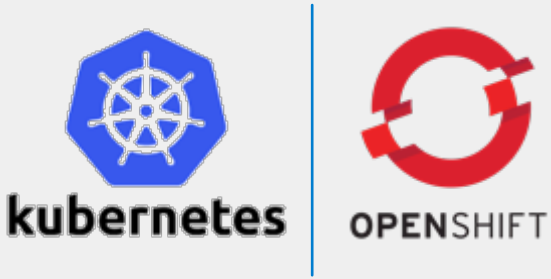
```
apiVersion: storage.k8s.io/v1
kind: StorageClass
metadata:
  name: bronze
provisioner: netapp.io/trident
parameters:
  backendType: "ontap-nas"
  mediaType: "hdd"
```

Persistent Volumes with NetApp Trident

Trident

- A dynamic and automated storage provisioner for Kubernetes and Red Hat OpenShift
- Supports ONTAP, SolidFire, and E-Series
- Abstracts back ends into pools of capabilities and retains the ability to differentiate storage
- IOPS, compression, disk type, etc. all able to be specified
- Maps storage requests to storage pools, each backend can contain one or more storage pools

[Download now on github]

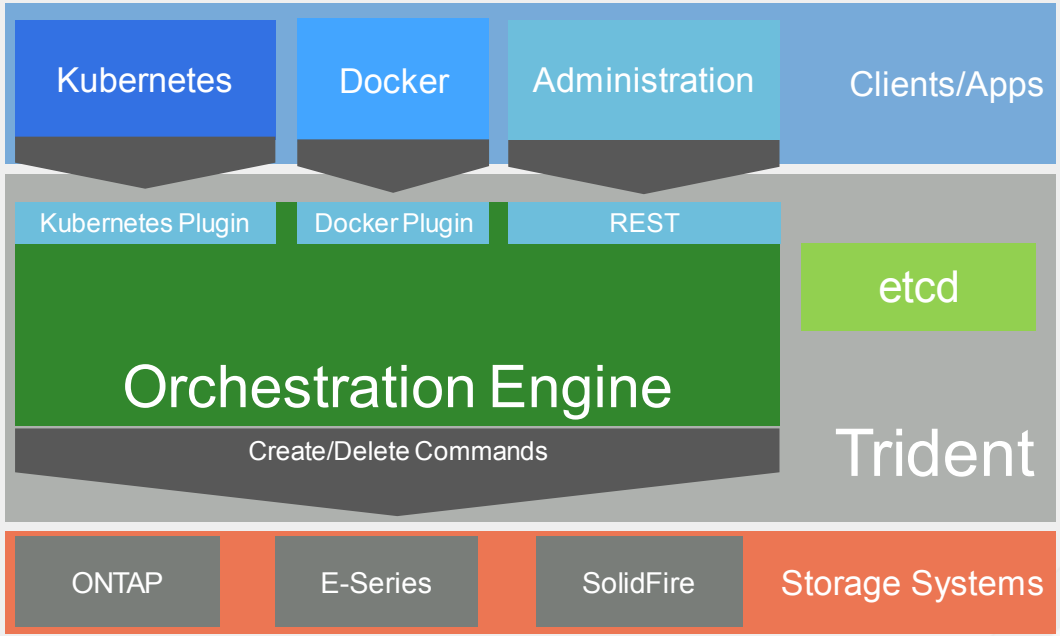


Trident Architecture

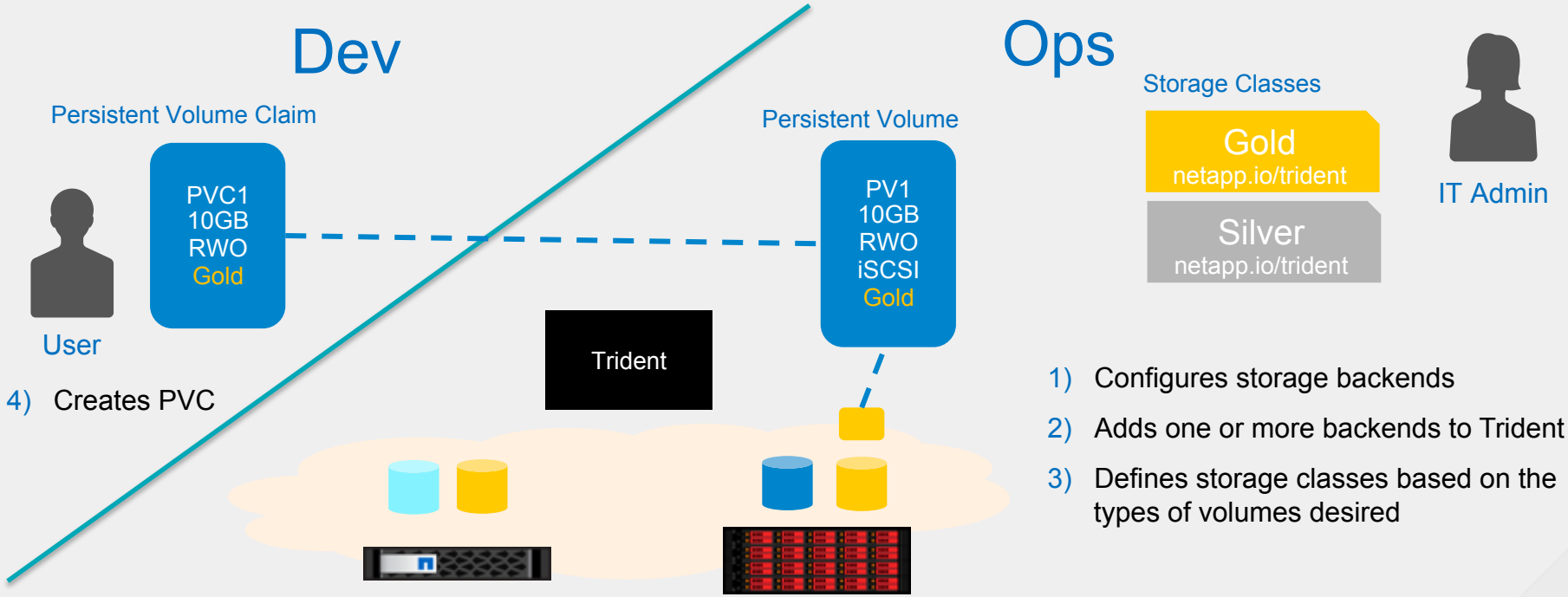
Clients integrate with Trident

Orchestration Engine decides what and where to create ressources

Backend Systems, ontap, e-series and SolidFire Support



Storage Provisioning



Cool Features I

CloneFromPVC

Create PVC from Clones

- Ability to clone existing volumes by setting a custom annotation in a newly created PVC
- Existing PV will be cloned in backend and presented as a new PVC to enduser

```
kind: PersistentVolumeClaim
apiVersion: v1
metadata:
  name: prod-clone
  annotations:
    trident.netapp.io/cloneFromPVC: prod
spec:
  accessModes:
    - ReadWriteOnce
  resources:
    requests:
      storage: 1Gi
  storageClassName: gold
```

Cool Features continued…

SnapshotDir, Encryption

Access NetApp Snapshots

- Admin can allow access to .snapshot directory where NetApp Snapshots are available

Encryption

- Admin can enable NetApp Volume Encryption (NVE)

Rate the Session in the Event App

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NEXT PRESENTATION

16:30

END NOTE & COCKTAIL RECEPTION