Red Hat Summit

Connect

INTEGRATED SOLUTIONS

Hosted Control Planes

Jak zoptymalizować klastry OpenShift

Paweł Wojtyra
Integrated Solutions
DevOps Team Leader

Red Hat

Agenda

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- Wyzwania przy rozwoju środowisk Openshfit
- Architektura Hosted Control Planes
- HCP – jak to wygląda w praktyce
- Wspierane platformy
- Przykłady użycia
- Zagadnienia
- Podsumowanie

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Architektura klastrów wraz z rozwojem środowiska

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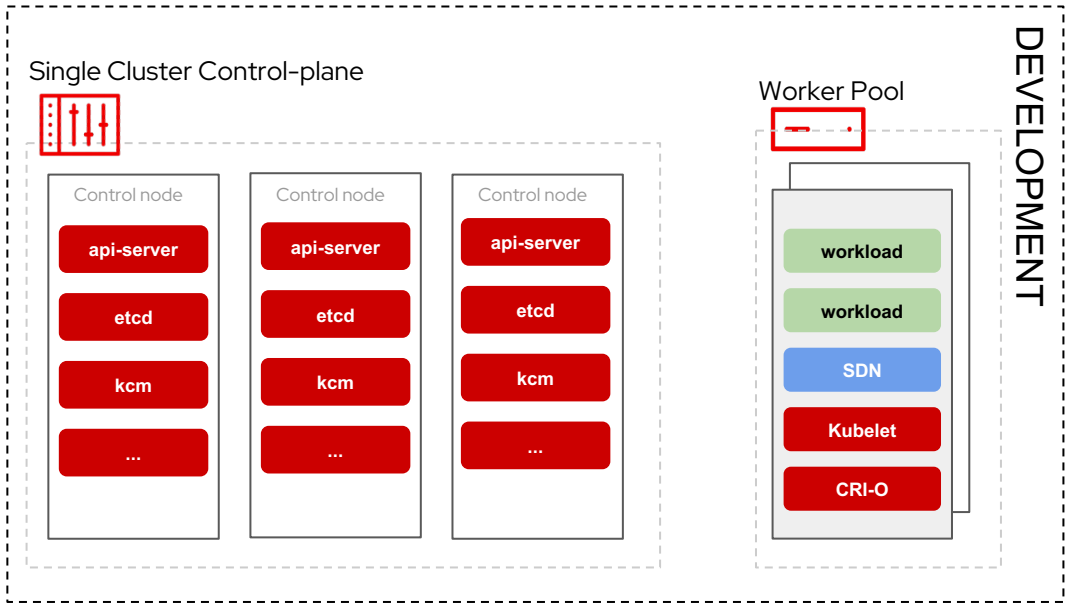
Standalone OpenShift On-premise

Control-Plane (CP) + Workers

Standalone OpenShift **Cluster** (dedicated CP nodes)



Warstwa zarządzania (węzły master)	
Liczba serwerów	3
Liczba rdzeni	12
Ilość RAM [GB]	48
Liczba adresów IP	3

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Architektura klastrów wraz z rozwojem środowiska

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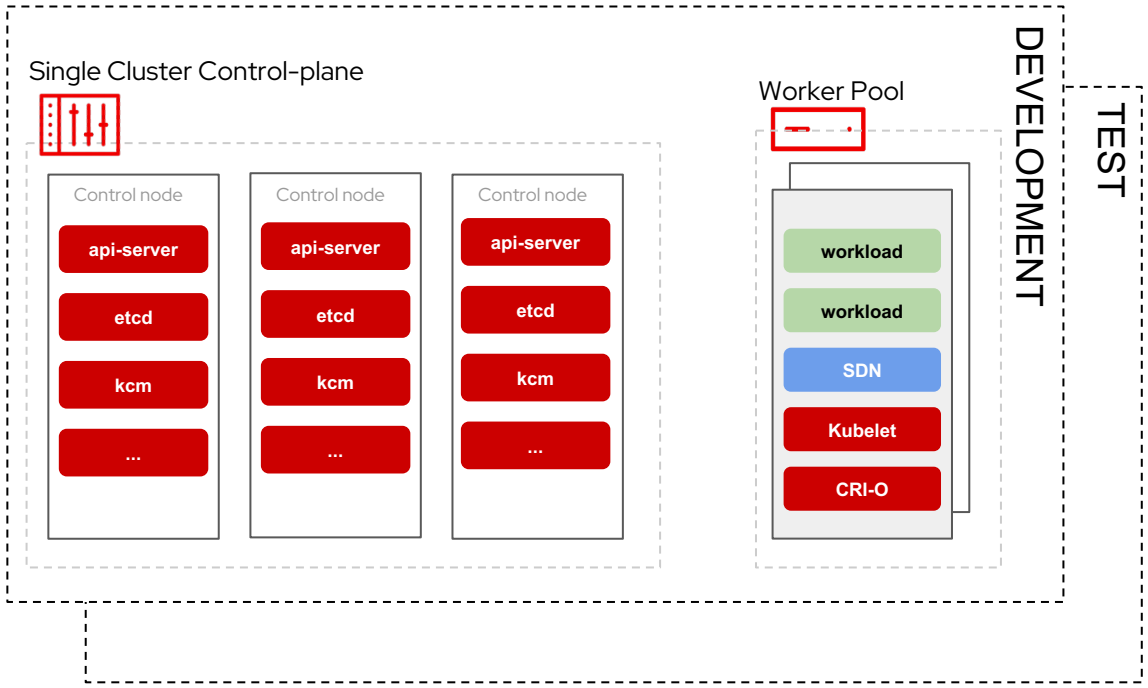

Warstwa zarządzania (węzły master)	
Liczba serwerów	6
Liczba rdzeni	24
Ilość RAM [GB]	96
Liczba adresów IP	6

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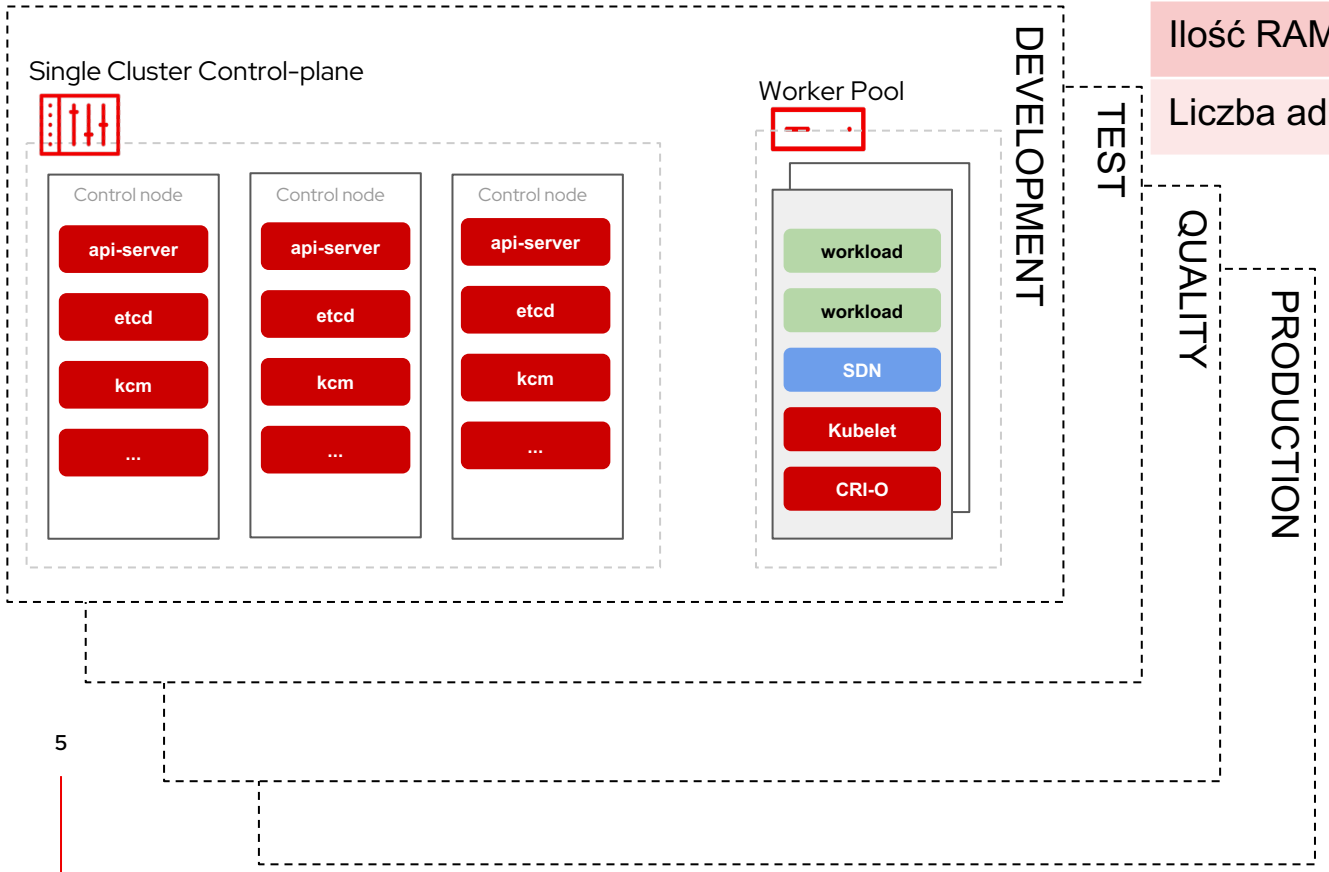

Warstwa zarządzania (węzły master)	
Liczba serwerów	12
Liczba rdzeni	48
Ilość RAM [GB]	192
Liczba adresów IP	12

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Architektura klastrów wraz z rozwojem środowiska

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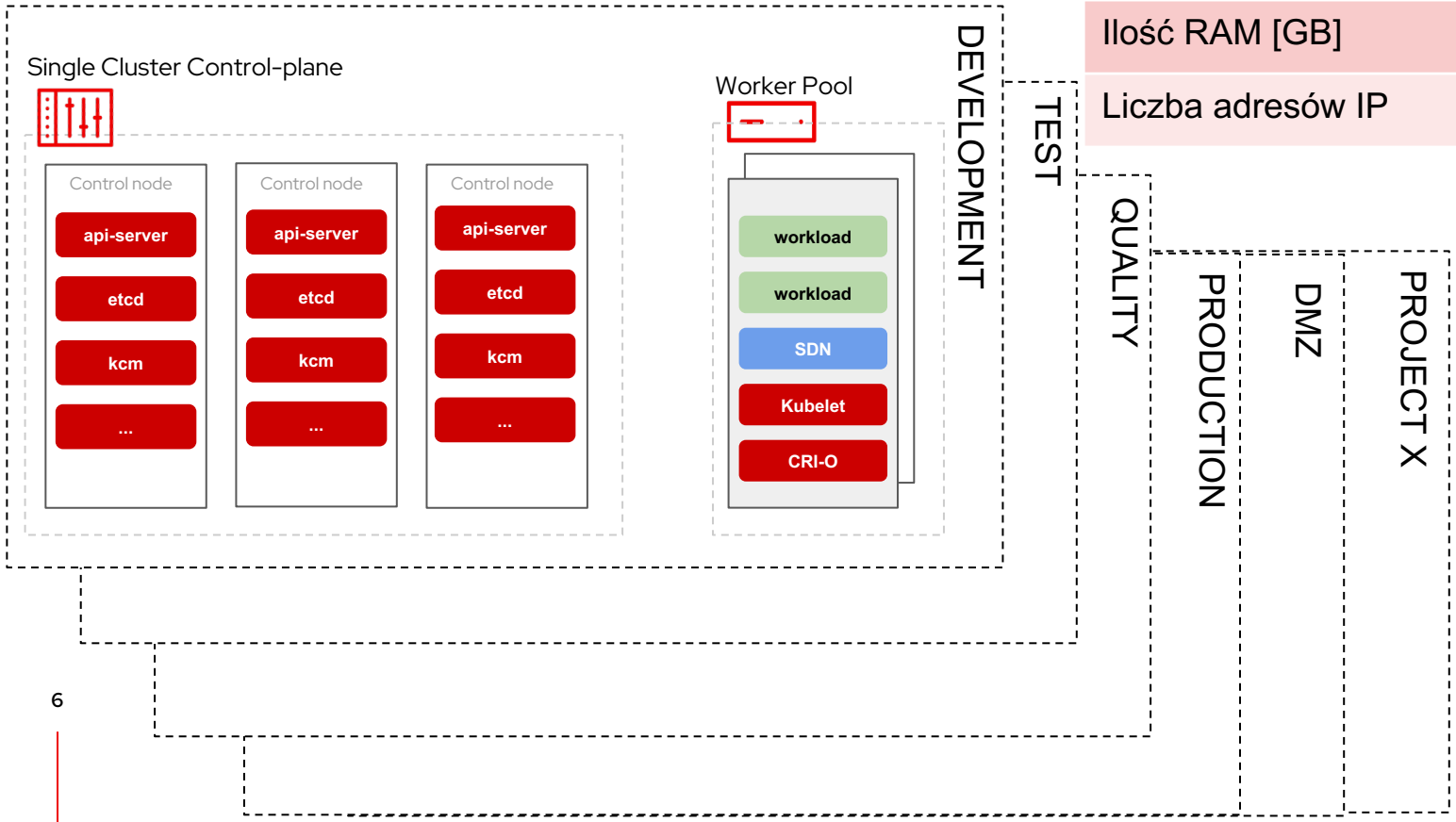

Warstwa zarządzania (węzły master)	
Liczba serwerów	18
Liczba rdzeni	72
Ilość RAM [GB]	288
Liczba adresów IP	18

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Architektura klastrów wraz z rozwojem środowiska

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Standalone OpenShift On-premise

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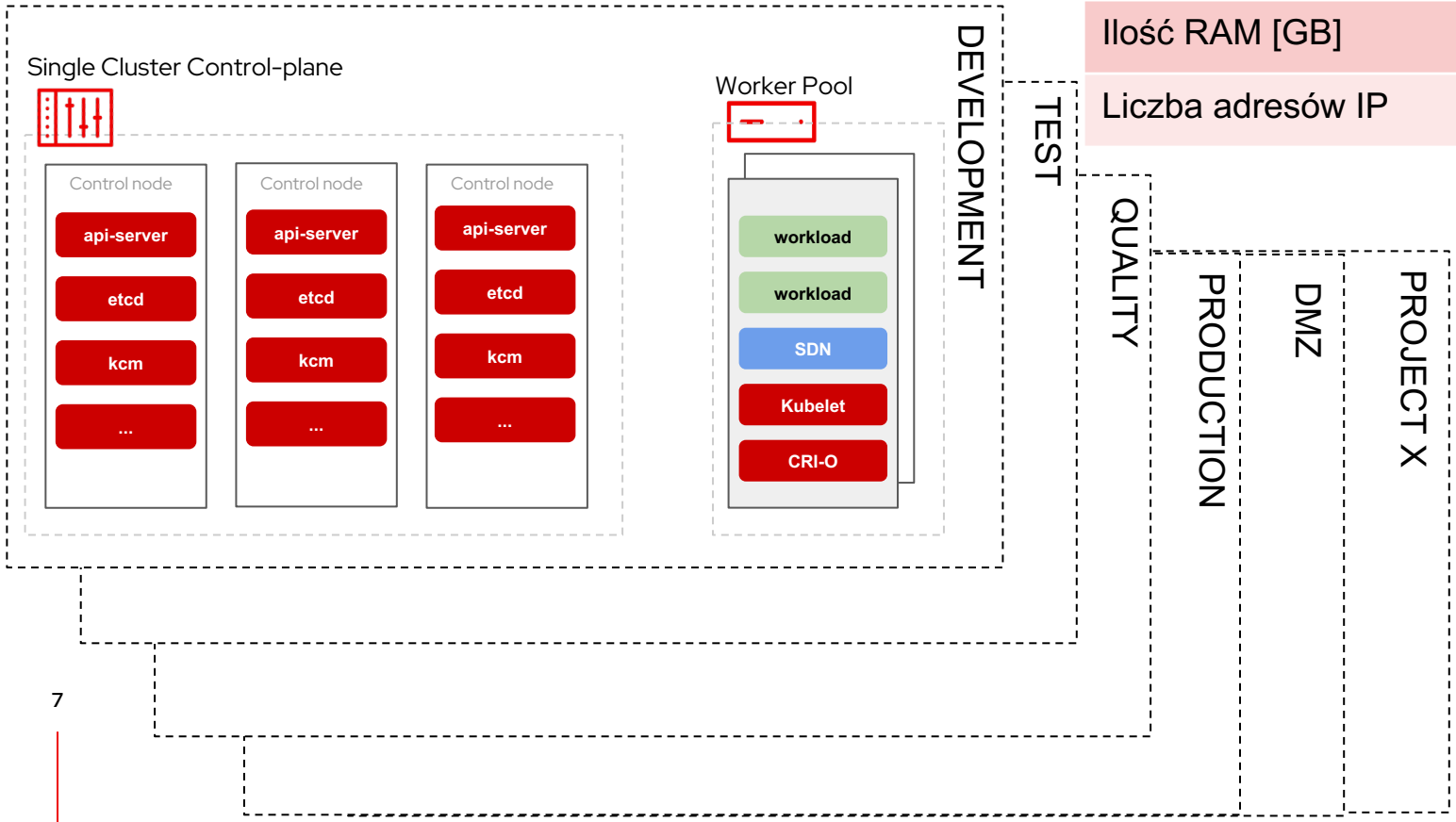

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Liczba serwerów	18
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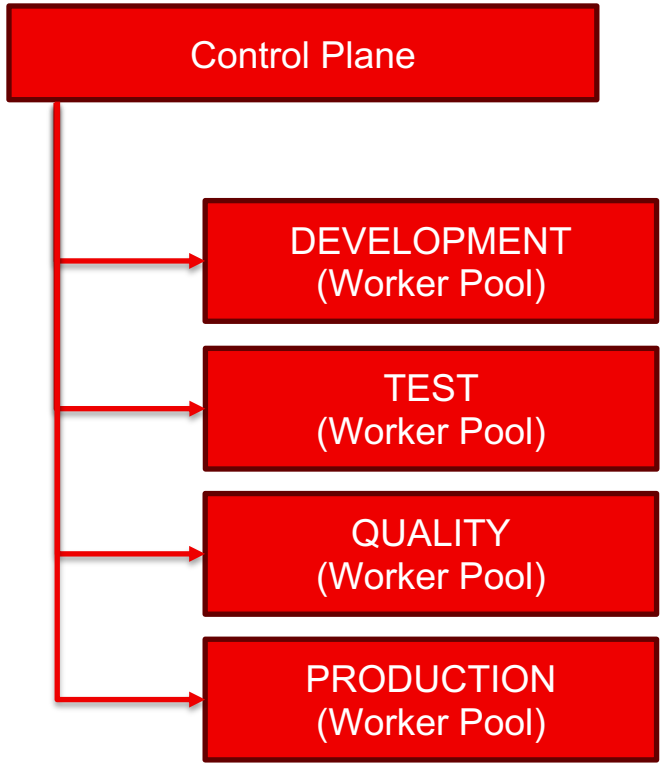
Public Cloud K8S Architecture



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Architektura klastrów (Hosted Control Planes)

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Openshift Platform Plus – ACM Hosted Controlplanes

Control-Plane Cluster + Workers

HyperShift **Clusters** (decoupled CP and workers)

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Architektura klastrów (Hosted Control Planes)

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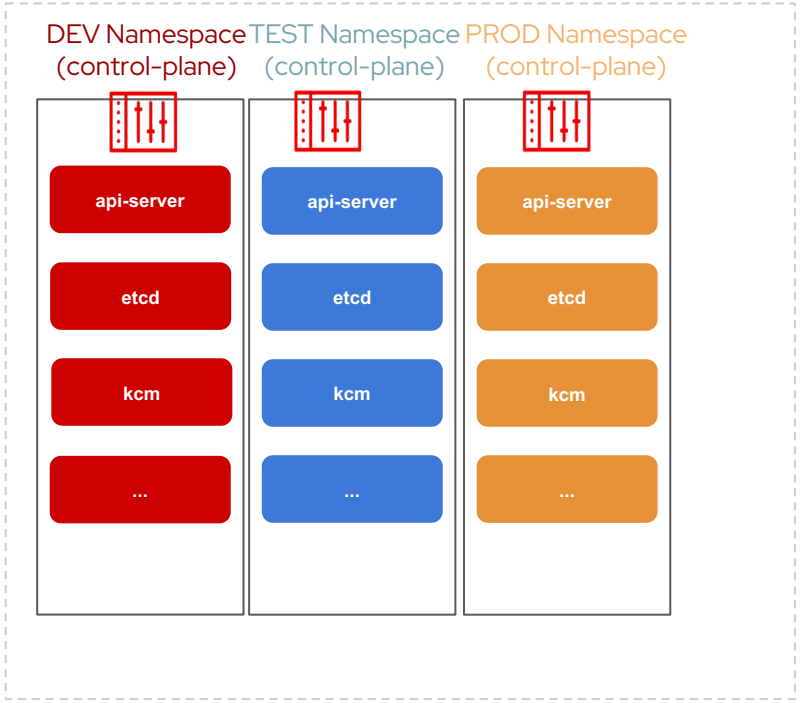
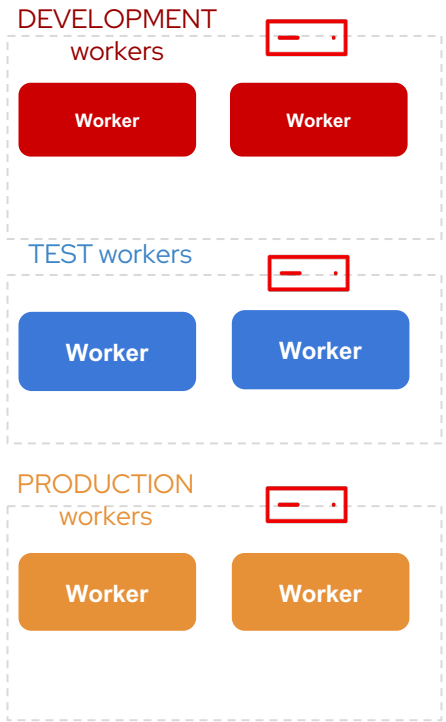
Management Cluster (Hosts Control Planes)





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Hosted Control Planes – demo

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Clusters

Cluster list | Cluster sets | Cluster pools | Discovered clusters

Search | Filter | Create cluster | Import cluster | Actions

Name	Namespace	Status	Infrastructure	Control plane type	Distribution version	Labels	Nodes	Add-ons
hwtest	hwtest	Ready	Host inventory	Hosted	OpenShift 4.16.9 Upgrade available	openshiftVersion-major=4 openshiftVersion-major-minor=4.16 14 more	2	8
local-cluster	local-cluster	Ready	Bare metal	Hub	OpenShift 4.16.8 Upgrade available	openshiftVersion-major=4 openshiftVersion-major-minor=4.16 velero.io/exclude-from-backup=true 15 more	7	8
ocp-demo-virt	clusters	Ready	Red Hat OpenShift Virtualization	Hosted	OpenShift 4.16.9 Upgrade available	app.kubernetes.io/instance=ocp-provision-dev-ocp-de... openshiftVersion-major=4 openshiftVersion-major-minor=4.16 14 more	3	8
ocp-demo-vmware	ocp-demo-vmware	Ready	VMware vSphere	Standalone	OpenShift 4.16.10 Upgrade available	app.kubernetes.io/instance=provision-dev-ocp-demo-... openshiftVersion-major=4 openshiftVersion-major-minor=4.16 14 more	9	8

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Hosted Control Planes – demo

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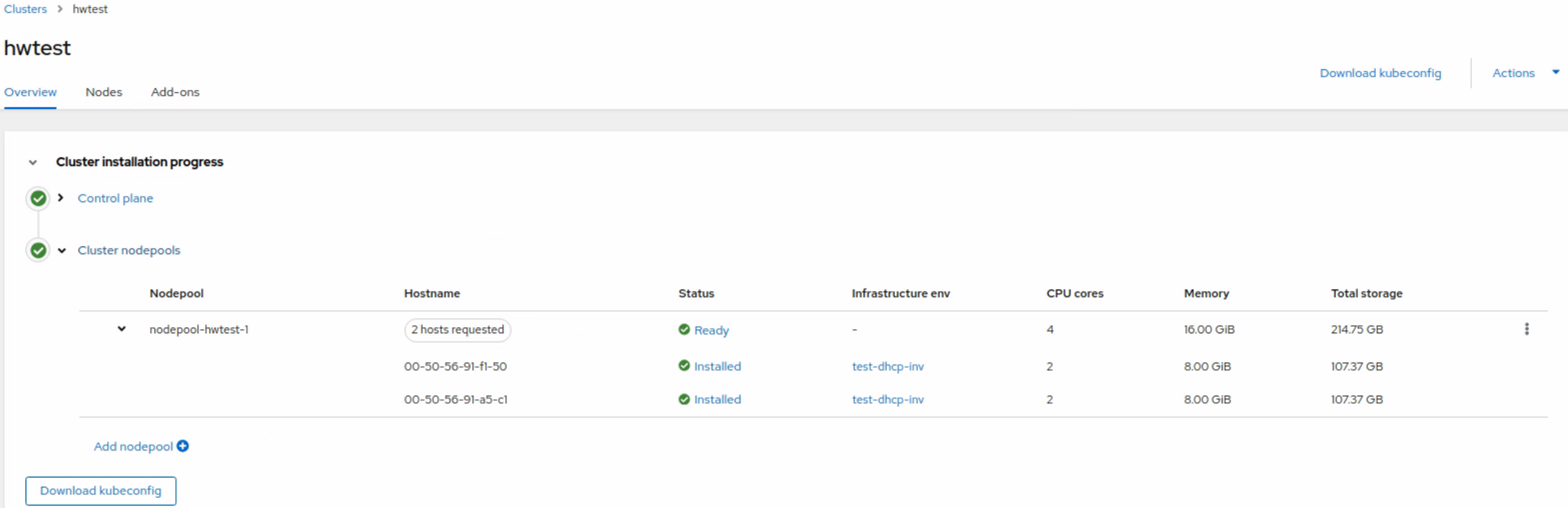

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Hosted Control Planes – demo

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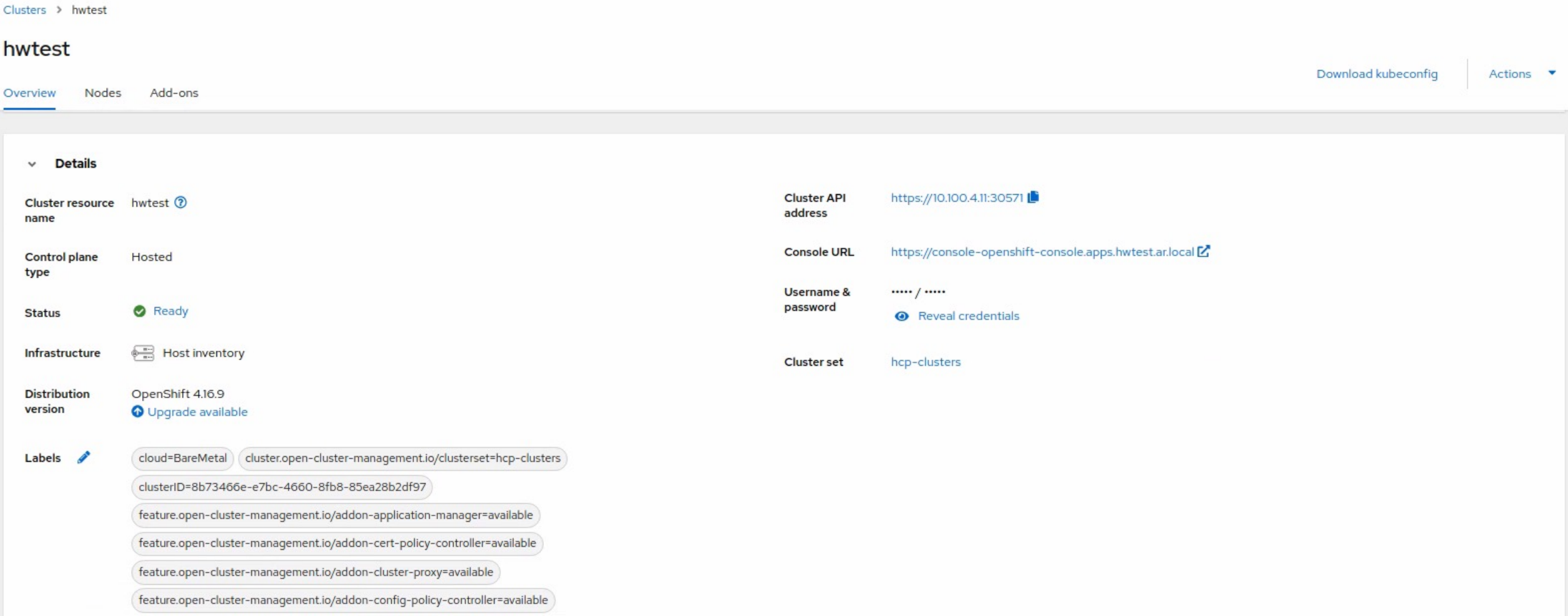

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Hosted Control Planes – demo

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Clusters > hwtest

hwtest

Download kubeconfig | Actions

Overview | Nodes | Add-ons

Search

1 - 2 of 2

Name	Status	Role	Region	Zone	Instance type	CPU	RAM
00-50-56-91-a5-c1	Ready	worker				4	15.6 Gi
00-50-56-91-f1-50	Ready	worker				4	15.6 Gi

1 - 2 of 2 items | 1 of 1 page

```
pwojtyra@ar.local@devops-przesiadka:~/Downloads/hw-test$ oc get nodes
NAME                STATUS   ROLES    AGE   VERSION
00-50-56-91-a5-c1   Ready    worker   67d   v1.29.7+4510e9c
00-50-56-91-f1-50   Ready    worker   67d   v1.29.7+4510e9c
```


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Hosted Control Planes – demo

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```
pwojtyra@ar.local@devops-przesiadka:~/Downloads/ocp-demo-vmware$ oc get pods -n hwtest-hwtest
NAME                                          READY   STATUS    RESTARTS       AGE
capi-provider-7b995d8b45-rr4n6                1/1     Running   5 (19h ago)    19d
catalog-operator-85655f4b7d-f8jhc             2/2     Running   0              19d
certified-operators-catalog-5f87c69559-dvsb7  1/1     Running   0              11h
cluster-api-5c5ffd4c8f-jsfrq                  1/1     Running   0              19d
cluster-image-registry-operator-587c8888c6-8lnk4  2/2  Running   1 (19d ago)    19d
cluster-network-operator-769c8f8c7-5n8sx      2/2     Running   3 (19d ago)    19d
cluster-node-tuning-operator-5679f8dc7c-8k79c 1/1     Running   1 (19d ago)    19d
cluster-policy-controller-55c99f6744-8n94h    1/1     Running   5 (19d ago)    65d
cluster-policy-controller-55c99f6744-dgj6m    1/1     Running   2 (19d ago)    19d
cluster-policy-controller-55c99f6744-gpjfs    1/1     Running   0              19d
cluster-storage-operator-7b45797b8d-pmtpt     1/1     Running   0              19d
cluster-version-operator-57d5cdb99d-dbfpz     1/1     Running   1 (19d ago)    19d
community-operators-catalog-64ff7bc467-nqm2g  1/1     Running   0              5h39m
control-plane-operator-7d999554bf-7ddh5       1/1     Running   0              19d
control-plane-pki-operator-7d845b75f5-j8ctf   1/1     Running   0              19d
csi-snapshot-controller-8664b9bd4-kcdgj       1/1     Running   1 (19d ago)    19d
csi-snapshot-controller-operator-bd7c79df8-kknm4  1/1  Running   0              19d
csi-snapshot-webhook-845bfd69b9-b6mgr         1/1     Running   0              19d
dns-operator-69c6899857-48w4q                 1/1     Running   0              19d
etcd-0                                        4/4     Running   1 (19d ago)    65d
etcd-1                                        4/4     Running   0              19d
etcd-2                                        4/4     Running   0              19d
hosted-cluster-config-operator-85698d65c5-lc6fp  1/1  Running   0              19d
ignition-server-79588f6c7d-kbcrr              1/1     Running   0              19d
ignition-server-79588f6c7d-mbqz5              1/1     Running   0              65d
ignition-server-79588f6c7d-stwzr              1/1     Running   0              19d
ignition-server-proxy-d47bdd897-j8rhw         1/1     Running   0              65d
ignition-server-proxy-d47bdd897-nlm6n         1/1     Running   0              19d
ignition-server-proxy-d47bdd897-q6vcw         1/1     Running   0              19d
ingress-operator-5958f74bbc-csjv9             2/2     Running   0              19d
konnectivity-agent-6cb6d9cf64-2vlj5           1/1     Running   0              65d
konnectivity-agent-6cb6d9cf64-47thr           1/1     Running   0              19d
konnectivity-agent-6cb6d9cf64-8ntrv           1/1     Running   0              19d
kube-apiserver-54d8b86976-4mdk6               4/4     Running   0              19d
kube-apiserver-54d8b86976-pk5qc               4/4     Running   0              19d
kube-apiserver-54d8b86976-xj7ks               4/4     Running   0              65d
pwojtyra@ar.local@devops-przesiadka:~/Downloads/ocp-demo-vmware$ oc get pvc -n hwtest-hwtest
NAME          STATUS   VOLUME                                     CAPACITY   ACCESS MODES   STORAGECLASS                  VOLUMEATTRIBUTESCLASS   AGE
data-etcd-0   Bound    pvc-6903edd2-9bd1-4eb3-9144-a0e28be1bd5c   8Gi        RWO            ocs-storagecluster-ceph-rbd   <unset>                 67d
data-etcd-1   Bound    pvc-06b3e8fe-03d6-4317-8dcb-4bddb386874a   8Gi        RWO            ocs-storagecluster-ceph-rbd   <unset>                 67d
data-etcd-2   Bound    pvc-a146cf84-eff4-41df-bf34-bc93dd489a8f   8Gi        RWO            ocs-storagecluster-ceph-rbd   <unset>                 67d
```


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Hosted Control Planes – wspierane platformy

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Table 2.1. Required OpenShift Container Platform versions for platforms

Platform	Hosting OpenShift Container Platform version	Hosted OpenShift Container Platform version
Amazon Web Services	4.11 - 4.16	4.14 - 4.16 (only)
IBM Power	4.16	4.16 (only)
IBM Z	4.16	4.16 (only)
OpenShift Virtualization	4.14 - 4.16	4.14 - 4.16 (only)
Bare metal	4.14 - 4.16	4.14 - 4.16 (only)
Non-bare metal agent machines	4.16	4.16 (only)

*Technology Preview

https://docs.redhat.com/en/documentation/openshift_container_platform/4.17/html/hosted_control_planes/preparing-to-deploy-hosted-control-planes#hcp-requirements-platform-version_hcp-requirements

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Przykład użycia #1

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HyperShift **Clusters** (decoupled CP and workers)

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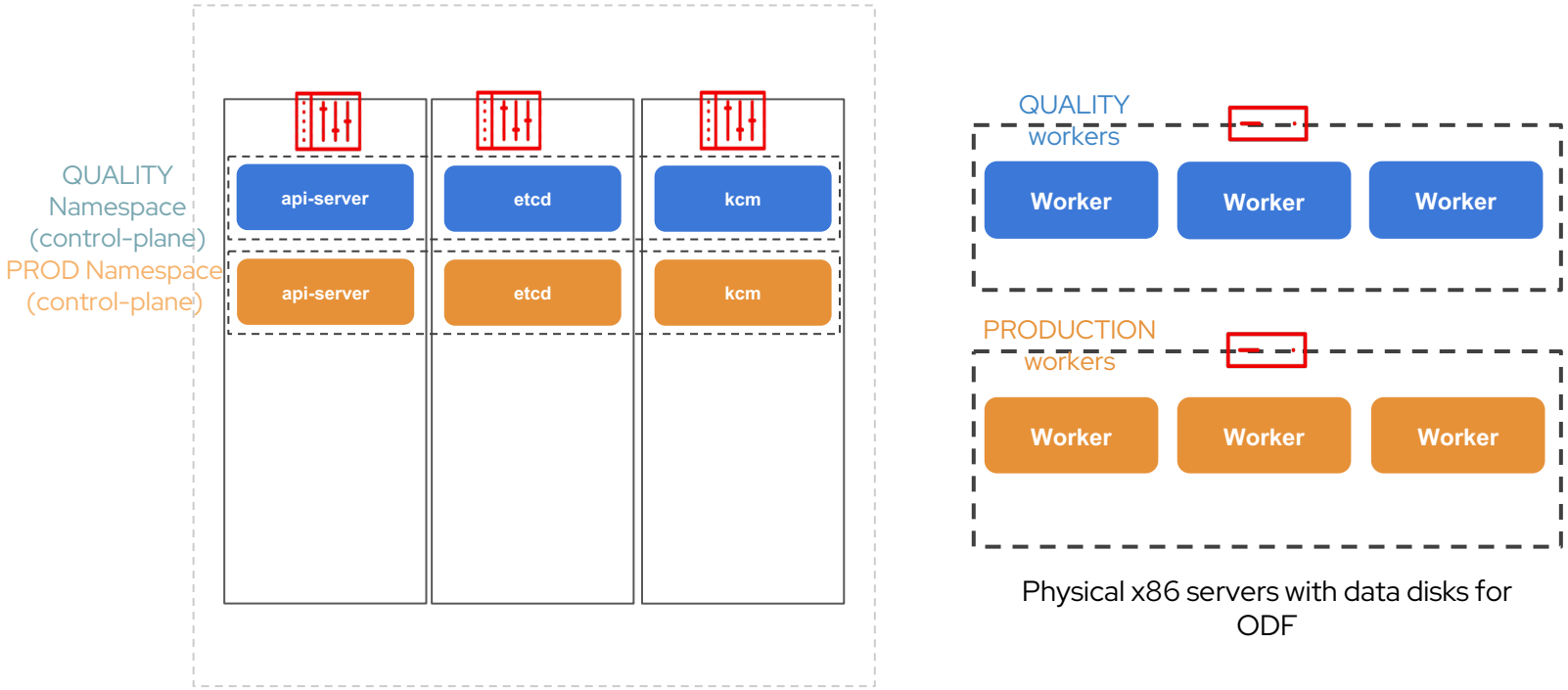

Physical x86 servers with data disks for ODF

Physical x86 servers with data disks for ODF

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Przykład użycia #2

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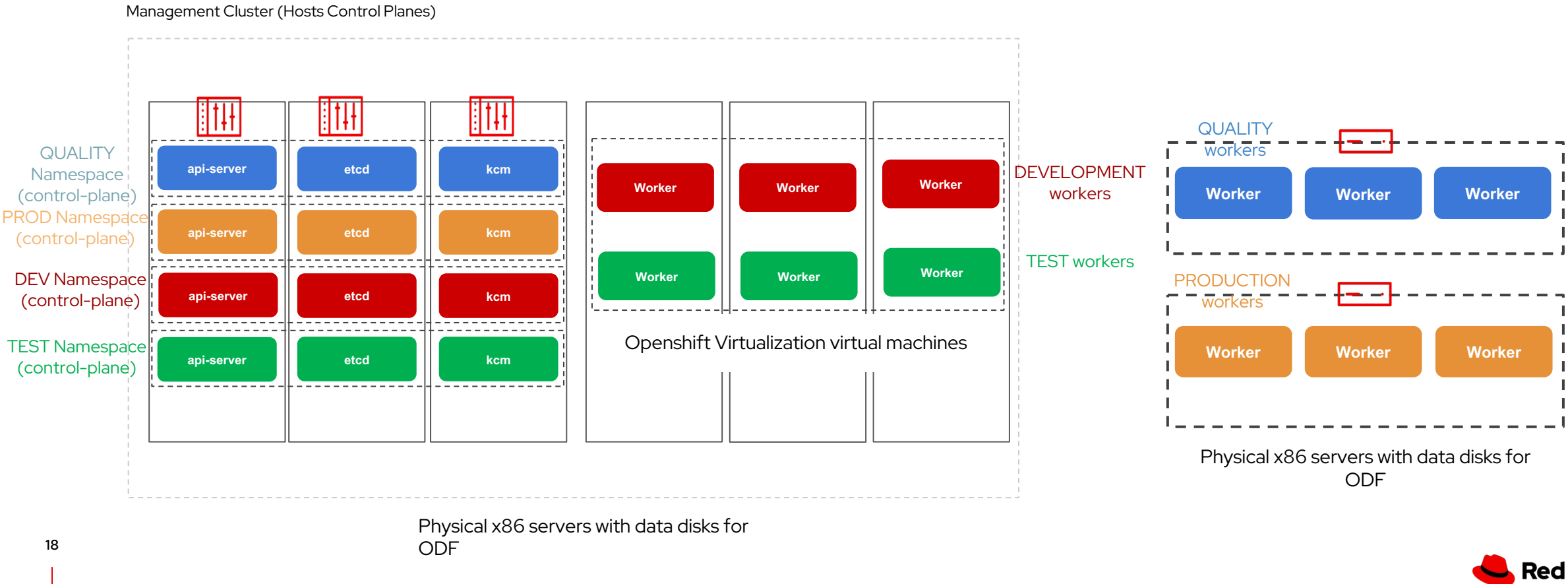
Openshift Platform Plus – ACM Hosted Controlplanes

Control-Plane Cluster + Workers

HyperShift **Clusters** (decoupled CP and workers)



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Zagadnienia

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- Jeden punkt dostępu do api klastrów
- Zarządzanie skupione na jednym klastrze
- Modyfikacja konfiguracji niektórych operatorów (brak możliwości uruchomienia podów na węzłach master)
  - config.nodeSelector: **node-role.kubernetes.io/worker: ""**
- Brak wsparcia dla niektórych funkcjonalności (szyfrowanie ruchu wewnątrz klastra)
- Backup, restrore, distaster recovery
- Migracja usług ze standardowych klastrów

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Podsumowanie

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- Oszczędność
  - Zmniejszenie kosztów zasobów
  - Zmniejszenie kosztów operacyjnych
- Uproszczenie zarządzania (konsolidacja w ramach 1 klastra)
- Zwiększenie bezpieczeństwa (separacja mgmt od aplikacji)
- Większa kontrola i przewidywalność

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Dziękuję za uwagę


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