

VMUG
user **con**
2023

kubernetes ovunque con
TKGm



VMware Tanzu



kubernetes

abstract

Inizieremo con una breve panoramica su Tanzu Kubernetes Grid e come si è evoluta per giungere all'attuale TKGm, vedremo i requisiti necessari per l'installazione e il licensing. Passeremo poi ai dettagli tecnici su com'è strutturato e come funziona andando infine a vedere come integrare TKGm con i cloud provider supportati per il deploy dei cluster k8s.

New abstract



Inizieremo con una breve panoramica sulla suite Tanzu per poi giungere a TKG 2.4, vedremo i requisiti necessari per l'installazione e il licensing. Passeremo poi ai dettagli tecnici su installare un cluster di management andando infine a vedere come eseguire il deploy di cluster k8s su vSphere. Infine una breve menzione su TMC per il deploy sui maggiori cloud provider.

abstract

- Intro
 - Tanzu
 - TKG
 - Requisiti e installazione
 - Deploy di un cluster k8s
 - TMC



WHOAMI

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Networking, virtualization, learning by doing #vexpert

www.scanda.it



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Intro

Ma di cosa stiamo parlando?

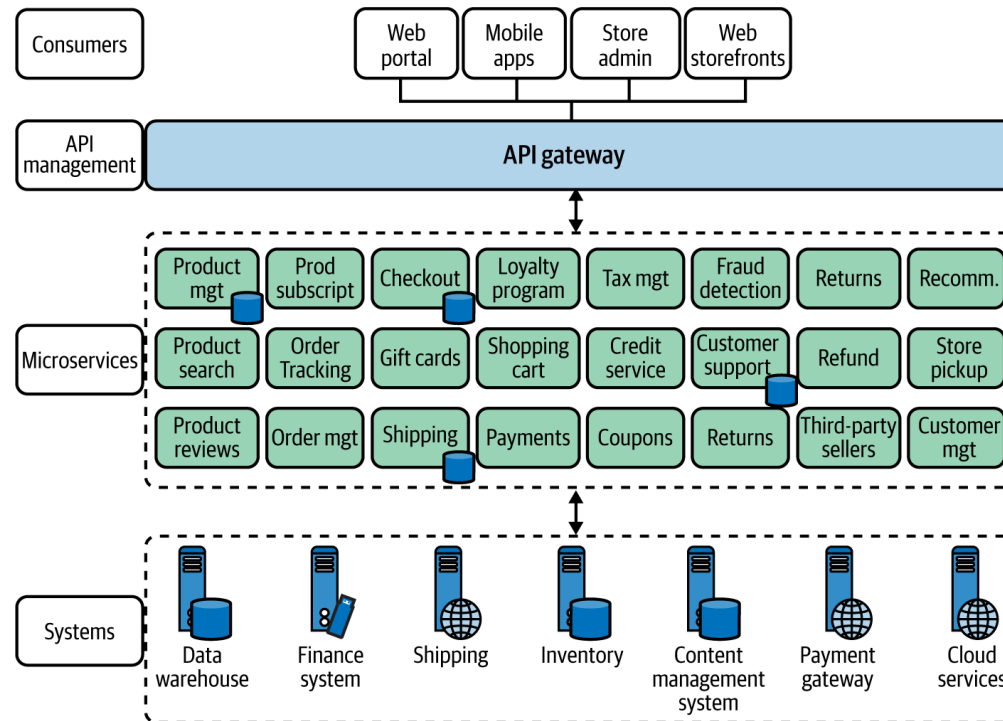
MODERN APPS

Le tecnologie **cloud native** permettono alle organizzazioni di costruire ed eseguire applicazioni scalabili in ambienti moderni e dinamici come cloud pubblici, privati e ibridi. I container, i micro-servizi, le infrastrutture immutabili e le API dichiarative esemplificano questo approccio.

Queste tecniche permettono che sistemi debolmente accoppiati siano resilienti, gestibili e osservabili. Combinati con un sistema robusto di automazione, permettono agli ingegneri di eseguire frequentemente e con minimo sforzo i cambi ad alto impatto

La **Cloud Native Computing Foundation** cerca di favorire l'adozione di questo paradigma incoraggiando e sostenendo un ecosistema di progetti open source e indipendenti dai vendor. Noi democratizziamo le pratiche allo stato dell'arte per rendere queste innovazioni accessibili a tutti.

<https://github.com/cncf/toc/blob/main/DEFINITION.md>



Intro



<https://landscape.cncf.io/>



VMware Tanzu

ENTERPRISE-GRADE KUBERNETES

VMware Tanzu for Kubernetes Operations	Automated Kubernetes platform operations
VMware Tanzu Kubernetes Grid	Enterprise-ready Kubernetes runtime
VMware Tanzu Mission Control	Multi-cloud Kubernetes management
VMware Tanzu Service Mesh	Connectivity and security for modern applications



VMware Tanzu

CLOUD NATIVE APP DEVELOPMENT

VMware Tanzu Application Platform	Faster, more secure paths to production
VMware Tanzu Application Catalog	Secure open source software supply chain
VMware Tanzu Application Service	A modern runtime for microservices, built on Cloud Foundry
VMware Tanzu Build Service	Automated container creation, management, governance
VMware Tanzu Data Services	Cloud native data and messaging including GemFire , RabbitMQ , Postgres , and Greenplum



VMware Tanzu

<https://tanzu.vmware.com/get-started>

<https://tanzu.vmware.com/products>

<https://vmc.techzone.vmware.com/resource/tanzu-explainer#overview>



VMware Tanzu

VMware Tanzu Entitlements by Bundle, Edition, or Platform

	Tanzu Bundle			vSphere Edition		VMware Cloud Platform	
	Tanzu for Kubernetes Operations Foundation	Tanzu for Kubernetes Operations	VMware Cloud with Tanzu services	vSphere 8 Enterprise Plus with Tanzu Kubernetes Grid	vSphere+	VMware Cloud Foundation	VMware Cloud on AWS
Tanzu Application Service							
Tanzu Application Platform							
Tanzu Build Service							
VMware Application Catalog							
Tanzu Kubernetes Grid		Included	Included	Included	Included	Included	Included

	Tanzu Bundle			vSphere Edition		VMware Cloud Platform	
	Tanzu for Kubernetes Operations Foundation	Tanzu for Kubernetes Operations	VMware Cloud with Tanzu services	vSphere 8 Enterprise Plus with Tanzu Kubernetes Grid	vSphere+	VMware Cloud Foundation	VMware Cloud on AWS
Tanzu Kubernetes Grid Integrated Edition							
Tanzu Mission Control	Advanced	Advanced	Essentials		Essentials	Essentials	Essentials
Aria Operations for Applications		Included					
Tanzu Service Mesh	Included	Included					
Tanzu Labs	Tanzu Activation Services available separately	Tanzu Activation Services available separately					

TKG

Tanzu Kubernetes Grid

CNCF-certified, enterprise-ready Kubernetes runtime that streamlines operations across a multi-cloud infrastructure. TKG offers simplified installation, automated multi-cluster operations, integrated platform service, and open source alignment. Includes support for Harbor, Antrea, Calico, NSX Advanced Load Balancer Essentials, Contour, FluentBit, Prometheus, Grafana, and Velero. TKG can be deployed as the integrated vSphere with Tanzu experience using [Tanzu Kubernetes Grid with Supervisor Clusters](#) on supported platforms, or [Tanzu Kubernetes Grid with Management Clusters](#).

TKG

TKGm Tanzu Kubernetes Grid Multi-cloud

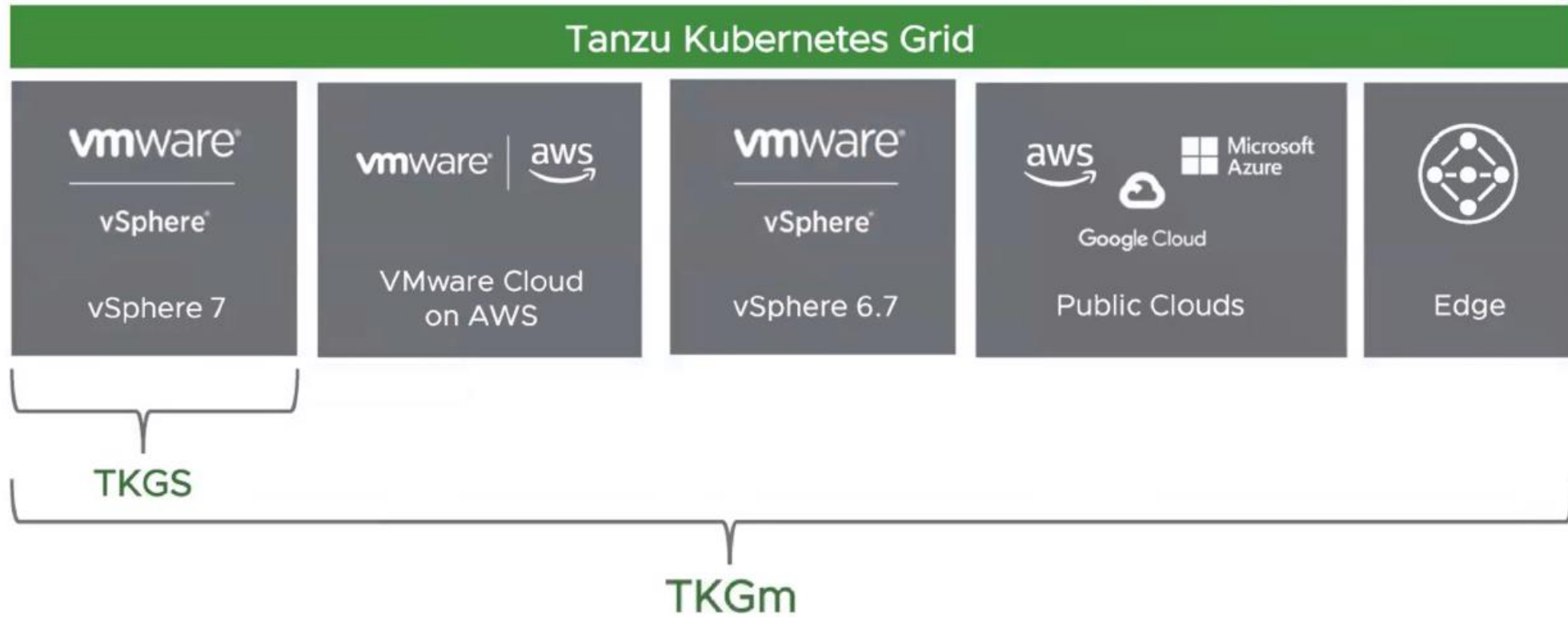
TKGs Tanzu Kubernetes Grid Service

TKGi Tanzu Kubernetes Grid Integrated (ex PKS)



	On-premise (vSphere)	Multi-cloud (+ on prem)
vSphere 7 with NSX	TKGi	TKGm
vSphere 7 without NSX	TKGs	TKGm
vSphere 8	TKG 2.0	TKG 2.0

TKG



TKG

Tanzu Kubernetes Grid Service

- Tightly integrated / Deploy Kubernetes on premise exclusively on vSphere
- Simplified cluster operations with CAPI
- One CRD TanzuKubernetesCluster
- Best UX experience for AI admins
- Companion to VM Service, Registry Service, as part of the Tanzu ecosystem, first release of GPU/NIC support

Tanzu Kubernetes Grid Multi-cloud

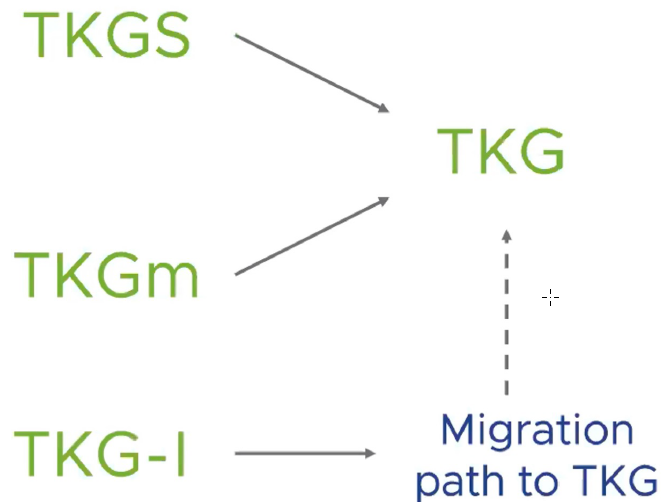
- UX focused on the Kubernetes operator, operating across clouds using Tanzu CLI
- Pure 100% upstream cluster API enables complete control over cluster definition
- Rapid innovation of in-cluster & shared services through new Tanzu Packaging ecosystem, and first release vehicle for multi AZ, Ubuntu, and bring-your-own-image, etc.

2 Different APIs, different packaging

TKG 2.0

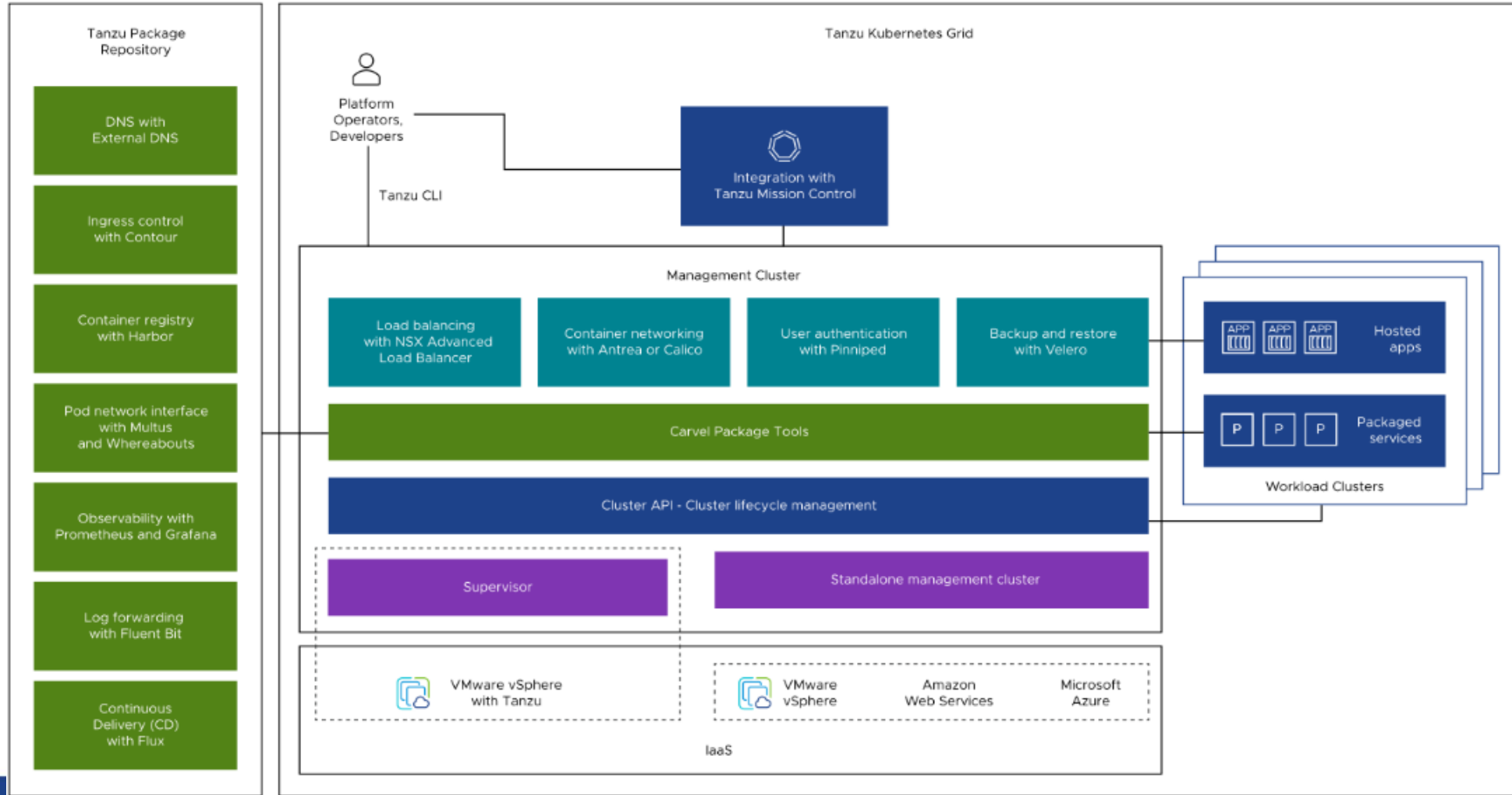
New: Tanzu Kubernetes Grid 2.0

One unified, declarative API



- TKG 2.x supports running on vSphere and public cloud
- On vSphere, there are two deployment options with identical northbound API
 - TKG 2.x with Supervisor
 - TKG 2.x with Standalone Management Cluster
- For datacenter use cases, we position TKG 2.x with Supervisor by default
- For Edge and Telco use cases, we will continue leveraging TKG 2.x with Standalone Management Clusters till the use cases are supported with TKG 2.x with Supervisor

TKG 2.0



Requisiti

Standalone Management Cluster Requirements ([tkg-deploy-mc](#))

- A machine with the Tanzu CLI, Docker, and kubectl installed
- A vSphere 8, vSphere 7, VMware Cloud on AWS, or Azure VMware Solution
- At least the permissions described in [Required Permissions for the vSphere Account](#)
- vSphere instance has the following objects in place
 - a standalone host or a vSphere cluster with at least two hosts
 - Optionally, a resource pool in which to deploy the Tanzu Kubernetes Grid Instance
 - A VM folder in which to collect the Tanzu Kubernetes Grid VMs
 - A datastore with sufficient capacity for the control plane and worker node VM files
 - Created a base image template that matches the management cluster's Kubernetes version
 - Created a vSphere account for Tanzu Kubernetes Grid
 - NSX Advanced Load Balancer to load-balance workloads
 - DNS record, DHCP pool for network involved, NTP, Firewall rules to permit traffic

Management Cluster Sizing Examples

Management cluster plan	Management cluster VM size	Can manage...	Workload cluster VM size
3 control plane nodes and 3 worker nodes	<p>Control plane nodes:</p> <ul style="list-style-type: none"> CPU: 2 Memory: 4 GB Disk: 20 GB <p>Worker nodes:</p> <ul style="list-style-type: none"> CPU: 2 Memory: 4 GB Disk: 20 GB 	<p>Examples:</p> <ul style="list-style-type: none"> 5 workload clusters, each cluster deployed with 3 control plane and 200 worker nodes; or 10 workload clusters, each cluster deployed with 3 control plane and 50 worker nodes 	<p>Control plane nodes:</p> <ul style="list-style-type: none"> CPU: 2 Memory: 4 GB Disk: 20 GB <p>Worker nodes:</p> <ul style="list-style-type: none"> CPU: 2 Memory: 4 GB Disk: 20 GB
3 control plane nodes and 3 worker nodes	<p>Control plane nodes:</p> <ul style="list-style-type: none"> CPU: 4 Memory: 16 GB Disk: 40 GB <p>Worker nodes:</p> <ul style="list-style-type: none"> CPU: 4 Memory: 16 GB Disk: 40 GB 	<p>Example: One workload cluster, deployed with 3 control plane and 500 worker nodes</p>	<p>Control plane nodes:</p> <ul style="list-style-type: none"> CPU: 16 Memory: 64 GB Disk: 100 GB <p>Worker nodes:</p> <ul style="list-style-type: none"> CPU: 8 Memory: 8 GB Disk: 20 GB
3 control plane nodes and 3 worker nodes	<p>Control plane nodes:</p> <ul style="list-style-type: none"> CPU: 4 Memory: 16 GB Disk: 40 GB <p>Worker nodes:</p> <ul style="list-style-type: none"> CPU: 4 Memory: 16 GB Disk: 40 GB 	<p>Example: 200 workload clusters, each cluster deployed with 3 control plane and 5 worker nodes</p>	<p>Control plane nodes:</p> <ul style="list-style-type: none"> CPU: 2 Memory: 4 GB Disk: 20 GB <p>Worker nodes:</p> <ul style="list-style-type: none"> CPU: 2 Memory: 4 GB Disk: 20 GB

Requisiti

vSphere with Tanzu Supervisor is a Management Cluster



On vSphere 8, the vSphere with Tanzu feature includes a Supervisor that you can use as a management cluster for Tanzu Kubernetes Grid. This means that on vSphere 8, you do not need to use *tanzu management-cluster create* or *tanzu mc create* to deploy a management cluster if vSphere with Tanzu and the Supervisor are enabled. Deploying a Tanzu Kubernetes Grid management cluster to vSphere 8 when vSphere with Tanzu is not enabled is supported, but the preferred option is to enable vSphere with Tanzu and use the built-in Supervisor Cluster if possible. The vSphere with Tanzu Supervisor is closely integrated with vSphere, so offers a more streamlined user experience than using a standalone management cluster. **However, using a standalone management cluster on vSphere offers more configuration and customization options than a Supervisor.**

Requisiti

Import the Base Image Template into vSphere

Supported base images for cluster nodes depend on the type of cluster, as follows:

Management Cluster: OVA must have Kubernetes v1.27.5, the default version for Tanzu Kubernetes Grid v2.4.0. So it must be one of the following:

- Ubuntu v20.04 Kubernetes v1.27.5 OVA 
- Photon v3 Kubernetes v1.27.5 OVA 
- A custom OVA with a custom Tanzu Kubernetes release (TKr)

Deploy OVA on vcenter and after convert to template

Requisiti

Bootstrap machine

VM con Ubuntu server 20.04 + ambiente grafico

16GB RAM

4 vCPU

Almeno 50GB di spazio disco libero

È possibile utilizzare altri sistemi operativi per la Bootstrap machine : macOS e Windows

<https://docs.vmware.com/en/VMware-Tanzu-Kubernetes-Grid/2.4/tkg-deploy-mc/install-cli.html>

Bootstrap machine

```
super@jumplinux:~$ lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 20.04.6 LTS
Release:       20.04
Codename:      focal
super@jumplinux:~$ █
```

```
sudo apt update
```

```
sudo apt upgrade
```

```
super@jumplinux:~$ timedatectl
      Local time: Tue 2023-11-14 16:10:56 UTC
      Universal time: Tue 2023-11-14 16:10:56 UTC
      RTC time: Tue 2023-11-14 16:10:56
      Time zone: Etc/UTC (UTC, +0000)
System clock synchronized: yes
      NTP service: active
      RTC in local TZ: no
super@jumplinux:~$ █
```

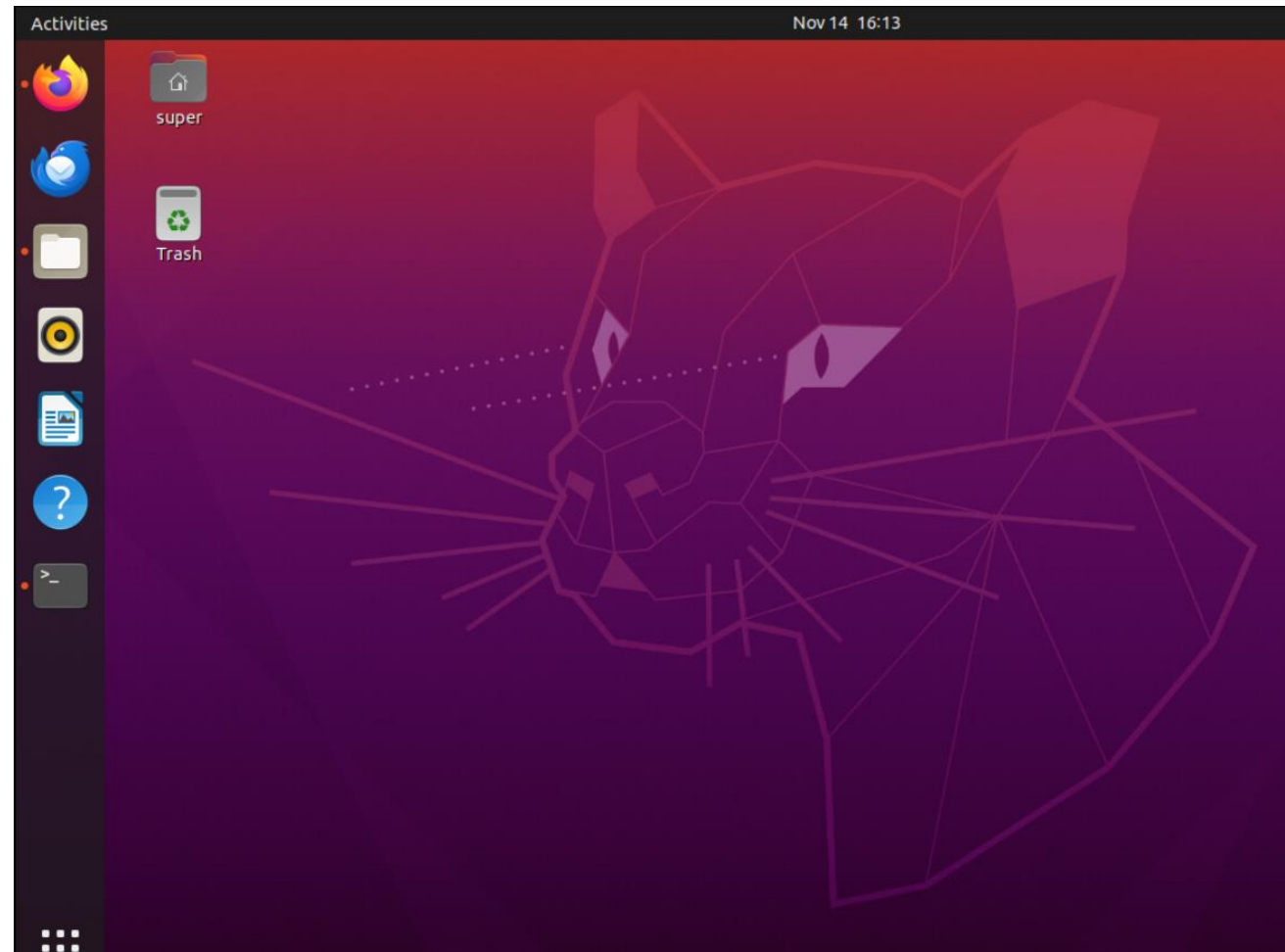
Bootstrap machine

installare l'ambiente grafico

```
apt install tasksel
```

```
tasksel install ubuntu-desktop
```

```
reboot
```



Bootstrap machine

installare Docker <https://docs.docker.com/engine/install/ubuntu/>

```
super@jumplinux:~$ sudo docker run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/

super@jumplinux:~$ █
```

Bootstrap machine

Manage Docker as a non-root user

<https://docs.docker.com/engine/install/linux-postinstall/#manage-docker-as-a-non-root-user>

```
sudo groupadd docker
```

```
sudo usermod -aG docker $USER
```

```
docker run hello-world
```

Configure Docker to start on boot with systemd

```
sudo systemctl enable docker.service
```

```
sudo systemctl enable containerd.service
```

attivare kind

```
sudo modprobe nf_conntrack
```


Bootstrap machine

Installare Tanzu CLI 2.4

Check [Product Interoperability Matrix](#)

Interoperability Result

☆ Add to My Favorite List

Hide Interoperability

Compatible Incompatible

Hide Legacy Releases ⓘ

Past End of General Support Past End of Technical Guidance

Hide Pa

Hide

	VMware Tanzu CLI	
	1.1.0	1.0.0
— Tanzu Application Platform		
1.7.0	✓	—
1.6.1	—	✓
1.5.0	—	✓
1.4.0	—	✓
— Tanzu Service Mesh		
v3.2.2	—	✓
— Tanzu Mission Control		
Tanzu Mission Control	—	✓
— VMware Tanzu Kubernetes Grid		
2.4.0	—	✓
2.3.1	—	✓
2.3.0	—	✓

Bootstrap machine

scaricare la versione per [linux](#)

Home / VMware Tanzu CLI

Download Product

Select Version

1.0.0

Documentation

[Release Notes](#)

Release Date

2023-08-17

Type

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[OEM Addons](#)



File	Information
VMware Tanzu CLI 1.0.0	
VMware Tanzu CLI for Mac File size: 38.73 MB File type: gz Read More	DOWNLOAD NOW
VMware Tanzu CLI for Linux File size: 37.91 MB File type: gz Read More	DOWNLOAD NOW
VMware Tanzu CLI for Windows File size: 38.33 MB File type: zip Read More	DOWNLOAD NOW

Bootstrap machine

Installare Tanzu CLI 2.4 come utente non root

```
mkdir tkg
```

```
cd tkg
```

```
wget https://download3.vmware.com/software/TCLI-100/tanzu-cli-linux-amd64.tar.gz
```

```
tar -xvf tanzu-cli-linux-amd64.tar.gz
```

```
cd v1.0.0
```

```
sudo install tanzu-cli-linux_amd64 /usr/local/bin/tanzu
```

```
super@jumplinux:~$ tanzu version  
version: v1.0.0  
buildDate: 2023-08-08  
sha: 006d0429  
super@jumplinux:~$ █
```

Bootstrap machine

Installare i Tanzu CLI Plugins per TKG v2.4

```
tanzu plugin group search -n vmware-tkg/default --show-details
```

```
tanzu plugin install --group vmware-tkg/default:v2.4.0
```

```
tanzu plugin list
```

```
super@jumplinux:~$ tanzu plugin list
Standalone Plugins
NAME                DESCRIPTION                                                    TARGET    VERSION  STATUS
isolated-cluster    Prepopulating images/bundle for internet-restricted environments  global    v0.31.0  installed
pinniped-auth       Pinniped authentication operations (usually not directly invoked)  global    v0.31.0  installed
telemetry           configure cluster-wide settings for vmware tanzu telemetry        global    v1.1.0   installed
management-cluster  Kubernetes management cluster operations                        kubernetes  v0.31.0  installed
package             Tanzu package management                                         kubernetes  v0.31.0  installed
secret              Tanzu secret management                                          kubernetes  v0.31.0  installed
telemetry           configure cluster-wide settings for vmware tanzu telemetry        kubernetes  v0.31.0  installed
super@jumplinux:~$
```

Bootstrap machine

Installare la [Kubernetes CLI](#)

Scaricare il file `kubectl-linux-v1.27.5+vmware.1.gz` e portarlo sulla Bootstrap machine

```
gunzip kubectl-linux-v1.27.5+vmware.1.gz
```

```
chmod ugo+x kubectl-linux-v1.27.5+vmware.1
```

```
sudo install kubectl-linux-v1.27.5+vmware.1 /usr/local/bin/kubectl
```

```
kubectl version --short --client=true
```

```
super@jumplinux:~/tkg$ kubectl version --short --client=true
Flag --short has been deprecated, and will be removed in the future. The --short output will become the default.
Client Version: v1.27.5+vmware.1
Kustomize Version: v5.0.1
super@jumplinux:~/tkg$
```

Bootstrap machine

Installare la [Kubernetes CLI](#)

Enable autocompletion for kubectl

```
echo 'source <(kubectl completion bash) ' >> ~/.bash_profile
```

Enable autocompletion for Tanzu CLI

```
echo 'source <(tanzu completion bash) ' >> ~/.bash_profile
```

Generare le chiavi ssh da utilizzare per la creazione del management cluster

```
ssh-keygen
```

```
cat ~/.ssh/id_rsa.pub
```

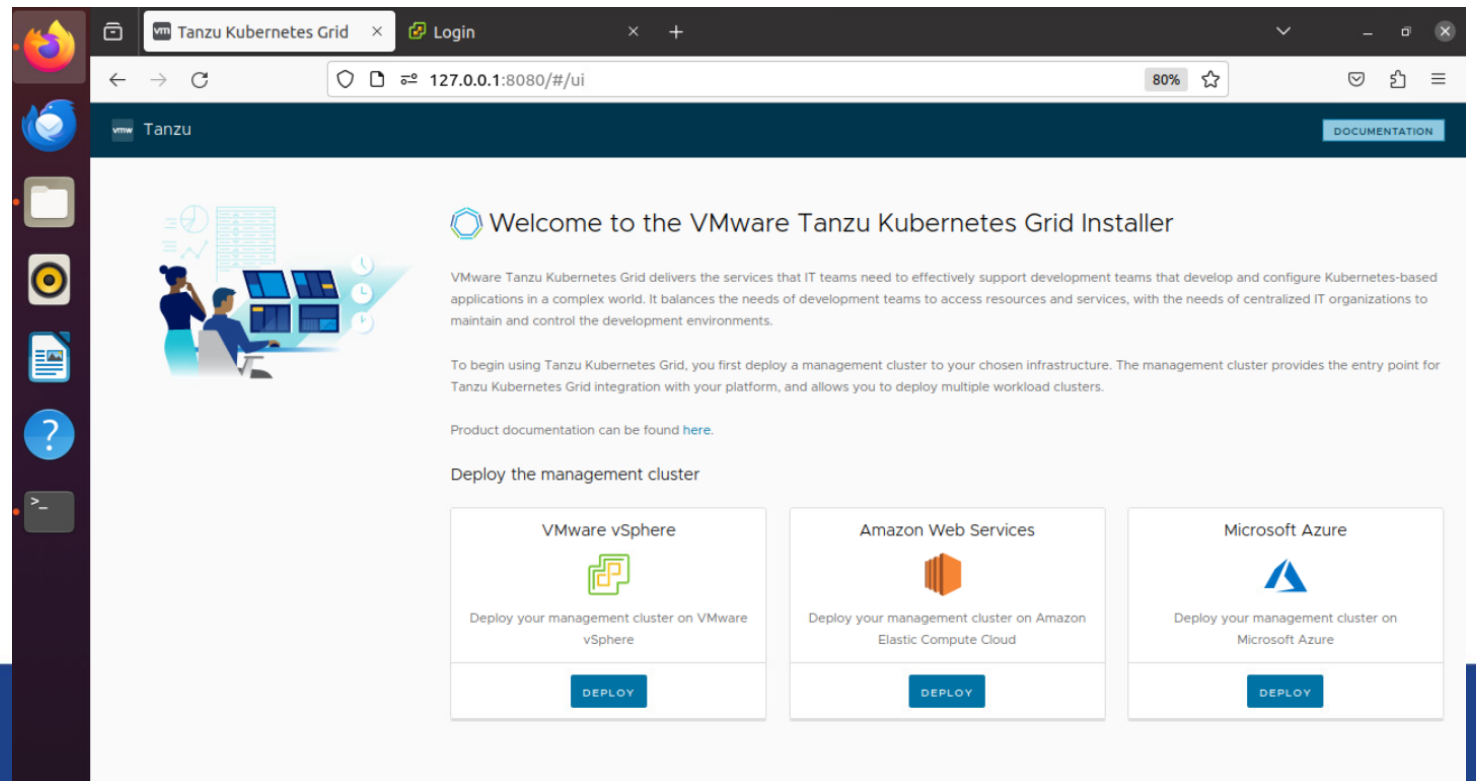
Installazione

Per l'installazione dello standalone management cluster vmware raccomanda la modalità grafica

<https://docs.vmware.com/en/VMware-Tanzu-Kubernetes-Grid/2.4/tkg-deploy-mc/mgmt-deploy-ui.html>

```
tanzu management-cluster create --ui --bind 10.20.30.40:8080
```

```
super@jumplinux:~/tkg$ tanzu management-cluster create --ui
Validating the pre-requisites...
Serving kickstart UI at http://127.0.0.1:8080
```



The screenshot shows a web browser window displaying the VMware Tanzu Kubernetes Grid Installer interface. The browser address bar shows the URL `127.0.0.1:8080/#/ui`. The page title is "Tanzu Kubernetes Grid" and the page content includes a "Welcome to the VMware Tanzu Kubernetes Grid Installer" message. Below the welcome message, there is a section titled "Deploy the management cluster" with three deployment options: VMware vSphere, Amazon Web Services, and Microsoft Azure. Each option has a "DEPLOY" button.

VMware Tanzu Kubernetes Grid delivers the services that IT teams need to effectively support development teams that develop and configure Kubernetes-based applications in a complex world. It balances the needs of development teams to access resources and services, with the needs of centralized IT organizations to maintain and control the development environments.

To begin using Tanzu Kubernetes Grid, you first deploy a management cluster to your chosen infrastructure. The management cluster provides the entry point for Tanzu Kubernetes Grid integration with your platform, and allows you to deploy multiple workload clusters.


Product documentation can be found [here](#).


Deploy the management cluster


- VMware vSphere: Deploy your management cluster on VMware vSphere
- Amazon Web Services: Deploy your management cluster on Amazon Elastic Compute Cloud
- Microsoft Azure: Deploy your management cluster on Microsoft Azure

Installazione

Procedere selezionando come target VMware vSphere

←  Deploy Management Cluster on vSphere

▼  IaaS Provider Validate the vSphere 7.0.3 provider account for Tanzu

VCENTER SERVER ⓘ 10.20.20.8	USERNAME administrator@vsphere.local	PASSWORD 
---------------------------------------	--	--

SSL THUMBPRINT VERIFICATION ⓘ
 Disable Verification


CONNECTED

DATACENTER ⓘ /VxRail-Datacenter ▼	SSH PUBLIC KEY ⓘ <pre>AAAAB3NzaC1yc2EAAAADAQABAAQGDpbU72yBZksFQzHFD5S7RuWa bSiktsjCqPvF1HdfsWbBI52wuAdoXPhNCbBBFXUYbxhCWNOWvTegM+MP 8/hVfAr+rZJbilD6uKunWPuelqpbBLu74UzfrHd5IFvty3rQ5bYgdzRY7Imul UqT4kczRDITbsS+qfzmxF+bZpr2oMbsPvQXfQE9nr /YxvtThK1dybzG0HZe8o /kmKfc7iN+LVchzOYYxVOp1TpG0IYNm5cTXiyzq+Zsl/dBN6/rHy3zmmhPhGM /KKx6fQ9L1fNnIY/uXUg4//+dWRkEDbbu /...</pre> BROWSE FILE
---	---

NEXT

Installazione

Selezionare Deploy TKG Management Cluster

 **vSphere 7.0.3 Environment Detected** ✕

You have connected to a vSphere 7.0.3 environment which does not have vSphere with Tanzu enabled. vSphere with Tanzu includes an integrated Tanzu Kubernetes Grid Service which turns a vSphere cluster into a platform for running Kubernetes workloads in dedicated resource pools. Configuring Tanzu Kubernetes Grid Service is done through the vSphere HTML5 Client.

[CONFIGURE VSPHERE WITH TANZU](#)

Tanzu Kubernetes Grid Service is the preferred way to consume Tanzu Kubernetes Grid in vSphere 7.0.3 environments. Alternatively you may deploy a non-integrated Tanzu Kubernetes Grid instance on vSphere 7.0.3.

[DEPLOY TKG MANAGEMENT CLUSTER](#)


What's the difference between Tanzu Kubernetes Grid multicloud and Tanzu Kubernetes Grid Service? Learn more [here](#).
Documentation for vSphere with Tanzu and Tanzu Kubernetes Grid Service can be found [here](#).

Installazione

Selezionare il tipo di controlplane, il size dei nodi e il tipo di bilanciatore


Cluster Settings Production cluster selected: 3 node control plane

Management Cluster Settings


Development

Single control plane node. Recommended for a development environment.

INSTANCE TYPE ⓘ


Production

Three control plane nodes. Recommended for a production environment.

INSTANCE TYPE ⓘ

MANAGEMENT CLUSTER NAME (OPTIONAL) ⓘ <input type="text" value="tkgvmug"/>	MACHINE HEALTH CHECKS ⓘ <input checked="" type="checkbox"/> Enable
CONTROL PLANE ENDPOINT PROVIDER ⓘ <input type="text" value="NSX Advanced Load Balancer"/>	CONTROL PLANE ENDPOINT (OPTIONAL) ⓘ <input type="text"/>
WORKER NODE INSTANCE TYPE ⓘ <input type="text" value="medium (cpu: 2, ram: 8 GB, disk: 40 GB)"/>	ACTIVATE AUDIT LOGGING ⓘ <input checked="" type="checkbox"/> Enable

Installazione

Inserire eventuali dati nella sezione Metadata

4. Metadata Specify metadata for the management cluster

Optional Metadata

LOCATION (OPTIONAL) ⓘ
optional

DESCRIPTION (OPTIONAL) ⓘ
optional

LABELS (OPTIONAL) ⓘ
key : value

ADD

NEXT

Installazione

Selezionare la VM folder

Selezionare il Datastore e il cluster da utilizzare per il deploy

5. Resources Resource Pool: /VxRail-Datacenter/host/VxRail-vSAN-Cluster/Resources, VM Folder: /VxRail-Datacenter/vm/Tanzu, Datastore: /VxRail-Datacenter/datastore/VxRail-Virtual-SAN-Datastore-44e8b652-6360-47b0-b3f0-2043b1fbd466

Specify the Resources [↻](#)

VM FOLDER ⓘ
/VxRail-Datacenter/vm/Tanzu

Specify Availability Zones ⓘ

No AZs Cluster based AZs Host group based AZs

DATASTORE ⓘ
/VxRail-Datacenter/datastore/

CLUSTERS, HOSTS, AND RESOURCE POOLS ⓘ

> VxRail-vSAN-Cluster

NEXT

Installazione

Selezionare la Kubernetes network

6. Kubernetes Network Network: /VxRail-Datacenter/network/DP-vlan101-LB, Cluster Service CIDR: 100.64.0.0/13, Cluster Pod CIDR: 100.96.0.0/11

Kubernetes Network Settings [↻](#)

CNI Provider: Antrea

NETWORK NAME ⓘ	CLUSTER SERVICE CIDR ⓘ	CLUSTER POD CIDR ⓘ
<input type="text" value="/VxRail-Datacenter/network/DP-vlan101-LB"/>	<input type="text" value="100.64.0.0/13"/>	<input type="text" value="100.96.0.0/11"/>

Proxy Settings

ACTIVATE PROXY SETTINGS

Installazione

Configurare l'eventuale Identity provider

7. Identity Management Optionally specify identity management

Optionally Specify Identity Management with OIDC or LDAPS

ACTIVATE IDENTITY MANAGEMENT SETTINGS

[NEXT](#)

Installazione

Selezionare l'immagine da utilizzare per il deploy dei nodi controller e worker

8. OS Image OS Image: /VxRail-Datacenter/vm/SCANDA/ubuntu-2004-efi-kube-v1.27.5+vmware.1

OS Image with Kubernetes v1.27.5+vmware.1-tkg.1

OS IMAGE ⓘ

/VxRail-Datacenter/vm/SCANDA/ubuntu-2004-efi-kube-v1.2 ↕ ↻

NEXT

Installazione

Selezionare se abilitare il CEIP

9. CEIP Agreement Join the CEIP program for TKG

VMware's Customer Experience Improvement Program ("CEIP") provides VMware with information that enables VMware to improve its products and services and fix problems. By choosing to participate in CEIP, you agree that VMware may collect technical information about your use of VMware products and services on a regular basis. This information does not personally identify you.

For more details about the Program, please see <http://www.vmware.com/trustvmware/ceip.html>


Participate in the Customer Experience Improvement Program

Verificare I dati inseriti e avviare la creazione del management cluster

Installazione

Inizia la fase di deploy del cluster di management

vmw Tanzu Open application menu



- Configure prerequisite
- Validate configuration
- Generate cluster configuration
- Setup bootstrap cluster**
- Install providers on bootstrap cluster
- Create management cluster
- Install providers on management cluster
- Move cluster-api objects from bootstrap cluster to management cluster

Logs

```
i [1114 22:08:24.85488]: init.go:122) Validating configuration...
i [1114 22:08:24.96177]: init.go:181) Using infrastructure provider vsphere:v1.7.1
i [1114 22:08:24.96196]: init.go:183) Generating cluster configuration...
i [1114 22:08:24.96209]: init.go:186) Setting up bootstrapper...
i [1114 22:08:24.98523]: client.go:125) Fetching configuration for kind node image...
i [1114 22:08:24.98686]: client.go:227) kindConfig: &{{Cluster kind.x-k8s.io/v1alpha4} [{ map[] [{} /var/run/docker.sock /var/run/docker.sock false false }}] [] []] { 0 100.96.0.0/11 100.64.0.0/13 false <nil>} map[] map[] [apiVersion: kubeadm.k8s.io/v1beta3 kind: ClusterConfiguration imageRepository: projects.registry.vmware.com/tkg etcd: local: imageRepository: projects.registry.vmware.com/tkg imageTag: v3.5.7_vmware.6 dns: type: CoreDNS imageRepository: projects.registry.vmware.com/tkg imageTag: v1.10.1_vmware.7] [] []]}
i [1114 22:08:24.98688]: client.go:133) Creating kind cluster: tkg-kind-cl9uvm611j3v9bmmu2qg
i [1114 22:08:25.09267]: logger.go:115) Creating cluster "tkg-kind-cl9uvm611j3v9bmmu2qg" ...
i [1114 22:08:25.09273]: logger.go:115) Ensuring node image (projects.registry.vmware.com/tkg /kind/node:v1.27.5_vmware.1-tkg.1_v0.17.0) ...
i [1114 22:08:25.12202]: logger.go:115) Image: projects.registry.vmware.com/tkg/kind/node:v1.27.5_vmware.1-tkg.1_v0.17.0 present locally
i [1114 22:08:25.14663]: logger.go:115) Preparing nodes ...
i [1114 22:08:27.75671]: logger.go:115) Writing configuration ...
i [1114 22:08:28.18372]: logger.go:115) Starting control-plane ...
i [1114 22:08:43.51349]: logger.go:115) Installing CNI ...
i [1114 22:08:44.68071]: logger.go:115) Installing StorageClass ...
i [1114 22:08:45.36558]: logger.go:115) Waiting 2m0s for control-plane = Ready ...
```

CLI Command Equivalent ⓘ

```
tanzu management-cluster create tkggmt --file /home/super/.config/tanzu/tkg/clusterconfigs/2626gg4v5c.yaml -v 6
```

DARK COPY CLI COMMAND

Installazione

Verificare che tutte le fasi vadano a buon fine e che il cluster di management venga creato

Installation complete, you can now close the browser....

Deploying Tanzu Kubernetes Grid on vSphere

Deployment of the Tanzu Kubernetes Grid management cluster to vSphere is successful.

- Configure prerequisite
- Validate configuration
- Generate cluster configuration
- Setup bootstrap cluster
- Install providers on bootstrap cluster
- Create management cluster
- Install providers on management cluster
- Move cluster-api objects from bootstrap cluster to management cluster

Logs

```
i [1115 02:15:16.43794]: clusterClient.go:1515] waiting for resources type ^v1beta1.MachineDeploymentList to be up and running
i [1115 02:15:16.46343]: clusterClient.go:1515] waiting for resources type ^v1beta1.MachineList to be up and running
i [1115 02:15:16.48831]: init.go:400] Waiting for addons installation...
i [1115 02:15:16.48944]: clusterClient.go:1515] waiting for resources type ^v1beta1.ClusterResourceSetList to be up and running
i [1115 02:15:16.49245]: clusterClient.go:1481] waiting for resource antrea-controller of type ^v1.Deployment to be up and running
i [1115 02:15:16.49885]: init.go:420] Applying ClusterBootstrap and its associated resources on management cluster
i [1115 02:15:16.70091]: clusterClient.go:1481] waiting for resource v1.27.5---vmware.1-tkg.1 of type ^v1alpha3.TanzuKubernetesRelease to be up and running
i [1115 02:15:19.10283]: init.go:427] Moving all Cluster API objects from bootstrap cluster to management cluster...
i [1115 02:15:19.19921]: mover.go:68] Performing move...
i [1115 02:15:19.66963]: objectgraph.go:416] Discovering Cluster API objects
i [1115 02:15:20.47640]: mover.go:315] Moving Cluster API objects Clusters=1
i [1115 02:15:20.47647]: mover.go:318] Moving Cluster API objects ClusterClasses=1
i [1115 02:15:21.05739]: mover.go:345] Creating objects in the target cluster
i [1115 02:15:38.87258]: mover.go:353] Deleting objects from the source cluster
i [1115 02:15:44.05060]: init.go:486] Creating tkg-bom versioned ConfigMaps...
i [1115 02:15:44.28991]: init.go:492] You can now access the management cluster tkgvmug by running 'kubect] config use-context tkgvmug-admin@tkgvmug'
i [1115 02:15:44.30926]: client.go:163] Deleting kind cluster: tkg-kind-cla2cuel1j3ocor6jtk0
i [1115 02:15:46.49404]: logger.go:115] Deleted nodes: ["tkg-kind-cla2cuel1j3ocor6jtk0-control-plane"]
i [1115 02:15:46.49411]: init.go:89] Management cluster created!
i [1115 02:15:46.49420]: init.go:90] Please run 'tanzu plugin sync' command manually to install/update plugins
i [1115 02:15:46.49423]: init.go:91] You can now create your first workload cluster by running the following:
i [1115 02:15:46.49428]: init.go:92] tanzu cluster create [name] -f [file]
```

Installazione

Verificare dalla Bootstrap machine lo stato del cluster

tanzu mc get

```
super@jumplinux:~$ tanzu mc
available-zone      (Get or set or delete available zone of the management cluster)  get          (Get details about the current management cluster)
ceip-participation (Get or set ceip participation)                                   help        (Help about any command)
create              (Create a Tanzu Kubernetes Grid management cluster)              kubeconfig  (Kubeconfig of management cluster)
credentials         (Update Credentials for Management Cluster)                       permissions (Configure permissions on cloud providers)
delete             (Delete a management cluster)                                     upgrade     (Upgrades the management cluster)
super@jumplinux:~$ tanzu mc get
NAME      NAMESPACE  STATUS  CONTROLPLANE  WORKERS  KUBERNETES  ROLES  PLAN  TKR
tkgvmug   tkg-system  running  3/3           3/3      v1.27.5+vmware.1  management  prod  v1.27.5---vmware.1-tkg.1

Details:
NAME      READY  SEVERITY  REASON  SINCE  MESSAGE
/tkgvmug
-ClusterInfrastructure - VSphereCluster/tkgvmug-rx88s  True      24s
-ControlPlane - kubeadmControlPlane/tkgvmug-x9mpz  True      24s
  Machine/tkgvmug-x9mpz-51bmz  True      23s
  Machine/tkgvmug-x9mpz-wp4rp  True      23s
  Machine/tkgvmug-x9mpz-zz4rp  True      23s
-Workers
  MachineDeployment/tkgvmug-md-0-lb8tm  True      23s
  Machine/tkgvmug-md-0-lb8tm-6c75df7954x6d6b4-t7cdd  True      23s
  MachineDeployment/tkgvmug-md-1-6w94d  True      23s
  Machine/tkgvmug-md-1-6w94d-d64bc688cxhbp51-tmjff6  True      23s
  MachineDeployment/tkgvmug-md-2-c62t6  True      23s
  Machine/tkgvmug-md-2-c62t6-57c57c99bbxbhn69-nrj9d  True      23s

Providers:
NAMESPACE      NAME      TYPE      PROVIDERNAME  VERSION
caip-in-cluster-system  ipam-in-cluster  IPAMProvider  in-cluster  v0.1.0
capi-kubeadm-bootstrap-system  bootstrap-kubeadm  BootstrapProvider  kubeadm  v1.4.5
capi-kubeadm-control-plane-system  control-plane-kubeadm  ControlPlaneProvider  kubeadm  v1.4.5
capi-system      cluster-api  CoreProvider  cluster-api  v1.4.5
capv-system      infrastructure-vsphere  InfrastructureProvider  vsphere  v1.7.1
super@jumplinux:~$
```

Deploy di un cluster k8s

Installare i Carvel tools

<https://docs.vmware.com/en/VMware-Tanzu-Kubernetes-Grid/2.4/using-tkg/workload-carvel-tools.html>

```
super@jumplinux:~/tkg/cli$ kblid --version
kblid version 0.37.0

Succeeded
super@jumplinux:~/tkg/cli$ ytt --version
ytt version 0.45.0
super@jumplinux:~/tkg/cli$ imgpkg --version
imgpkg version 0.36.0

Succeeded
super@jumplinux:~/tkg/cli$ kapp --version
kapp version 0.55.0

Succeeded
super@jumplinux:~/tkg/cli$ kblid --version
kblid version 0.37.0

Succeeded
super@jumplinux:~/tkg/cli$ █
```

Deploy di un cluster k8s

Creare il file di configurazione del nuovo cluster di workload

Dopo la creazione del cluster di management troviamo il suo file di definizione al percorso

~/.config/tanzu/tkg/clusterconfigs

Il file ha un nome generato casualmente (9zjvc31zb7.yaml), viene poi convertito in un file con le specifiche per la creazione del cluster (tkgvmug.yaml)

Fare una copia del file 9zjvc31zb7.yaml dando il nome del nuovo cluster da creare (myk8svmug.yaml)

Editare il nuovo file modificando la variabile CLUSTER_NAME inserendo il nome del nuovo cluster

```
super@jumlinux:~/.config/tanzu/tkg/clusterconfigs$ ls -lrt
total 24
-rw----- 1 super super 4699 Nov 15 02:01 9zjvc31zb7.yaml
-rw----- 1 super super 5293 Nov 15 02:04 tkgvmug.yaml
-rw----- 1 super super 4564 Nov 15 09:47 myk8svmug.yaml
super@jumlinux:~/.config/tanzu/tkg/clusterconfigs$ █
```

Deploy di un cluster k8s

Creare il nuovo cluster

Eeguire il comando e attendere la creazione del cluster

```
tanzu cluster create --file ~/.config/tanzu/tkg/clusterconfigs/myk8svmug.yaml
```

```
Using this new Cluster configuration '/home/super/.config/tanzu/tkg/clusterconfigs/myk8svmug.yaml' to create the cluster.
creating workload cluster 'myk8svmug'...
waiting for cluster to be initialized...
[zero or multiple KCP objects found for the given cluster, 0 myk8svmug default, no MachineDeployment objects found for the given cluster]
cluster control plane is still being initialized: ScalingUp
waiting for cluster nodes to be available...
unable to get the autoscaler deployment, maybe it is not exist
waiting for addons core packages installation...

Workload cluster 'myk8svmug' created

super@jumplinux:~/config/tanzu/tkg/clusterconfigs$ tanzu cluster list
  NAME      NAMESPACE  STATUS  CONTROLPLANE  WORKERS  KUBERNETES  ROLES  PLAN  TKR
  myk8svmug default    running  3/3           3/3      v1.27.5+vmware.1  <none>  prod  v1.27.5--vmware.1-tkg.1
super@jumplinux:~/config/tanzu/tkg/clusterconfigs$
```

Deploy di un cluster k8s

Accedere al nuovo cluster

Recuperiamo le configurazioni da utilizzare con kubectl per accedere al nuovo cluster

```
tanzu cluster kubeconfig get --admin myk8svmug
```

```
kubectl config get-contexts
```

```
super@jumplinux:~/ .config/tanzu/tkg/clusterconfigs$ kubectl config get-contexts
CURRENT  NAME                                CLUSTER  AUTHINFO  NAMESPACE
*        myk8svmug-admin@myk8svmug          myk8svmug  myk8svmug-admin
         tkgvmug-admin@tkgvmug             tkgvmug    tkgvmug-admin
```

```
kubectl config use-context myk8svmug-admin@myk8svmug
```


Deploy di un cluster k8s

Accedere al nuovo cluster

Creiamo un pod di test

```
kubectl run nginx --image=nginx
```

```
kubectl get pods
```

```
super@jumplinux:~/ .config/tanzu/tkg/clusterconfigs$ kubectl get pods
```

NAME	READY	STATUS	RESTARTS	AGE
nginx	1/1	Running	0	5m16s

TKG 2.5

Deprecation of TKG Management and Workload Clusters on AWS and Azure



Important

Tanzu Kubernetes Grid v2.4 (including patch releases) is the last minor version of TKG that supports the creation of standalone TKG management clusters and TKG workload clusters on AWS and Azure. The ability to create standalone TKG management clusters and TKG workload clusters on AWS and Azure will be removed in the Tanzu Kubernetes Grid v2.5 release.

- Starting from now, VMware recommends that you use Tanzu Mission Control to create native AWS EKS and Azure AKS clusters instead of creating new standalone TKG management clusters or new TKG workload clusters on AWS and Azure. For information about how to create native AWS EKS and Azure AKS clusters with Tanzu Mission Control, see [Managing the Lifecycle of AWS EKS Clusters](#) and [Managing the Lifecycle of Azure AKS Clusters](#) in the Tanzu Mission Control documentation.
- Although the recommendation is to use Tanzu Mission Control to create native AWS EKS and Azure AKS clusters, creating and using standalone TKG management clusters and TKG workload clusters on AWS and Azure remains fully supported for all TKG releases up to and including TKG v2.4.x.
- For information about why VMware is deprecating TKG clusters on AWS and Azure, see [VMware Tanzu Aligns to Multi-Cloud Industry Trends](#) on the VMware Tanzu blog.

<https://docs.vmware.com/en/VMware-Tanzu-Kubernetes-Grid/2.4/tkg-deploy-mc/mgmt-release-notes.html#deprecate-aws-azure>

TMC

VMware Tanzu Mission Control is a centralized Kubernetes management hub for multi-cluster deployments.

Category	Key Features	Tanzu Mission Control Essentials <i>(Available with VMware Cloud offerings only - SaaS)</i>	Tanzu Mission Control Advanced <i>(SaaS)</i>	Tanzu Mission Control Advanced <i>(Self-managed)</i>
Provisioning and lifecycle management	Tanzu Kubernetes Grid clusters on vSphere	✓	✓	✓
	Tanzu Kubernetes Grid clusters on VMware Cloud on AWS, Azure, Dell, Google, Oracle	✓	✓	○
	Amazon EKS clusters on AWS	✓	✓	○
	Azure AKS clusters	✓	✓	○
Attaching clusters	Attach and manage policies on <i>CNCF-conformant</i> Kubernetes clusters	✓	✓	✓
Identity and access management	Access policies	✓	✓	✓
	IaaS account permissions	✓	✓	✓
	View existing access policies on a cluster	✓	✓	✓
	Federation to customer's identity provider	✓	✓	✓

○ = Not available on 1.0 release announced Ju 29, 2023

NOTE

I port-group utilizzati per i deploy dei cluster devono avere un DHCP server associato con un pool di indirizzi adeguato e con una lease bassa

Verificare che la chiave ssh generata venga riportata per intero nel campo dello step 1 (ssh-rsa AAAAB3..)

Se si utilizza NSX ALB non specificare un indirizzo per la CONTROL_PLANE_EDNPOINT, se lo fate deve essere un indirizzo compreso nel pool definite su NSX ALB (se diverso il cluster di management non sale)

Alla prossima

That's all Folks!

VMUG
usercon