GKE On-Prem

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Hybrid Use Cases

**Legacy Software**
- Ecommerce site
- Catalog, ERP

**Local Execution**
- Warehouse
- Branch
- Factory

**Jurisdictional / PII**
- Europe
- US
- Secure records

**Augmented Services**
- On-Prem
- Cloud
- Cloud Storage
- Cloud ML
- Big Query

**Edge / IoT**
- Cloud Storage
- Cloud ML
- Big Query

**Cloud bursting**
Kubernetes Can Help
Benefits of Containers

- Environmental consistency across development, testing, and production
- Application-centric management
- Micro service development
- Resource isolation
- Resource utilization
- Continuous development, integration, and deployment
- Dev and Ops separation of concerns
Picking the Right Solution

Kubernetes can run on various platforms: from your laptop, to VMs on a cloud provider, to a rack of bare metal servers. The effort required to set up a cluster varies from running a single command to crafting your own customized cluster. Use this guide to choose a solution that fits your needs.

If you just want to “kick the tires” on Kubernetes, use the local Docker-based solutions.

When you are ready to scale up to more machines and higher availability, a hosted solution is the easiest to create and maintain.

Turnkey cloud solutions require only a few commands to create and cover a wide range of cloud providers. On-Premises turnkey cloud solutions have the simplicity of the turnkey cloud solution combined with the security of your own private network.

If you already have a way to configure hosting resources, use kubeadm to easily bring up a cluster with a single command per machine.

Custom solutions vary from step-by-step instructions to general advice for setting up a Kubernetes cluster from scratch.

- Local-machine Solutions
- Hosted Solutions
- Turnkey Cloud Solutions
- On-Premises turnkey cloud solutions
- Custom Solutions
  - Universal
  - Cloud
  - On-Premises VMs
  - Bare Metal
  - Integrations
- Table of Solutions
  - Definition of columns
Picking the Right Solution

Kubernetes can run on various environments, from your laptop, to a cloud provider, to a rack of bare metal servers. The effort involved to set up and manage these environments vary from a single node to crafting your own customized cluster. Use this page to choose a solution that meets your needs.

Your Kubernetes installation methods can be categorized into "kicking the tires" on Kubernetes, or "local deployment based solutions."

When you’re ready to scale to more machines for higher availability, a **hosted solution** is the easiest to create and maintain. **Hosted solutions** require less overhead to create. These include a wide range of cloud providers. **On-Premises solutions** have the advantage of a 'local' cloud solution combined with the security of your own private network.

If you already have a way to configure hosting resources, use kubectl or easily bring up a cluster with a single command per machine.

Custom solutions vary from step-by-step instructions to general advice for setting up a Kubernetes cluster from scratch.

- **Local-machine solutions**
- **Hosted solutions**
- **Turnkey Cloud solutions**
- **On-Premises turnkey cloud solutions**
- **Custom Solutions**
  - **Universal**
  - **Cloud**
  - **On-Premises VMs**
  - **Bare Metal**
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  - **Table of Solutions**
  - **Definition of columns**
Don’t Forget “Day 2” Ops

- Managing components
- Encrypting and securing etcd
- Configuring HA
- Rolling out security patches
- Backups and disaster recovery
- Managing users and policies
GKE On-Prem

- Turn-key, production-grade, conformant Kubernetes with best-practice configuration
- Easy upgrade path to the latest Kubernetes releases that have been validated and tested by Google
- Access to Container services on GCP such as Cloud Build, Container Registry, Audit Logging, and more.
- Integration with Istio, Knative, Marketplace Solutions

ALPHA IN FALL
Run your cluster the way Google does

The same tools are used to install, configure, and manage clusters in GKE and GKE On-Prem.

Cluster environments are consistent (k8s version, OS image, plug-ins, components configuration).
Single Pane of Glass across GCP & On-Prem

Orchestrate and manage on-prem containers just like GKE in the cloud

Consistent operating model with access to GCP services across hybrid environments

Single-pane-of-glass for multiple Kubernetes clusters, no matter where
CLI (Installation)

$ gke-on-prem create cluster --dry-run
Welcome! This command will take you through the installation of a cluster. --dry-run saves your configuration to a YAML file.

Please enter the path of a directory where this configuration will be saved? [/Users/karangoel/my-test-cluster/]:

Where do you want to install your cluster?
[1] vSphere v6.5
Please enter your numeric choice [1]: 1

What version of GKE On-Prem do you want to install?
[1] 1.10.3 (Uses k8s v1.10.3)
[2] 1.9.2-rc2 (Uses K8s 1.9.2)
[3] 1.8.3 (Uses K8s 1.8.3)
Please enter your numeric choice [1]: 1

Pulling gke-on-prem-vsphere-1.10.3... DONE

Path to kubeconfig for the GKE On-Prem Admin Control Plane (leave empty to create it):

A GKE On-Prem Control Plane will be created.

Would you like to use existing CA?
[1] I'll provide CA certificate and key
[2] Generate CA certificate and key
Please enter your numeric choice [2]: 2

Enter the path to the SSH private key to use (leave empty to generate): /Users/karangoel/.ssh/vsphere

Enter proxy without "http://" or "https://" (leave blank if none):
username:password@1.1.1.1:5413/
Register with Google Cloud Console

A Kubernetes cluster is a managed group of uniform VM instances for running Kubernetes. Learn more

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Cluster size</th>
<th>Total cores</th>
<th>Total memory</th>
<th>Notifications</th>
<th>Labels</th>
<th>Connect</th>
</tr>
</thead>
<tbody>
<tr>
<td>east-coast</td>
<td>us-east4-a</td>
<td>3</td>
<td>24 vCPUs</td>
<td>90.00 GB</td>
<td>Low resource requests</td>
<td></td>
<td>Connect</td>
</tr>
<tr>
<td>south</td>
<td>moscone-south</td>
<td>3</td>
<td>12 CPU</td>
<td>10.38 GB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Verification

Double checking to make sure your external cluster is ready to go.

- GKE Connect agent is connected.
- Cluster is running.
- Successfully authenticated into cluster.
- Cluster was successfully added to cluster registry.
- Google services successfully enabled.

VIEW CLUSTERS  VIEW WORKLOADS
Logging and Monitoring

- Pre-built dashboard in-cluster dashboards based on Prometheus + Grafana + EFK
- Ingest metrics and logs into Stackdriver without any instrumentation changes
- Integration with other logging systems (e.g., Splunk)
- Aggregate logs from many clusters -- whether GKE or GKE On-Prem
GKE On-Prem Identity

- Seamless Google Cloud Identity
- Active Directory Integration
- Use your own Public-Key Infrastructure
Centrally Managing Users and Policies

- Centrally define policies declaratively in yaml, store in git
- Syncs across multiple clusters, whether in cloud or on-prem
- Namespaces are tenants
- Manage namespaces, RBAC, and more...
Thank you!

Learn More: cloud.google.com/gke-on-prem