1- Should we move to GKE? Why? -ZhihaoChen

**Answer:**

Customers should move to Google Kubernetes Engine and activate ISTIO. Google Kubernetes Engine is a management system and can be orchestrated. The main problems faced by customers are related to scale. According to Rob and Maciek （2020）， they introduced several important features of Google Kubernetes Engine,"clusters with up to 15,000 nodes", and "If you're running large, internet-scale services; If you need to simplify infrastructure management by having fewer clusters to manage; Batch processing — shortening the time needed to process data by temporarily using much more resources". These features mean that Google Kubernetes Engine can help companies solve the problem of scale and improve the company's efficiency by reducing the number of clusters managed and increasing the speed of data processing. In addition, Google Kubernetes Engine can help maintainers and developers to automatically maintain and repair nodes, which is very convenient and highly secure. In addition to using Google Kubernetes Engin, customers also need to activate Istio. According to istio（n.d.）,"Istio's powerful features provide a uniform and more efficient way to secure, connect, and monitor services. "This means that combining Google Kubernetes Engine and istio can improve scalability and monitor and maintain products more efficiently Quality and improve user experience.

2- What are the list of services that we need to activate on GCP? -HongjingBian

Answer:

Google Cloud services:

1-[**Compute Engine**](https://cloud.google.com/compute/) **[1]**

**2-**[**App Engine**](https://cloud.google.com/appengine/) **[1]**

**3-**[**Container Engine**](https://cloud.google.com/container-engine/) **[1]**

**4-**[**Container Registry**](https://cloud.google.com/container-registry) **[1]**

**5-**[**Cloud Functions**](https://cloud.google.com/functions/) **[1]**

**6-**[**Cloud Pub/Sub**](https://cloud.google.com/pubsub) **[1]**

**7-**[**Cloud Endpoints Frameworks for App Engine**](https://cloud.google.com/appengine/docs/java/endpoints/) **[1]**

**8-**[**Cloud Storage**](https://cloud.google.com/storage/) **[1]**

**9-**[**Cloud SQL**](https://cloud.google.com/sql) **[1]**

**10-**[**Bigtable**](https://cloud.google.com/bigtable/) **[1]**

**11-**[**Cloud Datastore**](https://cloud.google.com/datastore/) **[1]**

**12-**[**Cloud Spanner**](https://cloud.google.com/spanner/) **[1]**

**13-**[**Persistent Disk**](https://cloud.google.com/persistent-disk/) **[1]**

**14-**[**Cloud Source Repositories**](https://cloud.google.com/source-repositories/) **[1]**

**15-**[**BigQuery**](http://cloud.google.com/bigquery) **[1]**

**16-**[**Cloud Dataflow**](https://cloud.google.com/dataflow/) **[1]**

**17-**[**Dataproc**](https://cloud.google.com/dataproc/) **[1]**

**18-**[**Cloud Datalab**](https://cloud.google.com/datalab/) **[1]**

**19-**[**Google Genomics**](https://cloud.google.com/genomics/overview) **[1]**

**20-**[**Cloud Machine Learning**](https://cloud.google.com/products/machine-learning/) **[1]**

**21-**[**Cloud Vision API**](https://cloud.google.com/vision/) **[1]**

**22-**[**Cloud Speech API**](https://cloud.google.com/speech/) **[1]**

**23-**[**Natural Language API**](https://cloud.google.com/natural-language/) **[1]**

**24-**[**Translate API**](https://cloud.google.com/translate/) **[1]**

**25-**[**Google Cloud Virtual Network**](https://cloud.google.com/compute/docs/networking) **[1]**

**26-**[**Cloud Load Balancing**](https://cloud.google.com/compute/docs/load-balancing-and-autoscaling) **[1]**

**27-**[**Cloud CDN**](https://cloud.google.com/cdn/) **[1]**

**28-**[**Google Cloud Interconnect**](https://cloud.google.com/interconnect/docs) **[1]**

**29-**[**Cloud DNS**](https://cloud.google.com/dns/docs/) **[1]**

**30-**[**Google Cloud IAM**](https://cloud.google.com/iam/) **[1]**

**31-**[**Cloud Resource Manager**](https://cloud.google.com/resource-manager/) **[1]**

**32-**[**Cloud Security Scanner**](https://cloud.google.com/security-scanner/) **[1]**

**33-**[**Stackdriver**](http://thenewstack.io/closer-look-google-stackdriver/) **[1]**

**34-**[**Deployment Manager**](https://cloud.google.com/deployment-manager/) **[1]**

**35-**[**Cloud Shell**](https://cloud.google.com/shell/) **[1]**

**36-**[**Google Cloud Billing API**](https://cloud.google.com/billing/) **[1]**

**In Asignment 2 , we have activated the google cloud services, which is google cloud shell services and and activate the** [**Cloud SQL**](https://cloud.google.com/sql) **services, furthermore we also enabled the API service and google cloud service.**

3- What resources do I need to do this migration?-Zheng Wu

In this deploying of migration to Google Cloud the first resoures is need the system should have 10 core CPU and 32GM RAM it also should have user role for thar can access to GCP as well. Some example of resources are Computer instances, Cloud Storage buckets. And also in different type of users there is have different resourse required If a user needs access to a specific Google Cloud resource, you can grant the user a role for that resource. Some examples of resources are [projects](https://cloud.google.com/resource-manager/docs/cloud-platform-resource-hierarchy#projects), [Compute Engine instances](https://cloud.google.com/compute/docs/instances), and [Cloud Storage buckets](https://cloud.google.com/storage/docs/key-terms).

Some services support granting IAM permissions at a granularity finer than the project level. For example, you can grant the Storage Admin role (roles/storage.admin) to a user for a particular Cloud Storage bucket, or you can grant the Compute Instance Admin role (roles/compute.instanceAdmin) to a user for a specific Compute Engine instance.

In other cases, you can grant IAM permissions at the project level. The permissions are then inherited by all resources within that project. For example, to grant access to all Cloud Storage buckets in a project, grant access to the project instead of each individual bucket. Or to grant access to all Compute Engine instances in a project, grant access to the project rather than each individual instance.

For information on what roles can be granted on which resources, see [Understanding roles](https://cloud.google.com/iam/docs/understanding-roles#predefined_roles) and refer to the Lowest Resource column for a given role. (migration to cloud guild line)

4- What deployment pattern should I use to minimize the impact on my clients? -Boying Lei

When deploying the new version of API, we also need to keep the old API environment running normally. Before deployment, we use the load balancer to point to the old API, and after the new API is ready, we can point the load balancer to the new API environment to achieve version update. If anything goes wrong at this point we can immediately roll back to the old version to restore the previous version. This approach is very fast for version switching and minimizes the risk of downtime.（Blue/Green Deployment Pattern）

Reference: https://www.techmagic.co/blog/best-application-deployment-strategies/

5- final project –zicheng Wang

**Reference:**

Rob Long & Maciek Różacki (2020, June 23. *Bayer Crop Science seeds the future with 15000-node GKE clusters.* Google Cloud. Retrieved from[*https://cloud.google.com/blog/products/containers-kubernetes/google-kubernetes-engine-clusters-can-have-up-to-15000-nodes*](https://cloud.google.com/blog/products/containers-kubernetes/google-kubernetes-engine-clusters-can-have-up-to-15000-nodes)

Istio （n.d.）. *The Istio service mesh* T. Istio. Retrieved from <https://istio.io/latest/about/service-mesh/>

IEEE reference:

1-R. Meier, “What are the Google Cloud Platform (GCP) Services?,” *Google Cloud - Community*, 10-Feb-2017. [Online]. Available: <https://medium.com/google-cloud/what-are-the-google-cloud-platform-gcp-services-285f1988957a>. [Accessed: 12-Dec-2021].

Migration to Google Cloud: Assessing and discovering your workloads

https://cloud.google.com/architecture/migration-to-gcp-assessing-and-discovering-your-workloads