GCP Flowcharts

Please note that I have no association with any training companies or third parties linking through to this post. This post is freely available to help folks understand Google Cloud!

For those of you who have been reading my GCP flowchart series over on medium the collection now lives here. This post contains all the ones that are still applicable at the time of writing that I posted on medium here (https://medium.com/google-cloud/some-more-gcp-flowcharts-dc0bb6f7c94e) together with a few brand new ones. I've now arranged them under the following headings:

Compute

Storage and Data

Security

Networking

Data Analytics

Misc

So it's easy to find the one you want. This single post also allows me to maintain an up to date collection from one place.

Once I have more than 1 flowchart for a topic/ area I will create a new heading ,for now those singletons are under misc.

Attribution: All graphics & flowcharts apart from ones I drew myself & Sara's cheerfully copied from the Google Cloud platform (http://cloud.google.com/) or blog site (https://cloudplatform.googleblog.com/)

Latest additions - May 2021: Authenticating service accounts & choosing private access options (Security)

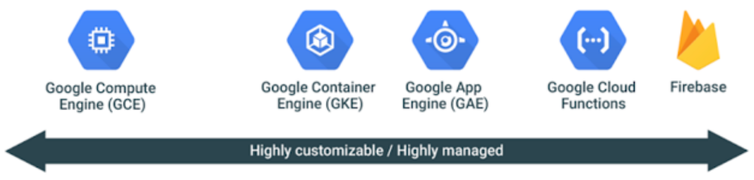
And this (https://www.skimspace.com/Object/33/whats-the-right-choice-for-me-on-google-cloud-platform) great interactive picker was created based on this collection of flowcharts. Go have a look it's really cool 😜

Compute

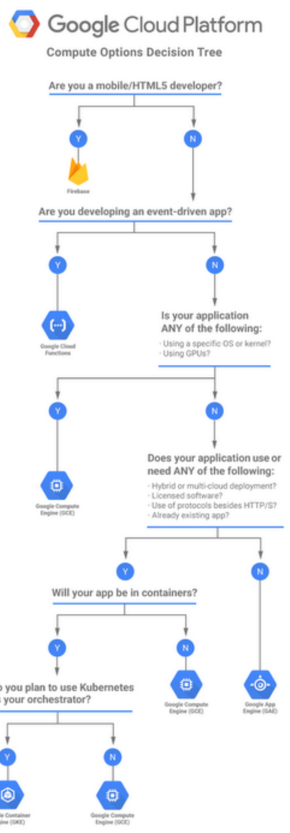
Which compute option ?

Even with the increasing popularity of serverless options traditional Compute options are very much in demand. I know I know I'm using traditional and including App engine & Kubernetes but even k8s is 5 years old now (at the time of writing June 2019) so I think I can get away with that :-) So choosing a traditional compute option flowchart is still very much valid

GCP has a continuum of compute options which can be graphically depicted as:


Google Compute Engine (GCE)
Google Container Engine (GKE)
Google App Engine (GAE)
Google Cloud Functions
Firebase
Highly customizable / Highly managed

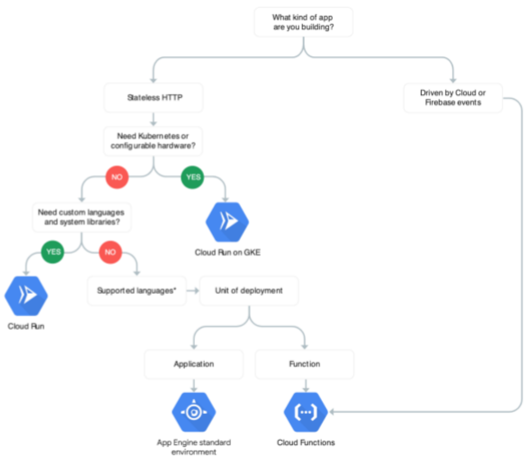
It may be obvious at either end of the continuum which option you choose but the decision becomes less straigh tforward in the middle so flowchart to the rescue :


Google Cloud Platform
Compute Options Decision Tree
Are you a mobile/HTML5 developer?
Y
N
Firebase
Are you developing an event-driven app?
Y
N
Google Cloud Functions
Is your application ANY of the following:
· Using a specific OS or kernel?
· Using GPUs?
Y
N
Google Compute Engine (GCE)
Does your application use or need ANY of the following:
· Hybrid or multi-cloud deployment?
· Licensed software?
· Use of protocols besides HTTP/S?
· Already existing app?
Y
N
Will your app be in containers?
Y
N
Do you plan to use Kubernetes as your orchestrator?
Google Compute Engine (GCE)
Google App Engine (GAE)
Y
N
Google Container Engine (GKE)
Google Compute Engine (GCE)

The compute flowchart with accompanying words can be found here (https://cloudplatform.googleblog.com/2017/07/choosing-the-right-compute-option-in-GCP-a-decision-tree.html?m=1) and a nice table comparing the compute options is here (https://cloud.google.com/docs/choosing-a-compute-option#comparing_options) .

Which Serverless (compute) Option?

If you want access to compute power where you just want to write the code and not have to worry about the underlying infrastructure then the serverless options are for you. Basically GCP takes care of the servers that are actually lurking way underneath the abstraction for you as well as the provisioning (scaling up & down) .

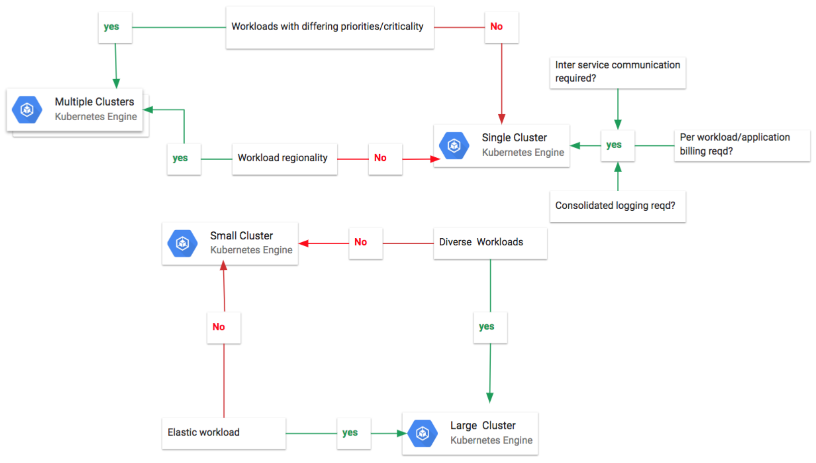

What kind of app are you building?
Stateless HTTP
Driven by Cloud or Firebase events
Need Kubernetes or configurable hardware?
NO
YES
Need custom languages and system libraries?
Cloud Run on GKE
YES
NO
Cloud Run
Supported languages*
Unit of deployment
Application
Function
App Engine standard environment
Cloud Functions

GKE by itself is not serverless as fits this description as you still have to define and configure way too much it's not just a here's my code and here you go through but it does provide the platform for a serverless platform as you can see in the flow chart. But the sharp eyed amongst you may have noticed that Apo Engine can be considered a serverless service although it's also included in the what I call traditional compute option

The flow chart and words about GCP serverless options can be found here (https://cloud.google.com/serverless-options/) There's also a product comparison table (https://cloud.google.com/serverless-options/#header_3)

Sizing & scoping GKE clusters to meet your use case

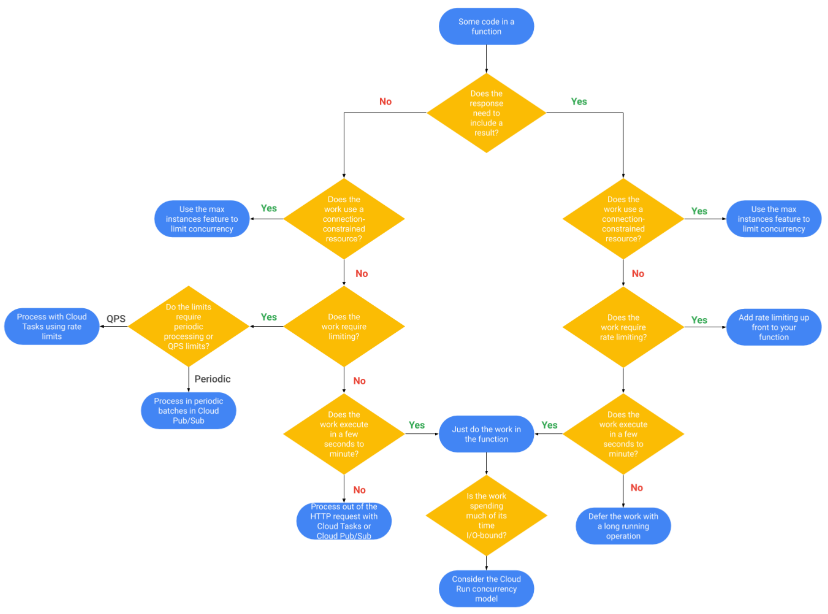
Determining the number of GKE (Google kubernetes engine) clusters and the size of the clusters required for your workloads requires looking at a number of factors. The article Choose size and scope of Kubernetes engine (https://cloud.google.com/solutions/scope-and-size-kubernetes-engine-clusters) discusses these factors. Alas it's sadly lacking a flowchart so I've addressed that for you (maybe at some point the article will include a flowchart). I know it seems I have created 2 mini charts but then it was a post about sizng & scoping your GKE clusters !



The words discussing the decision points are all in the article (https://cloud.google.com/solutions/scope-and-size-kubernetes-engine-clusters)

Serverless Scaling Strategies

Write code, deploy it and the scaling will happen automagically for you thats the usp of "serverless" . That may be mostly true if your full stack auto scales but in a lot of cases that isn't the case and suddenly you do need to start worrying about backend services such as a database for example that has rate and connection limits. To help you with architecting your serverless applications built with GCP so they scale effectively my colleague @ptone wrote about 6 strategies you can adopt here (https://cloud.google.com/blog/products/serverless/6-strategies-for-scaling-your-serverless-applications) . And yes he included a flowchart for your delectation to help you figure out which strategy is the right one for your use case :

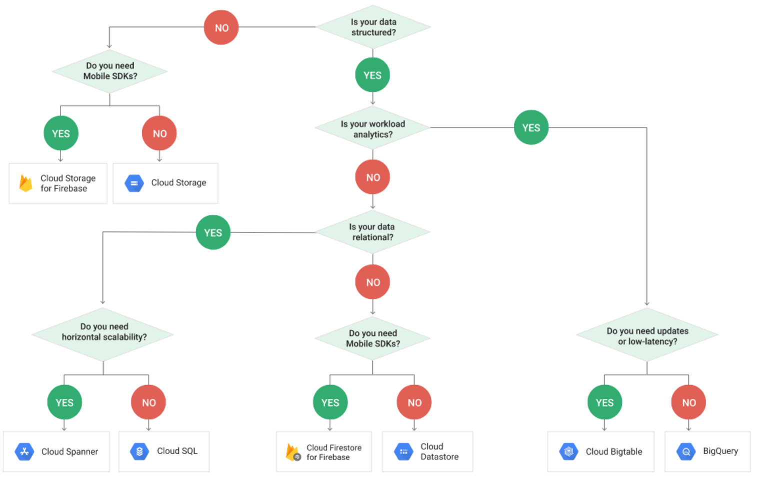

Some code in a function
Does the response need to include a result?
No
Yes
Does the work use a connection-constrained resource?
Yes
Use the max instances feature to limit concurrency
No
Does the work require limiting?
Yes
Do the limits require periodic processing or QPS limits?
QPS
Process with Cloud Tasks using rate limits
Periodic
Process in periodic batches in Cloud Pub/Sub
No
Does the work execute in a few seconds to minute?
Yes
Just do the work in the function
No
Process out of the HTTP request with Cloud Tasks or Cloud Pub/Sub
Is the work spending much of its time I/O-bound?
Consider the Cloud Run concurrency model
Does the work use a connection-constrained resource?
Yes
Use the max instances feature to limit concurrency
No
Does the work require rate limiting?
Yes
Add rate limiting up front to your function
Does the work execute in a few seconds to minute?
Yes
No
Defer the work with a long running operation

If after admiring that flowchart you want to dive deeper into rate limiting techniques using GCP there's this (https://cloud.google.com/solutions/rate-limiting-strategies-techniques)

Storage and Data

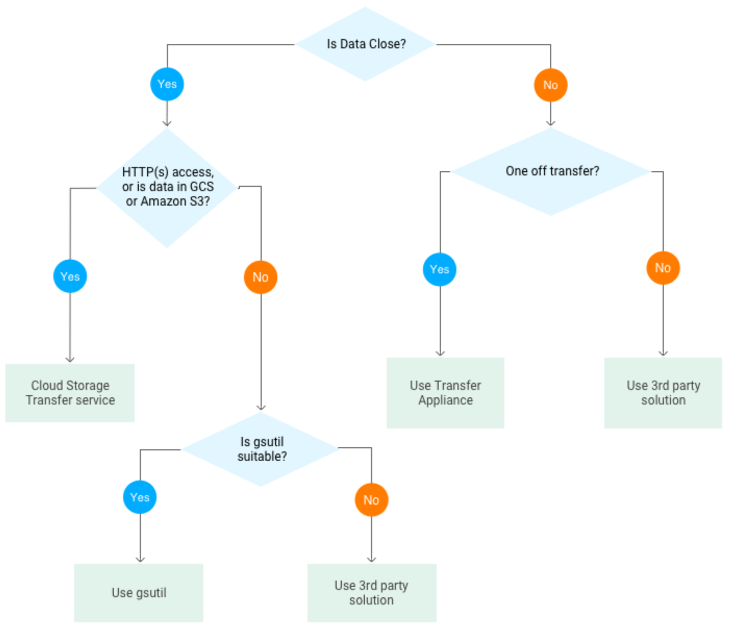
What Storage type?

Data data data data data! (Sung to the 60's Batman theme music (https://www.youtube.com/watch?v=1qP-NglUeZU)) . I struggle to think of any application where data isn't a thing . The myriad ways you can store your data is probably after considering the security controls needed the most important decision you need to make. Google Cloud has your back with some useful tables (I love tables too) which can be found here (https://cloud.google.com/products/databases/) and here's a complementary flowchart to help you decide which storage option fits your use case



How to select the appropriate way to transfer data sets to GCP for your use case

Transferring large data sets to GCP (or indeed any cloud) means that you have to consider two initial questions How much data do you need to transfer? and how long have you got to get that data to GCP? In this case we are really focusing on getting large volumes of data to Cloud Storage. This then leads onto the other questions that you need to consider to allow you to determine what transfer method may meet your use case . How are you connected to GCP? How much bandwidth is actually available between your source and GCP? The article on Transferring big data sets to GCP (https://cloud.google.com/solutions/transferring-big-data-sets-to-gcp) discusses the information you need to determine the connectivity required and what methods to choose. It has a flowchart and the one below is a slightly modified version of the one found in the article.



Choosing a Cloud Storage class for your use case

Cloud Storage (GCS) is a fantastic service which is suitable for a variety of use cases. The thing is it has different classes and each class is optimised to address different use cases. (https://cloud.google.com/storage/docs/storage-classes#comparison_of_storage_classes) All the storage classes offer low latency (time to first byte typically tens of milliseconds) and high durability. You can use the same APIls , lifecycle rules etc . Basically the classes differ by their availability, minimum storage durations, and charges for storage and access.

There are 4 classes that you need to care about .

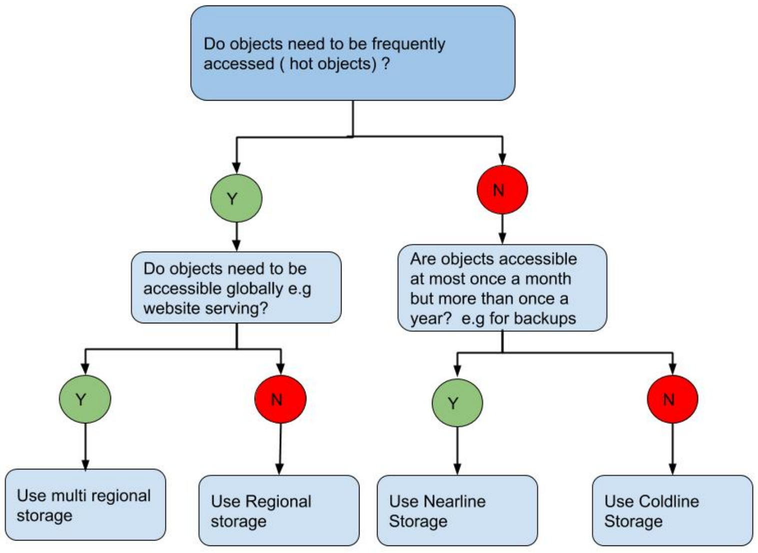
Multi regional—geo redundant (https://cloud.google.com/storage/docs/key-terms#geo-redundant) storage optimised for storing data that is frequently accessed ("hot" objects) for example web site serving and multi media streaming.

Regional—Data can be stored at lower cost, with the trade-off of data being stored in a specific regional location, instead of having redundancy distributed over a large geographic area. This is ideal for when you need the data to be close to the computing resources that process the data say for when using Dataproc.

Nearline—Nearline Storage is ideal for data you plan to read or modify on average once a month or less. Nearline Storage data stored in multi-regional locations is redundant across multiple regions, providing higher availability than Nearline Storage data stored in regional locations. This is great for backups . You should be carrying out regular DR fire drills at least once a month which includes recovering your data from your backups !

Coldline- a very low cost, highly durable storage service. It is the best choice for data that you plan to access at most once a year, due to its slightly lower availability, 90-day minimum storage duration, costs for data access, and higher per-operation costs. This is ideal for long term archiving use cases

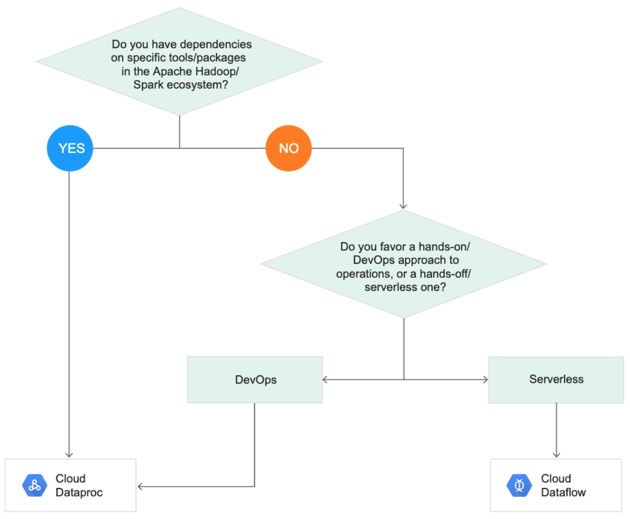
Here's a flow chart that helps you decide which storage class is appropriate for your use case when you don't feel like reading too many words to figure out your choices (which after all is what flowcharts are for) .


Do objects need to be frequently accessed (hot objects) ?
Y
N
Do objects need to be accessible globally e.g website serving?
Are objects accessible at most once a month but more than once a year? e.g for backups
Y
N
Y
N
Use multi regional storage
Use Regional storage
Use Nearline Storage
Use Coldline Storage

For an overview of the GCS storage classes see here (https://cloud.google.com/storage/docs/storage-classes)

Data processing - Cloud Dataflow versus Cloud Dataproc

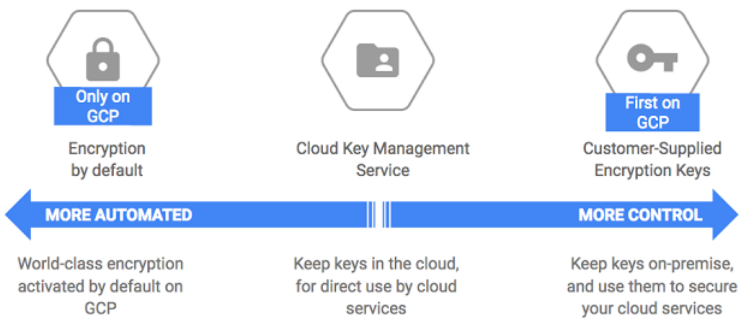
If you have lots of files that need processing you may already be familiar with the Hadoop /Spark ecoystem and you would probably use GCP's Cloud Dataproc (https://cloud.google.com/dataproc/) as the path of least resistance. But GCP also has a unified batch & stream service Cloud Dataflow (https://cloud.google.com/dataflow/) which is their managed Apache beam (https://beam.apache.org/) . Cloud Dataflow is a service unlike Dataproc where you don't need to worry about the compute so it's a "serverless" service because GCP takes care of provisioning and managing the compute on your behalf. GCP have created a handy flowchart for you which can be found on both the Cloud Dataflow & Cloud Dataproc landing pages with more words than I have here.


Do you have dependencies on specific tools/packages in the Apache Hadoop/ Spark ecosystem?
YES
NO
Do you favor a hands-on/ DevOps approach to operations, or a hands-off/ serverless one?
DevOps
Serverless
Cloud Dataproc
Cloud Dataflow

Security

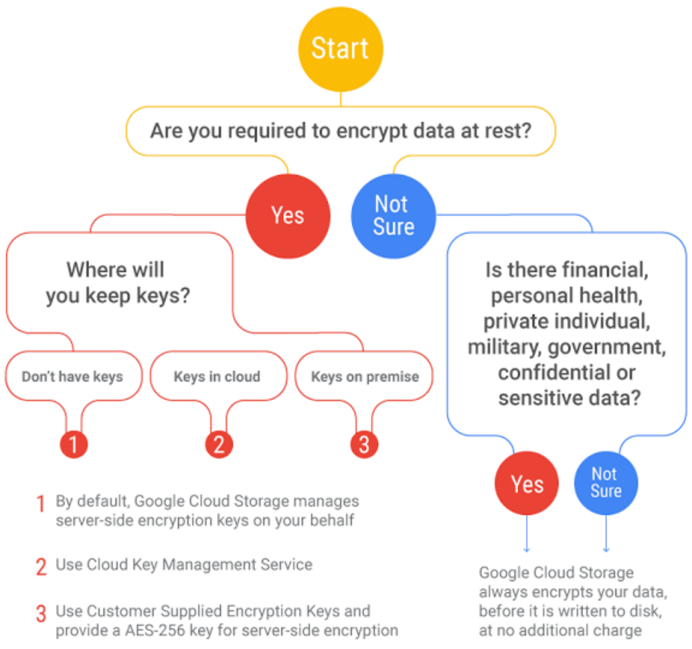
How to manage encryption keys

GCP has a continuum of ways for you to manage your encryption keys graphically depicted as



Only on GCP
Encryption by default
Cloud Key Management Service
First on GCP
Customer-Supplied Encryption Keys
MORE AUTOMATED
MORE CONTROL
World-class encryption activated by default on GCP
Keep keys in the cloud, for direct use by cloud services
Keep keys on-premise, and use them to secure your cloud services

Yes I know that the continuum graphic alone is probably all you need but when the announcement for the KMS service was made they produced a flow chart and I Just had to include it here



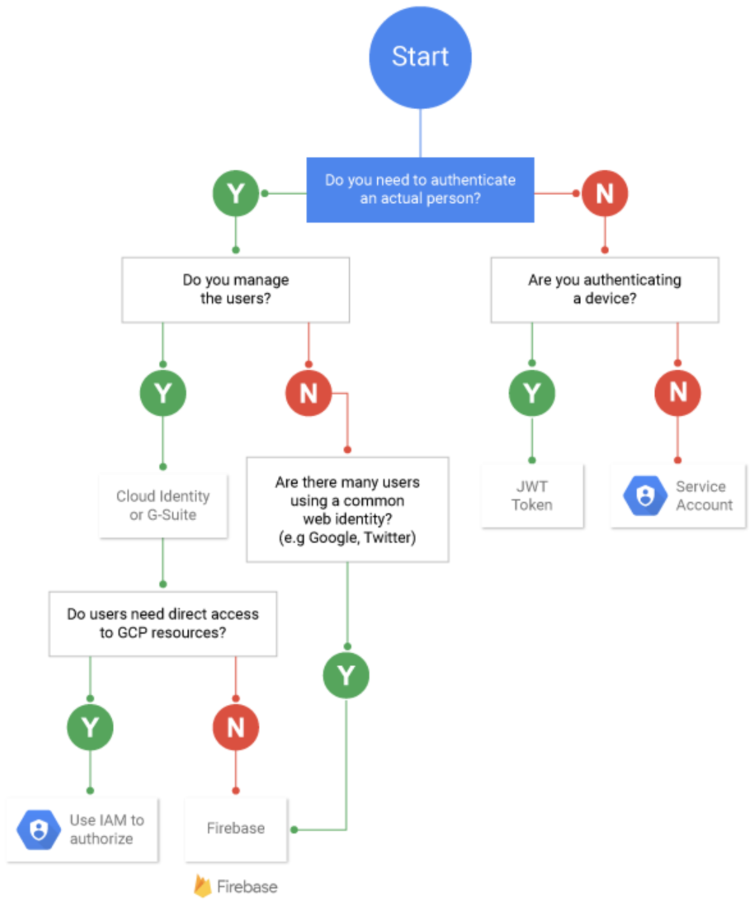
Start
Are you required to encrypt data at rest?
Yes
Not Sure
Where will you keep keys?
Don't have keys
Keys in cloud
Keys on premise
1
2
3
Is there financial, personal health, private individual, military, government, confidential or sensitive data?
Yes
Not Sure
1 By default, Google Cloud Storage manages server-side encryption keys on your behalf
2 Use Cloud Key Management Service
3 Use Customer Supplied Encryption Keys and provide a AES-256 key for server-side encryption
Google Cloud Storage always encrypts your data, before it is written to disk, at no additional charge

The words that go with the above can be found here (https://cloudplatform.googleblog.com/2017/01/managing-encryption-keys-in-the-cloud-introducing-Google-Cloud-Key-Management-Service.html?m=1) and a nice table that compliments the flow chart can be found here (https://cloud.google.com/security/encryption-at-rest/) at the Encryption at rest landing page . (Everything you ever wanted to know about Encryption at rest on GCP and more !)

Which Authentication option ?

I was torn about keeping this one in this list but in the end I decided to keep it as it was still valid and the flowchart below it on using GCP's Identity platform complemented rather than replaced it. This is one of my own flowcharts as at the time I wrote the original medium post GCP didn't have one for this yet!! Then in Dec 2nd 2017: Neal Mueller (https://medium.com/u/bb122fd3fe7a) responded to my hint about wanting a GCP flowchart for Authentication and it's so much prettier than my version 😊 so I updated the flowchart below with the prettier version! Thanks Neal.

So just to make sure we are on the same page authentication identifies who you are ! This flowchart is focused on whether its identity—> application (deployed on GCP) or identity—> direct access to GCP



Start
Do you need to authenticate an actual person?
Y
N
Do you manage the users?
Are you authenticating a device?
Y
N
Y
N
Cloud Identity or G-Suite
Are there many users using a common web identity? (e.g Google, Twitter)
JWT Token
Service Account
Do users need direct access to GCP resources?
Y
Y
N
Use IAM to authorize
Firebase
Firebase

and as I haven't written the words to go with this flowchart I've left you a few links instead:

Firebase Authentication (https://firebase.google.com/docs/auth/)

Service Accounts (https://cloud.google.com/iam/docs/service-accounts)

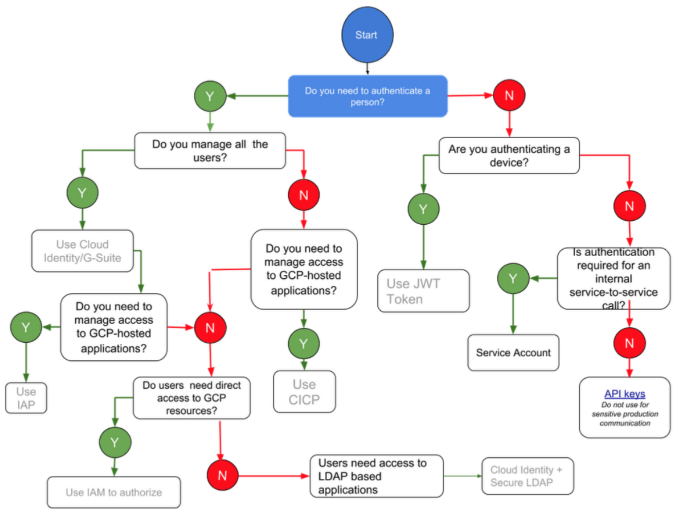
GAE User authentication options (https://cloud.google.com/appengine/docs/standard/python/oauth/)

Cloud IoT using JSON Web Tokens (https://cloud.google.com/iot/docs/how-tos/credentials/jwts)

Cloud Identity (https://support.google.com/a/answer/7319251?hl=en)

Need an identity mgt product?

How you manage your identities depends on the use case. Need to manage users who will have direct access to GCP resources versus users who need access to an application that you're hosting on GCP? Different requirements and thus different solutions required. Here's a flowchart to help you figure out out the right solution for your use case.

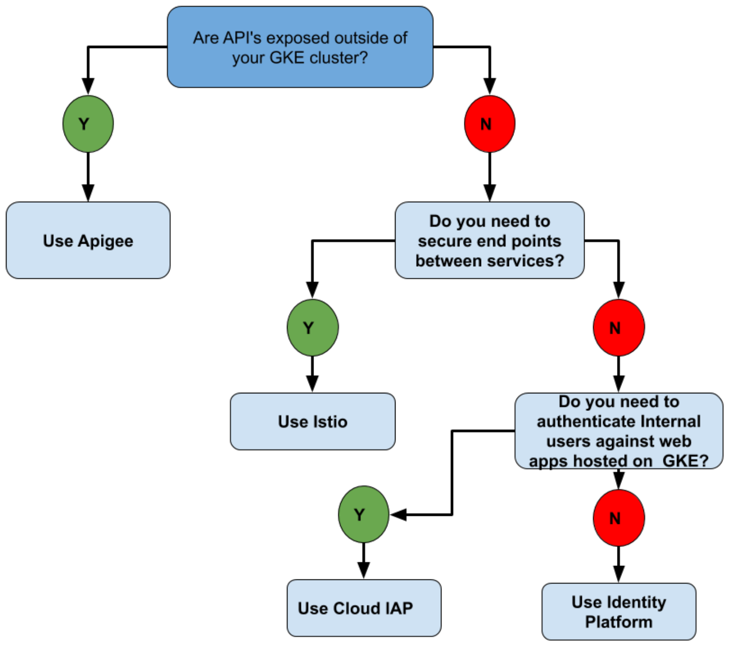

Start
Do you need to authenticate a person?
Y
N
Do you manage all the users?
Are you authenticating a device?
Y
N
Y
N
Use Cloud Identity/G-Suite
Do you need to manage access to GCP-hosted applications?
Use JWT Token
Is authentication required for an internal service-to-service call?
Do you need to manage access to GCP-hosted applications?
Y
N
Y
Y
N
Service Account
Use IAP
Use CICP
Do users need direct access to GCP resources?
API keys
Do not use for sensitive production communication
Y
N
Use IAM to authorize
Users need access to LDAP based applications
Cloud Identity + Secure LDAP

I will get round to updating this flowchart one day to reflect the name change from CICP to identity platform (https://cloud.google.com/blog/products/identity-security/simplifying-identity-and-access-management-of-your-employees-partners-and-customers) . The words that go with the flowchart can be found here (https://cloud.google.com/blog/products/identity-security/identity-and-authentication-the-google-cloud-way) .

Securing your GKE end points

Arguably this flowchart could be catalogued under Compute but as it's about **securing** end points under security it goes. The idea for this flowchart arose after my team had the discussion re what option would be appropriate for what use case when you want to secure your end points using GKE. So thanks team for the inspiration for this one

When a GKE operator wants to serve content from GKE and secure it they have a number of ways of addressing this depending on the use case as shown in this flow chart:


Are API's exposed outside of your GKE cluster?
Y
N
Use Apigee
Do you need to secure end points between services?
Y
N
Use Istio
Do you need to authenticate Internal users against web apps hosted on GKE?
Y
N
Use Cloud IAP
Use Identity Platform

APi's exposed outside of your GKE cluster then use Apigee edge (https://docs.apigee.com/api-platform/get-started/what-apigee-edge) which provides a way to manage your API'ss acting as a proxy to them. It can provide services such as security e.g is that call to your API authorized.

If you are looking at service to service security within the cluster then Istio is the mesh (https://istio.io/docs/concepts/security/) for you

if you are wanting to authenticate access to your web apps it depends on whether they are internal users or external. For internal users then Cloud IAP (https://cloud.google.com/iap/docs/enabling-kubernetes-howto) is where you need to stop and have a look while for end users Identity platform (https://cloud.google.com/blog/products/identity-security/getting-started-with-identity-platform) is the stop you need.

You can also use Istio and Apigee together. Istio can secure the communication between services, provide observability, etc while Apigee can provide external authentication, quotas and overall API policy management.

There are nuances particularly with istio which and I quote my team mate James "the lines blur a bit when looking at Istio" but starting from here isn't a bad place to start from

Authenticating service accounts

Depending on your use case the way you configure service accounts to authenticate to Google cloud to access resources differs

The article: Best practices for using and managing service accounts (https://cloud.google.com/iam/docs/best-practices-for-using-and-managing-service-accounts)

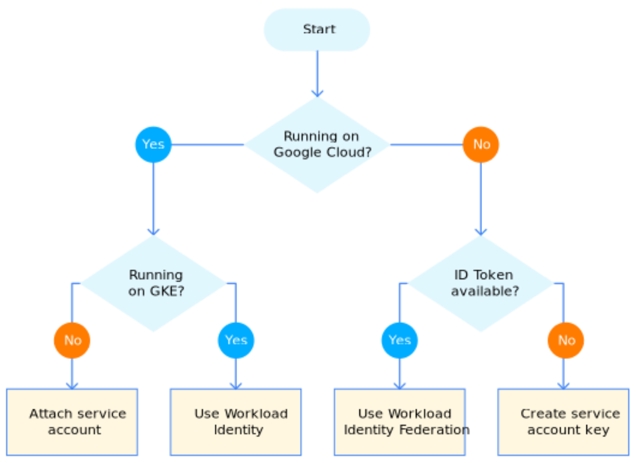
Identifies four ways you can approach authentication to meet specific use cases.

Attached service accounts (https://cloud.google.com/iam/docs/impersonating-service-accounts#attaching-to-resources) - you attach the service account to the underlying compute resource. By attaching the service account, you enable the application to obtain tokens for the service account and to use the tokens to access Google Cloud APIs and resources.

For kubernetes use **workload identity (https://cloud.google.com/kubernetes-engine/docs/how-to/workload-identity)** - Create a dedicated service account for each Kubernetes pod that requires access to Google APIs or resources. This limits the scope of access to the pod level rather than the node. For each Kubernetes pod that requires access to Google APIs or resources you create a Kubernetes service account (https://kubernetes.io/docs/reference/access-authn-authz/service-accounts-admin/) and attach it to the pod . Workload Identity is used to create a mapping between the service accounts and their corresponding Kubernetes service accounts.

Running your application on premises or another cloud no problem you can use **Workload identity federation (https://cloud.google.com/iam/docs/workload-identity-federation)** . Workload identity federation lets you create a one-way trust relationship between a Google Cloud project and an external identity provider. Once you've established the trust, applications can use credentials issued by the trusted identity provider to impersonate a service account. By using workload identity federation, you can let applications use the authentication mechanisms that the external environment provides (e.g AD FS,AWS temporary credentials (https://docs.aws.amazon.com/IAM/latest/UserGuide/id_credentials_temp_request.html)) and you avoid having to store and manage service account keys.

There are always cases where you need to do the thing we really don't want to do and in this case it's having to download service account keys so as loathe as I am to mention this option due to the risks involved with downloading service account keys there are just some situations it cannot be avoided . If you must do this then I would suggest using Vault secrets engine (https://www.vaultproject.io/docs/secrets/gcp#service-account-keys) to manage service account keys. And no entry here is complete without its flowchart:



Choosing Private access options (https://cloud.google.com/vpc/docs/private-access-options)

Accessing Google APIs and services from non public routable IP addresses is a very common configuration requirement and as you would expect there are various ways to achieve this using Google Cloud. What configuration you use ultimately boils down to having to be concerned about three things

- If your source is on premises or it's a Google cloud resource
- If you need to only access resources that are supported by VPC service controls
- Is your Google cloud source serverless or not

If your source is on premises you need to connect to a Google cloud VPC network by using Cloud VPN (https://cloud.google.com/network-connectivity/docs/vpn) or Cloud Interconnect (https://cloud.google.com/network-connectivity/docs/interconnect) . If you need to restrict access to only those services supported by VPC Service controls you need to configure DNS, firewall rules, and routes to use one of the Private Google Access-specific domains and VIPs (https://cloud.google.com/vpc/docs/private-google-access-hybrid#private-vips)

Use **restricted.googleapis.com** when you only need access to Google APIs and services that are supported by VPC Service Controls. See the list of supported services here (https://cloud.google.com/vpc-service-controls/docs/supported-products) .

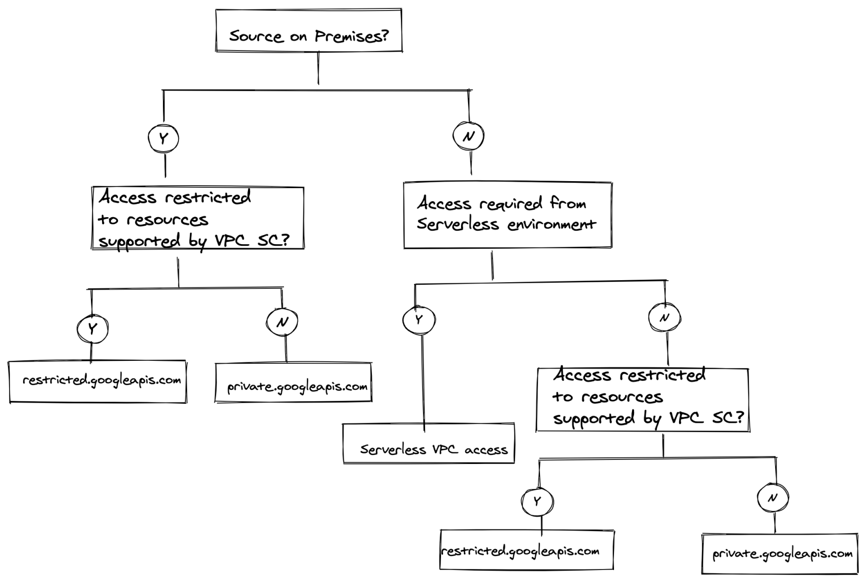
Use **private.googleapis.com** if you need access to any google apis or service that is not restricted by you configuring VPC Service Controls.

By configuring private google access (https://cloud.google.com/vpc/docs/configure-private-google-access#config) on the subnet of your Google cloud VPC network where you have VMs without external IP addresses the VMs can also use Private Google Access-specific domains and VIPs (https://cloud.google.com/vpc/docs/private-google-access-hybrid#private-vips) to access Google Cloud services and APIs

An alternative configuration for VMs without external IPs is to use a private service connect endpoint (https://cloud.google.com/vpc/docs/private-service-connect) in your VPC network. There are some cool use cases that this can be used with from your on-premises network as well. For example you can use your own wide-area networking instead of Google's, to control data movement by you managing which Cloud Interconnect attachment (VLAN) is used to send traffic to Google APIs.

If your serverless environment needs to access resources in your VPC network via internal IP addresses then use Serverless VPC access (https://cloud.google.com/vpc/docs/serverless-vpc-access) . This enables you to connect from Cloud Run, Cloud Functions or App Engine Standard directly to your VPC network.

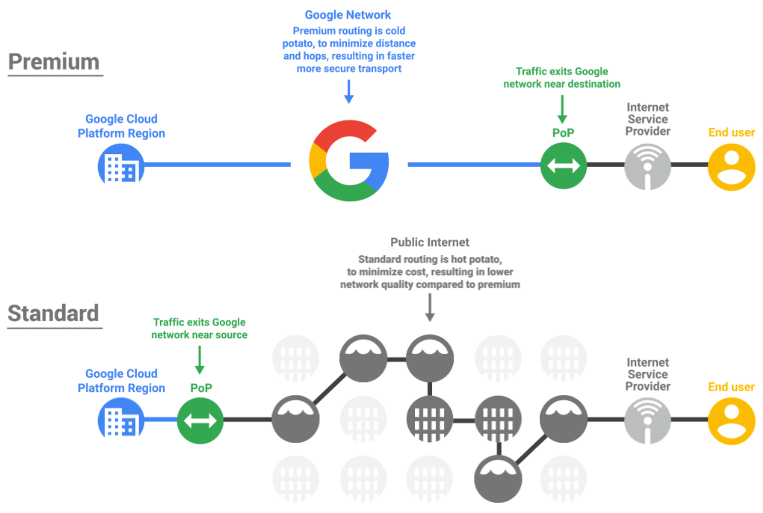
Here's the obligatory flowchart (I used Excalidraw (https://excalidraw.com/))


Source on Premises?
Y
N
Access restricted to resources supported by VPC SC?
Access required from Serverless environment
Y
N
Y
N
restricted.googleapis.com
private.googleapis.com
Serverless VPC access
Access restricted to resources supported by VPC SC?
Y
N
restricted.googleapis.com
private.googleapis.com

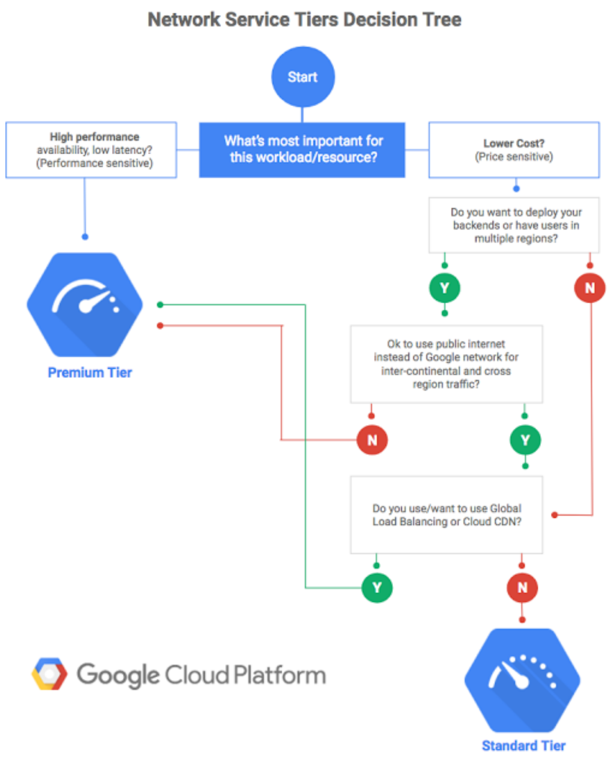
Networking

Which Network Tier?

GCP's network even if I say so myself is fantastic but it's recognised that not every use case needs to optimize for performance and cost may be the driver. So welcome to Network tiers.


Premium
Google Network
Premium routing is cold potato, to minimize distance and hops, resulting in faster more secure transport
Traffic exits Google network near destination
Google Cloud Platform Region
PoP
Internet Service Provider
End user
Standard
Public Internet
Standard routing is hot potato, to minimize cost, resulting in lower network quality compared to premium
Traffic exits Google network near source
Google Cloud Platform Region
PoP
Internet Service Provider
End user

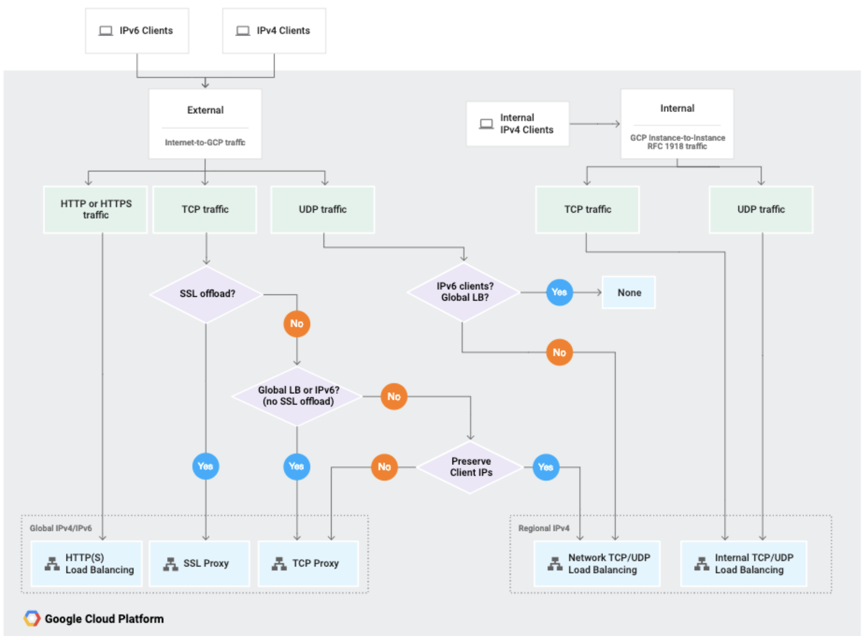
You can see the funky animated gif for the above image here (https://2.bp.blogspot.com/-Za3HWtGbQK8/WZ3TuWoVxzI/AAAAAAAAETc/bkqmGj9TBXYGTMO6naL3t_pRh_LIz7XtACK4BGAYYCw/s1600/image2.gif)


Network Service Tiers Decision Tree
Start
What's most important for this workload/resource?
High performance availability, low latency? (Performance sensitive)
Lower Cost? (Price sensitive)
Do you want to deploy your backends or have users in multiple regions?
Y
N
Ok to use public internet instead of Google network for inter-continental and cross region traffic?
N
Y
Do you use/want to use Global Load Balancing or Cloud CDN?
Y
N
Premium Tier
Standard Tier
Google Cloud Platform

The words that go with the above can be found here (https://cloud.google.com/network-tiers/) . There are some useful tables there too.

Choosing a Load balancer

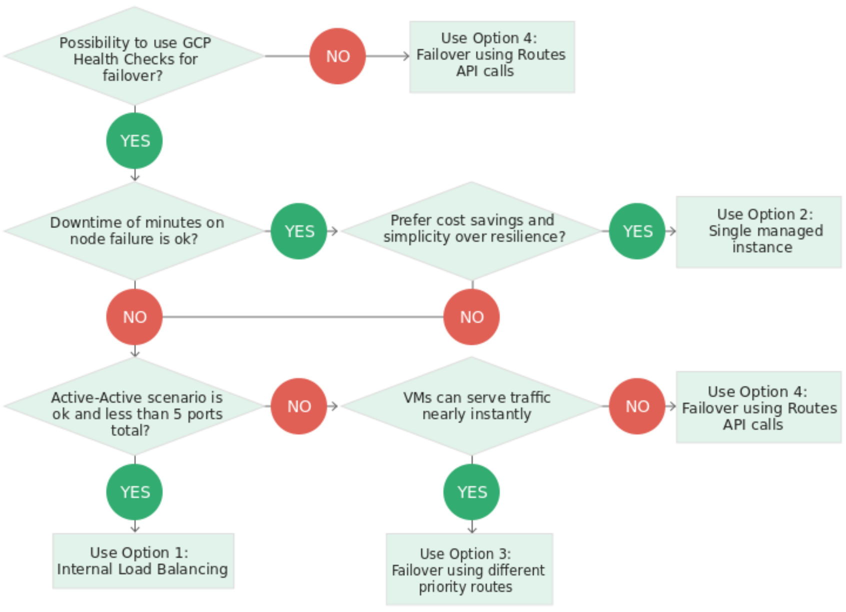
Load balancing is great it allows you to treat a group of compute resources as a single entity providing an entry point that has in the case of GCP load balancing services a single anycast IP address. Combining GCP Load balancers with autoscaling you can scale the resources up and down according to metrics you configure. There are loads more cool features but you get the idea. So what type of load balancing service do you need? Layer 7, layer 4, global , regional? Maybe you need an internal load balancer well there's a flowchart for helping you decide (Okay you knew that was coming didn't you? 😜)



Here (https://cloud.google.com/load-balancing/docs/choosing-load-balancer) are the words to go with the flowchart. Once you have figured out what load balancing option is likely to address your needs have a look at the load balancing overview (https://cloud.google.com/load-balancing/docs/load-balancing-overview) page as a first stop before diving in.

Choosing the floating IP address pattern that maps to your use case

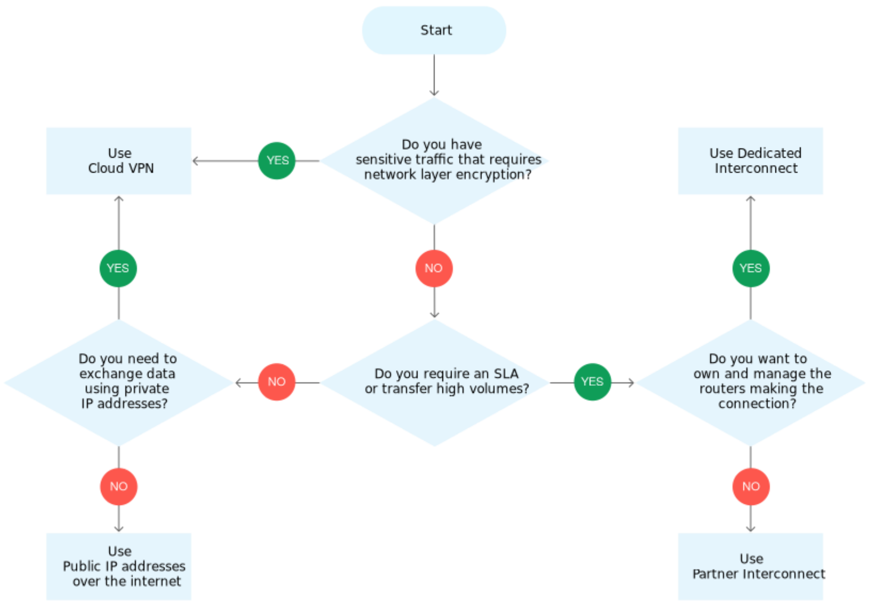
Floating IP's are a way to allow you to move an IP address from one server to another . Typically this pattern is usually required for HA deployments or for disaster recovery scenarios. For example where you have one active server or appliance such as databases with a non serving replica /hot standby . When you have to swap to the secondary server you point the floating IP to it. This negates the need to update clients to use an alternative IP to point to the alternative server. The article On best practices for floating IP addresses (https://cloud.google.com/solutions/best-practices-floating-ip-addresses) has a list of uses cases for on premises (https://cloud.google.com/solutions/best-practices-floating-ip-addresses#floating_ips_in_on-premises_environments) and provides a number of options for implementing the pattern for Compute engine instances and yes has a flowchart to help you choose the solution for your use case . Here's the flow chart


Possibility to use GCP Health Checks for failover?
NO
Use Option 4: Failover using Routes API calls
YES
Downtime of minutes on node failure is ok?
YES
Prefer cost savings and simplicity over resilience?
YES
Use Option 2: Single managed instance
NO
NO
Active-Active scenario is ok and less than 5 ports total?
NO
VMs can serve traffic nearly instantly
NO
Use Option 4: Failover using Routes API calls
YES
YES
Use Option 1: Internal Load Balancing
Use Option 3: Failover using different priority routes

Options for connecting to other clouds from GCP

Whatever the reasons (They range from having processing in one place and data somewhere else, to distributing processing across clouds, through to DR etc) people want to be able to connect to other clouds from GCP.

GCP have written a great article describing the various patterns that can be employed and yes they have a flowchart to help you decide which pattern is the right one for your use case which I share here for your delectation:



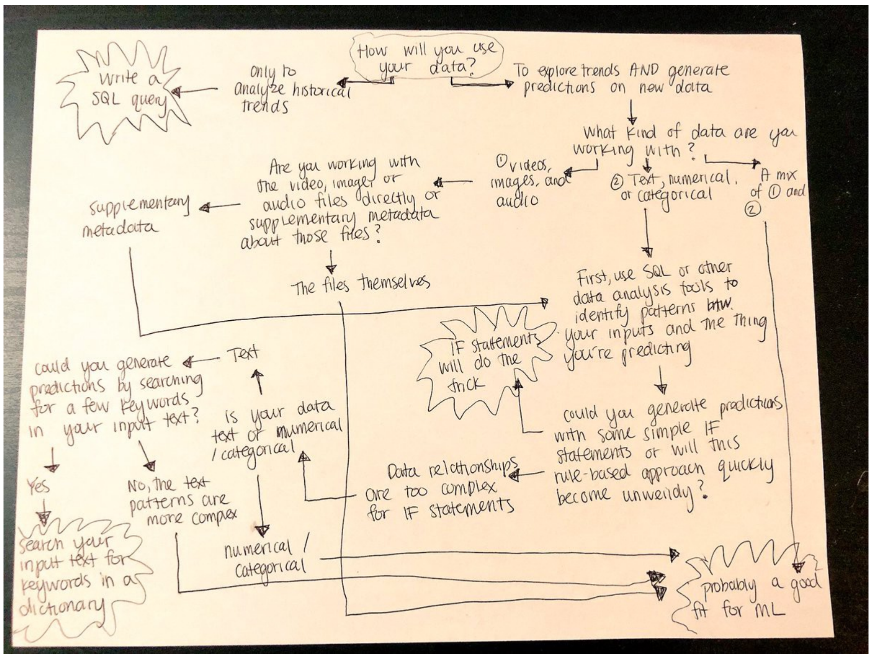
Start
Do you have sensitive traffic that requires network layer encryption?
YES
Use Cloud VPN
NO
Do you require an SLA or transfer high volumes?
NO
Do you need to exchange data using private IP addresses?
YES
NO
Use Public IP addresses over the internet
YES
Do you want to own and manage the routers making the connection?
YES
Use Dedicated Interconnect
NO
Use Partner Interconnect

The article with this flowchart and a walk through of the different patterns can be found here (https://cloud.google.com/solutions/patterns-for-connecting-other-csps-with-gcp)

Data Analytics

ML or SQL ?

Always wanted to know whether you really need to use ML or whether a SQL query will suffice well Sara Robinson (https://medium.com/@srobtweets) tweeted this flow chart



How will you use your data?
Only to analyze historical trends
Write a SQL query
To explore trends AND generate predictions on new data
What kind of data are you working with?
① Videos, images, and audio
② Text, numerical, or categorical
A mix of ① and ②
Are you working with the video, image or audio files directly or supplementary metadata about those files?
supplementary metadata
The files themselves
First, use SQL or other data analysis tools to identify patterns b/w your inputs and the thing you're predicting
Could you generate predictions with some simple IF statements or will this rule-based approach quickly become unweildy?
IF statements will do the trick
Data relationships are too complex for IF statements
Is your data text or numerical / categorical
Text
Could you generate predictions by searching for a few keywords in your input text?
Yes
Search your input text for keywords in a dictionary
No, the text patterns are more complex
numerical / categorical
Probably a good fit for ML

From https://twitter.com/SRobTweets/status/1053273512079699968 (https://twitter.com/SRobTweets/status/1053273512079699968)

She then wrote some words to augment the flowchart here (https://medium.com/@srobtweets/when-should-you-use-machine-learning-part-1-b0028603ac3a) and then wrote some more words (https://medium.com/@srobtweets/sql-or-ml-the-same-dataset-two-ways-233e611619bd) walking you through figuring out if ML is a good fit for your prediction task. A SQL query may be all you need. Use the right tool for the job . I love these two posts well I do get to look at the flowchart twice !

Running Juypter notebooks on Google cloud

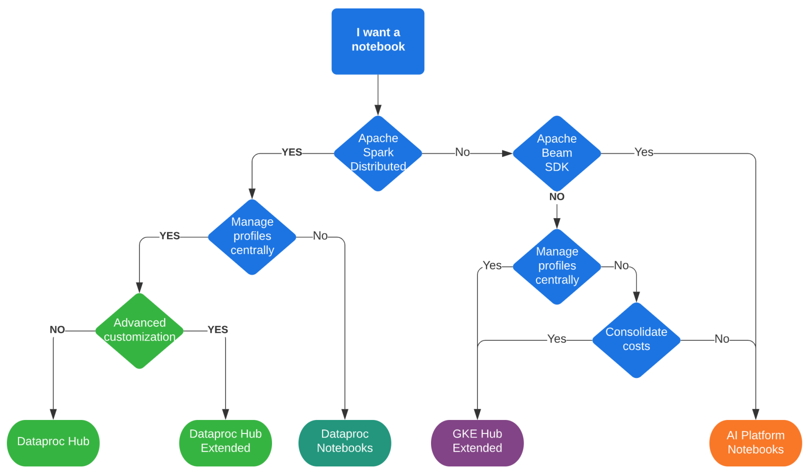
Jupyter notebooks (https://jupyter.org/) are used to create and share documents that contain live code, equations, visualizations and narrative text. Their use for data science use cases is ubiquitous. Depending on your use case you need to make a decision re exactly how you manage them on Google cloud to meet the balance between the controls administrators need to apply to meet the principles of least privilege by using a hub (https://cloud.google.com/solutions/extending-ai-platform-notebooks-to-dataproc-and-gke?authuser=0#choosing_a_hub) to manage user profiles centrally , yet allowing users of the notebooks to do their jobs without restrictive controls getting in the way as they see it!

It's a delicate balancing act and then to add to that you need to figure out what product is suitable to run your notebooks on:

- Dataproc (https://cloud.google.com/dataproc/docs/tutorials/jupyter-notebook?authuser=0) : where users run notebook servers through the Jupyter component (https://cloud.google.com/dataproc/docs/concepts/components/jupyter?authuser=0) on a Spark-enabled Dataproc cluster.
- AI Platform Notebooks (https://cloud.google.com/ai-platform-notebooks?authuser=0) : where users run notebook servers on a single Compute Engine instance.

This all starts to feel confusing but by starting with the question of whether the users of the notebooks need to use spark you can quickly determine what configuration meets your use case.

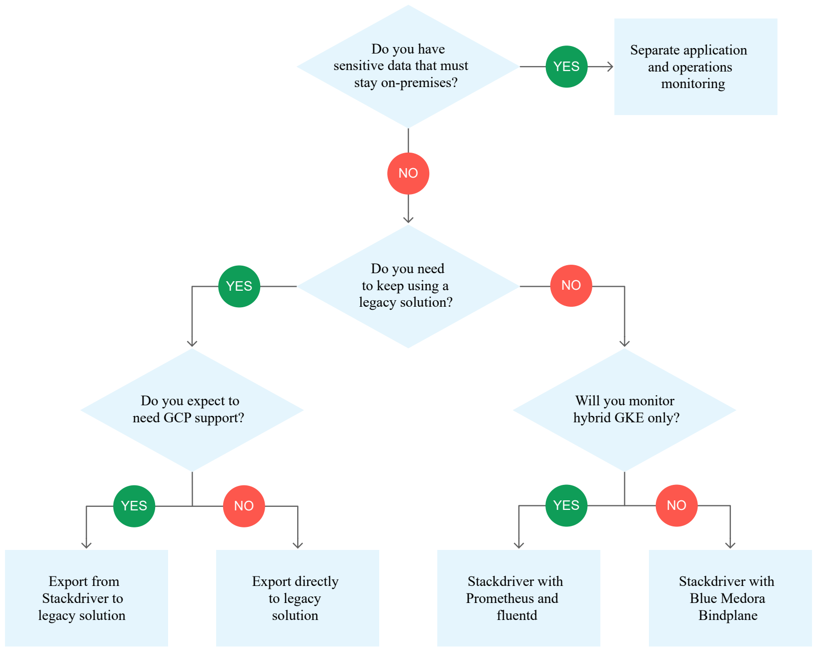
The article Extending AI Platform Notebooks to Dataproc and Google Kubernetes Engine (https://cloud.google.com/solutions/extending-ai-platform-notebooks-to-dataproc-and-gke) has a handy flow chart that basically starts with that question and a comprehensive walkthrough to help you figure out what is the right configuration for you to run Jupyter notebooks for your use case.



Misc

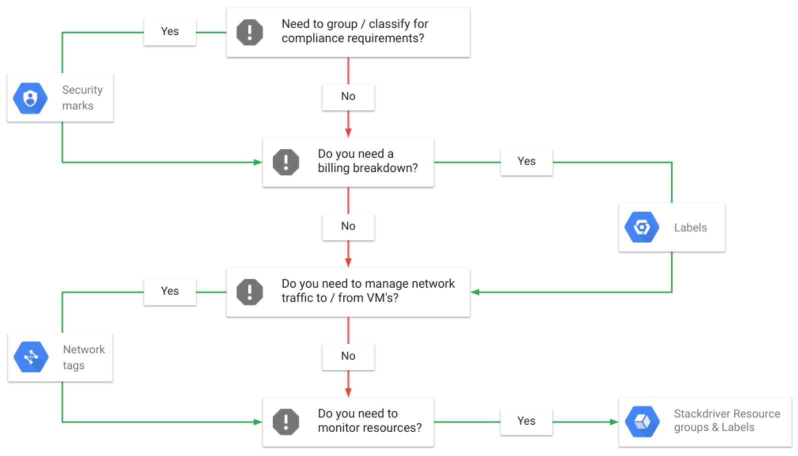
Hybrid & multi-cloud logging & monitoring patterns

Hybrid and multi-cloud architectures are here to stay and looking at ways to manage those is key to not having to wipe the tears of ops/ sysadmin staff dealing with the operational overhead. It's important to have a consistent logging and monitoring approach not only to give a single pane of glass but to simplify the admin of managing applications in two environments. This guide (https://cloud.google.com/solutions/hybrid-and-multi-cloud-monitoring-and-logging-patterns) discusses architectural patterns for logging & monitoring in hybrid or multi cloud environments and it's flow chart helps navigate your choices between a centralised logging approach no matter where your apps are deployed versus a segregated approach.


Do you have sensitive data that must stay on-premises?
YES
Separate application and operations monitoring
NO
Do you need to keep using a legacy solution?
YES
NO
Do you expect to need GCP support?
Will you monitor hybrid GKE only?
YES
NO
YES
NO
Export from Stackdriver to legacy solution
Export directly to legacy solution
Stackdriver with Prometheus and fluentd
Stackdriver with Blue Medora Bindplane

What annotations(labels) should you use for which use case

GCP has a number of ways of annotating or labelling(this can get slightly over loaded hence the use of the word annotation) resources. Each annotation has different functionality and scope, they are not mutually exclusive and you will often use a combination of them to meet your requirements so I wrote a post (https://cloudplatform.googleblog.com/2018/06/Labelling-and-grouping-your-Google-Cloud-Platform-resources.html) with added flow chart to help you navigate which annotation(s) to use for what use case. Here's the flow chart :


Need to group / classify for compliance requirements?
Yes
Security marks
No
Do you need a billing breakdown?
Yes
Labels
No
Do you need to manage network traffic to / from VM's?
Yes
Network tags
No
Do you need to monitor resources?
Yes
Stackdriver Resource groups & Labels

Read the post (https://cloudplatform.googleblog.com/2018/06/Labelling-and-grouping-your-Google-Cloud-Platform-resources.html) for the words .

Posted on Jun 16, 2019 at 13:36

← Older Posts (https://grumpygrace.dev/posts/back-logging/)

Newer Posts → (https://grumpygrace.dev/posts/top5-gcp-shoutout/)