#### Section 2. Planning and configuring a cloud solution

2.1 Planning and estimating Google Cloud product use using the Pricing Calculator

* Pricing calculator: <https://cloud.google.com/products/calculator/>

2.2 Planning and configuring compute resources. Considerations include:

a. Selecting appropriate compute choices for a given workload (e.g., Compute Engine, Google Kubernetes Engine, Cloud Run, Cloud Functions)

* Compute Options - Where should I run my stuff? <https://cloud.google.com/blog/topics/developers-practitioners/where-should-i-run-my-stuff-choosing-google-cloud-compute-option>
* Cloud Functions vs. Cloud Run: when to use one over the other: <https://cloud.google.com/blog/products/serverless/cloud-run-vs-cloud-functions-for-serverless>
* More detail on each product:
  + Compute Engine: <https://cloud.google.com/blog/topics/developers-practitioners/what-compute-engine-use-cases-security-pricing-and-more>
  + Cloud Run: <https://cloud.google.com/blog/topics/developers-practitioners/cloud-run-story-serverless-containers>
  + GKE: [https://cloud.google.com/blog/topics/developers-practitioners/container-story-google-kubernetes-engine](https://cloud.google.com/blog/topics/developers-practitioners/container-story-google-kubernetes-engine?utm_source=ext&utm_medium=partner&utm_campaign=CDR_pve_gcp_gcpsketchnote_&utm_content=-)
  + Cloud Functions:
    - <https://cloud.google.com/blog/topics/developers-practitioners/learn-cloud-functions-snap>
    - Nice example: <https://medium.com/raccoons-group/how-to-build-an-event-driven-application-on-google-cloud-using-cloud-functions-481caa6b800e>
  + App Engine: <https://cloud.google.com/appengine>

b. Using preemptible VMs and custom machine types as appropriate

* Preemptible VM instances: <https://cloud.google.com/compute/docs/instances/preemptible>
* Creating a preemptible VM: <https://cloud.google.com/compute/docs/instances/create-use-preemptible#creating_a_preemptible_vm>
* Kubernetes use case: ​​<https://cloud.google.com/kubernetes-engine/docs/how-to/preemptible-vms>
* Spot VM Instances: [https://cloud.google.com/compute/docs/instances/spot](https://cloud.google.com/compute/docs/instances/spot?_ga=2.261328013.-1069416389.1634116773&_gac=1.83741412.1652213377.Cj0KCQjwmuiTBhDoARIsAPiv6L_1yW4peJJut7e2T0tgdjrOyfhQarTDmyAl2GNMtX0lKRgKunl6KWkaAuF2EALw_wcB)
* Using Spot instances with GKE: <https://cloud.google.com/kubernetes-engine/docs/concepts/spot-vms>
* Top 5 use cases for Google Cloud Spot VMs explained: [https://cloud.google.com/blog/products/compute/google-cloud-spot-vm-use-cases-and-best-practices](https://cloud.google.com/blog/products/compute/google-cloud-spot-vm-use-cases-and-best-practices?utm_source=ext&utm_medium=partner&utm_campaign=CDR_rom_gcp_gcptechnuggets_feb-a-2022_021622&utm_content=-)
* Custom machine types: <https://cloud.google.com/custom-machine-types>
* Compute Engine (scroll down to see the image providing use cases for the different types): <https://cloud.google.com/compute#section-6>

2.3 Planning and configuring data storage options. Considerations include:

a. Product choice (e.g., Cloud SQL, BigQuery, Firestore, Cloud Spanner, Cloud Bigtable)

* Database Options <https://cloud.google.com/blog/topics/developers-practitioners/your-google-cloud-database-options-explained>
* Cloud SQL: <https://cloud.google.com/blog/topics/developers-practitioners/what-cloud-sql>
* Cloud SQL: <https://cloud.google.com/sql/docs/mysql/introduction>
* Cloud SQL Read Replicas: <https://cloud.google.com/sql/docs/mysql/replication>
* Cloud SQL High Availability: <https://cloud.google.com/sql/docs/mysql/high-availability>
* Cloud SQL backups: <https://cloud.google.com/sql/docs/postgres/backup-recovery/backups>
* Cloud SQL Create on-demand backup: <https://cloud.google.com/sql/docs/postgres/backup-recovery/backing-up#on-demand>
* Cloud Spanner: <https://cloud.google.com/blog/topics/developers-practitioners/what-cloud-spanner>
* Cloud Spanner: <https://cloud.google.com/spanner>
* Firestore: <https://cloud.google.com/blog/topics/developers-practitioners/all-you-need-know-about-firestore-cheatsheet>
* Firestore - What is a Document Database (note this is a reference to a site for MongoDB, which is a document database similar to Firestore): <https://www.mongodb.com/document-databases>
* Firestore codelab (as an example of usage): <https://firebase.google.com/codelabs/firestore-web#0>
* How BIG is Cloud Bigtable: <https://cloud.google.com/blog/topics/developers-practitioners/how-big-cloud-bigtable>
* Bigtable codelab (as an example of usage): <https://codelabs.developers.google.com/codelabs/cloud-bigtable-intro-java#0>

b. Choosing storage options (e.g., Zonal persistent disk, Regional balanced persistent disk, Standard, Nearline, Coldline, Archive)

* A map of storage options in Google Cloud: <https://cloud.google.com/blog/topics/developers-practitioners/map-storage-options-google-cloud>
* A Google Cloud block storage options cheat sheet: <https://cloud.google.com/blog/topics/developers-practitioners/google-cloud-block-storage-options-cheat-sheet>
* Add a persistent disk to your VM: <https://cloud.google.com/compute/docs/disks/add-persistent-disk>
* Formatting and mounting a disk: <https://devopscube.com/mount-extra-disks-on-google-cloud/>
* Share disks between VMs: <https://cloud.google.com/compute/docs/disks/sharing-disks-between-vms>
* High availability options using regional disks: <https://cloud.google.com/compute/docs/disks/high-availability-regional-persistent-disk>
* All you need to know about Cloud Storage: [https://cloud.google.com/blog/topics/developers-practitioners/all-you-need-know-about-cloud-storage](https://cloud.google.com/blog/topics/developers-practitioners/all-you-need-know-about-cloud-storage?utm_source=ext&utm_medium=partner&utm_campaign=CDR_pve_gcp_gcpsketchnote_&utm_content=-)
* gsutil commands: <https://cloud.google.com/storage/docs/gsutil/commands/mb>, <https://cloud.google.com/storage/docs/gsutil/commands/mv> <https://cloud.google.com/storage/docs/gsutil/commands/lifecycle> <https://alexisperrier.com/gcp/2018/01/01/google-storage-gsutil.html>

2.4 Planning and configuring network resources. Tasks include:

a. Differentiating load balancing options

* Choosing a load balancer (contains decision tree): <https://cloud.google.com/load-balancing/docs/choosing-load-balancer>
* Choosing the right load balancer in Google Cloud: <https://medium.com/google-cloud/choosing-the-right-load-balancer-9ec909148a85>
* Cloud Load Balancing overview: <https://cloud.google.com/load-balancing/docs/load-balancing-overview>
* What is Cloud Load Balancing? <https://cloud.google.com/blog/topics/developers-practitioners/what-cloud-load-balancing>
* YouTube video: <https://www.youtube.com/watch?v=h8EqM6Xt3MA&t=160s>
* Load Balancing docs: <https://cloud.google.com/load-balancing/docs>
* Capacity Management with Load Balancing (watch the included video as well): <https://medium.com/google-cloud/capacity-management-with-load-balancing-32bd22a716a7>
* Internal HTTP(S) load balancing: [https://cloud.google.com/load-balancing/docs/l7-internal](https://cloud.google.com/load-balancing/docs/l7-internal?hl=en_US)
* External TCP/UDP Network Load Balancing overview: [https://cloud.google.com/load-balancing/docs/network](https://cloud.google.com/load-balancing/docs/network?hl=en_US)
* Lab suggestions
  + Create an Internal Load Balancer: (must log into Cloud Skills Boost using your partner email: <https://partner.cloudskillsboost.google/focuses/11632?catalog_rank=%7B%22rank%22%3A2%2C%22num_filters%22%3A0%2C%22has_search%22%3Atrue%7D&parent=catalog&search_id=16809788>
  + HTTP Load Balancer with Cloud Armor: <https://partner.cloudskillsboost.google/focuses/11633?catalog_rank=%7B%22rank%22%3A1%2C%22num_filters%22%3A0%2C%22has_search%22%3Atrue%7D&parent=catalog>
  + Network Tiers - Optimizing Network Spend: <https://partner.cloudskillsboost.google/focuses/11629?parent=catalog>

b. Identifying resource locations in a network for availability

* Design for scale and high availability: <https://cloud.google.com/architecture/framework/reliability/design-scale-high-availability?hl=en>

c. Configuring Cloud DNS

* Cloud DNS explained!: <https://cloud.google.com/blog/topics/developers-practitioners/cloud-dns-explained>
* Tutorial: <https://cloud.google.com/dns/docs/tutorials/create-domain-tutorial>
* Another tutorial: <https://cloud.google.com/architecture/warm-recoverable-static-site-failover-cloud-dns?hl=en>
* Quickstart: <https://cloud.google.com/dns/docs/set-up-dns-records-domain-name>