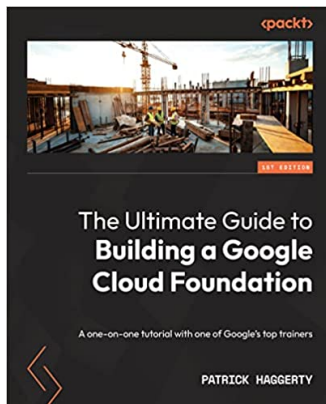

Google Cloud Helpful Resources

About Me	<p>Name: Patrick Haggerty (Director of Google Cloud Learning, ROI Training) Email: patrick.haggerty@roitraining.com or phaggerty@google.com Mobile: +1-228-369-8550 Social Media: https://www.linkedin.com/in/patrickhaggerty/ This Helpful Links File (simple redirect): http://gcp.help PDF version (updated every couple weeks): http://files.gcp.how/links.pdf</p>
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My book on Google Cloud:



<https://www.amazon.com/dp/B09ZV5X257>

Did you know, ROI Training offers training on a broad set of technical topics, including Google Cloud, AWS, Python, Java, JavaScript, Agile, C#, Security, and Technology Project Management?

Great [ROI Training](#) resources:

- ROI YouTube Tutorials and Demos:
https://www.youtube.com/channel/UC8-g09s_opdDruUjYdiuCxg
- LinkedIn Student Resource Group: <https://www.linkedin.com/groups/8620249/>
- ROI Training LinkedIn for News and Updates:
<https://www.linkedin.com/company/roi-training/>

- ROI Google Certification Paths:
<https://docs.google.com/presentation/d/1ppKcy4yMZo9L6CWxAe9ZRwSXvxLLt2c5AoNCLyBHrr0/edit?usp=sharing>
- Full Course List: <https://www.roitraining.com/course-list/>

General:

Keeping informed:

- Google Cloud Console: <https://console.cloud.google.com/>
- Google Cloud Platform (GCP) podcast: <https://www.gcppodcast.com/>
- Kubernetes podcast: <https://kubernetespodcast.com/>
- GCP blog: <https://cloud.google.com/blog/>
- GCP newsletter: <https://cloud.google.com/newsletter>
- GCP YouTube channel: <https://www.youtube.com/user/googlecloudplatform>
- GCP Medium page: <https://medium.com/google-cloud>
- Recent GCP product changes (release notes): <https://cloud.google.com/release-notes>
- **Product specific release notes: <https://cloud.google.com/release-notes/all>
- **What's new in Google Cloud:
<https://cloud.google.com/blog/topics/inside-google-cloud/whats-new-google-cloud>
- GCP on Reddit: <https://www.reddit.com/r/googlecloud/>

Starter information:

- About Google Cloud Services:
<https://cloud.google.com/docs/overview/cloud-platform-services>
- **Google cloud developer's cheat sheet (GCP product list):
 - <https://github.com/priyankavergadia/google-cloud-4-words>
 - (interactive version): <https://googlecloudcheatsheet.withgoogle.com/>
- **Great graphics related to Google Cloud: <https://thecloudgirl.dev/>
- GCP Tutorials: <https://cloud.google.com/docs/tutorials>
- Google cloud design icons: <https://cloud.google.com/icons>
- General Googly (material) icons: <https://fonts.google.com/icons>
- Architecture diagram tool: <https://googlecloudcheatsheet.withgoogle.com/architecture>
- **Google Regions: <https://cloud.google.com/about/locations>
- **Compare Azure, AWS, and GCP services:
<https://cloud.google.com/free/docs/aws-azure-gcp-service-comparison>
- **Check latency from you to every GCP Region: <http://www.gcping.com/>

- Inter-region latency and throughput:
<https://datastudio.google.com/u/0/reporting/fc733b10-9744-4a72-a502-92290f608571/page/70YCB>
- Google datacenter photo gallery: <https://www.google.com/about/datacenters/gallery/>
- Info on GCP Certification: <https://cloud.google.com/certification>
- Google's "green" status: <https://cloud.google.com/sustainability/region-carbon>
- Case studies and customers: <https://cloud.google.com/customers/>
- Find a Google partner: <https://cloud.google.com/find-a-partner/>
- Google Cloud Support hub: <https://cloud.google.com/support-hub>
- Customer care packages: <https://cloud.google.com/support/docs>
- Google Cloud Issue tracker: <https://cloud.google.com/support/docs/issue-trackers>

Cloud Shell / SDK:

- Installing the GCP Cloud SDK: <https://cloud.google.com/sdk/install>
- gcloud cheat sheet:
 - <https://cloud.google.com/sdk/docs/cheatsheet>
 - <https://cloud.google.com/sdk/docs/images/gcloud-cheat-sheet.pdf>
 - <https://gist.github.com/pydevops/cffbd3c694d599c6ca18342d3625af97>
- gcloud reference: <https://cloud.google.com/sdk/gcloud/reference>
- gsutil docs: <https://cloud.google.com/storage/docs/gsutil>
- bq command line reference:
<https://cloud.google.com/bigquery/docs/reference/bq-cli-reference>
- Interactive GCP cloud SDK: <https://cloud.google.com/sdk/docs/interactive-gcloud>
- How Cloud Shell works: <https://cloud.google.com/shell/docs/how-cloud-shell-works>

Compute Technologies:

- Nice "where should I run my stuff" sketch: <https://thecloudgirl.dev/images/vs.jpg>
- Google Cloud Compute Products: <https://cloud.google.com/products/compute>

App Engine:

- App Engine: Managed app platform: <https://cloud.google.com/appengine/docs/>
- Standard: <https://cloud.google.com/appengine/docs/standard>
- Supported Runtimes: <https://cloud.google.com/appengine/docs/standard/runtimes>

- Flex: <https://cloud.google.com/appengine/docs/flexible>

Cloud Functions:

- Cloud Functions: <https://cloud.google.com/functions/docs/concepts/overview>
- Supported environments: <https://cloud.google.com/functions/docs/concepts/exec>
- Tips and tricks on using: <https://cloud.google.com/functions/docs/bestpractices/tips>

Compute Engine:

- General info: <https://cloud.google.com/compute>
- GCE How-to guides: <https://cloud.google.com/compute/docs/how-to>
- Compute Engine instances overview: <https://cloud.google.com/compute/docs/instances>
- GCE Machine Types: <https://cloud.google.com/compute/docs/machine-types>
- GCE Storage (drive) types: <https://cloud.google.com/compute/docs/disks>
- Persistent disk performance:
<https://cloud.google.com/compute/docs/disks/performance>
- Image management best practices:
<https://cloud.google.com/compute/docs/images/image-management-best-practices>
- Migrate for Compute Engine: <https://cloud.google.com/migrate/compute-engine/docs/>
- OS Login (leverage IAM to manage SSH access):
<https://cloud.google.com/compute/docs/oslogin>
- Shielded VMs for better bootkit and rootkit protection:
<https://cloud.google.com/compute/shielded-vm/docs/shielded-vm>
- TCP Forwarding through IAP (substitute for jump boxes):
<https://cloud.google.com/iap/docs/tcp-forwarding-overview>
- Build images using CI/CD and Packer: <https://www.packer.io/>
- Sole-tenancy: <https://cloud.google.com/compute/docs/nodes/sole-tenant-nodes>

Cloud Run:

- Cloud Run: <https://cloud.google.com/run/docs/overview/what-is-cloud-run>
- Cloud Run Graphic: <https://thecloudgirl.dev/images/CloudRun.jpg>
- Cloud Run How-to guides: <https://cloud.google.com/run/docs/how-to>
- Cloud Run vs Cloud Run for Anthos:
<https://cloud.google.com/run/docs/choosing-a-platform>
- Managed Knative: <https://knative.dev/>
- CloudEvents: <https://cloudevents.io/>

- Eventarc (Cloud Run triggers): <https://cloud.google.com/eventarc/docs/overview>
- Cloud Run ingress options: <https://cloud.google.com/run/docs/securing/ingress>
- Cloud Run for Anthos How-tos: <https://cloud.google.com/anthos/run/docs/how-to>

Kubernetes:

Containers/Background

- What is a container: <https://www.docker.com/resources/what-container>
- Open Container Initiative: <https://opencontainers.org/>
- Containerd graphic: <https://containerd.io/img/architecture.png>
- The differences between Docker, containerd, CRI-O and runc: <https://www.tutorialworks.com/difference-docker-containerd-runc-crio-oci/>
- Docker, getting started: <https://docs.docker.com/get-started/overview/>
- Docker Hub (base images): <https://hub.docker.com/search/?type=image>
- Dockerfile reference: <https://docs.docker.com/engine/reference/builder/>
- Docker commands cheat sheet:
 - <https://dockerlabs.collabnix.com/docker/cheatsheet/>
 - <https://www.docker.com/wp-content/uploads/2022/03/docker-cheat-sheet.pdf>
- Dockerfile best practices:
 - https://docs.docker.com/develop/develop-images/dockerfile_best-practices/
 - <https://dev.to/chrisedrego/21-best-practise-in-2021-for-dockerfile-1dji>
- Kubernetes is deprecating Docker (Don't panic!): <https://kubernetes.io/blog/2020/12/02/dont-panic-kubernetes-and-docker/>

General K8S

- Children's illustrated guide to Kubernetes: <https://youtu.be/4ht22ReBjno>
 - Text version: <https://www.cncf.io/the-childrens-illustrated-guide-to-kubernetes/>
- The Kubernetes Documentary:
 - <https://youtu.be/BE77h7dmoQU>
 - <https://youtu.be/318ellq37PE>
- What is Kubernetes: <https://kubernetes.io/docs/concepts/overview/what-is-kubernetes/>

- Nice “What is GKE” sketch: <https://thecloudgirl.dev/images/GKE.jpg>
- K8S glossary: <https://kubernetes.io/docs/reference/glossary/>
- Kubernetes components:
<https://kubernetes.io/docs/concepts/overview/components/>
- GKE Cluster Architecture:
<https://cloud.google.com/kubernetes-engine/docs/concepts/cluster-architecture>
- Google Kubernetes Engine docs:
<https://cloud.google.com/kubernetes-engine/docs/concepts/kubernetes-engine-overview>
- Pod concepts: <https://cloud.google.com/kubernetes-engine/docs/concepts/pod>
- YAML cheat sheet: <https://lzone.de/cheat-sheet/YAML>
- **Kubernetes resource list:
<https://kubernetes.io/docs/reference/kubectl/overview/#resource-types>
- **kubectl docs:
 - <https://kubernetes.io/docs/reference/kubectl/cheatsheet/>
 - <https://unofficial-kubernetes.readthedocs.io/en/latest/user-guide/kubectl-cheatsheet/>
 - <https://kubernetes.io/docs/reference/generated/kubectl/kubectl-commands>
- Working with k8s yml in VS Code / Cloud Shell:
<https://cloud.google.com/code/docs/vscode/yaml-editing>
- Pods: <https://cloud.google.com/kubernetes-engine/docs/concepts/pod>
- Deployments:
<https://cloud.google.com/kubernetes-engine/docs/concepts/deployment>
- StatefulSets:
<https://cloud.google.com/kubernetes-engine/docs/concepts/statefulset>
- StatefulSet demo:
<https://kubernetes.io/docs/concepts/workloads/controllers/statefulset/>
- Storage options:
<https://cloud.google.com/kubernetes-engine/docs/concepts/storage-overview>
- Info on pod resource specifications:
 - <https://kubernetes.io/docs/concepts/configuration/manage-resources-containers/>
 - <https://cloud.google.com/blog/products/gcp/kubernetes-best-practices-resource-requests-and-limits>

- Pod overhead:
<https://kubernetes.io/docs/concepts/scheduling-eviction/pod-overhead/>
- Assigning pods to nodes (affinity, taints):
 - <https://kubernetes.io/docs/concepts/scheduling-eviction/assign-pod-node/>
 - <https://kubernetes.io/docs/concepts/scheduling-eviction/taint-and-toleration/>
- Rolling updates:
<https://cloud.google.com/kubernetes-engine/docs/how-to/updating-apps>
- Pod autoscaling:
<https://cloud.google.com/kubernetes-engine/docs/how-to/horizontal-pod-autoscaling>
- Kubernetes custom Application resource template (Marketplace requirement):
<https://github.com/kubernetes-sigs/application>
- Helm package manager: <https://helm.sh/>
- Skaffold (another k8s installer): <https://skaffold.dev/>
- Kustomize: <https://kustomize.io/>
- Cool instance calculator: <https://learnk8s.io/kubernetes-instance-calculator>
- Create and manage multiple similar clusters: <https://gardener.cloud/>

GKE Networking

- K8S network overview:
<https://cloud.google.com/kubernetes-engine/docs/concepts/network-overview>
- Services: <https://cloud.google.com/kubernetes-engine/docs/concepts/service>
- GKE Ingress:
<https://cloud.google.com/kubernetes-engine/docs/concepts/ingress>
- Kubernetes ingress:
<https://kubernetes.io/docs/concepts/services-networking/ingress/>
- NetworkPolicy documentation:
<https://kubernetes.io/docs/concepts/services-networking/network-policies/>
- Container native load balancing:
<https://cloud.google.com/kubernetes-engine/docs/how-to/container-native-load-balancing>
- Multi-cluster services:
<https://cloud.google.com/kubernetes-engine/docs/concepts/multi-cluster-services>

- Using Cloud DNS for GKE:
<https://cloud.google.com/kubernetes-engine/docs/how-to/cloud-dns>

Some GKE specifics

- Vertical pod autoscaling:
<https://cloud.google.com/kubernetes-engine/docs/concepts/verticalpodautoscaler>
- Multidimensional autoscaling:
<https://cloud.google.com/kubernetes-engine/docs/how-to/multidimensional-pod-autoscaling>
- GKE quotas and limits: <https://cloud.google.com/kubernetes-engine/quotas>
- GKE Cluster autoscaling:
<https://cloud.google.com/kubernetes-engine/docs/concepts/cluster-autoscaler>
- Autoscaling using Cloud Monitoring metrics:
<https://cloud.google.com/kubernetes-engine/docs/tutorials/autoscaling-metrics>
- GKE docs on Windows Applications:
<https://cloud.google.com/kubernetes-engine/docs/how-to/deploying-windows-apps>
- Info on deploying Windows pods:
<https://cloud.google.com/blog/products/containers-kubernetes/how-to-deploy-a-windows-container-on-google-kubernetes-engine>
- GKE Cost optimization:
<https://cloud.google.com/solutions/best-practices-for-running-cost-effective-kubernetes-applications-on-gke>
- Building highly available clusters:
<https://cloud.google.com/blog/products/containers-kubernetes/best-practices-for-creating-a-highly-available-gke-cluster>
- Multi-tenant clusters:
<https://cloud.google.com/kubernetes-engine/docs/best-practices/enterprise-multi-tenancy>
- Multi-tenant logging:
<https://cloud.google.com/stackdriver/docs/solutions/gke/multi-tenant-logging>
- Autopilot clusters:
<https://cloud.google.com/blog/products/containers-kubernetes/introducing-gke-autopilot>

- Autopilot documentation: <https://cloud.google.com/kubernetes-engine/docs/concepts/autopilot-overview>
- Comparing GKE Standard and Autopilot: <https://cloud.google.com/kubernetes-engine/docs/concepts/autopilot-overview#comparison>
- GKE container image streaming:
 - <https://cloud.google.com/blog/products/containers-kubernetes/introducing-container-image-streaming-in-gke>
 - <https://cloud.google.com/kubernetes-engine/docs/how-to/image-streaming>

Monitoring/Troubleshooting

- Monitoring, logging, and debugging: <https://kubernetes.io/docs/tasks/debug-application-cluster/>
- Operations suite for GKE: <https://cloud.google.com/stackdriver/docs/solutions/gke/installing>
- Customizing cluster logs: <https://cloud.google.com/architecture/customizing-stackdriver-logs-fluentd>
- Troubleshooting Kubernetes: <https://cloud.google.com/kubernetes-engine/docs/troubleshooting>
- Kubernetes events: <https://www.containiq.com/post/kubernetes-events>
- Troubleshooting k8s: <https://learnk8s.io/troubleshooting-deployments>
- Newer managed Prometheus: <https://cloud.google.com/stackdriver/docs/managed-prometheus>
- Older way to work Prometheus:
 - Installing Prometheus: https://prometheus.io/docs/prometheus/latest/getting_started/
 - Adding the Prometheus collector for Cloud Monitoring (Stackdriver): <https://cloud.google.com/stackdriver/docs/solutions/kubernetes-engine/prometheus>
- Grafana: <https://grafana.com/>
- Open source Istio mesh visualization with Kiali: <https://kiali.io/>

GKE Security

- GKE security overview:
<https://cloud.google.com/kubernetes-engine/docs/concepts/security-overview>
- GKE Hardening your cluster (and links to other security articles):
<https://cloud.google.com/kubernetes-engine/docs/how-to/hardening-your-cluster>
- NSA Kubernetes Hardening guide:
https://media.defense.gov/2021/Aug/03/2002820425/-1/-1/1/CTR_KUBERNETES%20HARDENING%20GUIDANCE.PDF
- Role Based Access Control (RBAC):
<https://cloud.google.com/kubernetes-engine/docs/how-to/role-based-access-control>
- Pod admission controllers:
<https://kubernetes.io/docs/concepts/security/pod-security-admission/>
- GKE Private clusters:
<https://cloud.google.com/kubernetes-engine/docs/concepts/private-cluster-concept>
- GKE related IAM roles:
<https://cloud.google.com/iam/docs/understanding-roles#kubernetes-engine-roles>
- Binary Auth: <https://cloud.google.com/binary-authorization/docs>
- Workload Identity:
<https://cloud.google.com/kubernetes-engine/docs/how-to/workload-identity>
- Google Groups for RBAC:
<https://cloud.google.com/kubernetes-engine/docs/how-to/role-based-access-control#google-groups-for-gke>
- Gatekeeper for pod policy management:
<https://cloud.google.com/kubernetes-engine/docs/how-to/pod-security-policies-with-gatekeeper>
- Better control over Secrets:
 - Hashicorp Vault: <https://www.vaultproject.io/>

Creating a Cluster

- Local dev K8S cluster
 - Minikube: <https://minikube.sigs.k8s.io/docs/>

- Kind: <https://kind.sigs.k8s.io/>
- Installing on-prem with kOps:
<https://kubernetes.io/docs/setup/production-environment/tools/kops/>
- Other options for installing and setting up Kubernetes:
<https://kubernetes.io/docs/setup/>
- Creating a GKE cluster in Google Cloud:
<https://cloud.google.com/kubernetes-engine/docs/how-to/creating-a-zonal-cluster>

Custom Resources and Operators

- 3p operators: <https://operatorhub.io/>
- Custom Resources:
<https://kubernetes.io/docs/concepts/extend-kubernetes/api-extension/custom-resources/>
- Example creating a CRD:
<https://developer.ibm.com/tutorials/kubernetes-custom-resource-definitions/>
- Java example:
<https://medium.com/xgeeks/kubernetes-dummy-operator-in-java-6b2f26198a55>
- Example creating an operator:
<https://developers.redhat.com/articles/2021/09/07/build-kubernetes-operator-six-steps>
- Creating an operator in Java;
<https://github.com/java-operator-sdk/java-operator-sdk>
- Operator pattern:
<https://kubernetes.io/docs/concepts/extend-kubernetes/operator/>
- Installing a CRD:
<https://kubernetes.io/docs/tasks/extend-kubernetes/custom-resources/custom-resource-definitions/>
- K8S client libraries:
<https://kubernetes.io/docs/reference/using-api/client-libraries/>
- Operator SDK: <https://sdk.operatorframework.io/>

Istio

- Istio homepage: <https://istio.io/>

- **Istio architecture overview:
<https://istio.io/latest/docs/ops/deployment/architecture>
- Great overview video: <https://www.youtube.com/watch?v=oZrZlx2fmcM>
- Istio deployment models:
<https://istio.io/docs/ops/deployment/deployment-models/>
- **Envoy proxy: <https://www.envoyproxy.io/>
 - Envoy proxy 101: <https://www.getambassador.io/learn/envoy-proxy/>
 - Getting started:
<https://www.katacoda.com/envoyproxy/scenarios/getting-started>
 - Using Envoy as a front proxy:
<https://medium.com/cloudx-at-fidelity/using-envoy-as-a-front-proxy-c7b49cc6d4cf>
- Istio installation: <https://istio.io/latest/docs/setup/install/>
- Istio security:
 - <https://istio.io/latest/docs/concepts/security/>
 - <https://istio.io/latest/docs/reference/config/security/>
- Troubleshooting multicluster:
<https://istio.io/latest/docs/ops/diagnostic-tools/multicluster/>
- Destination rule documentation:
<https://istio.io/docs/reference/config/networking/destination-rule/>
- Some Istio performance info:
<https://istio.io/docs/ops/deployment/performance-and-scalability/>
- Large Scale Security Policy Performance Tests:
<https://istio.io/latest/blog/2020/large-scale-security-policy-performance-tests/>
- Istio traffic management:
 - ** <https://istio.io/latest/docs/concepts/traffic-management/>
 - <https://istio.io/latest/docs/tasks/traffic-management/>
- More than you ever wanted to know about mTLS (The Illustrated TLS Connection): <https://tls.ulfheim.net/>
- Open source mesh visualization with Kiali: <https://kiali.io/>
- Circuit Breaking example:
<https://istio.io/latest/docs/tasks/traffic-management/circuit-breaking/>

Anthos

General

- Anthos doc homepage: <https://cloud.google.com/anthos/docs>
- Anthos 101 videos:
<https://cloud.google.com/blog/topics/anthos/anthos-101-learning-series-all-the-videos-in-one-place>
- **Anthos technical overview:
<https://cloud.google.com/anthos/docs/concepts/overview>
- Anthos overview sketch: <https://thecloudgirl.dev/images/Anthos.jpg>
- **Anthos deployment options (Features and where they work):
<https://cloud.google.com/anthos/deployment-options>
- Anthos vs. competitors:
<https://competitiveinsightshub.withgoogle.com/area/21/matrix/1487>
- Fleets: <https://cloud.google.com/anthos/multicloud-management/fleets>
- Multi-cluster management (start here):
<https://cloud.google.com/anthos/multicloud-management>
- Setting up Anthos: <https://cloud.google.com/anthos/docs/setup/overview>
- Migrate for Anthos (GKE):
<https://cloud.google.com/migrate/anthos/docs/getting-started>
- Migrate for Anthos architecture: <https://cloud.google.com/migrate/anthos/docs/architecture>
- Bank of Anthos demo app:
<https://github.com/GoogleCloudPlatform/bank-of-anthos>
- Terraform for Anthos:
<https://cloud.google.com/architecture/provisioning-anthos-clusters-with-terraform>

On-Prem

- Anthos GKE (GKE on-prem) docs:
<https://cloud.google.com/anthos/gke/docs/on-prem>
- Setup Anthos GKE (start here):
<https://cloud.google.com/anthos/docs/setup/overview>

- Anthos GKE VMware install guide:
<https://cloud.google.com/anthos/gke/docs/on-prem/how-to/install-overview-basics>
 - Anthos GKE AWS install:
<https://cloud.google.com/anthos/clusters/docs/multi-cloud/aws/how-to/create-cluster>
 - Setting up Cloud Run for GKE on-prem (Anthos):
<https://cloud.google.com/anthos/run/docs/setup>
 - GKE on-prem quotas and limits:
<https://cloud.google.com/anthos/clusters/docs/on-prem/quotas>
 - Hardening on-prem clusters:
<https://cloud.google.com/anthos/clusters/docs/on-prem/how-to/hardening-your-cluster>
 - Anthos GKE release notes:
<https://cloud.google.com/anthos/gke/docs/on-prem/release-notes>
 - Manage Identity with Anthos Identity Service:
<https://cloud.google.com/anthos/clusters/docs/on-prem/concepts/authentication>
 - Load Balancer configuration options:
<https://cloud.google.com/anthos/clusters/docs/on-prem/how-to/setup-load-balance>
- ABM / APM
- About Anthos on Bare Metal:
<https://cloud.google.com/anthos/clusters/docs/bare-metal/concepts/about-bare-metal>
 - ABM installation and prerequisite guides:
<https://cloud.google.com/anthos/clusters/docs/bare-metal/installing>
 - Try ABM on GCE using Terraform:
<https://cloud.google.com/anthos/clusters/docs/bare-metal/try/gce-vms-tf>
 - APM and ABM network requirements:
<https://cloud.google.com/anthos/clusters/docs/bare-metal/concepts/network-reqs>
 - Anthos Private Mode home (you may need to be allow listed):
<https://cloud.google.com/anthos/private-mode/docs>

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- APM Installation (Start here):
<https://cloud.google.com/anthos/private-mode/docs/concepts/requirements>
 - Service Mesh
 - Anthos Service Mesh documentation:
<https://cloud.google.com/service-mesh/docs>
 - ASM installation guides: <https://cloud.google.com/service-mesh/docs/install>
 - Adding clusters to ASM:
<https://cloud.google.com/service-mesh/docs/gke-install-multi-cluster>
 - Integrating IAP with Anthos Service Mesh:
<https://cloud.google.com/service-mesh/docs/iap-integration>
 - Setting up and use CA Service:
<https://cloud.google.com/service-mesh/docs/security/configure-ca-service>
 - Multi-cluster Anthos Ingress (to load balance over multiple clusters):
<https://cloud.google.com/kubernetes-engine/docs/concepts/ingress-for-anthos>
 - Deploying to multi-cluster ingress:
<https://cloud.google.com/kubernetes-engine/docs/how-to/multi-cluster-ingress>
 - Configuring multi-cluster services:
<https://cloud.google.com/kubernetes-engine/docs/how-to/multi-cluster-services>
 - Traffic Director: <https://cloud.google.com/traffic-director/docs>
 - Config Management
 - Anthos Config Management (ACM) overview:
<https://cloud.google.com/anthos-config-management/docs/overview>
 - Structure and layout of the ACM Git repository:
<https://cloud.google.com/anthos-config-management/docs/concepts/repo>
 - Installing ACM:
<https://cloud.google.com/anthos-config-management/docs/how-to/installing>
 - Policy Controller:
<https://cloud.google.com/anthos-config-management/docs/concepts/policy-controller>
 - Policy template library:
<https://cloud.google.com/anthos-config-management/docs/reference/constraint-template-library>

- Hierarchy controller overview:
<https://cloud.google.com/anthos-config-management/docs/concepts/hierarchy-controller>
- Anthos Config Connector overview:
<https://cloud.google.com/config-connector/docs/overview>

Data:

- **GCP Storage Products: <https://cloud.google.com/products/storage>
- **Which storage should I use: <https://thecloudgirl.dev/images/storageoptions.jpg>
- **Database products: <https://cloud.google.com/products/databases>
- **Which database should I use: <https://thecloudgirl.dev/images/DBoptions.jpg>
- **Classic data processing pipeline sketch: <https://thecloudgirl.dev/images/analytics.png>
- Data Science on Google Cloud: <https://thecloudgirl.dev/images/datascience.jpg>
- Create and manage a data lake and data warehouse with Dataplex:
<https://cloud.google.com/dataplex/docs/introduction>
- Colossus:
 - Peak behind the scenes:
<https://cloud.google.com/blog/products/storage-data-transfer/a-peek-behind-colossus-googles-file-system>
 - Google's data storage array, Colossus:
https://cloud.google.com/files/storage_architecture_and_challenges.pdf
 - Nice video overview of Google's storage infrastructure (Colossus):
https://www.youtube.com/embed/q4WC_6SzBz4

BigQuery

- What is BigQuery: <https://cloud.google.com/bigquery/docs/introduction>
- Overview sketch: <https://thecloudgirl.dev/images/BigQuery.png>
- bq command line reference:
<https://cloud.google.com/bigquery/docs/reference/bq-cli-reference>

Querying

- **BigQuery SQL reference:
<https://cloud.google.com/bigquery/docs/reference/standard-sql/query-syntax>

- **SQL Function one page list:
<https://cloud.google.com/bigquery/docs/reference/standard-sql/functions-and-operators>
- Querying nested repeated structures:
 - **Working with arrays and structures:
<https://cloud.google.com/bigquery/docs/reference/standard-sql/arrays>
 - Overview:
<https://towardsdatascience.com/https-medium-com-martin-weitzmann-bigquery-sql-on-nested-data-cf9589c105f4>
- Queries over external data:
 - External data sources: <https://cloud.google.com/bigquery/external-data-sources>
 - Federated queries:
<https://cloud.google.com/bigquery/docs/federated-queries-intro>
 - **Query from Cloud Storage:
<https://cloud.google.com/bigquery/external-data-cloud-storage>
- Scheduling queries: <https://cloud.google.com/bigquery/docs/scheduling-queries>
- Dry run query: <https://cloud.google.com/bigquery/docs/dry-run-queries>
- User Defined Functions (UDFs):
 - <https://cloud.google.com/bigquery/docs/reference/standard-sql/user-defined-functions>
 - Community UDFs:
<https://github.com/GoogleCloudPlatform/bigquery-utils/tree/master/udfs/community>
- Remote Functions:
<https://cloud.google.com/bigquery/docs/reference/standard-sql/remote-functions>
- Multi-statement queries:
<https://cloud.google.com/bigquery/docs/multi-statement-queries>
- BQ Sessions: <https://cloud.google.com/bigquery/docs/sessions-intro>
- Example utils for BigQuery: <https://github.com/GoogleCloudPlatform/bigquery-utils>
- BigQuery ML:
 - **BigQuery ML Intro:
<https://cloud.google.com/bigquery-ml/docs/bigqueryml-intro>
 - **Good BigQuery logistic regression how to:
<https://cloud.google.com/bigquery-ml/docs/logistic-regression-prediction>

Performance, troubleshooting, and cost control

- **Intro to optimizing BigQuery performance:
<https://cloud.google.com/bigquery/docs/best-practices-performance-overview>
- **Execution details info: <https://cloud.google.com/bigquery/query-plan-explanation>
- Nice blog post on query optimization:
<https://cloud.google.com/blog/topics/developers-practitioners/bigquery-admin-reference-guide-query-optimization>
- Getting job metadata (INFORMATION_SCHEMA.JOBS*):
<https://cloud.google.com/bigquery/docs/information-schema-jobs>
- Couple of cool examples using job information schema:
<https://cloud.google.com/blog/topics/developers-practitioners/monitor-analyze-bigquery-performance-using-information-schema>
 - Git with the scripts: <https://github.com/monishdoshi22/BQInfoSchema>
- BQ Query Visualizer:
 - <https://bqvisualiser.appspot.com/>
 - <https://github.com/GoogleCloudPlatform/professional-services/tree/main/tools/bq-visualizer>
- Another query plan visualizer:
https://github.com/shollyman/gcp-go-snippets/tree/main/queryplan_visualization
- How BigQuery caching works: <https://cloud.google.com/bigquery/docs/cached-results>
- Controlling costs: <https://cloud.google.com/bigquery/docs/controlling-costs>
- What is BI Engine: <https://cloud.google.com/bigquery/docs/bi-engine-intro>
- Error messages: <https://cloud.google.com/bigquery/docs/error-messages>
- BQ logs: <https://cloud.google.com/bigquery/docs/reference/auditlogs>
- BQ monitoring:
 - In BQ: <https://cloud.google.com/bigquery/docs/admin-resource-charts>
 - Metrics for Metrics Explorer:
https://cloud.google.com/monitoring/api/metrics_gcp#gcp-bigquery
- Flat rate pricing and reservations:
<https://cloud.google.com/bigquery/docs/reservations-intro>

Data ingestion and DML

- Nice blog post on ingesting data into BigQuery:
<https://cloud.google.com/blog/topics/developers-practitioners/bigquery-explained-data-ingestion>

- Batch loading data: <https://cloud.google.com/bigquery/docs/batch-loading-data>
- Load performance from GCS for the different file formats: <https://cloud.google.com/blog/products/data-analytics/data-loading-into-bigquery>
- BigQuery Transfer Service: <https://cloud.google.com/bigquery-transfer/docs/introduction>
- Streaming into BigQuery (legacy): <https://cloud.google.com/bigquery/streaming-data-into-bigquery>
- **New streaming/batch write API: <https://cloud.google.com/bigquery/docs/write-api>
- Using DML: <https://cloud.google.com/bigquery/docs/reference/standard-sql/data-manipulation-language>
- DML and transactions: <https://cloud.google.com/blog/products/data-analytics/dml-without-limits-now-in-bigquery>
- Multi-statement transactions: <https://cloud.google.com/bigquery/docs/reference/standard-sql/transactions>

Schema and design

- BigQuery schemas: <https://cloud.google.com/bigquery/docs/schemas>
- Nested and repeated columns: <https://cloud.google.com/bigquery/docs/nested-repeated>
- **Views: <https://cloud.google.com/bigquery/docs/views-intro>
- **Materialized views: <https://cloud.google.com/bigquery/docs/materialized-views-intro>
- Table functions: <https://cloud.google.com/bigquery/docs/reference/standard-sql/table-functions>
- Managing and updating table schemas: <https://cloud.google.com/bigquery/docs/managing-table-schemas>
- **Getting info about datasets with INFORMATION_SCHEMA: <https://cloud.google.com/bigquery/docs/information-schema-intro>
- Getting info about table metadata: <https://cloud.google.com/bigquery/docs/information-schema-tables>
- Table partitioning: <https://cloud.google.com/bigquery/docs/partitioned-tables>
- Managing partitioned tables: <https://cloud.google.com/bigquery/docs/managing-partitioned-tables>
- Table clustering: <https://cloud.google.com/bigquery/docs/clustered-tables>

- BigQuery quotas and limits: <https://cloud.google.com/bigquery/quotas>

Security, backup, DLP

- BigQuery permissions and info on roles: <https://cloud.google.com/bigquery/docs/access-control>
- BigQuery table access control: <https://cloud.google.com/bigquery/docs/table-access-controls-intro>
- BigQuery column-level security: <https://cloud.google.com/bigquery/docs/column-level-security>
- Row-level security: <https://cloud.google.com/bigquery/docs/row-level-security-intro>
- Time travel (data at point in time, within last 7 days): <https://cloud.google.com/bigquery/docs/time-travel>
- Table snapshots (table backup): <https://cloud.google.com/bigquery/docs/table-snapshots-intro>
- DLP and BigQuery: <https://cloud.google.com/dlp/docs/data-profiles>

How BigQuery works

- Reliability in BQ: <https://cloud.google.com/bigquery/docs/reliability-intro>
- Disaster planning: <https://cloud.google.com/bigquery/docs/reliability-disaster>
- Big Query's native storage format (Capacitor): <https://cloud.google.com/blog/products/bigquery/inside-capacitor-bigquerys-next-generation-columnar-storage-format>
- BigQuery under the hood: <https://cloud.google.com/blog/products/bigquery/bigquery-under-the-hood>
- How a query works (by a Spark guy): <https://www.waitingforcode.com/data-engineering-gcp/gcp-bigquery-by-apache-spark-guy/read>
- An inside look at BigQuery: <https://emergetech.org/wp-content/uploads/2020/05/BigQueryTechnicalWP.pdf>
- A little history on BigQuery: <https://towardsdatascience.com/bigquery-the-unlikely-birth-of-a-cloud-juggernaut-b5ad476525b7>
- Info on Slots: <https://cloud.google.com/bigquery/docs/slots>

Bigtable:

- Big Table docs: <https://cloud.google.com/bigtable/docs/>
- Nice graphis: <https://thecloudgirl.dev/images/Bigtable.jpg>
- Big Table schema design: <https://cloud.google.com/bigtable/docs/schema-design>
- Understanding BigTable performance:
<https://cloud.google.com/bigtable/docs/performance>
- Replication: <https://cloud.google.com/bigtable/docs/replication-overview>
- Application Profiles: <https://cloud.google.com/bigtable/docs/app-profiles>
- Bigtable backups: <https://cloud.google.com/bigtable/docs/backups>
- For development, consider using BigTable emulator:
<https://cloud.google.com/bigtable/docs/emulator>

Cloud Composer:

- What is Cloud Composer: <https://cloud.google.com/composer/docs/concepts/overview>
- Quickstart: <https://cloud.google.com/composer/docs/quickstart>
- Creating a Cloud Composer environment:
<https://cloud.google.com/composer/docs/how-to/managing/creating>
- Writing DAGs: <https://cloud.google.com/composer/docs/how-to/using/writing-dags>
- Airflow tutorial: <https://airflow.apache.org/docs/apache-airflow/stable/tutorial.html>
- Airflow for GCP docs:
<https://airflow.apache.org/docs/apache-airflow-providers-google/stable/index.html>
- Airflow operators for GCP:
<https://airflow.apache.org/docs/apache-airflow-providers-google/stable/operators/cloud/index.html>
- Airflow Examples:
<https://github.com/GoogleCloudPlatform/python-docs-samples/tree/main/composer>

Cloud SQL and Spanner:

- Cloud SQL documentation: <https://cloud.google.com/sql/docs>
- Cloud SQL Maintenance: <https://cloud.google.com/sql/docs/mysql/maintenance>
- Cloud SQL Backups: <https://cloud.google.com/sql/docs/mysql/backup-recovery/backups>
- Spanner docs: <https://cloud.google.com/spanner/docs/concepts>
- Cloud Girl Spanner: <https://thecloudgirl.dev/images/spanner.jpg>
- Spanner best practices: <https://cloud.google.com/spanner/docs/best-practice-list>

- Spanner Schema design and best practices: <https://cloud.google.com/spanner/docs/schema-design>
- Spanner white papers: <https://cloud.google.com/spanner/docs/whitepapers>
- Spanner emulator: <https://cloud.google.com/spanner/docs/emulator>
- Spanner compute capacity (Processing Units and Nodes): <https://cloud.google.com/spanner/docs/compute-capacity>

Cloud Storage:

- Google Cloud Storage: <https://cloud.google.com/storage/docs/introduction>
- Nice graphic: <https://thecloudgirl.dev/images/GCS.png>
- Best practices: <https://cloud.google.com/storage/docs/best-practices>
- Using versioning: <https://cloud.google.com/storage/docs/using-object-versioning>
- Retention policies and locks: <https://cloud.google.com/storage/docs/using-bucket-lock>
- File lifecycle management: <https://cloud.google.com/storage/docs/lifecycle>
- Access control: <https://cloud.google.com/storage/docs/access-control>
- Encryption options: <https://cloud.google.com/storage/docs/encryption>
- Cloud Transfer Service Docs: <https://cloud.google.com/storage-transfer/docs>
- On-prem transfer service: <https://cloud.google.com/storage-transfer/docs/on-prem-overview>
- CDN: <https://cloud.google.com/cdn/docs>
- Media CDN: <https://cloud.google.com/cdn/docs>
- gsutil docs: <https://cloud.google.com/storage/docs/gsutil>

Data Catalog

- Data Catalog overview: <https://cloud.google.com/data-catalog/docs/concepts/overview>
- How-to guides: <https://cloud.google.com/data-catalog/docs/how-to>
- Tagging BigQuery tables example: <https://cloud.google.com/data-catalog/docs/quickstart-tagging>

Dataflow:

- Dataflow documentation: <https://cloud.google.com/dataflow/docs>
- Apache Beam documentation: <https://beam.apache.org/documentation/>
- Beam basics and terminology: <https://beam.apache.org/documentation/basics/>

- Beam quickstarts:
<https://beam.apache.org/documentation/resources/learning-resources/#quickstart>
- **Beam programming guide:
<https://beam.apache.org/documentation/programming-guide/>
- Quickstart examples: <https://cloud.google.com/dataflow/docs/quickstarts>
- Beam Transformations:
 - Java: <https://beam.apache.org/documentation/transforms/java/overview/>
 - Python: <https://beam.apache.org/documentation/transforms/python/overview/>
- Built-in connectors: <https://beam.apache.org/documentation/io/built-in/>
- Dataflow prime (serverless):
<https://cloud.google.com/dataflow/docs/guides/enable-dataflow-prime>
- Working with BigQuery:
<https://beam.apache.org/documentation/io/built-in/google-bigquery/>
- Using the monitoring interface:
<https://cloud.google.com/dataflow/docs/guides/using-monitoring-intf>
- Troubleshooting and debugging:
<https://cloud.google.com/dataflow/docs/guides/troubleshooting-your-pipeline>
- Logging pipeline messages: <https://cloud.google.com/dataflow/docs/guides/logging>
- Dataflow workbench (notebooks):
<https://cloud.google.com/dataflow/docs/guides/interactive-pipeline-development>
- Job execution parameters:
<https://cloud.google.com/dataflow/docs/guides/specifying-exec-params>
- Dataflow SQL: <https://cloud.google.com/dataflow/docs/guides/sql/dataflow-sql-intro>
- Beam examples
 - Python:
https://github.com/apache/beam/tree/master/sdks/python/apache_beam/examples
 - Java: <https://github.com/GoogleCloudPlatform/DataflowTemplates/>
- Dataflow templates:
<https://cloud.google.com/dataflow/docs/concepts/dataflow-templates>
- Google provided OSS templates:
<https://cloud.google.com/dataflow/docs/guides/templates/provided-templates>

Data Fusion:

- Data Fusion: <https://cloud.google.com/data-fusion/docs>

- Data Fusion quickstart: <https://cloud.google.com/data-fusion/docs/quickstart>
- Data Fusion how-to guides: <https://cloud.google.com/data-fusion/docs/how-to>
- Cask Data Application Platform info: <https://cdap.io/>
- CDAP blog: <https://medium.com/cdapio>
- CDAP documentation: <https://cdap.atlassian.net/wiki/spaces/DOCS/overview>
- CDAP user guides: <https://cdap.atlassian.net/wiki/spaces/DOCS/pages/614891521/>
- Data Fusion plugin reference: <https://cloud.google.com/data-fusion/plugins>
- Using DLP with Data Fusion:
<https://cloud.google.com/data-fusion/docs/how-to/using-dlp>
- Data pipeline user guide:
<https://cdap.atlassian.net/wiki/spaces/DOCS/pages/517406816/>
- Wrangler user guide: <https://cdap.atlassian.net/wiki/spaces/DOCS/pages/515211781>
- Wrangler command line:
<https://cdap.atlassian.net/wiki/spaces/DOCS/pages/379748488>
- Performance tuning: <https://cdap.atlassian.net/wiki/spaces/DOCS/pages/818511873/>
- Working with logs:
 - <https://cloud.google.com/data-fusion/docs/how-to/audit-logging>
 - <https://cloud.google.com/data-fusion/docs/how-to/viewing-stackdriver-logs>

Data Studio:

- Data Studio (BI): <https://marketingplatform.google.com/about/data-studio/>
- Visualizing Big Query data with Data Studio:
<https://cloud.google.com/bigquery/docs/visualize-data-studio>
- Chart type reference: <https://support.google.com/datastudio/topic/7059081>
- Data Studio help: <https://support.google.com/datastudio>
- YouTube how-to videos:
https://www.youtube.com/playlist?list=PLI5YfMzCfRtag7tBfbVvA4_a6YZxWHEO4
- Forums: <https://support.google.com/datastudio/community>
- Create and edit data sources: <https://support.google.com/datastudio/topic/6370331>
- Calculated fields: <https://support.google.com/datastudio/answer/6299685>
- Functions:
 - <https://support.google.com/datastudio/topic/7019880>
 - <https://support.google.com/datastudio/table/6379764>
- Working with parameters: <https://support.google.com/datastudio/answer/9002005>

Dataproc:

- Dataproc (managed Hadoop):
<https://cloud.google.com/dataproc/docs/concepts/overview>
- Dataproc on GKE:
<https://cloud.google.com/dataproc/docs/guides/dpgke/dataproc-gke-overview>
- Serverless Dataproc: <https://cloud.google.com/dataproc-serverless/docs/overview>
- Nice graphic: <https://thecloudgirl.dev/images/Dataproc.jpg>
- Dataproc best practices:
<https://cloud.google.com/blog/topics/developers-practitioners/dataproc-best-practices-guide>
- Submit a job example: <https://cloud.google.com/dataproc/docs/guides/submit-job>
- Google Dataproc blog posts: <https://cloud.google.com/blog/products/dataproc>
- Dataproc addon components:
<https://cloud.google.com/dataproc/docs/concepts/components/overview>
- Initialization actions: <https://github.com/GoogleCloudDataproc/initialization-actions>
- Dataproc templates: <https://github.com/GoogleCloudPlatform/dataproc-templates/>
- Life of a Job: <https://cloud.google.com/dataproc/docs/concepts/jobs/life-of-a-job>
- Secondary workers and preemptible VMs:
<https://cloud.google.com/dataproc/docs/concepts/compute/secondary-vm>
- HDFS vs. Cloud Storage:
<https://cloud.google.com/blog/products/storage-data-transfer/hdfs-vs-cloud-storage-pros-cons-and-migration-tips>
- Improving Dataproc performance:
<https://cloud.google.com/blog/products/data-analytics/help-for-slow-hadoopspark-jobs-on-google-cloud-10-questions-to-ask-about-your-hadoop-and-spark-cluster-performance>
- Autoscaling clusters:
<https://cloud.google.com/dataproc/docs/concepts/configuring-clusters/autoscaling>
- Workflow templates:
<https://cloud.google.com/dataproc/docs/concepts/workflows/overview>

Filestore

- Overview: <https://cloud.google.com/filestore/docs>
- Quickstart: <https://cloud.google.com/filestore/docs/quickstart-console>

- How-to guides: <https://cloud.google.com/filestore/docs/how-to>

Firestore / Datastore:

- Firestore docs: <https://cloud.google.com/firestore/docs>
- Firestore best practices (latency):
<https://cloud.google.com/firestore/docs/best-practices>
- Firestore graphic: <https://thecloudgirl.dev/images/firestore.jpg>
- Firestore key visualizer: <https://cloud.google.com/firestore/docs/key-visualizer>
- Datastore docs: <https://cloud.google.com/datastore/docs/concepts/overview>
- Datastore how to guides: <https://cloud.google.com/datastore/docs/how-to>
- Datastore queries: <https://cloud.google.com/datastore/docs/concepts/queries>
- Datastore transactions: <https://cloud.google.com/datastore/docs/concepts/transactions>
- GQL reference: https://cloud.google.com/datastore/docs/reference/gql_reference
- Firestore native vs. Datastore mode:
<https://cloud.google.com/datastore/docs/firestore-or-datastore>

Looker

General

- Looker (BI): <https://cloud.google.com/looker>
- Looker documentation home: <https://docs.looker.com/>
- Looker Community (forums): <https://community.looker.com/>
- Looker Help Center: <https://help.looker.com/hc/en-us>
- **Exploring data: <https://docs.looker.com/exploring-data/exploring-data>
- **Creating visualizations:
<https://docs.looker.com/exploring-data/visualizing-query-results>
- **Visualization types:
<https://docs.looker.com/exploring-data/visualizing-query-results/visualization-types>
- Looker glossary: <https://docs.looker.com/reference/glossary>
- Keyboard shortcuts:
<https://docs.looker.com/exploring-data/exploring-data/keyboard-shortcuts>
- **Looker/LookML terms and concepts:
<https://docs.looker.com/data-modeling/learning-lookml/lookml-terms-and-concepts>
- Retrieving and charting data (good high-level set of other links):
<https://docs.looker.com/exploring-data/retrieve-chart-intro>

- Delivering Looks and Explorers:
<https://docs.looker.com/sharing-and-publishing/scheduling-and-sharing/delivering-looks-explors>
- Using table calculations: <https://docs.looker.com/exploring-data/using-table-calculations>
- **Looker expressions (table calculations, tests, custom fields and filters):
<https://docs.looker.com/exploring-data/creating-looker-expressions>
- **Looker functions and operators:
<https://docs.looker.com/exploring-data/creating-looker-expressions/looker-functions-and-operators>
- **Looker filter expressions: <https://docs.looker.com/reference/filter-expressions>
- Dashboard anatomy:
https://docs.looker.com/dashboards/new-dashboard-experience#anatomy_of_a_dashboard
- **Creating dashboards and reports (good page of links):
<https://docs.looker.com/dashboards/dashboards-reports-intro>
- Visualizing data effectively:
<https://help.looker.com/hc/en-us/articles/360001835128-Best-Practice-Visualize-Data-Effectively>
- Improving dashboard performance:
<https://help.looker.com/hc/en-us/articles/360038233334-Considerations-When-Building-Performant-Looker-Dashboards>
- Boards: <https://docs.looker.com/sharing-and-publishing/presenting-content>
- Scheduling and sending dashboards:
<https://docs.looker.com/sharing-and-publishing/scheduling-and-sharing/scheduling-new-dashboards>
- Organizing and securing content (folders, permissions):
<https://docs.looker.com/sharing-and-publishing/organizing-spaces>

LookML

- Development basics: <https://docs.looker.com/data-modeling>
- **Looker/LookML terms and concepts:
<https://docs.looker.com/data-modeling/learning-lookml/lookml-terms-and-concepts>
- ** Intro to LookML (page of links):
<https://docs.looker.com/data-modeling/learning-lookml/lookml-intro>
- ** LookML reference: <https://docs.looker.com/reference/lookml>

- What is Looker Modeling Language (LookML):
<https://docs.looker.com/data-modeling/learning-lookml/what-is-lookml>
- Editing and validating LookML:
<https://docs.looker.com/data-modeling/getting-started/lookml-validation>
- Understanding Model and View files:
<https://docs.looker.com/data-modeling/getting-started/model-development>
- Generating initial Model files from the database:
<https://docs.looker.com/data-modeling/getting-started/connect-to-db-and-generate-model>
- Using SQL in LookML objects:
<https://docs.looker.com/data-modeling/learning-lookml/sql-and-referring-to-lookml>
- How Looker generates SQL:
<https://docs.looker.com/data-modeling/learning-lookml/how-looker-generates-sql>
- The Symmetric Aggregation problem, explained:
<https://help.looker.com/hc/en-us/articles/360023722974-A-Simple-Explanation-of-Symmetric-Aggregates-or-Why-On-Earth-Does-My-SQL-Look-Like-That>
- Derived tables: <https://docs.looker.com/data-modeling/learning-lookml/derived-tables>
- Aggregate tables:
https://docs.looker.com/data-modeling/learning-lookml/aggregate_awareness
- Looker Git integration, version control, and deploying changes:
<https://docs.looker.com/data-modeling/getting-started/version-control-and-deploying-changes>
- Multi-stage development options:
<https://help.looker.com/hc/en-us/articles/360033944133-Looker-Multistage-Development-Framework-Dev-QA-Prod>
- Optimizing performance
 - <https://community.looker.com/sql-10/a-hitchhiker-s-guide-to-query-performance-in-looker-25586>
 - <https://help.looker.com/hc/en-us/articles/360001847227-Best-Practice-Optimize-Looker-Performance>
 - <https://help.looker.com/hc/en-us/articles/360038233334-Considerations-When-Building-Performant-Looker-Dashboards>
- Working with BigQuery nested repeated structures:
<https://help.looker.com/hc/en-us/articles/360023638874-Nested-Data-in-BigQuery-Repeated-Records>

- Looker best practices: <https://help.looker.com/hc/en-us/articles/360001784587-Best-Practice-Writing-Sustainable-Maintainable-LookML>
- Building LookML dashboards:
 - <https://docs.looker.com/dashboards/creating-lookml-dashboards>
 - <https://docs.looker.com/reference/lookml-dashboard-overview>

Looker Admin

- Looker setup and administration: <https://docs.looker.com/admin-options>
- Setting up and testing Git connection: <https://docs.looker.com/data-modeling/getting-started/setting-up-git-connection>
- Looker database dialects and connection instructions: <https://docs.looker.com/setup-and-management/database-config>
 - BigQuery: <https://docs.looker.com/setup-and-management/database-config/google-bigquery>
 - Cloud SQL: <https://docs.looker.com/setup-and-management/database-config/google-cloud-sql>
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<https://cloud.google.com/kms/docs/reference/permissions-and-roles>

- Products supporting customer managed encryption keys (CMEK):
https://cloud.google.com/kms/docs/using-other-products#cmek_integrations
- Using customer managed encryption keys with External Key Manager (EKM):
<https://cloud.google.com/kms/docs/ekm>
- Information on using customer supplied encryption keys:
<https://cloud.google.com/docs/security/encryption/customer-supplied-encryption-keys>
- Cloud HSM (Hardware Security Module):
<https://cloud.google.com/kms/docs/hsm>
- Encryption in transit: <https://cloud.google.com/security/encryption-in-transit>
- Google Encryption at rest details:
 - <https://cloud.google.com/security/encryption-at-rest/default-encryption>
 - <https://cloud.google.com/docs/security/encryption/default-encryption/resources/encryption-whitepaper.pdf>
- Identity Provider
 - Cloud Identity: <https://cloud.google.com/identity/docs/overview>
 - GCP Identity Platform: <https://cloud.google.com/identity-platform/docs/how-to>
 - Best practices for planning accounts and organizations:
<https://cloud.google.com/architecture/identity/best-practices-for-planning>
 - Differences between Firebase and Identity Platform:
<https://cloud.google.com/identity-platform/docs/product-comparison>
 - Best practices for federating Google Cloud with an external identity provider:
<https://cloud.google.com/architecture/identity/best-practices-for-federating>
 - Identity reference architectures:
<https://cloud.google.com/architecture/identity/reference-architectures>
 - Integrating Cloud Identity with 3rd-party user or IdPs:
<https://support.google.com/cloudidentity/topic/7558767>
 - Federating with Active Directory:
[https://cloud.google.com/architecture/identity/federating-gcp-with-active-direct-ory-introduction](https://cloud.google.com/architecture/identity/federating-gcp-with-active-directory-introduction)
 - GCP Directory Sync: <https://support.google.com/a/answer/106368?hl=en>
 - GCP Managed AD:
<https://cloud.google.com/managed-microsoft-ad/docs/quickstart-create-domain>
- Other security tools and Best Practices
 - Security best practices center: <https://cloud.google.com/security/best-practices>

- **Secure foundations blueprint guide:
<https://services.google.com/fh/files/misc/google-cloud-security-foundations-guide.pdf>
- GCP Compliance info: <https://cloud.google.com/security/compliance>
- Web Security Scanner:
<https://cloud.google.com/security-command-center/docs/concepts-web-security-scanner-overview>
- Best practices for DDOS protection:
<https://cloud.google.com/files/GCPDDoSprotection-04122016.pdf>
- Security partner info: <https://cloud.google.com/security/partners/>
- Security Command Center documentation:
 - <https://cloud.google.com/security-command-center/docs>
 - <https://cloud.google.com/security-command-center/docs/concepts-security-command-center-overview>
- Forseti (security scanner) tutorials:
<https://cloud.google.com/community/tutorials/private-forseti-with-scc-integration>
- Forseti home page: <https://forsetisecurity.org/>
- Five pillars of protection against ransomware attacks:
<https://cloud.google.com/blog/products/identity-security/5-pillars-of-protection-to-prevent-ransomware-attacks>

Pricing

- GCP Billing: <https://cloud.google.com/billing/docs>
- Guide to Cloud Billing Resource Organization and Access Management:
<https://cloud.google.com/billing/docs/onboarding-checklist>
- **Price list for all resources: <https://cloud.google.com/pricing/list>
- **GCP Pricing Calculator: <https://cloud.google.com/products/calculator>
- Committed use discounts: <https://cloud.google.com/docs/cuds>
- Billing best practices:
https://cloud.google.com/docs/enterprise/best-practices-for-enterprise-organizations#billing_and_management
- **Cost optimization for developers and operators:
<https://cloud.google.com/architecture/cost-efficiency-on-google-cloud>
- What is FinOps: <https://www.finops.org/introduction/what-is-finops/>

- Setting budgets and alerts: <https://cloud.google.com/billing/docs/how-to/budgets>
- Using BigQuery to analyze exported billing data:
<https://cloud.google.com/billing/docs/how-to/export-data-bigquery>
- Lots of good Cloud Billing account how to's:
<https://cloud.google.com/billing/docs/how-to/account-management-overview>
- How to use GCP and not lose sleep: <https://sudcha.com/guide-to-cloud/>