#### Section 5. Configuring access and security

**Topics discussed in Section 1 of exam guide but more details provided here**

* Understanding roles <https://cloud.google.com/iam/docs/understanding-roles>
* Basic role definitions: <https://cloud.google.com/iam/docs/understanding-roles#basic-definitions>
* Predefined roles: <https://cloud.google.com/iam/docs/understanding-roles#predefined_roles>
* Choosing predefined roles: <https://cloud.google.com/iam/docs/choose-predefined-roles>
* Custom roles:

<https://cloud.google.com/iam/docs/understanding-custom-roles>

**Website showing how to implement a lot of the concepts in Section 5**

<https://cloudaffaire.com/how-to-create-and-manage-cloud-iam-policy-in-gcp/>

**5.1 Managing Identity and Access Management (IAM). Tasks include:**

a. Viewing IAM policies

* Understanding roles (link also in Section 1 of exam guide) <https://cloud.google.com/iam/docs/understanding-roles>
* Basic role definitions: <https://cloud.google.com/iam/docs/understanding-roles#basic-definitions>
* Predefined roles: <https://cloud.google.com/iam/docs/understanding-roles#predefined_roles>

b. Creating IAM policies

* Policy: <https://cloud.google.com/iam/docs/reference/rest/v1/Policy?WT.mc_id=ravikirans>
* Configure temporary access: <https://cloud.google.com/iam/docs/configuring-temporary-access>
* Configure resource-based access: <https://cloud.google.com/iam/docs/configuring-resource-based-access>
* Manage conditional role bindings: <https://cloud.google.com/iam/docs/managing-conditional-role-bindings>
* Suggested Lab: Configuring IAM Permissions with gcloud: <https://partner.cloudskillsboost.google/focuses/42345?catalog_rank=%7B%22rank%22%3A1%2C%22num_filters%22%3A0%2C%22has_search%22%3Atrue%7D&parent=catalog&search_id=17891365>

c. Managing the various role types and defining custom IAM roles (e.g., primitive, predefined and custom)

* Policies: <https://cloud.google.com/iam/docs/reference/rest/v1/Policy#:~:text=A%20Policy%20is%20a%20collection,a%20user%2Dcreated%20custom%20role>.
* Understanding allow policies: <https://cloud.google.com/iam/docs/policies>
* Policy version: <https://cloud.google.com/iam/docs/policies#valid>
* Using gcloud: <https://cloud.google.com/iam/docs/creating-custom-roles#iam-custom-roles-create-gcloud>
* Viewing available permissions for projects, folders, and organizations: <https://cloud.google.com/iam/docs/creating-custom-roles#viewing-resource-permissions>
* API Explorer: <https://cloud.google.com/iam/docs/reference/rest/v1/projects.roles/create>
* Using Client Libraries: <https://cloud.google.com/apis/docs/cloud-client-libraries>
* Examples of creating a custom role using client libraries (scroll to bottom of page: <https://cloud.google.com/iam/docs/reference/rest/v1/projects.roles/create>
* Lab in partner.cloudskillsboost.google: IAM Custom Roles: <https://partner.cloudskillsboost.google/focuses/11638?catalog_rank=%7B%22rank%22%3A2%2C%22num_filters%22%3A0%2C%22has_search%22%3Atrue%7D&parent=catalog&search_id=16714645>
* Cloud storage overview: <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=->
* Identity and Access Management for Cloud Storage: <https://cloud.google.com/storage/docs/access-control/iam>

**5.2 Managing service accounts. Tasks include:**

**Nice set of YouTube videos explaining service accounts:**

* What are service accounts: <https://www.youtube.com/watch?v=xXk1YlkKW_k&list=PLIivdWyY5sqIlPnZ7cvkg2Ck-8ZZ8TA5t&index=1>
* Creating, managing and retiring Service accounts: <https://www.youtube.com/watch?v=2TdLmI3G5Rc&list=PLIivdWyY5sqIlPnZ7cvkg2Ck-8ZZ8TA5t&index=2>
* How to secure your service accounts: <https://www.youtube.com/watch?v=CTcQNPWNRkE&list=PLIivdWyY5sqIlPnZ7cvkg2Ck-8ZZ8TA5t&index=3>
* Service account keys and impersonation: <https://www.youtube.com/watch?v=SDhMwyyd9_0&list=PLIivdWyY5sqIlPnZ7cvkg2Ck-8ZZ8TA5t&index=4>
* Service accounts in action: <https://www.youtube.com/watch?v=UhYqag7Xjhw&list=PLIivdWyY5sqIlPnZ7cvkg2Ck-8ZZ8TA5t&index=5>

a. Creating service accounts:

* Understanding service accounts: <https://cloud.google.com/iam/docs/service-accounts>
* Types of service accounts: <https://cloud.google.com/iam/docs/service-accounts#types>
* Creating: <https://cloud.google.com/iam/docs/creating-managing-service-accounts>
* Cloud Skills Boost lab; Service Accounts and Roles: Fundamentals: <https://partner.cloudskillsboost.google/focuses/11640?catalog_rank=%7B%22rank%22%3A2%2C%22num_filters%22%3A0%2C%22has_search%22%3Atrue%7D&parent=catalog&search_id=16714631>

b. Using service accounts in IAM policies with minimum permissions

* Granting minimum permissions to service accounts: <https://cloud.google.com/iam/docs/understanding-service-accounts#granting_minimum>
* Service account permissions for common scenarios: <https://cloud.google.com/iam/docs/understanding-service-accounts#sa_common>

c. Assigning service accounts to resources

* How compute engine uses service accounts: <https://cloud.google.com/compute/docs/access/service-accounts>
* Creating and enabling service accounts for instances: <https://cloud.google.com/compute/docs/access/create-enable-service-accounts-for-instances>
* How service accounts work with Compute Engine: <https://cloud.google.com/compute/docs/access/service-accounts>
* Attaching a service account to a CE instance: <https://cloud.google.com/compute/docs/access/service-accounts#associating_a_service_account_to_an_instance>
* Authenticating Applications using service account credentials: <https://cloud.google.com/compute/docs/access/create-enable-service-accounts-for-instances#authenticating_applications_using_service_account_credentials>

d. Managing IAM of a service account

* Manage access to service accounts: <https://cloud.google.com/iam/docs/manage-access-service-accounts>
* Service Account permissions: <https://cloud.google.com/iam/docs/service-accounts#service_account_permissions>
* Best practices for using and managing service accounts: <https://cloud.google.com/iam/docs/best-practices-for-using-and-managing-service-accounts>

e. Managing service account impersonation

* Attaching a service account to a resource: <https://cloud.google.com/iam/docs/impersonating-service-accounts#attaching-to-resources>

e. Creating and managing short-lived service account credentials

* Creating short-lived service account credentials: <https://cloud.google.com/iam/docs/creating-short-lived-service-account-credentials>

**5.3 Viewing audit logs**

* Audit logs overview: <https://cloud.google.com/logging/docs/audit>
* Google services with audit logs: <https://cloud.google.com/logging/docs/audit/services>