

Google APIs required by the OpenShift 4.9 GCP IPI installer

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Purpose: Discover which Google APIs are required as a minimum by the OpenShift 4.9 GCP IPI installer.

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Bootstrap node

During the installer process the following resources are used for the bootstrapping process.

- Creates a storage bucket using resources
 - “google_storage_bucket” with name “ignition”
 - Uses the “storage.googleapis.com” and “standard google compute” APIs.
 - Source file “resource_storage_bucket.go” imports “google.golang.org/api/storage/v1” and “google.golang.org/api/googleapi”
 - <https://pkg.go.dev/google.golang.org/api/storage/v1>
 - https://cloud.google.com/storage/docs/json_api
 - <https://cloud.google.com/compute/docs/reference/rest/v1/networks>
 - <https://pkg.go.dev/google.golang.org/api/googleapi#pkg-overview>
 - Github resources are also imported.
 - "github.com/gammazero/workerpool"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/customdiff"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/resource"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/validation"
 - “google_storage_bucket_object” with name “ignition”
 - Uses the “storage.googleapis.com” and “standard google compute” APIs.
 - Source file “resource_storage_bucket_object.go” imports “google.golang.org/api/storage/v1” and “google.golang.org/api/googleapi”
 - <https://pkg.go.dev/google.golang.org/api/storage/v1>
 - https://cloud.google.com/storage/docs/json_api
 - <https://cloud.google.com/compute/docs/reference/rest/v1/networks>
 - <https://pkg.go.dev/google.golang.org/api/googleapi#pkg-overview>
 - “google_storage_bucket_signed_url” with name “ignition”
 - Cannot find a resource file but did find a data source file called data_source_storage_object_signed_url. The following are imported.
 - "github.com/hashicorp/errwrap"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/validation"
 - "golang.org/x/oauth2/google"
 - "golang.org/x/oauth2/jwt"
 - In the code however, there is a call to <https://storage.googleapis.com>

- Creates compute resources using.
 - “google_compute_address” with name “bootstrap”
 - No APIs are imported other than the following github source.
 - github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema
 - “google_compute_firewall” with name “bootstrap_ingress_ssh”
 - No APIs are imported other than the following github source.
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/customdiff"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/validation"
 - “google_compute_instance” with name “bootstrap”
 - uses the “compute.googleapis.com” API.
 - Source file “resource_compute_instance.go” imports “google.golang.org/api/compute/v1”
 - <https://pkg.go.dev/google.golang.org/api/compute/v1>
 - <https://cloud.google.com/compute/docs/reference/rest/v1>
 - “google_compute_instance_group” with name “bootstrap”
 - uses the “compute.googleapis.com” API.
 - Source file “resource_compute_instance_group.go” imports “google.golang.org/api/compute/v1”
 - <https://pkg.go.dev/google.golang.org/api/compute/v1>
 - <https://cloud.google.com/compute/docs/reference/rest/v1>

Cluster steps

The only resource run in the cluster directory by the installer, is to create a compute image using the resource below.

- “google_compute_image” with “cluster”
 - No APIs are imported other than the following github source.
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema”

The following “child” steps are called to run through a few tasks.

Master

Master configuration for the installer are done with the following resources.

- “google_service_account” with “master-node-sa”
 - uses the “iam.googleapis.com” API
 - Source file “resource_google_service_account.go” imports “google.golang.org/api/iam/v1”
 - <https://pkg.go.dev/google.golang.org/api@v0.69.0/iam/v1>
 - <https://cloud.google.com/iam/docs/reference/rest>
- “google_project_iam_member” with “master-compute-admin” & “google_project_iam_member” with “master-network-admin” & “google_project_iam_member” with “master-compute-security” & “google_project_iam_member” with “master-storage-admin” & “google_project_iam_member” with “master-service-account-user”
 - Uses the "cloudresourcemanager.googleapis.com" API.
 - Source file “resource_iam_member.go” imports the “google.golang.org/api/cloudresourcemanager/v1”
 - <https://pkg.go.dev/google.golang.org/api/cloudresourcemanager/v1>
 - <https://cloud.google.com/resource-manager/reference/rest>
 - There are also other github resources that are imported.
 - "github.com/davecgh/go-spew/spew"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/validation"
- “google_compute_instance” with “master”
 - uses the “compute.googleapis.com” API.
 - Source file “resource_compute_instance.go” imports “google.golang.org/api/compute/v1”
 - <https://pkg.go.dev/google.golang.org/api/compute/v1>

- <https://cloud.google.com/compute/docs/reference/rest/v1>
- “google_compute_instance_group” with “master”
 - uses the “compute.googleapis.com” API.
 - Source file “resource_compute_instance_group.go” imports “google.golang.org/api/compute/v1”
 - <https://pkg.go.dev/google.golang.org/api/compute/v1>
 - <https://cloud.google.com/compute/docs/reference/rest/v1>

IAM

IAM configuration for the installer are done with the following resources.

- “google_service_account” with “worker-node-sa”
 - uses the “iam.googleapis.com” API
 - Source file “resource_google_service_account.go” imports “google.golang.org/api/iam/v1”
 - <https://pkg.go.dev/google.golang.org/api@v0.69.0/iam/v1>
 - <https://cloud.google.com/iam/docs/reference/rest>
- “google_project_iam_member” with “worker-compute-viewer” & “google_project_iam_member” with “worker-storage-admin”
 - Uses the “cloudresourcemanager.googleapis.com” API.
 - Source file “resource_iam_member.go” imports the “google.golang.org/api/cloudresourcemanager/v1”
 - <https://pkg.go.dev/google.golang.org/api/cloudresourcemanager/v1>
 - <https://cloud.google.com/resource-manager/reference/rest>
 - There are also other github resources that are imported.
 - “github.com/davecgh/go-spew/spew”
 - “github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema”
 - “github.com/hashicorp/terraform-plugin-sdk/v2/helper/validation”

Network

The following sub tasks are run in the network section of the installer.

Firewall

The following configuration for the firewall is done with the installer using the following resources.

- “google_compute_firewall” with “api” & “google_compute_firewall” with “health_checks” & “google_compute_firewall” with “etcd” & “google_compute_firewall” with “control_plane” &

“google_compute_firewall” with “internal_network” & “google_compute_firewall” with “internal_cluster”

- No APIs are imported other than the following github source.
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/customdiff"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/validation"

Load balancer

The following load balancer configuration is done with the following resources in the installer.

Private

- “google_compute_address” with “cluster_ip”
 - No APIs are imported other than the following github source.
 - github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema
- “google_compute_health_check” with “api_internal”
 - No APIs are imported other than the following github source.
 - github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema

Public

- “google_compute_address” with “cluster_public_ip”
 - No APIs are imported other than the following github source.
 - github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema
- “google_compute_http_health_check” with “api”
 - No APIs are imported other than the following github source.
 - github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema

Network

The following network configuration is done with the following resources in the installer.

- “google_compute_network” with “cluster_network”
 - Uses the standard “google.golang.org/api/googleapi” APIs. Cannot find anything yet that requires enabling to use this other than the compute API.
 - <https://cloud.google.com/compute/docs/reference/rest/v1/networks>
 - <https://pkg.go.dev/google.golang.org/api/googleapi#pkg-overview>
- “google_compute_subnetwork” with “worker_subnet” & “google_compute_subnetwork” with “master_subnet”

- No APIs are imported other than the following github sources.
 - "github.com/apparentlymart/go-cidr/cidr"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/customdiff"
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema"
- "google_compute_router" with "router"
 - No APIs are imported other than the following github source.
 - github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema
- "google_compute_router_nat" with "master_nat" & "google_compute_router_nat" with "worker_nat"
 - Uses the standard "google.golang.org/api/googleapi" APIs. Cannot find anything yet that requires enabling to use this other than the compute API.
 - <https://cloud.google.com/compute/docs/reference/rest/v1/networks>
 - <https://pkg.go.dev/google.golang.org/api/googleapi#pkg-overview>

DNS

DNS configuration for the installer are done with the following resources.

- "google_dns_managed_zone" with "init"
 - Uses the "google.golang.org/api/dns/v1" API.
 - <https://pkg.go.dev/google.golang.org/api/dns/v1>
 - Possibly need to enable "dns.googleapis.com" but I cannot find a direct link in the documentation to confirm. More [here](#).
- "google_dns_record_set" with "api_external" & "google_dns_record_set" with "api_internal" & "google_dns_record_set" with "api_external_internal_zone"
 - Uses the "google.golang.org/api/dns/v1" API.
 - <https://pkg.go.dev/google.golang.org/api/dns/v1>
 - Possibly need to enable "dns.googleapis.com" but I cannot find a direct link in the documentation to confirm. More [here](#).

Post bootstrap

The following steps and resources are used in the post bootstrap part of the installer.

- “google_compute_region_backend_service” with “api_internal”
 - Uses the standard “google.golang.org/api/googleapi” APIs. Cannot find anything yet that requires enabling to use this other than the compute API.
 - <https://cloud.google.com/compute/docs/reference/rest/v1/backendServices>
 - <https://pkg.go.dev/google.golang.org/api/googleapi#pkg-overview>
- “google_compute_forwarding_rule” with “api_internal”
 - No APIs are imported. There are however, the following github resources being imported.
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema"
 - dcl "github.com/GoogleCloudPlatform/declarative-resource-client-library/dcl"
 - compute "github.com/GoogleCloudPlatform/declarative-resource-client-library/services/google/compute"
- “google_compute_target_pool” with “api”
 - Uses the standard “google.golang.org/api/googleapi” APIs. Cannot find anything yet that requires enabling to use this other than the compute API.
 - <https://cloud.google.com/compute/docs/reference/rest/v1/targetPools>
 - <https://pkg.go.dev/google.golang.org/api/googleapi#pkg-overview>
 - Uses the “compute.googleapis.com” API.
 - Source file “resource_compute_target_pool.go” imports “google.golang.org/api/compute/v1”
 - <https://pkg.go.dev/google.golang.org/api/compute/v1>
 - <https://cloud.google.com/compute/docs/reference/rest/v1>
- “google_compute_forwarding_rule” with “api”
 - No APIs are being imported. There are however, the following github resources being imported.
 - "github.com/hashicorp/terraform-plugin-sdk/v2/helper/schema"
 - dcl "github.com/GoogleCloudPlatform/declarative-resource-client-library/dcl"
 - compute "github.com/GoogleCloudPlatform/declarative-resource-client-library/services/google/compute"

Summary

After looking through all the Terraform files in the OpenShift 4.9 GCP IPI installer I have only found reference to the APIs in the Google APIs section below.

The installer makes use of a few APIs, mainly, “compute”, “iam”, “cloudresourcemanager”, “storage”, “dns” and the standard APIs that are enabled when “compute” has been enabled.

Google APIs

The following are the different Google APIs used by the OpenShift IPI installer.

Golang API	Google API
google.golang.org/api/compute/v1	https://compute.googleapis.com
google.golang.org/api/iam/v1	https://iam.googleapis.com
google.golang.org/api/cloudresourcemanager/v1	https://cloudresourcemanager.googleapis.com
google.golang.org/api/storage/v1	https://storage.googleapis.com
google.golang.org/api/googleapi	Package googleapi contains the common code shared by all Google API libraries.
google.golang.org/api/dns/v1	“https://dns.googleapis.com”*

Other resources

Other than the Google APIs mentioned above, the Terraform Google Provider makes use of other github resources during the install. None of which I have been able to find reference to Google requiring an API to be enabled.

Resources & References

The following links and resources were used to determine the results in this document.

Name	Link
OpenShift 4.8 GCP installer source code	https://github.com/openshift/installer/tree/release-4.9/data/data/gcp
Google provider for Terraform	https://registry.terraform.io/providers/hashicorp/google/latest/docs
Golang api library for GCP	https://pkg.go.dev/google.golang.org/api