

Serverless VPC Access enables you to connect from the App Engine standard environment and Cloud Functions directly to your VPC network. This connection makes it possible for your App Engine standard environment apps and Cloud Functions to access resources in your VPC network via internal (private) IP addresses. Using internal IP addresses improves the latency of communication between your Google Cloud services and avoids exposing internal resources to the public internet.

Serverless VPC Access only allows your app or function to send requests to resources in your VPC network and receive responses to those requests. Communication in the opposite direction, where a VM initiates a request to an app or function, requires you to use the public address of the app or function—see [Private Google Access \(/vpc/docs/private-access-options#pga\)](/vpc/docs/private-access-options#pga) for more information.

Serverless VPC Access supports communication to VPC networks connected via [Cloud VPN \(/vpn/docs/\)](/vpn/docs/) and [VPC Network Peering \(/vpc/docs/using-vpc-peering\)](/vpc/docs/using-vpc-peering). Serverless VPC Access does not support [legacy networks \(/vpc/docs/legacy\)](/vpc/docs/legacy) or [Shared VPC networks \(/vpc/docs/provisioning-shared-vpc\)](/vpc/docs/provisioning-shared-vpc).

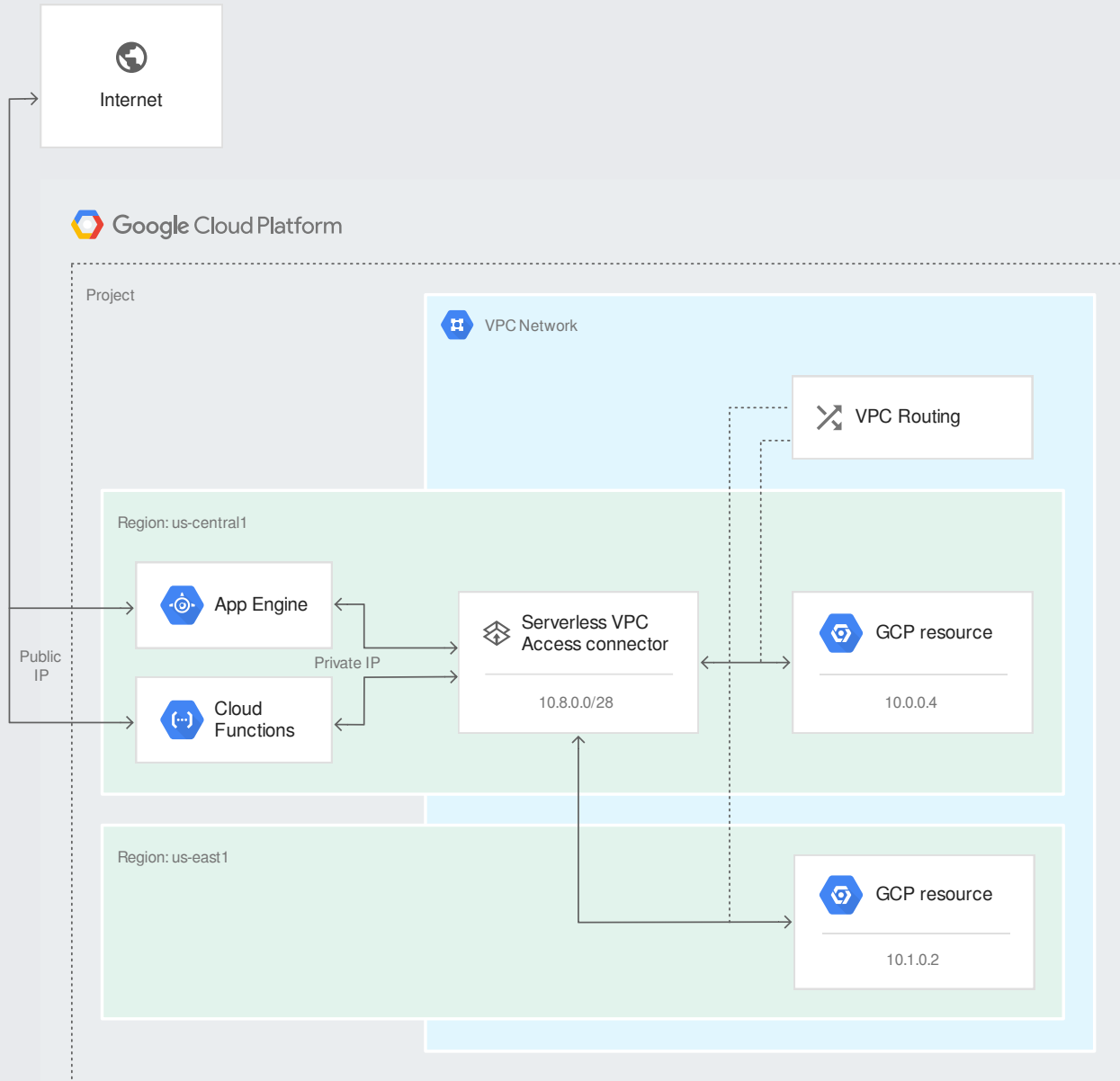
If you want to use internal IP addresses when connecting from the App Engine flexible environment, you don't need to use Serverless VPC Access. Just make sure your App Engine flexible environment VMs are located [in the same VPC network \(/appengine/docs/flexible/python/reference/app-yaml#network\\_settings\)](/appengine/docs/flexible/python/reference/app-yaml#network_settings) as the resources you want to connect to, and that they are located in a network connected via [VPC Network Peering \(/vpc/docs/using-vpc-peering\)](/vpc/docs/using-vpc-peering).

Serverless VPC Access is based on a resource called a *connector*. A connector handles traffic between your app or function on App Engine or Cloud Functions and your VPC network. When you create a connector in your Google Cloud project, you attach it to a specific VPC network and region. You can then configure your app or function to use the connector for internal network traffic.

When you create a connector, you also assign it an IP range to use for the source addresses for traffic sent through the connector. This IP range must be a CIDR /28 range that is not already reserved in your VPC network.

Serverless VPC Access automatically provisions throughput for a connector in 100 Mbps increments depending on the amount of traffic sent through the connector. Automatically provisioned throughput can only scale up and does not scale down. A connector always has at least 200 Mbps provisioned and cannot exceed a throughput of 1000 Mbps. You can configure minimum and maximum throughput limits when you create a connector.

Serverless VPC Access connectors incur a monthly charge based on usage. See [Pricing \(#pricing\)](#) for details.



(/vpc/images/serverless-vpc-access.svg)

Serverless VPC Access example (click to enlarge)

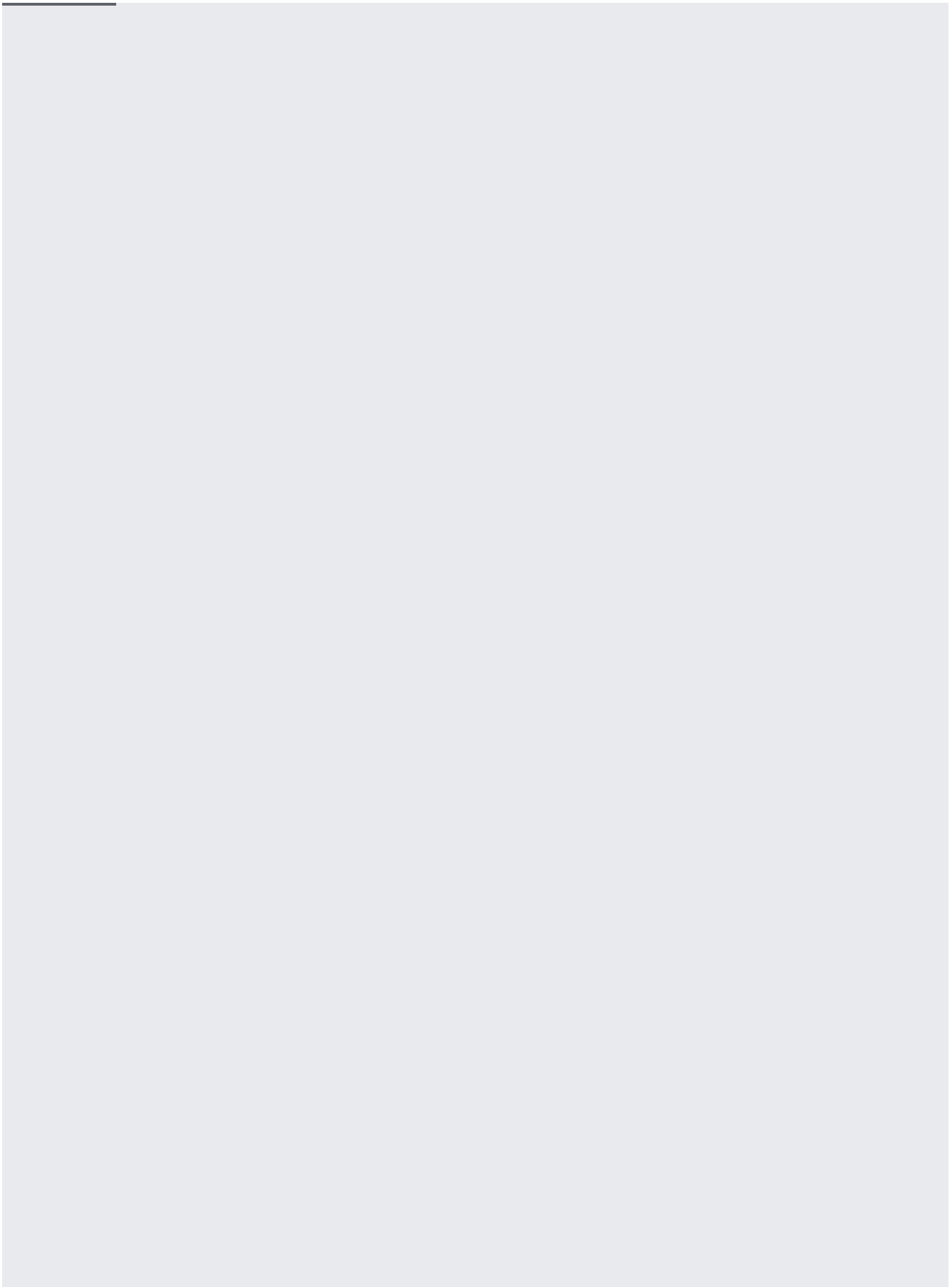
Note that:

- A connector must be located in the same project and region as the app or function that connects to it. See [Supported regions \(#supported\\_regions\)](#) for the list of regions in which you can create a connector.

- Traffic to internal IP addresses is routed through the connector, while traffic to public IP addresses is routed through the internet.
- You can use the same connector with multiple apps or functions if they are in the same region.
- For resources that allow cross-region access, a connector can be in a different region than the resource it is sending traffic to. You are billed for egress from the connector—see [Pricing](#) (#pricing).

★ **Note:** Some resources, such as Cloud SQL and Memorystore instances, require connections to come from the same region as the resource. Refer to the documentation for the resource you are connecting to.

To create a connector, use the Cloud Console or the `gcloud` command-line tool:



If creating a connector results in an error, try the following and re-create your connector:

- Specify an IP range that does not overlap with any existing IP address reservations in the VPC network.
- Grant your project permission to use Compute Engine VM images from the project with ID `serverless-vpc-access-images`. See [Setting image access constraints](/compute/docs/images/restricting-image-access#trusted_images) (`/compute/docs/images/restricting-image-access#trusted_images`) for information on how to update your organization policy accordingly.

Before you delete a connector, ensure that no services are still using it. See the documentation for [App Engine](/appengine/docs/standard/python/connecting-vpc) (`/appengine/docs/standard/python/connecting-vpc`) or [Cloud Functions](/functions/docs/connecting-vpc) (`/functions/docs/connecting-vpc`) for information on disconnecting a connector.

You cannot delete a VPC network if a Serverless VPC Access connector is still attached to it. You must delete all connectors before deleting the VPC network.

Once you've created a connector, you can configure your app or function on App Engine or Cloud Functions to use it. Remember that a connector must be located in the same region as the app or function that connects to it. If you have multiple apps or functions in the same region, you can use the same connector—for example, an app and a function in the same region can share a connector if they need to communicate with the same VPC network.

How you configure a service to use a connector depends on the product. For detailed instructions, see the relevant product's documentation:

- [Connecting your App Engine app to a VPC network](#) (/appengine/docs/standard/python/connecting-vpc)
- [Connecting your Cloud Functions to a VPC network](#) (/functions/docs/connecting-vpc)

The following services support connecting to a Serverless VPC Access connector:

- [App Engine standard environment](#) (/appengine/docs/standard/)
  - All runtimes except PHP 5.5 and Go 1.9
- [Cloud Functions](#) (/functions/docs)

You can create a Serverless VPC Access connector in the following regions:

- `us-central1`
- `us-east1`
- `eu-west-1`
- `eu-west-2`
- `asia-northeast1`

In App Engine, `us-central1` and `eu-west-1` are named `us-central` and `eu-west`.

The following table describes the Cloud Identity and Access Management (Cloud IAM) (/iam) roles associated with Serverless VPC Access and lists the permissions that are contained in each role.

Role	Description	Permissions
Serverless VPC Access Admin <code>roles/vpcaccess.admin</code>	Full access to all Serverless VPC Access resources	<code>vpcaccess.connectors.get</code> <code>vpcaccess.connectors.list</code> <code>vpcaccess.connectors.use</code> <code>vpcaccess.connectors.create</code> <code>vpcaccess.connectors.delete</code> <code>vpcaccess.operations.get</code> <code>vpcaccess.operations.list</code> <code>vpcaccess.locations.list</code>
Serverless VPC Access User <code>roles/vpcaccess.user</code>	User of Serverless VPC Access connectors	<code>vpcaccess.connectors.get</code> <code>vpcaccess.connectors.list</code> <code>vpcaccess.connectors.use</code> <code>vpcaccess.operations.get</code> <code>vpcaccess.operations.list</code> <code>vpcaccess.locations.list</code>

Role	Description	Permissions
Serverless VPC Access Viewer <code>roles/vpcaccess.viewer</code>	Viewer of all Serverless VPC Access resources	<code>vpcaccess.connectors.get</code> <code>vpcaccess.connectors.list</code> <code>vpcaccess.operations.get</code> <code>vpcaccess.operations.list</code> <code>vpcaccess.locations.list</code>

See [Serverless VPC Access audit logging information](/vpc/docs/serverless-vpc-access-audit-logging) (/vpc/docs/serverless-vpc-access-audit-logging).

Serverless VPC Access is priced as follows. Pricing is subject to change (and might increase) while Serverless VPC Access is in beta or at General Availability.

Resource	Price
Serverless VPC Access connector	Charged as 1 <b>f1-micro</b> (/compute/vm-instance-pricing#sharedcore) instance per 100 Mbps of throughput automatically provisioned for the connector
Network egress from app/function to destination	Charged at <a href="/compute/network-pricing">Compute Engine networking rates</a> (/compute/network-pricing)

You can view your Serverless VPC Access costs in the Cloud Console by filtering your billing reports by the label key `serverless-vpc-access`.