



Documentation

Technolo

Search /

Language ▾

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

Filter

Cloud Audit Logs

Cloud Audit Logs overview
Services with audit logs

Enable Data Access audit logs

▶ Audit logs in depth

Cloud Logging audit logs

▶ Google Workspace audit logs

▼ Audit logs datatypes

▶ AuditLog

Types

AuditLog

PolicyType

▶ App Engine AuditData
▶ App Engine AuditData (legacy)
▶ BigQuery AuditData
▶ IAM AuditData

Troubleshoot

Google Cloud Observability > Logging >

Documentation > Guides

Was this helpful?

AuditLog



Send feedback

On this page ▾

ResourceLocation
Status
AuthenticationInfo
ServiceAccountDelegationInfo
FirstPartyPrincipal
...

Common audit log format for Google Cloud Platform API operations.

JSON representation

```
{  
  "serviceName": string,  
  "methodName": string,  
  "resourceName": string,  
  "resourceLocation": {  
    object (ResourceLocation)  
  },  
  "resourceOriginalState": {  
    object  
  },  
  "numResponseItems": string,  
  "status": {  
    object (Status)  
  },  
  "authenticationInfo": {  
    object (AuthenticationInfo)  
  },  
  "authorizationInfo": [  
    {  
      object (AuthorizationInfo)  
    }  
  ],  
  "policyViolationInfo": {  
    object (PolicyViolationInfo)  
  },  
  ...  
}
```



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

Cloud Audit Logs

- Cloud Audit Logs overview
- Services with audit logs
- Enable Data Access audit logs

Audit logs in depth

- Cloud Logging audit logs
- Google Workspace audit logs
- Audit logs datatypes**
 - AuditLog**

Types

AuditLog

- PolicyType
 - App Engine AuditData
 - App Engine AuditData (legacy)
 - BigQuery AuditData
 - IAM AuditData

Troubleshoot

		example, "compute.googleapis.com".
	methodName	<p>string</p> <p>The name of the service method or operation. For API calls, this should be the name of the API method. For example,</p> <pre>"google.cloud.bigquery.v2.TableService.Insert" "google.logging.v2.ConfigServiceV2.CreateSinc</pre>
	resourceName	<p>string</p> <p>The resource or collection that is the target of the operation. The name is a scheme-less URI, not including the API service name. For example:</p> <pre>"projects/PROJECT_ID/zones/us-central1-a/in" "projects/PROJECT_ID/datasets/DATASET_ID"</pre>
	resourceLocation	<p>object (ResourceLocation)</p> <p>The resource location information.</p>
	resourceOriginalState	<p>object (Struct format)</p> <p>The resource's original state before mutation. Present only for operations which have successfully modified the targeted resource(s). In general, this field should contain all changed fields, except those that are already been included in <code>request</code>, <code>response</code>, <code>metadata</code> or <code>serviceData</code> fields. When the JSON object represented here has a proto equivalent, the proto name will be indicated in the <code>@type</code> property.</p>
	numResponseItems	<p>string (int64 format)</p> <p>The number of items returned from a List or Query API method, if applicable.</p>
	status	<p>object (Status)</p> <p>The status of the overall operation.</p>
	authenticationInfo	<p>object (AuthenticationInfo)</p>

Cloud Audit Logs

[Cloud Audit Logs overview](#)
[Services with audit logs](#)

- ▶ [Audit logs in depth](#)
 - [Cloud Logging audit logs](#)
 - [Google Workspace audit logs](#)

- ▼ [Audit logs datatypes](#)
 - ▼ [AuditLog](#)

Types

AuditLog

- [PolicyType](#)
- ▶ [App Engine AuditData](#)
- ▶ [App Engine AuditData \(legacy\)](#)
- ▶ [BigQuery AuditData](#)
- ▶ [IAM AuditData](#)

Troubleshoot

response	object (Struct format)
	The operation response. This may not include all response elements, such as those that are too large, privacy-sensitive, or duplicated elsewhere in the log record. It should never include user-generated data, such as file contents. When the JSON object represented here has a proto equivalent, the proto name will be indicated in the <code>@type</code> property.
metadata	object (Struct format)
	Other service-specific data about the request, response, and other information associated with the current audited event.
serviceData (deprecated)	object
	⚠ This item is deprecated!
	Deprecated. Use the <code>metadata</code> field instead. Other service-specific data about the request, response, and other activities.
	An object containing fields of an arbitrary type. An additional field " <code>@type</code> " contains a URI identifying the type. Example: <code>{ "id": 1234, "@type": "types.example.com/standard/id" }</code> .

ResourceLocation

Location information about a resource.

JSON representation

```
{
  "currentLocations": [
    string
  ],
  "originalLocations": [
    string
  ]
}
```

Fields



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

≡

Cloud Audit Logs

- Cloud Audit Logs overview
- Services with audit logs
- Enable Data Access audit logs
- ▶ Audit logs in depth
 - Cloud Logging audit logs
 - ▶ Google Workspace audit logs
 - ▼ Audit logs datatypes
 - ▶ AuditLog

Types

AuditLog

- PolicyType
- ▶ App Engine AuditData
- ▶ App Engine AuditData (legacy)
- ▶ BigQuery AuditData
- ▶ IAM AuditData

Troubleshoot

Status

The `Status` type defines a logical error model that is suitable for different programming environments, including REST APIs and RPC APIs. It is used by [gRPC](#). Each `Status` message contains three pieces of data: error code, error message, and error details.

You can find out more about this error model and how to work with it in the [API Design Guide](#).

JSON representation

```
{  
  "code": integer,  
  "message": string,  
  "details": [  
    {  
      "@type": string,  
      field1: ...,  
      ...  
    }  
  ]  
}
```

Fields

code	integer
	The status code, which should be an enum value of <code>google.rpc.Code</code> .
message	string
	A developer-facing error message, which should be in English. Any user-facing error message should be localized and sent in the <code>google.rpc.Status.details</code> field, or localized by the client.
details[]	object
	A list of messages that carry the error details. There is a common set of message types for APIs to use.



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

```

    "principalSubject": string
}

```

Fields

<code>principalEmail</code>	<code>string</code>
-----------------------------	---------------------

The email address of the authenticated user (or service account on behalf of third party principal) making the request. For third party identity callers, the `principalSubject` field is populated instead of this field. For privacy reasons, the principal email address is sometimes redacted. For more information, see [Caller identities in audit logs](#).

<code>authoritySelector</code>	<code>string</code>
--------------------------------	---------------------

The authority selector specified by the requestor, if any. It is not guaranteed that the principal was allowed to use this authority.

<code>thirdPartyPrincipal</code>	<code>object (Struct format)</code>
----------------------------------	---

The third party identification (if any) of the authenticated user making the request. When the JSON object represented here has a proto equivalent, the proto name will be indicated in the `@type` property.

<code>serviceAccountKeyName</code>	<code>string</code>
------------------------------------	---------------------

The name of the service account key used to create or exchange credentials for authenticating the service account making the request. This is a scheme-less URI full resource name. For example:

`"//iam.googleapis.com/projects/{PROJECT_ID}/serviceAccounts/{ACCOUNT}/keys/{key}"`

<code>serviceAccountDelegationInfo[]</code>	<code>object (ServiceAccountDelegationInfo)</code>
---	--

Identity delegation history of an authenticated service account that makes the request. It contains information on the real authorities that try to access GCP resources by delegating on a service account. When multiple authorities present, they are guaranteed to be sorted based on the original ordering of the identity delegation events.

<code>principalSubject</code>	<code>string</code>
-------------------------------	---------------------

String representation of identity of requesting party.



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

Cloud Audit Logs

- Cloud Audit Logs overview
- Services with audit logs
- Enable Data Access audit logs

- ▶ Audit logs in depth
 - Cloud Logging audit logs
- ▶ Google Workspace audit logs

- ▼ Audit logs datatypes
 - ▶ AuditLog

Types

AuditLog

- PolicyType
- ▶ App Engine AuditData
- ▶ App Engine AuditData (legacy)
- ▶ BigQuery AuditData
- ▶ IAM AuditData

Troubleshoot

<code>principalSubject</code>	<code>string</code>
	A string representing the principalSubject associated with the identity. For most identities, the format will be <code>principal://iam.googleapis.com/{identity pool name}/subject/{subject}</code> except for some GKE identities (GKE_WORKLOAD, FREEFORM, GKE_HUB_WORKLOAD) that are still in the legacy format <code>serviceAccount:{identity pool name}[{subject}]</code>

Union field **Authority**. Entity that creates credentials for service account and assumes its identity for authentication. **Authority** can be only one of the following:

<code>firstPartyPrincipal</code>	<code>object (FirstPartyPrincipal)</code>
	First party (Google) identity as the real authority.

<code>thirdPartyPrincipal</code>	<code>object (ThirdPartyPrincipal)</code>
	Third party identity as the real authority.

FirstPartyPrincipal

First party identity principal.

JSON representation

```
{
  "principalEmail": string,
  "serviceMetadata": {
    object
  }
}
```

Fields

<code>principalEmail</code>	<code>string</code>
	The email address of a Google account. .
<code>serviceMetadata</code>	<code>object (Struct format)</code>
	Metadata about the service that uses the service account. .



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

AuthorizationInfo

Authorization information for the operation.

JSON representation

```
{  
  "resource": string,  
  "permission": string,  
  "granted": boolean,  
  "resourceAttributes": {  
    object (Resource)  
  }  
}
```

Fields

resource	string The resource being accessed, as a REST-style or cloud resource string. For example: <code>bigquery.googleapis.com/projects/PROJECTID/</code> or <code>projects/PROJECTID/datasets/DATASETID</code>
permission	string The required IAM permission.
granted	boolean Whether or not authorization for <code>resource</code> and <code>permission</code> was granted.
resourceAttributes	object (Resource) Resource attributes used in IAM condition evaluation. This field contains resource attributes like resource type and resource name. To get the whole view of the attributes used in IAM condition evaluation, the user must also look into <code>AuditLog.request_metadata.request_attributes</code> .



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

```

    "displayName": "string",
    "createTime": "string",
    "updateTime": "string",
    "deleteTime": "string",
    "etag": "string",
    "location": "string"
}

```

Cloud Audit Logs

Cloud Audit Logs overview

Services with audit logs

Enable Data Access audit logs

▶ Audit logs in depth

Cloud Logging audit logs

▶ Google Workspace audit logs

▼ Audit logs datatypes

 ▼ AuditLog

 Types

 AuditLog

PolicyType

 ▶ App Engine AuditData

 ▶ App Engine AuditData (legacy)

 ▶ BigQuery AuditData

 ▶ IAM AuditData

Troubleshoot

Fields

service	string
---------	--------

The name of the service that this resource belongs to, such as pubsub.googleapis.com. The service may be different from the DNS hostname that actually serves the request.

name	string
------	--------

The stable identifier (name) of a resource on the service. A resource can be logically identified as "`//{resource.service}/{resource.name}`". The differences between a resource name and a URI are:

- Resource name is a logical identifier, independent of network protocol and API version. For example, `/pubsub.googleapis.com/projects/123/topics/news-feed`.
- URI often includes protocol and version information, so it can be used directly by applications. For example, `https://pubsub.googleapis.com/v1/projects/123/topics/news-feed`.

See <https://cloud.google.com/apis/design/resourceNames> for details.

type	string
------	--------

The type of the resource. The syntax is platform-specific because different platforms define their resources differently.

For Google APIs, the type format must be "`{service}/{kind}`", such as "pubsub.googleapis.com/Topic".

labels	map (key: string, value: string)
--------	----------------------------------

The labels or tags on the resource, such as AWS resource tags and Kubernetes resource labels.

An object containing a list of "key": value pairs.



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

Cloud Audit Logs
Cloud Audit Logs overview
Services with audit logs
Enable Data Access audit logs
▶ Audit logs in depth
Cloud Logging audit logs
▶ Google Workspace audit logs
▼ Audit logs datatypes
▼ AuditLog
AuditLog
PolicyType
▶ App Engine AuditData
▶ App Engine AuditData (legacy)
▶ BigQuery AuditData
▶ IAM AuditData

Troubleshoot

		Mutable. The display name set by clients. Must be <= 63 characters.
	createTime	string (Timestamp format) Output only. The timestamp when the resource was created. This may be either the time creation was initiated or when it was completed. A timestamp in RFC3339 UTC "Zulu" format, with nanosecond resolution and up to nine fractional digits. Examples: "2014-10-02T15:01:23Z" and "2014-10-02T15:01:23.045123456Z".
	updateTime	string (Timestamp format) Output only. The timestamp when the resource was last updated. Any change to the resource made by users must refresh this value. Changes to a resource made by the service should refresh this value. A timestamp in RFC3339 UTC "Zulu" format, with nanosecond resolution and up to nine fractional digits. Examples: "2014-10-02T15:01:23Z" and "2014-10-02T15:01:23.045123456Z".
	deleteTime	string (Timestamp format) Output only. The timestamp when the resource was deleted. If the resource is not deleted, this must be empty. A timestamp in RFC3339 UTC "Zulu" format, with nanosecond resolution and up to nine fractional digits. Examples: "2014-10-02T15:01:23Z" and "2014-10-02T15:01:23.045123456Z".
	etag	string Output only. An opaque value that uniquely identifies a version or generation of a resource. It can be used to confirm that the client and server agree on the ordering of a resource being written.
	location	string Immutable. The location of the resource. The location encoding is specific to the service provider, and new encoding may be introduced as the service evolves. For Google Cloud products, the encoding is what is used by Google Cloud APIs, such as us-east1, aws-us-east-1,



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

≡

OrgPolicyViolationInfo

Represents OrgPolicy Violation information.

JSON representation

```
{
  "payload": {
    "object"
  },
  "resourceType": string,
  "resourceTags": {
    string: string,
    ...
  },
  "violationInfo": [
    {
      "object (ViolationInfo)"
    }
  ]
}
```

Fields

<code>payload</code>	<code>object (Struct format)</code>
<code>resourceType</code>	Optional. Resource type that the orgpolicy is checked against. Example: compute.googleapis.com/Instance, store.googleapis.com/bucket
<code>resourceTags</code>	<p><code>map (key: string, value: string)</code></p> <p>Optional. Tags referenced on the resource at the time of evaluation. These also include the federated tags, if they are supplied in the CheckOrgPolicy or CheckCustomConstraints Requests.</p> <p>Optional field as of now. These tags are the Cloud tags that</p>



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

Cloud Audit Logs

Cloud Audit Logs overview
Services with audit logs

Enable Data Access audit logs

▶ Audit logs in depth

Cloud Logging audit logs

▶ Google Workspace audit logs

▼ Audit logs datatypes

▶ AuditLog

Types

AuditLog

- PolicyType
 - ▶ App Engine AuditData
 - ▶ App Engine AuditData (legacy)
 - ▶ BigQuery AuditData
 - ▶ IAM AuditData

Troubleshoot

Fields

constraint	string
	Optional. Constraint name
errorMessage	string
	Optional. Error message that policy is indicating.
checkedValue	string
	Optional. Value that is being checked for the policy. This could be in encrypted form (if pii sensitive). This field will only be emitted in LIST_POLICY types
policyType	enum (PolicyType)
	Optional. Indicates the type of the policy.

RequestMetadata

Metadata about the request.

JSON representation

```
{
  "callerIp": string,
  "callerSuppliedUserAgent": string,
  "callerNetwork": string,
  "requestAttributes": {
    object (Request)
  },
  "destinationAttributes": {
    object (Peer)
  }
}
```

Fields

callerIp	string
	The IP address of the caller. For a caller from the internet, this will be the public IPv4 or IPv6 address. For calls made

The IP address of the caller. For a caller from the internet, this will be the public IPv4 or IPv6 address. For calls made



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

Cloud Audit Logs

[Cloud Audit Logs overview](#)
[Services with audit logs](#)

[Enable Data Access audit logs](#)

▶ [Audit logs in depth](#)

[Cloud Logging audit logs](#)

▶ [Google Workspace audit logs](#)

▼ [Audit logs datatypes](#)

[AuditLog](#)

[Types](#)

[AuditLog](#)

[PolicyType](#)

 ▶ [App Engine AuditData](#)

 ▶ [App Engine AuditData \(legacy\)](#)

 ▶ [BigQuery AuditData](#)

 ▶ [IAM AuditData](#)

Troubleshoot

`s~my-project`: The request was made from the `my-project` App Engine app.

callerNetwork

string

The network of the caller. Set only if the network host project is part of the same GCP organization (or project) as the accessed resource. See <https://cloud.google.com/compute/docs/vpc/> for more information. This is a scheme-less URI full resource name. For example:

```
"//compute.googleapis.com/projects/PROJECT_ID"
```

requestAttributes

object (Request)

Request attributes used in IAM condition evaluation. This field contains request attributes like request time and access levels associated with the request.

To get the whole view of the attributes used in IAM condition evaluation, the user must also look into `AuditLog.authentication_info.resource_attributes`.

destinationAttributes

object (Peer)

The destination of a network activity, such as accepting a TCP connection. In a multi hop network activity, the destination represents the receiver of the last hop. Only two fields are used in this message, `Peer.port` and `Peer.ip`. These fields are optionally populated by those services utilizing the IAM condition feature.

Request

This message defines attributes for an HTTP request. If the actual request is not an HTTP request, the runtime system should try to map the actual request to an equivalent HTTP request.

JSON representation

```
{
  "id": "string"
}
```



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

Cloud Audit Logs

- Cloud Audit Logs overview
- Services with audit logs
- Enable Data Access audit logs
- ▶ Audit logs in depth
 - Cloud Logging audit logs
 - ▶ Google Workspace audit logs
 - ▼ Audit logs datatypes
 - ▼ AuditLog

Types**AuditLog**

- PolicyType
- ▶ App Engine AuditData
- ▶ App Engine AuditData (legacy)
- ▶ BigQuery AuditData
- ▶ IAM AuditData

Troubleshoot

method	string	downstream systems. The ID should have low probability of collision within a single day for a specific service.
headers	map (key: string, value: string)	The HTTP request headers. If multiple headers share the same key, they must be merged according to the HTTP spec. All header keys must be lowercased, because HTTP header keys are case-insensitive.
path	string	An object containing a list of "key": value pairs. Example: { "name": "wrench", "mass": "1.3kg", "count": "3" }.
host	string	The HTTP request Host header value.
scheme	string	The HTTP URL scheme, such as <code>http</code> and <code>https</code> .
query	string	The HTTP URL query in the format of <code>name1=value1&name2=value2</code> , as it appears in the first line of the HTTP request. No decoding is performed.
time	string (Timestamp format)	The timestamp when the destination service receives the last byte of the request. A timestamp in RFC3339 UTC "Zulu" format, with nanosecond resolution and up to nine fractional digits. Examples: "2014-10-02T15:01:23Z" and "2014-10-02T15:01:23.045123456Z".
size	string (int64 format)	The HTTP request size in bytes. If unknown, it must be -1.
protocol	string	The network protocol used with the request, such as



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

JSON representation

```
{
  "principal": string,
  "audiences": [
    string
  ],
  "presenter": string,
  "claims": {
    object
  },
  "accessLevels": [
    string
  ]
}
```

Fields

principal	string	<p>The authenticated principal. Reflects the issuer (<code>iss</code>) and subject (<code>sub</code>) claims within a JWT. The issuer and subject should be / delimited, with / percent-encoded within the subject fragment. For Google accounts, the principal format is: "<code>https://accounts.google.com/{id}</code>"</p>
audiences[]	string	<p>The intended audience(s) for this authentication information. Reflects the audience (<code>aud</code>) claim within a JWT. The audience value(s) depends on the <code>issuer</code>, but typically include one or more of the following pieces of information:</p> <ul style="list-style-type: none"> • The services intended to receive the credential. For example, <code>["https://pubsub.googleapis.com/", "https://storage.googleapis.com/"]</code>. • A set of service-based scopes. For example, <code>["https://www.googleapis.com/auth/cloud-platform"]</code>. • The client id of an app, such as the Firebase project id for JWTs from Firebase Auth. <p>Consult the documentation for the credential issuer to determine the information provided.</p>
presenter	string	<p>The authorized presenter of the credential. Reflects the optional Authorized Presenter (<code>azp</code>) claim within a JWT or</p>

Google Cloud Documentation Technolo / Sign in

Google Cloud Observability Guides Reference Samples Resources Contact Us Start free

Cloud Audit Logs

- Cloud Audit Logs overview
- Services with audit logs
- Enable Data Access audit logs
- Audit logs in depth
 - Cloud Logging audit logs
 - Google Workspace audit logs
- Audit logs datatypes
 - AuditLog
 - Types**
 - AuditLog**
 - PolicyType
 - App Engine AuditData
 - App Engine AuditData (legacy)
 - BigQuery AuditData
 - IAM AuditData

Troubleshoot

be accessed by authenticated requester. It is part of Secure GCP processing for the incoming request. An access level string has the format:
`"//{api_service_name}/accessPolicies/{policy_id}/accessLevels/{short_name}"`

Example:
`"//accesscontextmanager.googleapis.com/accessPolicies/MY_POLICY_ID/accessLevels/MY_LEVEL"`

Peer

This message defines attributes for a node that handles a network request. The node can be either a service or an application that sends, forwards, or receives the request. Service peers should fill in `principal` and `labels` as appropriate.

JSON representation

```
{
  "ip": string,
  "port": string,
  "labels": {
    string: string,
    ...
  },
  "principal": string,
  "regionCode": string
}
```

Fields

<code>ip</code>	<code>string</code> The IP address of the peer.
<code>port</code>	<code>string (int64 format)</code> The network port of the peer.
<code>labels</code>	<code>map (key: string, value: string)</code> The labels associated with the peer. An object containing a list of "key": value pairs. Example: { "name": "wrench", "mass": "1.3kg", }



Documentation

Technolo



/

Sign in

Google Cloud Observability

Guides

Reference

Samples

Resources

Contact Us

Start free

4.0 License, and code samples are licensed under the [Apache 2.0 License](#). For details, see the [Google Developers Site Policies](#). Java is a registered trademark of Oracle and/or its affiliates.

Last updated 2022-10-03 UTC.

Cloud Audit Logs

[Cloud Audit Logs overview](#)
[Services with audit logs](#)

[Enable Data Access audit logs](#)

► [Audit logs in depth](#)

[Cloud Logging audit logs](#)

► [Google Workspace audit logs](#)

▼ [Audit logs datatypes](#)

 ▼ [AuditLog](#)

Types

AuditLog

[PolicyType](#)

► [App Engine AuditData](#)
 ► [App Engine AuditData \(legacy\)](#)
 ► [BigQuery AuditData](#)
 ► [IAM AuditData](#)

Troubleshoot

Why Google	Products and pricing	Solutions	Resources	Engage
Choosing Google Cloud	Google Cloud pricing	Infrastructure modernization	Google Cloud Affiliate Program	Contact sales
Trust and security	Google Workspace pricing	Databases	Google Cloud documentation	Find a Partner
Modern Infrastructure	See all products	Application modernization	Google Cloud quickstarts	Become a Partner
Cloud		Smart analytics		Events
Multicloud		Artificial Intelligence	Google Cloud Marketplace	Podcasts
Global infrastructure		Security	Learn about cloud computing	Developer Center
Customers and case studies		Productivity & work transformation	Support	Press Corner
Analyst reports		Industry solutions	Code samples	Google Cloud on YouTube
Whitepapers		DevOps solutions	Cloud Architecture Center	Google Cloud Tech on YouTube
Blog		Small business solutions	Training	Follow on X
		See all solutions	Certifications	Join User Research
			Google for Developers	We're hiring. Join Google Cloud!
			Google Cloud for Startups	Google Cloud Community
			System status	
			Release Notes	

[About Google](#) | [Privacy](#) | [Site terms](#) | [Google Cloud terms](#)



Our third decade of climate action: join us

[Sign up for the Google Cloud newsletter](#)

[Subscribe](#)

[Language ▾](#)

cloud.google.com uses cookies from Google to deliver and enhance the quality of its services and to analyze traffic. [Learn more](#).