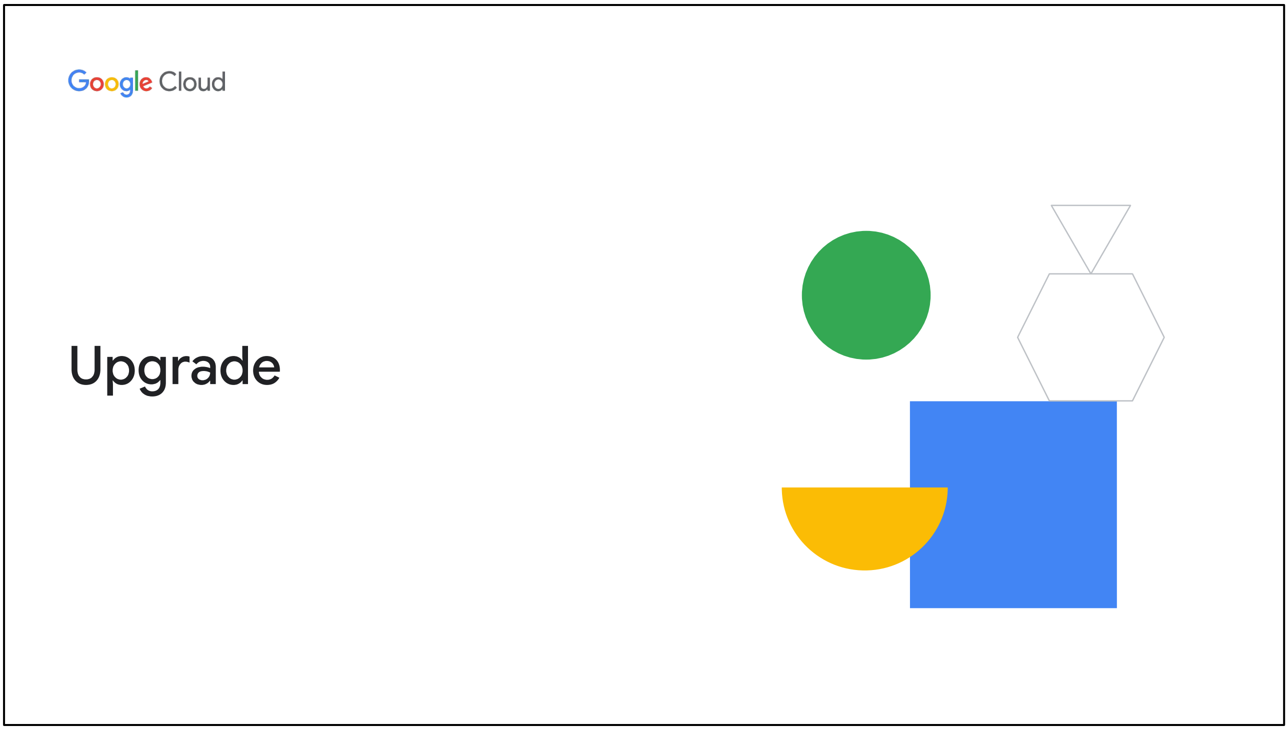
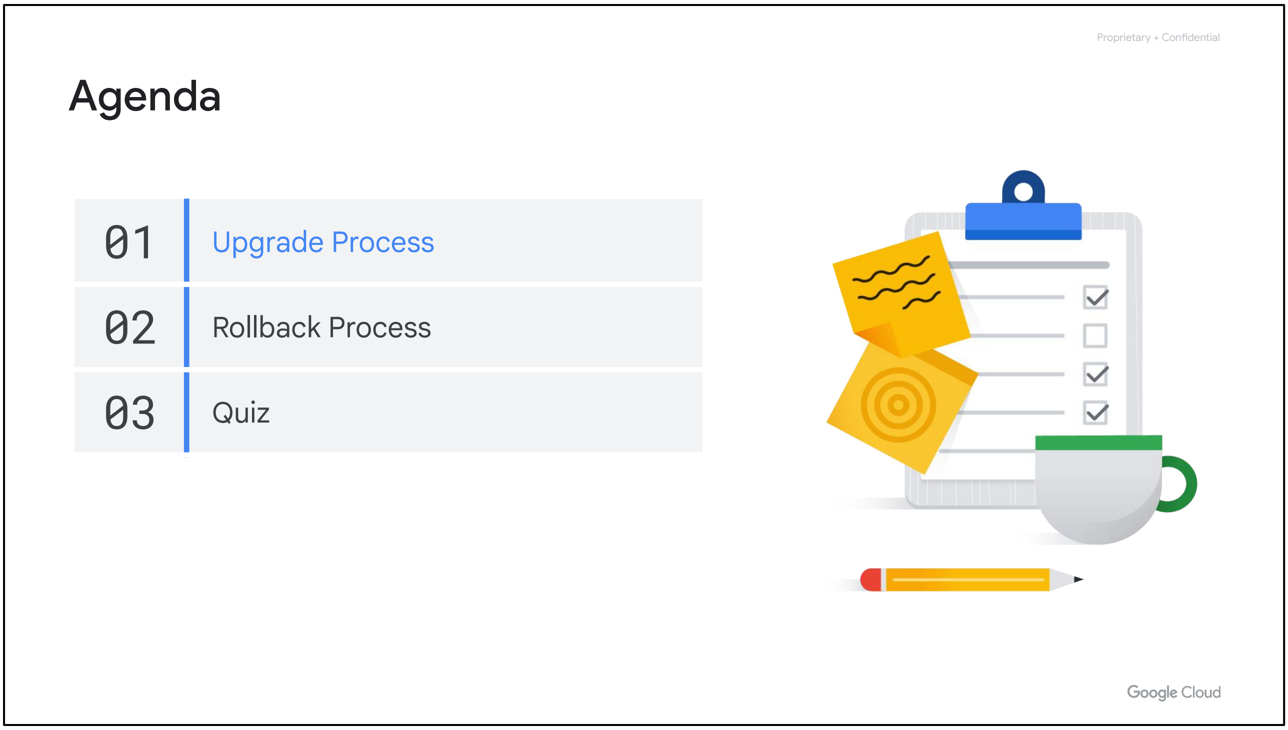


Upgrade

In this module, you will learn how to upgrade your Apigee hybrid installation to a new release of the software distribution.

We will also discuss rollback procedures so you can roll back the Apigee hybrid installation to a previous version.



Agenda

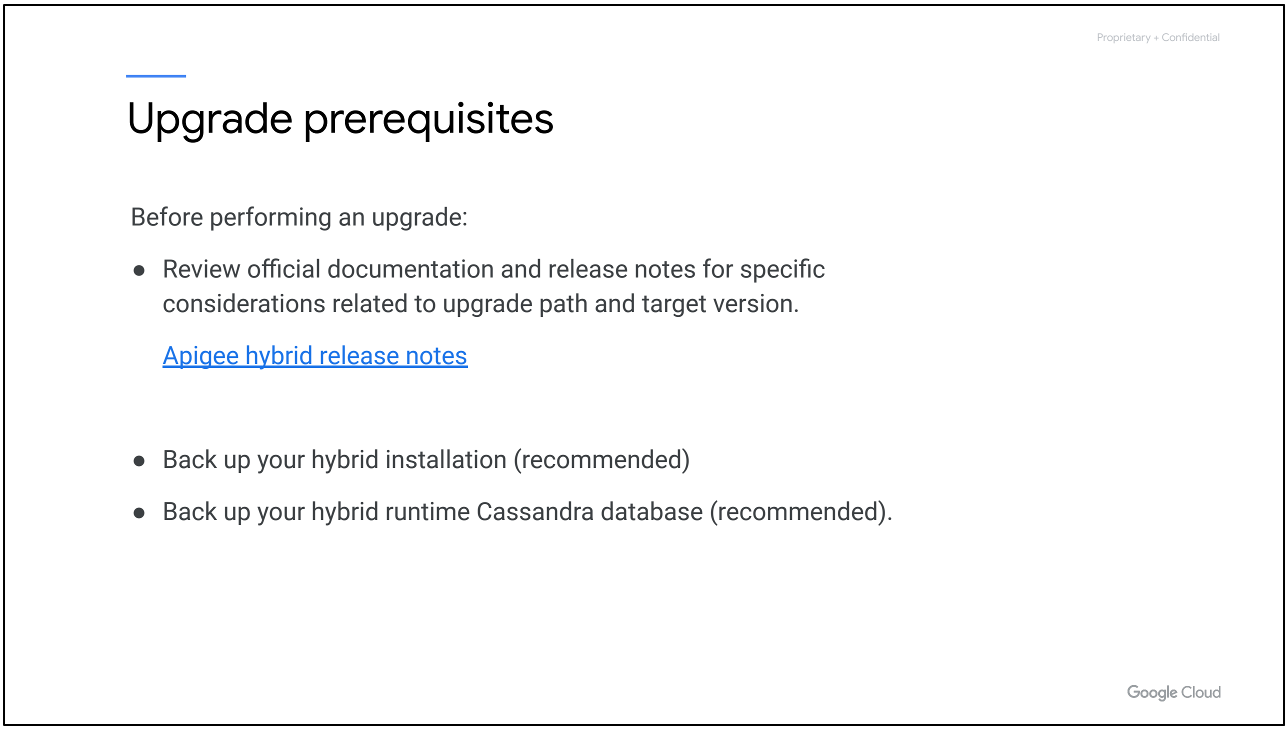
01 Upgrade Process

02 Rollback Process

03 Quiz

Google Cloud

In this lecture, we will review the process to upgrade Apigee hybrid to a newer version of the software distribution.



Upgrade prerequisites

Before performing an upgrade:

- Review official documentation and release notes for specific considerations related to upgrade path and target version.

  [Apigee hybrid release notes]

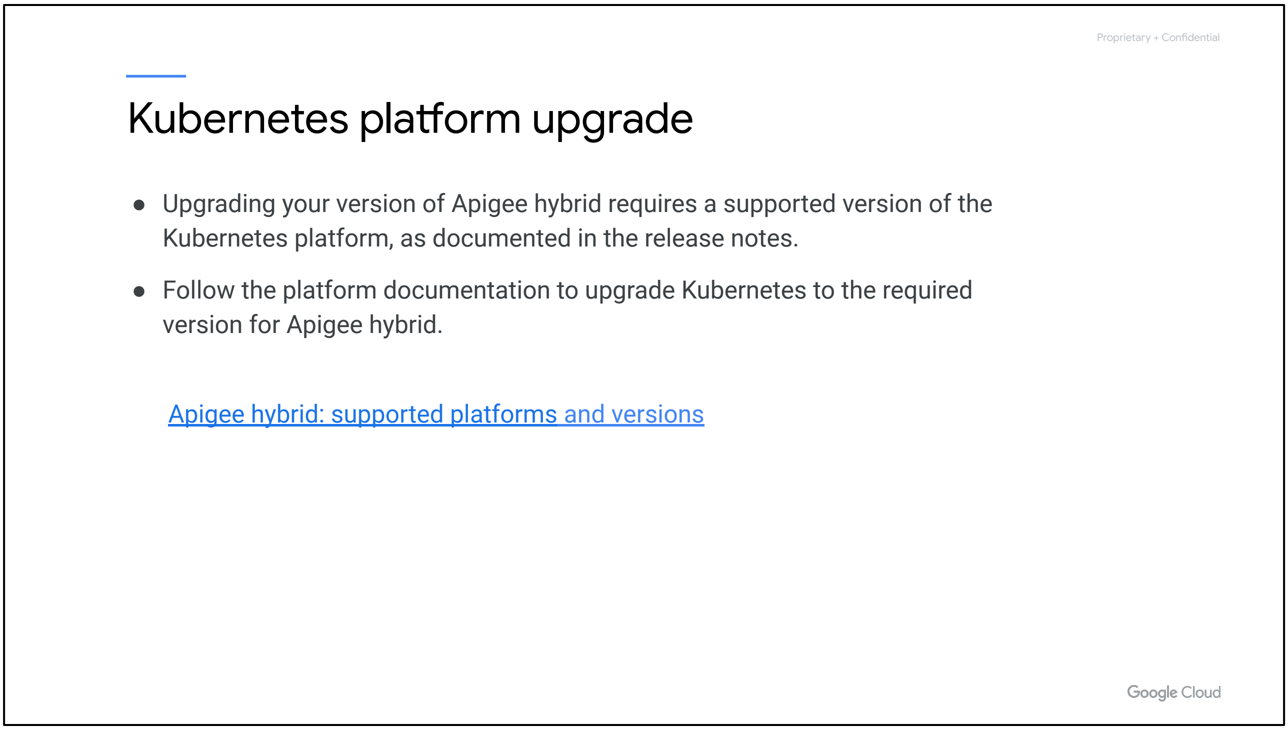
- Back up your hybrid installation (recommended)
- Back up your hybrid runtime Cassandra database (recommended).

Google Cloud

Before performing an upgrade, you should always review the release notes for the Apigee hybrid release version you are upgrading to.

The release notes contains important information about the new features that are released, any features that are in beta, bug fixes, any required configuration file changes, and any updates to supporting software platforms.

It is also recommended to back up your hybrid runtime installation and Cassandra database following the instructions in the Apigee hybrid documentation.



Kubernetes platform upgrade

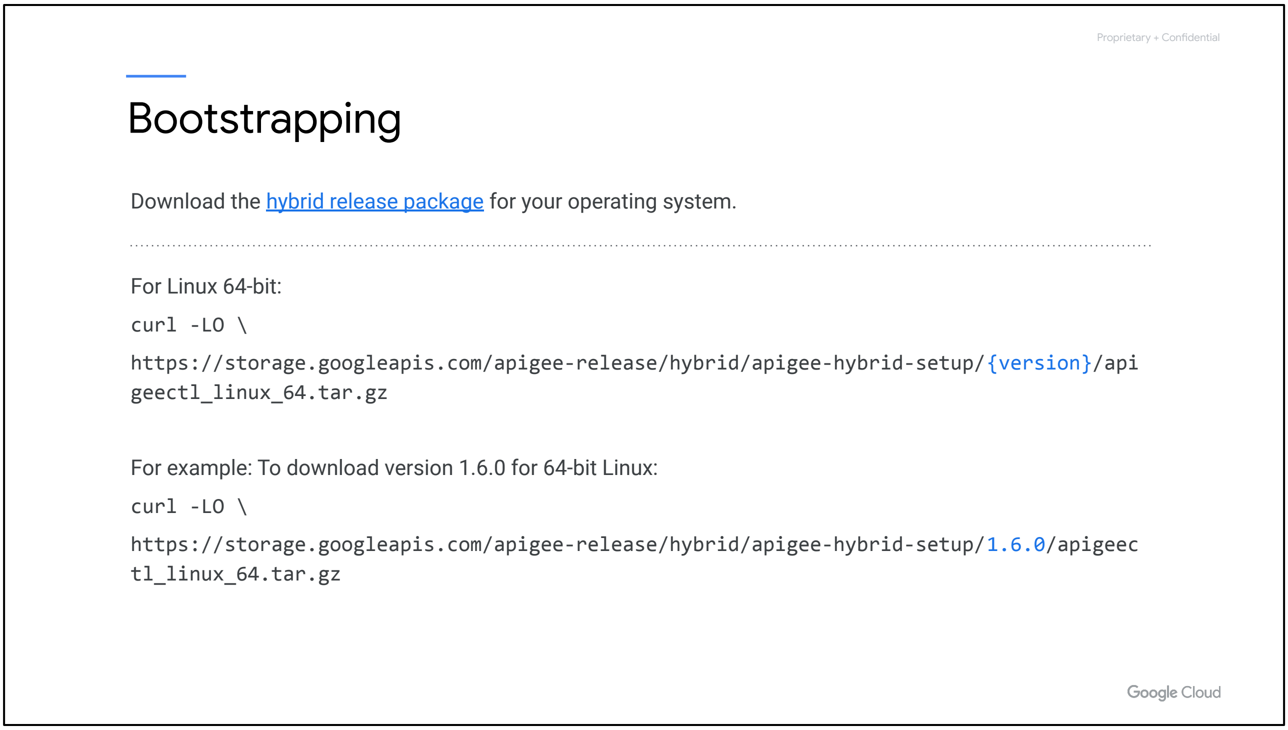
- Upgrading your version of Apigee hybrid requires a supported version of the Kubernetes platform, as documented in the release notes.
- Follow the platform documentation to upgrade Kubernetes to the required version for Apigee hybrid.

Apigee hybrid: supported platforms and versions

Upgrading your version of Apigee hybrid requires a supported version of the Kubernetes platform.

The minimum required Kubernetes version is documented in the release notes of the Apigee hybrid release version you are upgrading to.

Confirm that your Kubernetes platform version is supported. If it isn’t, follow your platform provider documentation to upgrade it.



Bootstrapping

Download the hybrid release package for your operating system.

For Linux 64-bit:

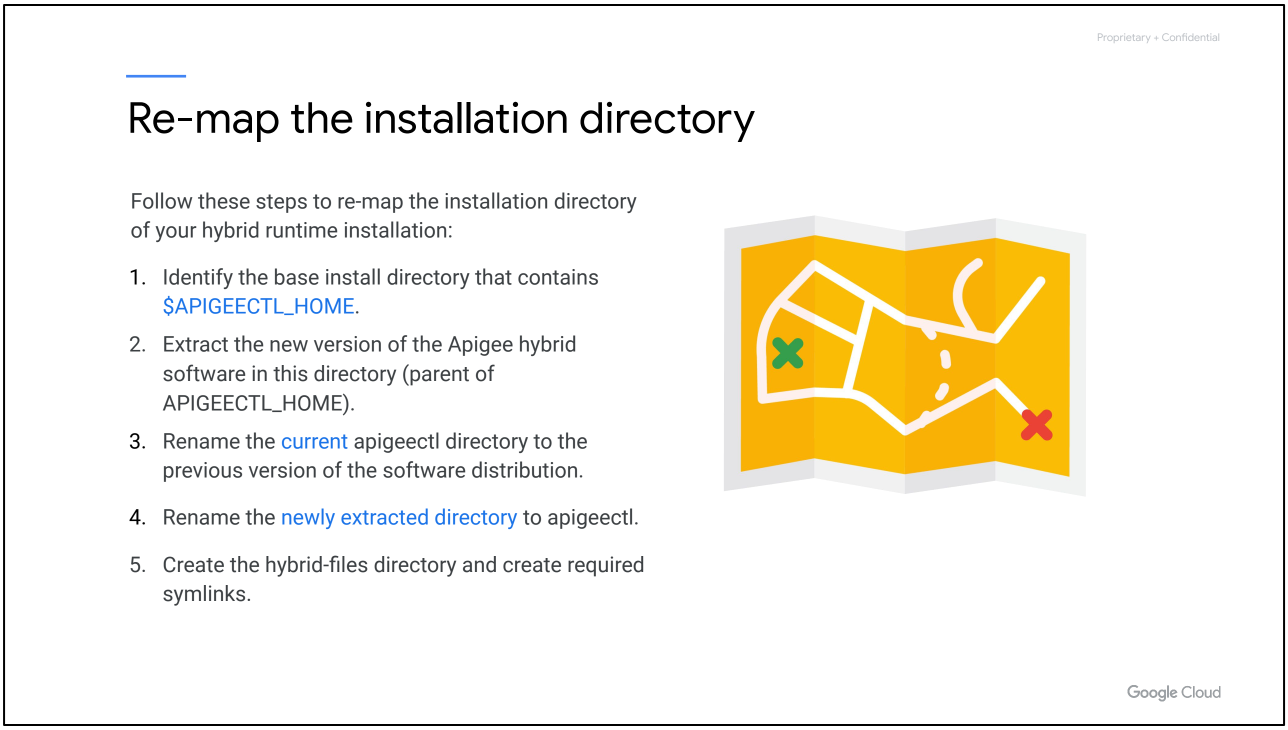
```
curl -LO \
https://storage.googleapis.com/apigee-release/hybrid/apigee-hybrid-setup/{version}/apigeectl_linux_64.tar.gz
```

For example: To download version 1.6.0 for 64-bit Linux:

```
curl -LO \
https://storage.googleapis.com/apigee-release/hybrid/apigee-hybrid-setup/1.6.0/apigeectl_linux_64.tar.gz
```

You first download the new release of the Apigee hybrid distribution for your operating system.

The software distribution packages are hosted in a public cloud storage repository.



Re-map the installation directory

Follow these steps to re-map the installation directory of your hybrid runtime installation:

1. Identify the base install directory that contains $APIGEECTL_HOME.
2. Extract the new version of the Apigee hybrid software in this directory (parent of APIGEECTL_HOME).
3. Rename the current apigeectl directory to the previous version of the software distribution.
4. Rename the newly extracted directory to apigeectl.
5. Create the hybrid-files directory and create required symlinks.

The next step in the upgrade process is to re-map your installation directory.

Identify the base installation directory that was created when Apigee hybrid was originally installed.

To find the base directory, inspect the value of the APIGEECTL_HOME environment variable. It will point to a directory that resides within the base directory.

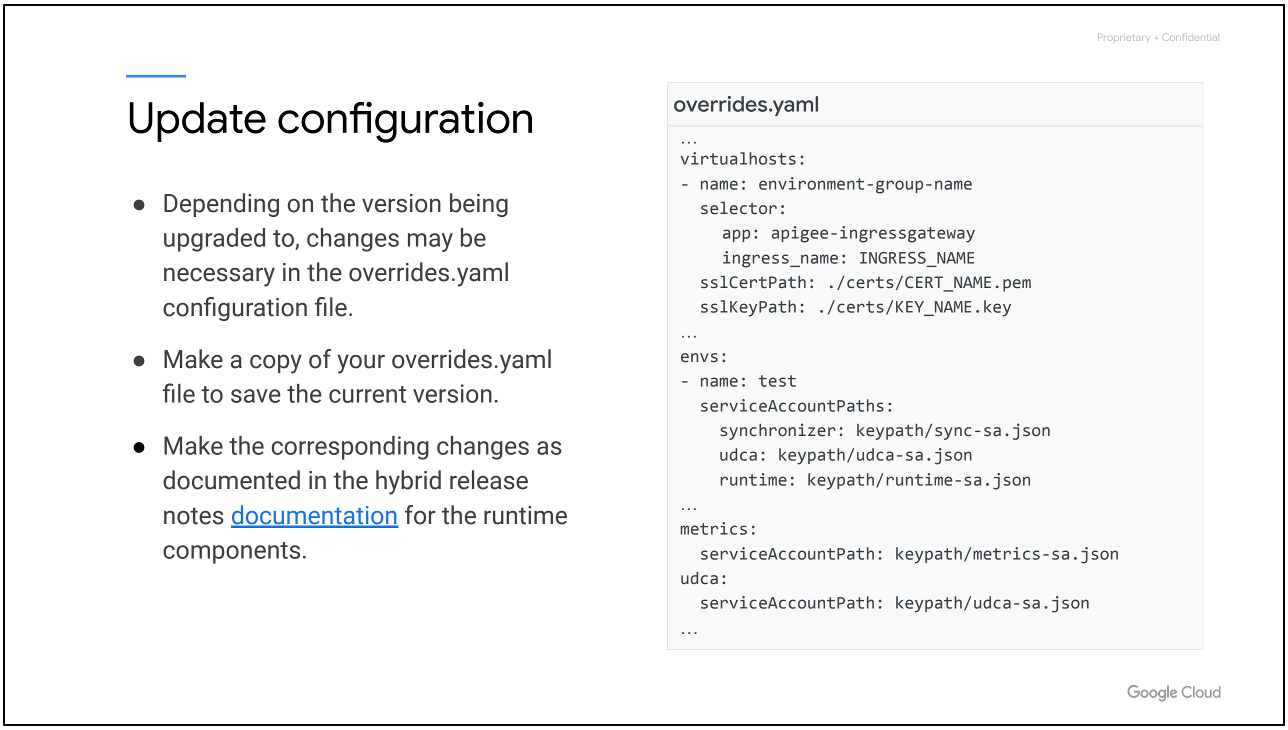
Extract the new version of Apigee hybrid software in the base installation directory.

Rename the current apigeectl directory. For example, if the current version is 1.1.1, rename the apigeectl directory to apigeectl_1.1.1.

Rename the newly extracted installation directory to apigeectl. This is now where the environment variable $APIGEECTL_HOME points to.

Create the hybrid-files directory, and required symlinks to the tools, config, templates, and plugins directories in the distribution.

Detailed instructions are documented here.



Update configuration

- Depending on the version being upgraded to, changes may be necessary in the overrides.yaml configuration file.
- Make a copy of your overrides.yaml file to save the current version.
- Make the corresponding changes as documented in the hybrid release notes documentation for the runtime components.

overrides.yaml

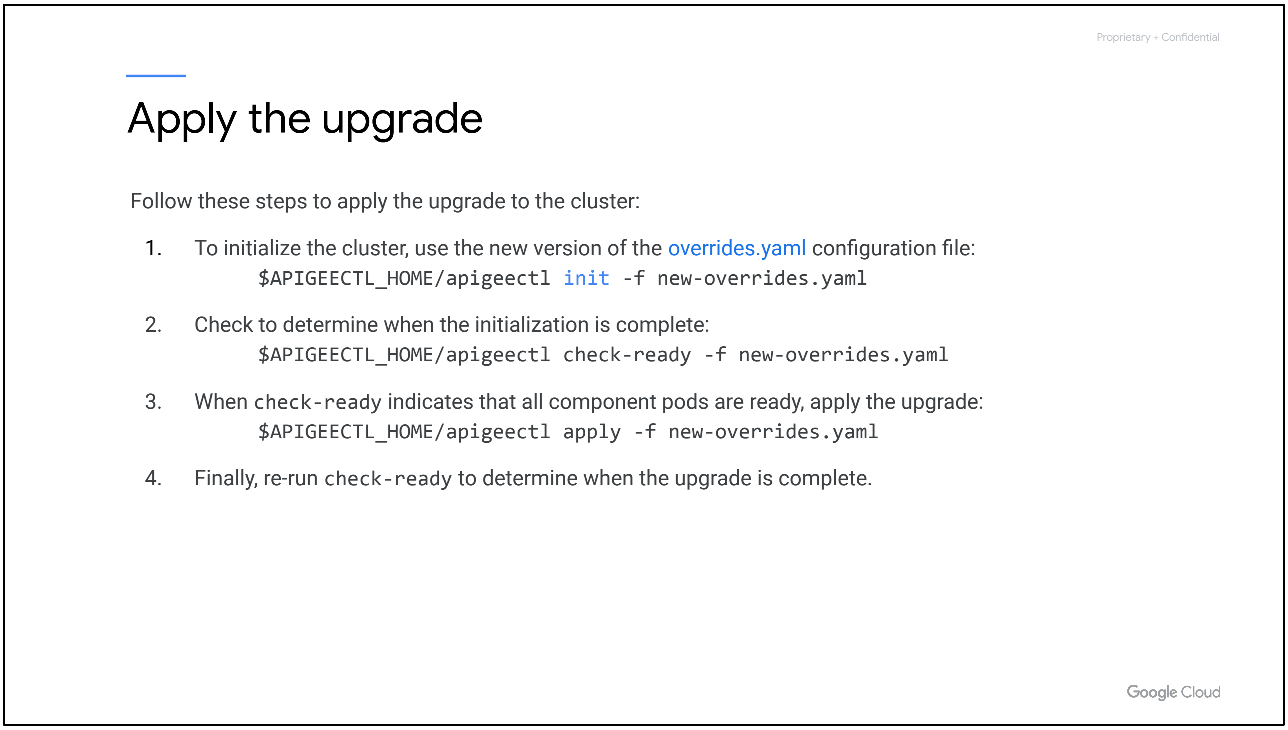
```
…
virtualhosts:
- name: environment-group-name
  selector:
    app: apigee-ingressgateway
    ingress_name: INGRESS_NAME
  sslCertPath: ./certs/CERT_NAME.pem
  sslKeyPath: ./certs/KEY_NAME.key
…
envs:
- name: test
  serviceAccountPaths:
    synchronizer: keypath/sync-sa.json
    udca: keypath/udca-sa.json
    runtime: keypath/runtime-sa.json
…
metrics:
  serviceAccountPath: keypath/metrics-sa.json
udca:
  serviceAccountPath: keypath/udca-sa.json
…
```

Google Cloud

For some newer versions of Apigee hybrid, you may have to update the overrides.yaml file used to configure your runtime plane cluster.

Make a copy of your current overrides file, and save the old file in case you ever need to roll back.

Make the required changes to the overrides file based on the release documentation.



Apply the upgrade

Follow these steps to apply the upgrade to the cluster:

1. To initialize the cluster, use the new version of the overrides.yaml configuration file:

```
$APIGEECTL_HOME/apigeectl init -f new-overrides.yaml
```

2. Check to determine when the initialization is complete:

```
$APIGEECTL_HOME/apigeectl check-ready -f new-overrides.yaml
```

3. When `check-ready` indicates that all component pods are ready, apply the upgrade:

```
$APIGEECTL_HOME/apigeectl apply -f new-overrides.yaml
```

4. Finally, re-run `check-ready` to determine when the upgrade is complete.

You are now ready to apply the upgrade.

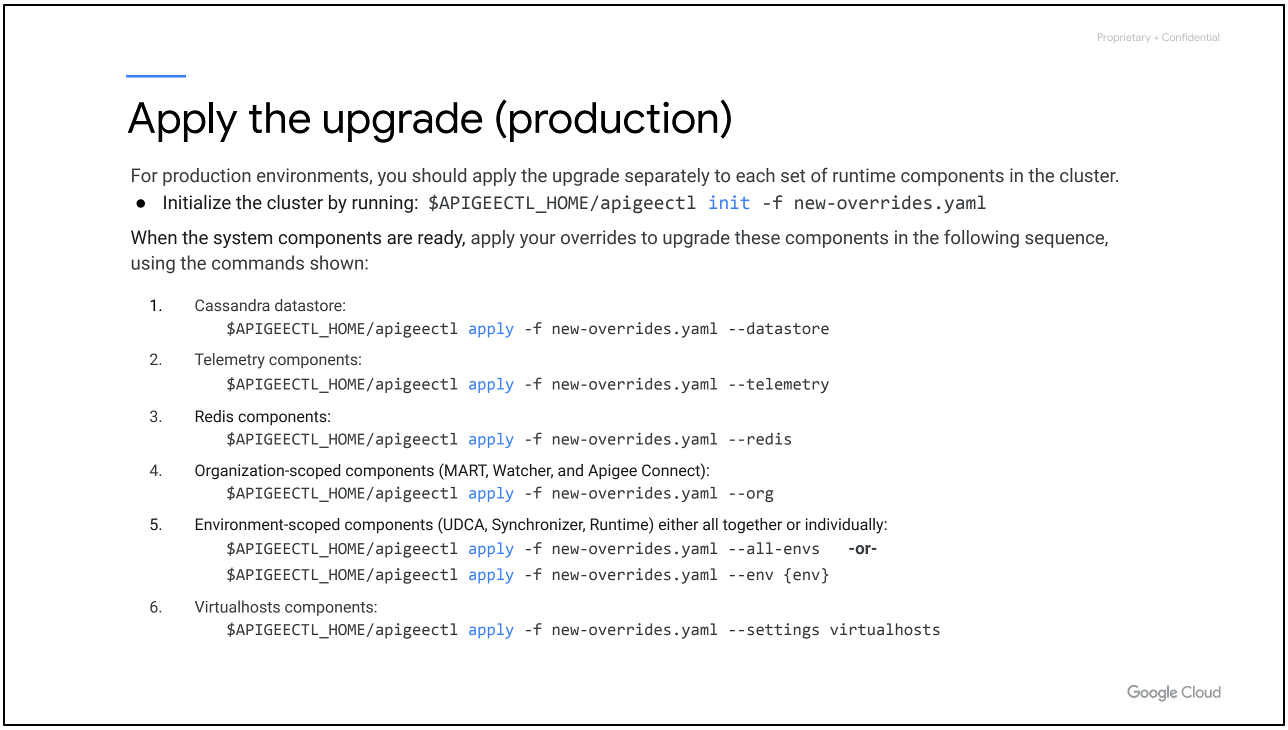
Run the apigeectl init command to re-initialize the cluster with the updated overrides.yaml configuration file.

This will update the Apigee hybrid system components. Run the apigeectl check-ready command to confirm that the initialization has completed.

If you want to check for configuration errors before modifying the cluster further, use the --dry-run option with the apigeectl apply command.

Then, update the hybrid workload components in the cluster by running the apigeectl apply command with the updated overrides.yaml file.

Finally, re-run the apigeectl check-ready command to confirm that all the containers in the cluster are running.



Apply the upgrade (production)

For production environments, you should apply the upgrade separately to each set of runtime components in the cluster.

- Initialize the cluster by running: `$APIGEECTL_HOME/apigeectl init -f new-overrides.yaml`

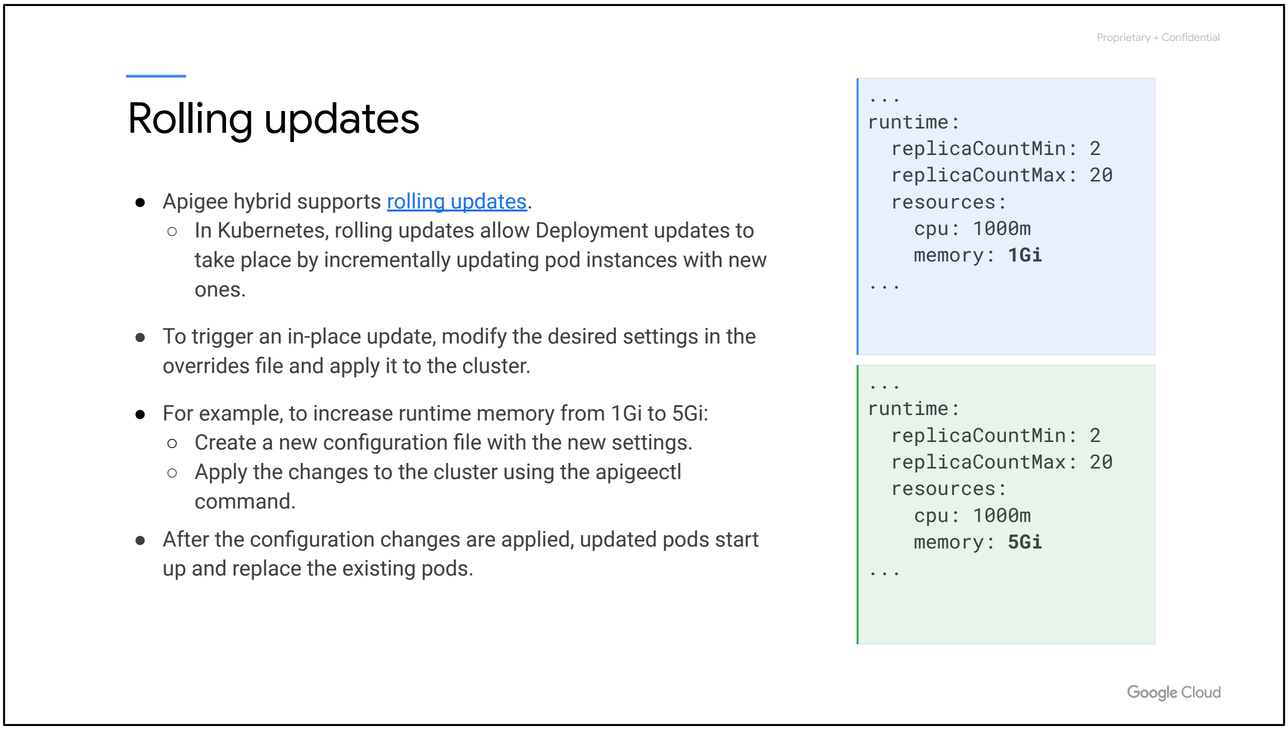
When the system components are ready, apply your overrides to upgrade these components in the following sequence, using the commands shown:

1. Cassandra datastore:
```
$APIGEECTL_HOME/apigeectl apply -f new-overrides.yaml --datastore
```
2. Telemetry components:
```
$APIGEECTL_HOME/apigeectl apply -f new-overrides.yaml --telemetry
```
3. Redis components:
```
$APIGEECTL_HOME/apigeectl apply -f new-overrides.yaml --redis
```
4. Organization-scoped components (MART, Watcher, and Apigee Connect):
```
$APIGEECTL_HOME/apigeectl apply -f new-overrides.yaml --org
```
5. Environment-scoped components (UDCA, Synchronizer, Runtime) either all together or individually:
```
$APIGEECTL_HOME/apigeectl apply -f new-overrides.yaml --all-envs
```
-or-
```
$APIGEECTL_HOME/apigeectl apply -f new-overrides.yaml --env {env}
```
6. Virtualhosts components:
```
$APIGEECTL_HOME/apigeectl apply -f new-overrides.yaml --settings virtualhosts
```

For production environments, you should apply the upgrade separately to each set of runtime components in the cluster.

After the cluster is initialized, apply the new overrides file first to the Cassandra datastore component, then to the telemetry components, the Redis components, the organization-scoped components, the environment-scoped components, and the virtualhosts components.

In production environments, it is a good practice to run the apigeectl check-ready command after each component is upgraded.



Rolling updates

- Apigee hybrid supports rolling updates.
  - In Kubernetes, rolling updates allow Deployment updates to take place by incrementally updating pod instances with new ones.
- To trigger an in-place update, modify the desired settings in the overrides file and apply it to the cluster.
- For example, to increase runtime memory from 1Gi to 5Gi:
  - Create a new configuration file with the new settings.
  - Apply the changes to the cluster using the apigeectl command.
- After the configuration changes are applied, updated pods start up and replace the existing pods.

```
...
runtime:
  replicaCountMin: 2
  replicaCountMax: 20
  resources:
    cpu: 1000m
    memory: 1Gi
...
```

```
...
runtime:
  replicaCountMin: 2
  replicaCountMax: 20
  resources:
    cpu: 1000m
    memory: 5Gi
...
```

Google Cloud

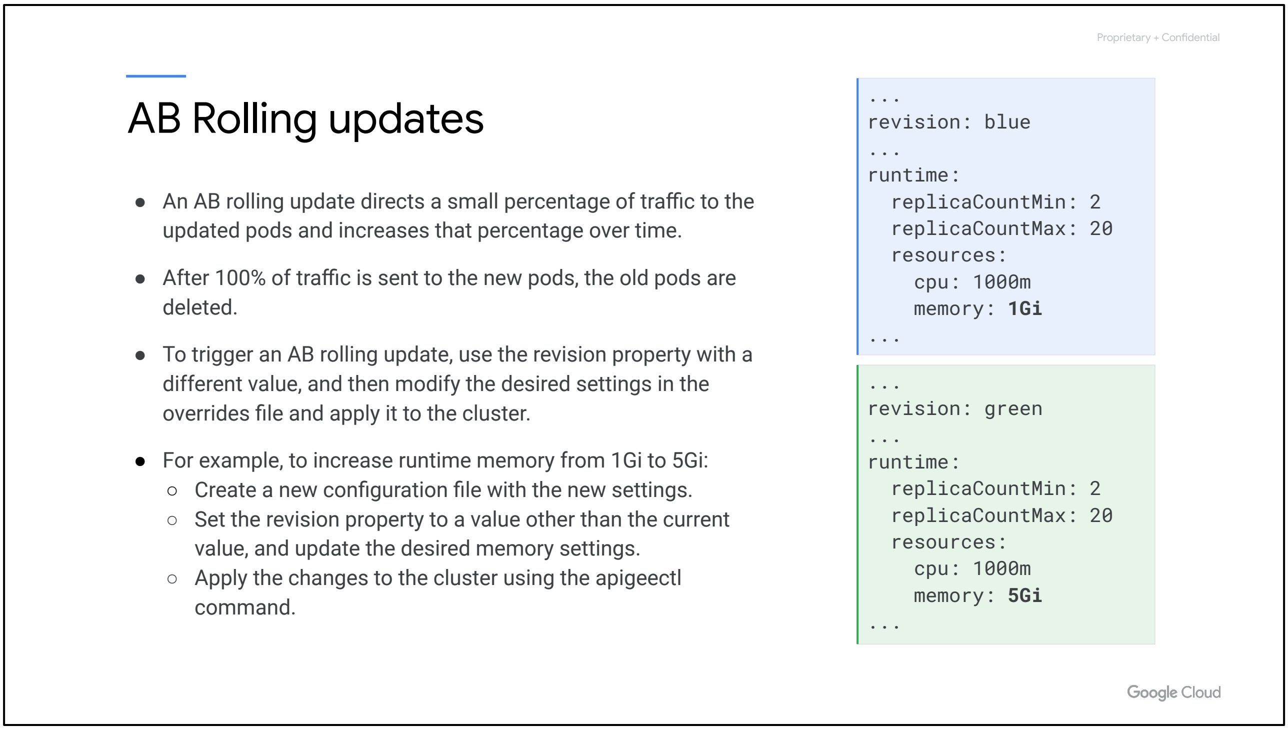
Apigee hybrid supports rolling updates to the runtime components in the cluster.

In Kubernetes, rolling updates are implemented by incrementally updating pod instances with new ones that are scheduled on nodes with available resources.

In the example, a new overrides.yaml configuration file is created with the memory property of the runtime message processor component increased from its current setting.

You then apply the new configuration to the cluster by running the *apigeectl apply* command.

After the configuration changes are applied, updated pods start up and replace the existing pods.



AB Rolling updates

- An AB rolling update directs a small percentage of traffic to the updated pods and increases that percentage over time.
- After 100% of traffic is sent to the new pods, the old pods are deleted.
- To trigger an AB rolling update, use the revision property with a different value, and then modify the desired settings in the overrides file and apply it to the cluster.
- For example, to increase runtime memory from 1Gi to 5Gi:
  - Create a new configuration file with the new settings.
  - Set the revision property to a value other than the current value, and update the desired memory settings.
  - Apply the changes to the cluster using the apigeectl command.

```
...
revision: blue
...
runtime:
  replicaCountMin: 2
  replicaCountMax: 20
  resources:
    cpu: 1000m
    memory: 1Gi
...
```

```
...
revision: green
...
runtime:
  replicaCountMin: 2
  replicaCountMax: 20
  resources:
    cpu: 1000m
    memory: 5Gi
...
```

Google Cloud

Apigee hybrid supports AB rolling updates to the runtime components configuration.

In this type of rolling update, a small percentage of traffic is initially directed to the updated pods. The traffic is increased incrementally until 100% of the traffic flows to the updated pods; the old pods are then deleted from the cluster.

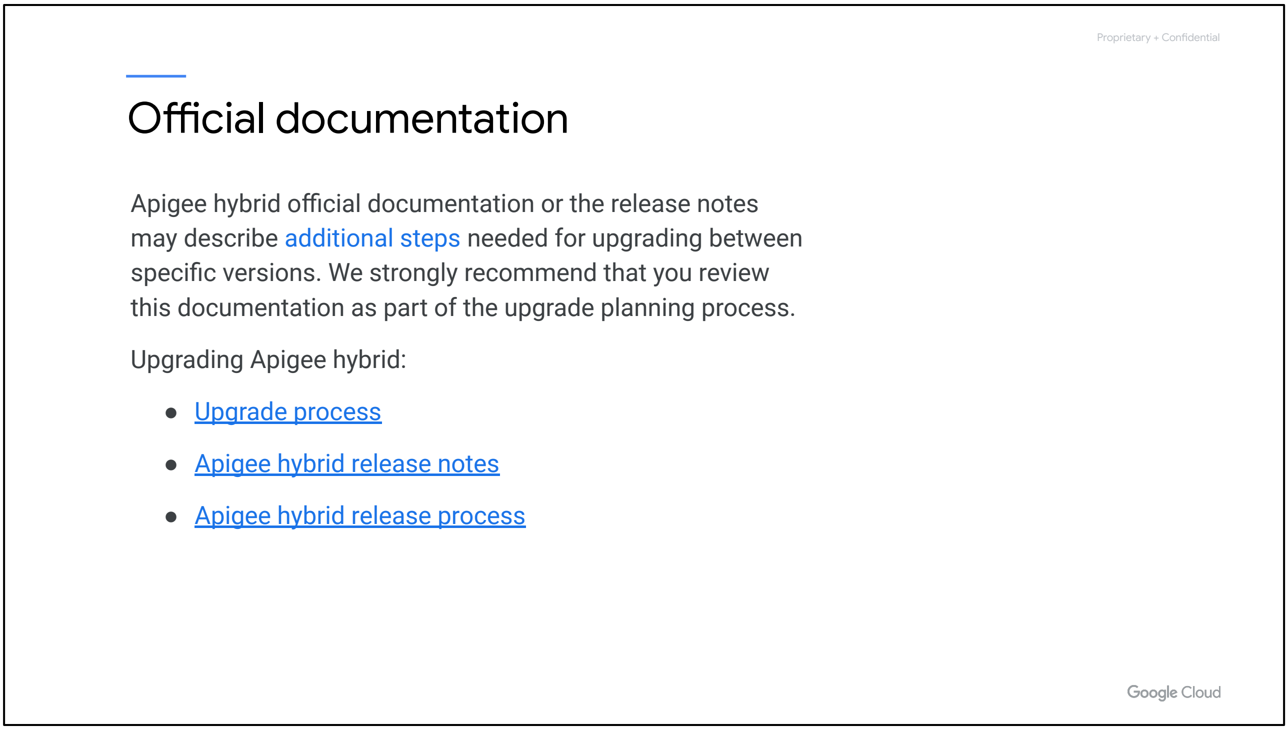
To implement an AB rolling update, use the revision property in your overrides.yaml configuration file.

In the example, a new overrides.yaml configuration file is created with the revision property set to green and the memory property of the runtime message processor component increased from its current setting.

The revision property can be set to any value that is different from the current setting.

You then apply the new configuration to the cluster by running the *apigeectl apply* command.

Performing an AB update



Official documentation

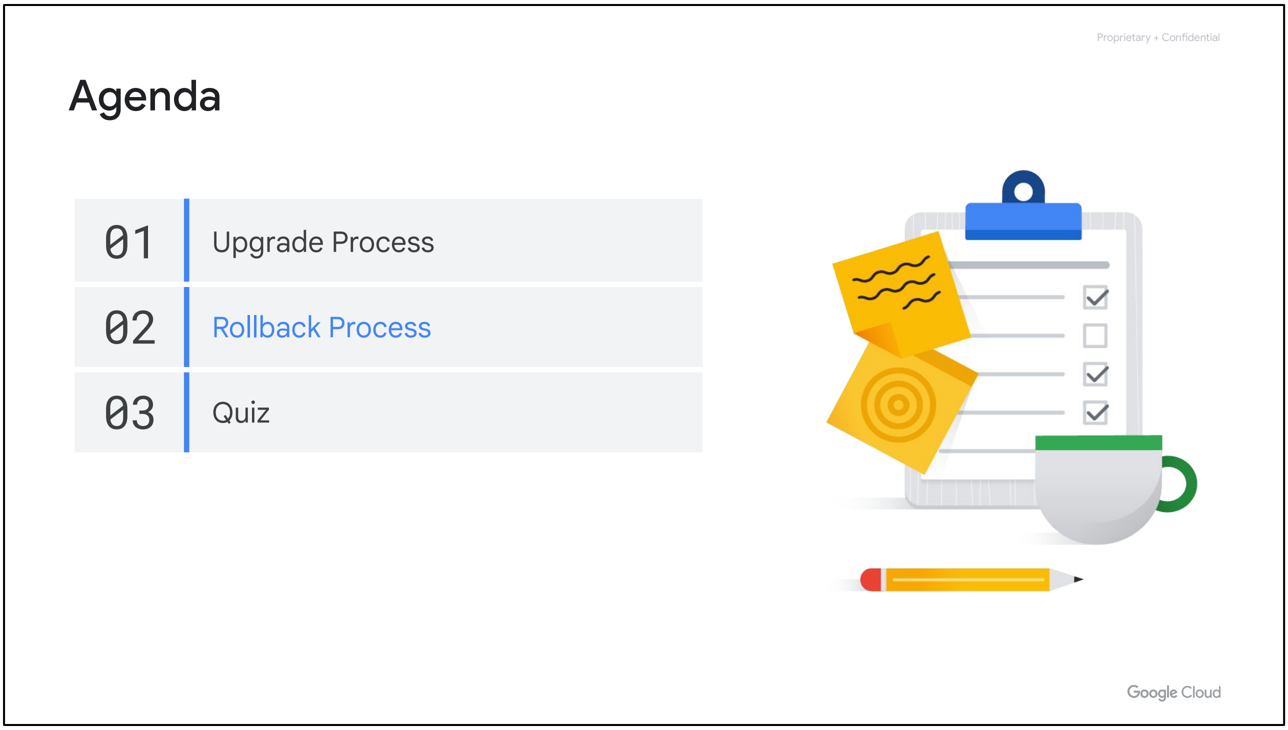
Apigee hybrid official documentation or the release notes may describe additional steps needed for upgrading between specific versions. We strongly recommend that you review this documentation as part of the upgrade planning process.

Upgrading Apigee hybrid:

- Upgrade process
- Apigee hybrid release notes
- Apigee hybrid release process

In addition to the Apigee hybrid release notes, you should also review the upgrade and release process documentation on the Apigee website.

The documentation may describe additional steps to be performed when upgrading your hybrid release between specific versions.



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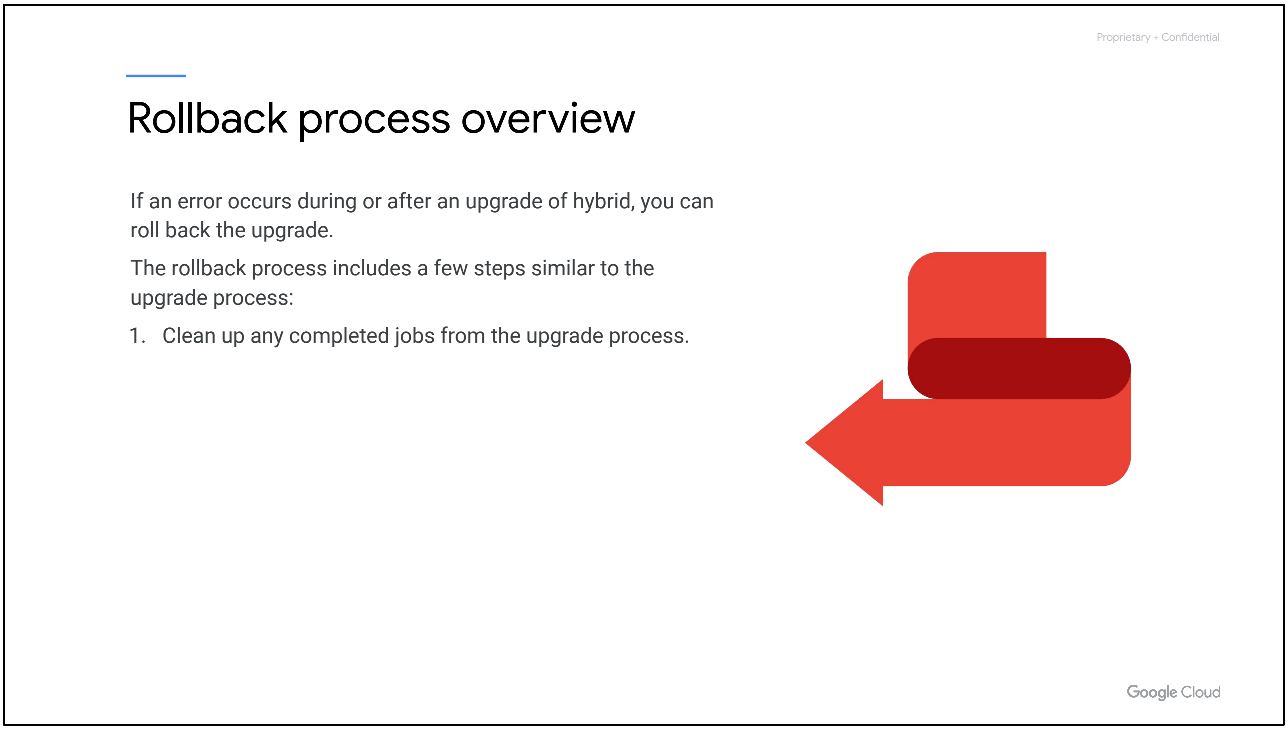
Agenda

01	Upgrade Process
02	Rollback Process
03	Quiz

Google Cloud

Let’s discuss the process to roll back Apigee hybrid in the runtime plane.



Rollback process overview

If an error occurs during or after an upgrade of hybrid, you can roll back the upgrade.

The rollback process includes a few steps similar to the upgrade process:

1. Clean up any completed jobs from the upgrade process.

Google Cloud

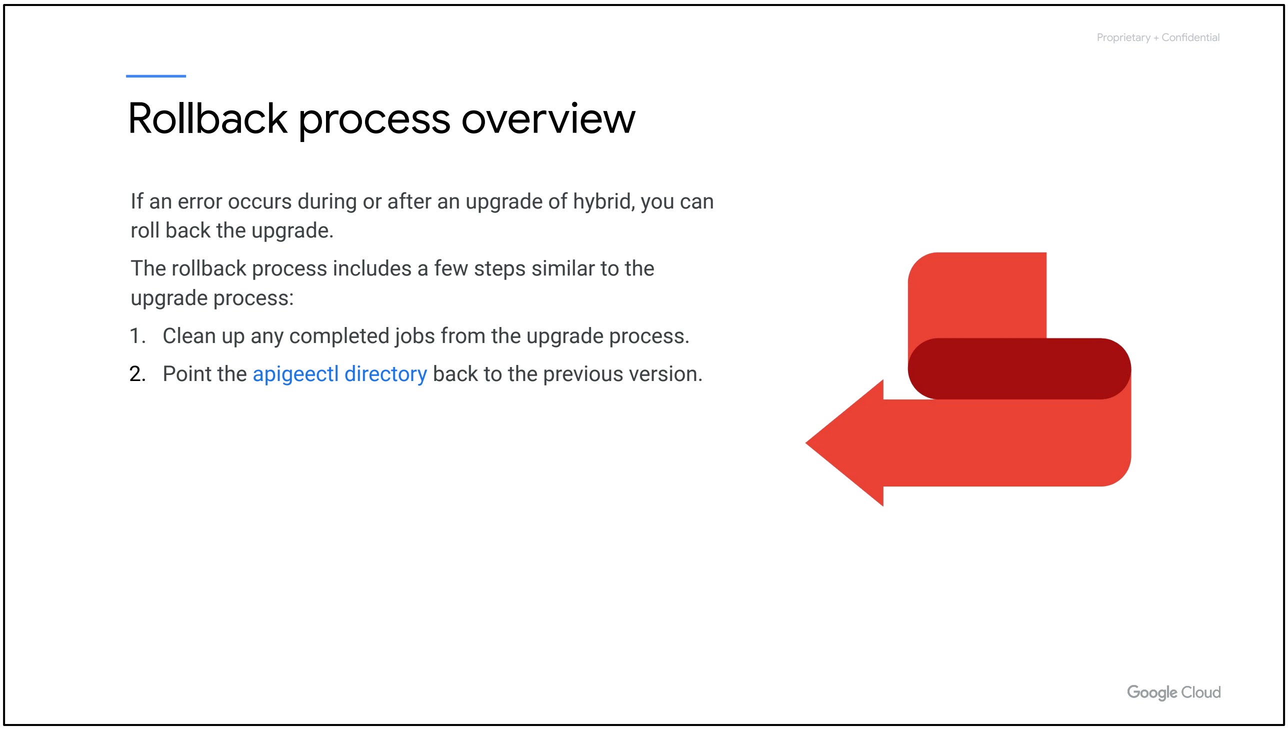
If you observe errors in the Apigee hybrid runtime plane during or after an upgrade, you can roll the upgrade back.

To roll back an upgrade, follow these steps.

First, clean up any completed jobs in your cluster from the upgrade process.

To delete a job, use the kubectl delete job command, passing in the name of the completed job to be deleted.

Repeat the command for all the completed jobs in the apigee and apigee-system namespaces used in Apigee hybrid.



Rollback process overview

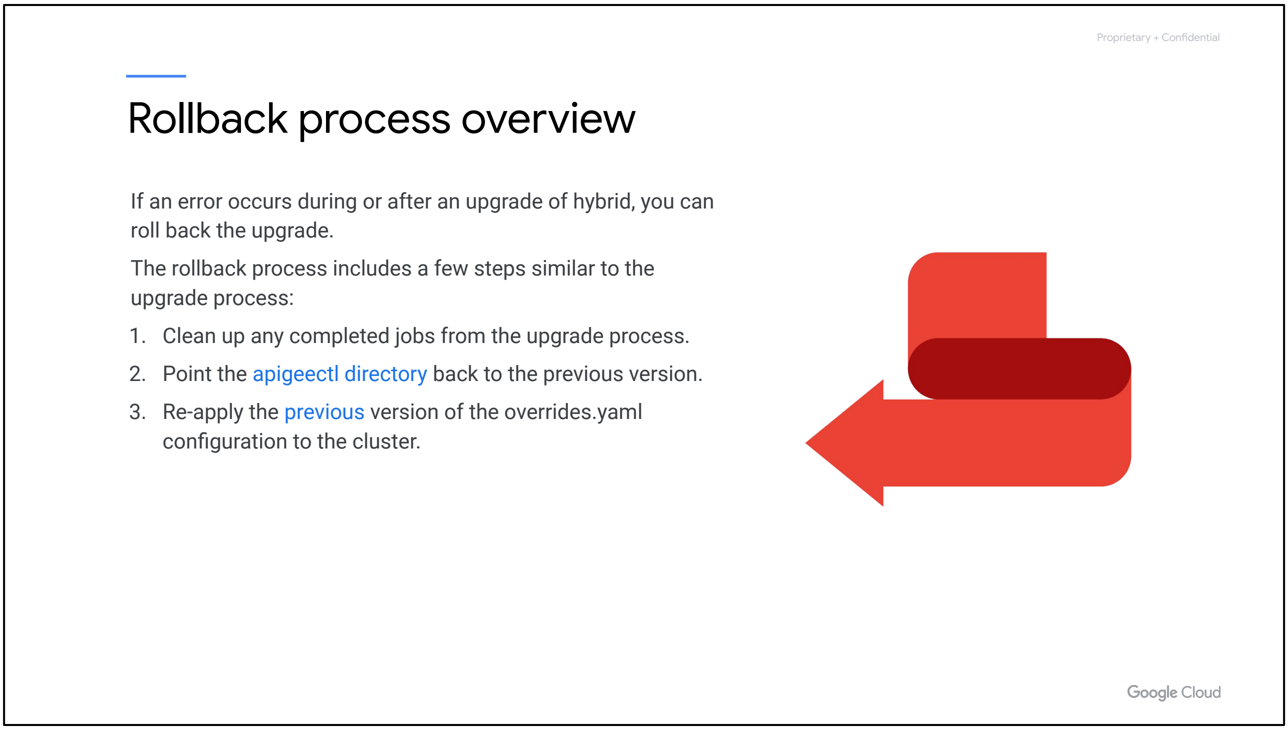
If an error occurs during or after an upgrade of hybrid, you can roll back the upgrade.

The rollback process includes a few steps similar to the upgrade process:

1. Clean up any completed jobs from the upgrade process.
2. Point the apigeectl directory back to the previous version.

Google Cloud

Change the APIGEECTL_HOME environment variable to point to the directory that contains the previous version of apigeectl.



Rollback process overview

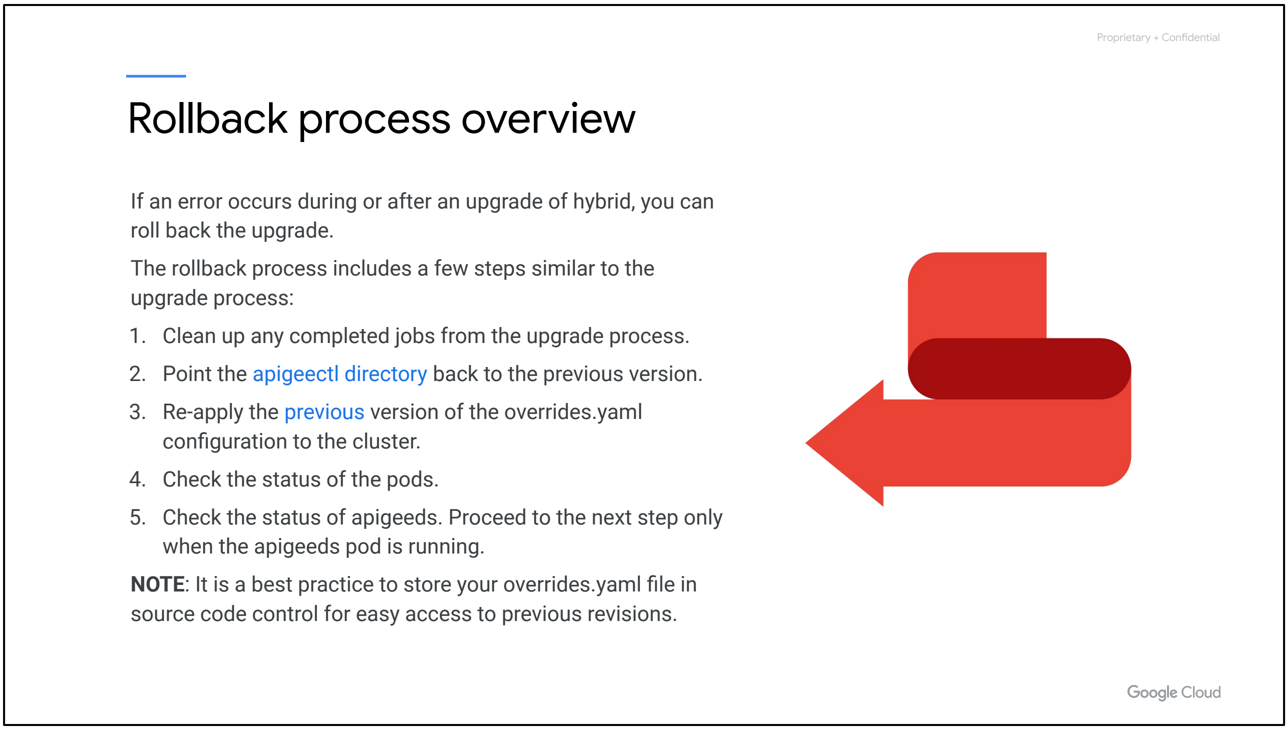
If an error occurs during or after an upgrade of hybrid, you can roll back the upgrade.

The rollback process includes a few steps similar to the upgrade process:

1. Clean up any completed jobs from the upgrade process.
2. Point the apigeectl directory back to the previous version.
3. Re-apply the previous version of the overrides.yaml configuration to the cluster.

Next, run the *apigeectl apply* command to update the hybrid workload components in the cluster with the overrides.yaml configuration file from your previous hybrid installation.

Re-run the *apigeectl check-ready* command to confirm that all the containers in the cluster are running.



Rollback process overview

If an error occurs during or after an upgrade of hybrid, you can roll back the upgrade.

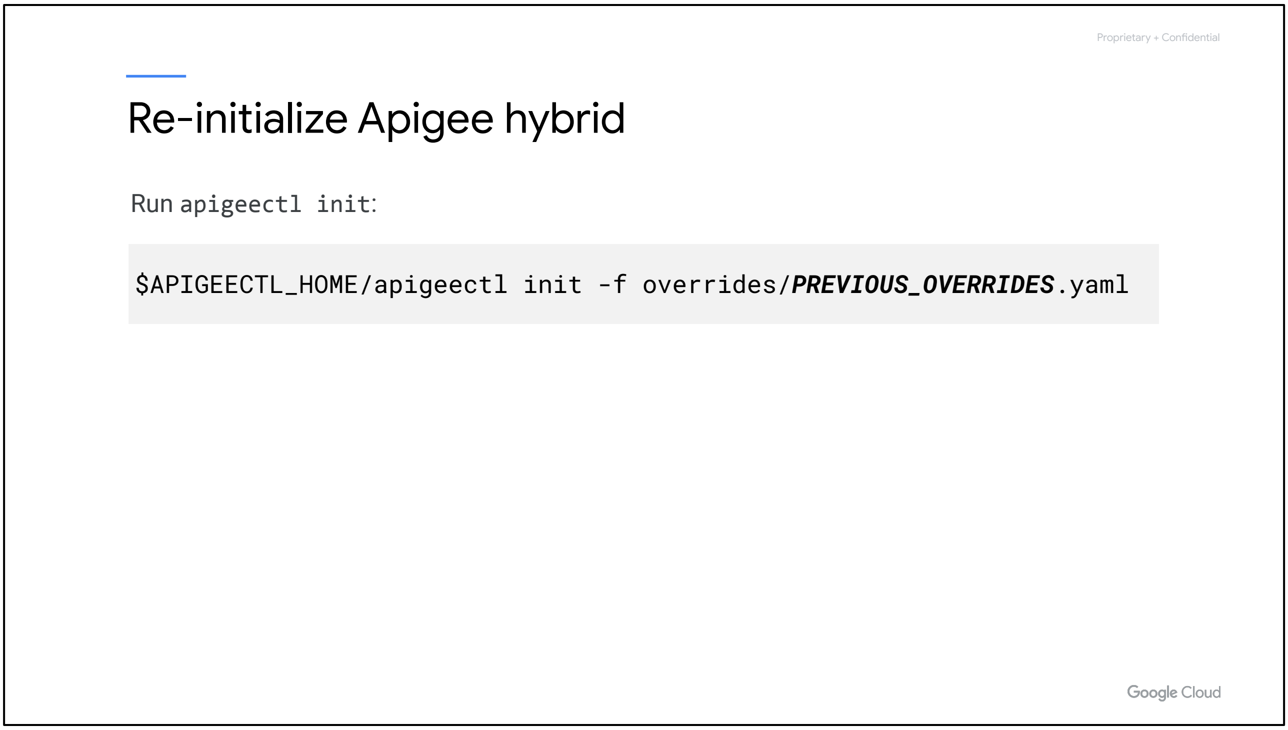
The rollback process includes a few steps similar to the upgrade process:

1. Clean up any completed jobs from the upgrade process.
2. Point the apigeectl directory back to the previous version.
3. Re-apply the previous version of the overrides.yaml configuration to the cluster.
4. Check the status of the pods.
5. Check the status of apigeeds. Proceed to the next step only when the apigeeds pod is running.

NOTE: It is a best practice to store your overrides.yaml file in source code control for easy access to previous revisions.

Finally, check the status of the pods and check the status of apigeeds. Proceed to the next step only when the apigeeds pod is running.

Note that it is best practice to store your overrides.yaml file in source code control for easy access to previous revisions.

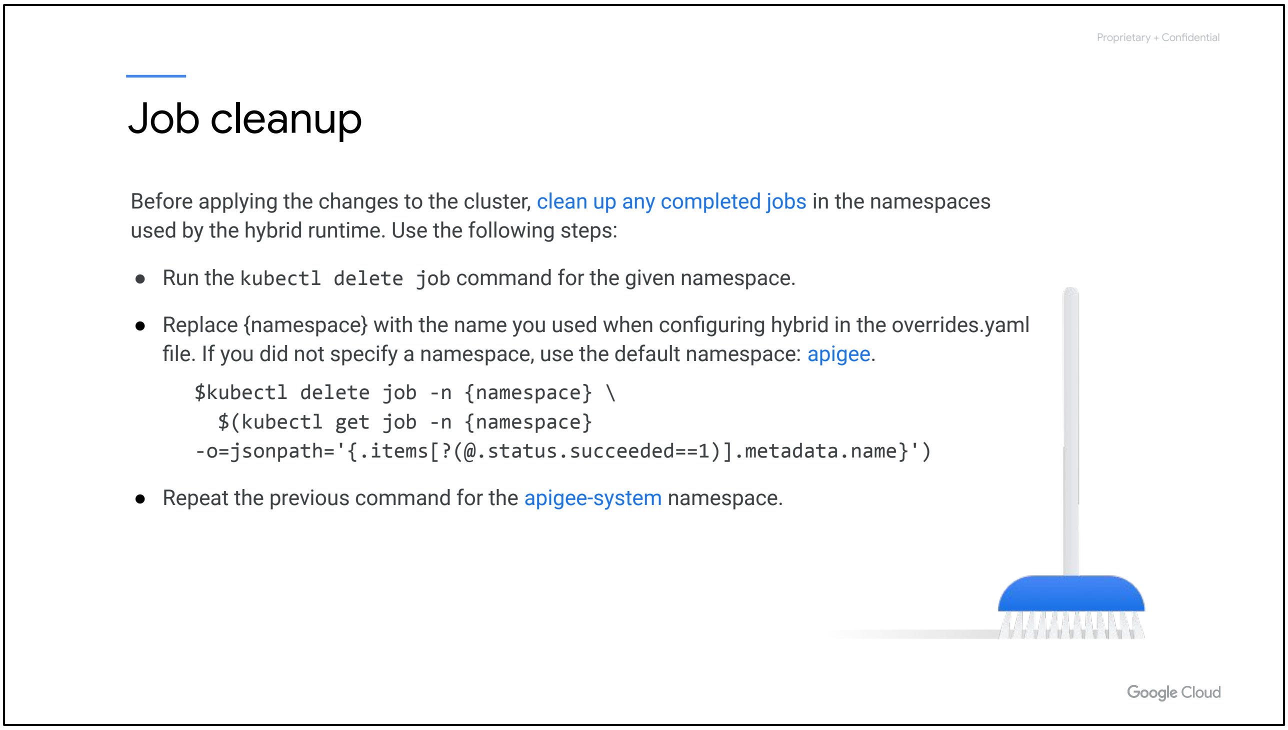


Re-initialize Apigee hybrid

Run `apigeectl init`:

```
$APIGEECTL_HOME/apigeectl init -f overrides/PREVIOUS_OVERRIDES.yaml
```

Finally, re-initialize Apigee hybrid by executing the command shown.



Job cleanup

Before applying the changes to the cluster, clean up any completed jobs in the namespaces used by the hybrid runtime. Use the following steps:

- Run the `kubectl delete job` command for the given namespace.
- Replace {namespace} with the name you used when configuring hybrid in the overrides.yaml file. If you did not specify a namespace, use the default namespace: apigee.

```
$kubectl delete job -n {namespace} \
  $(kubectl get job -n {namespace}
-o=jsonpath='{.items[?(@.status.succeeded==1)].metadata.name}')
```

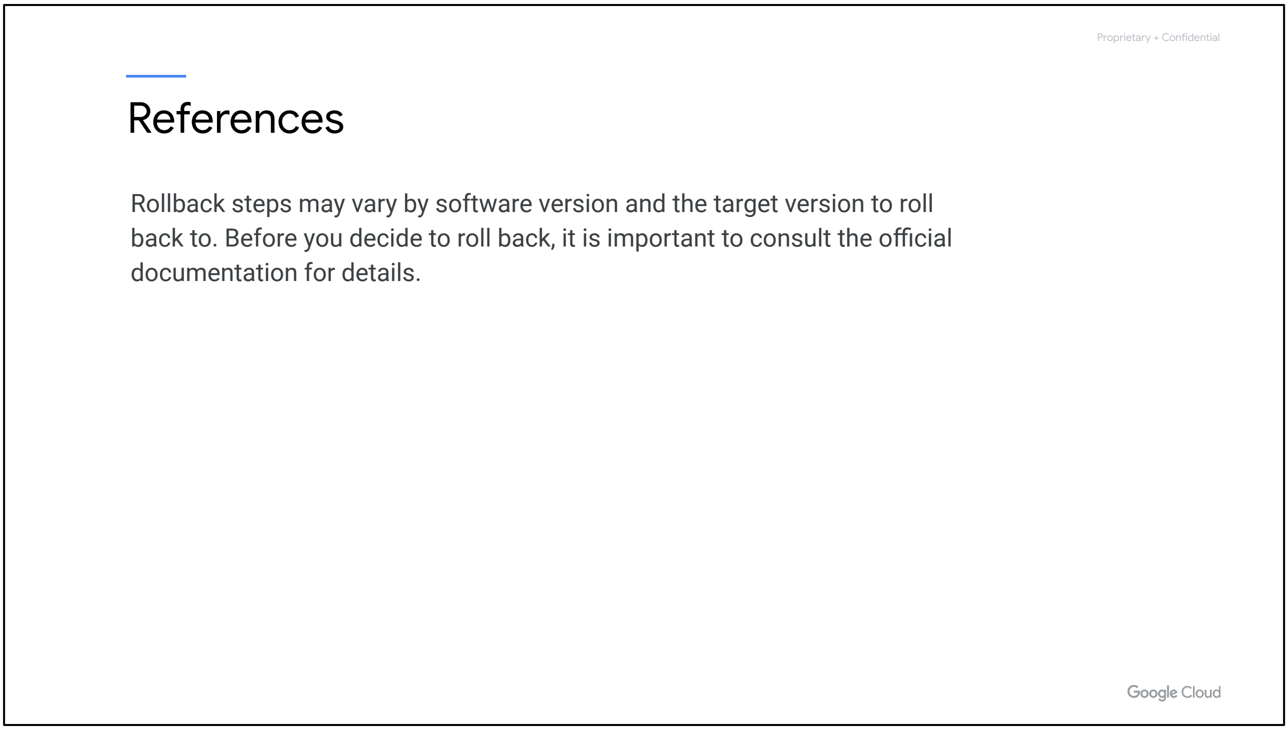
- Repeat the previous command for the apigee-system namespace.

Google Cloud

It is a good practice to clean up any completed jobs in your cluster from the previous installation.

To delete a job, use the kubectl delete job command, passing in the name of the completed job to be deleted.

Repeat the command for all the completed jobs in the apigee-system namespace used in Apigee hybrid.

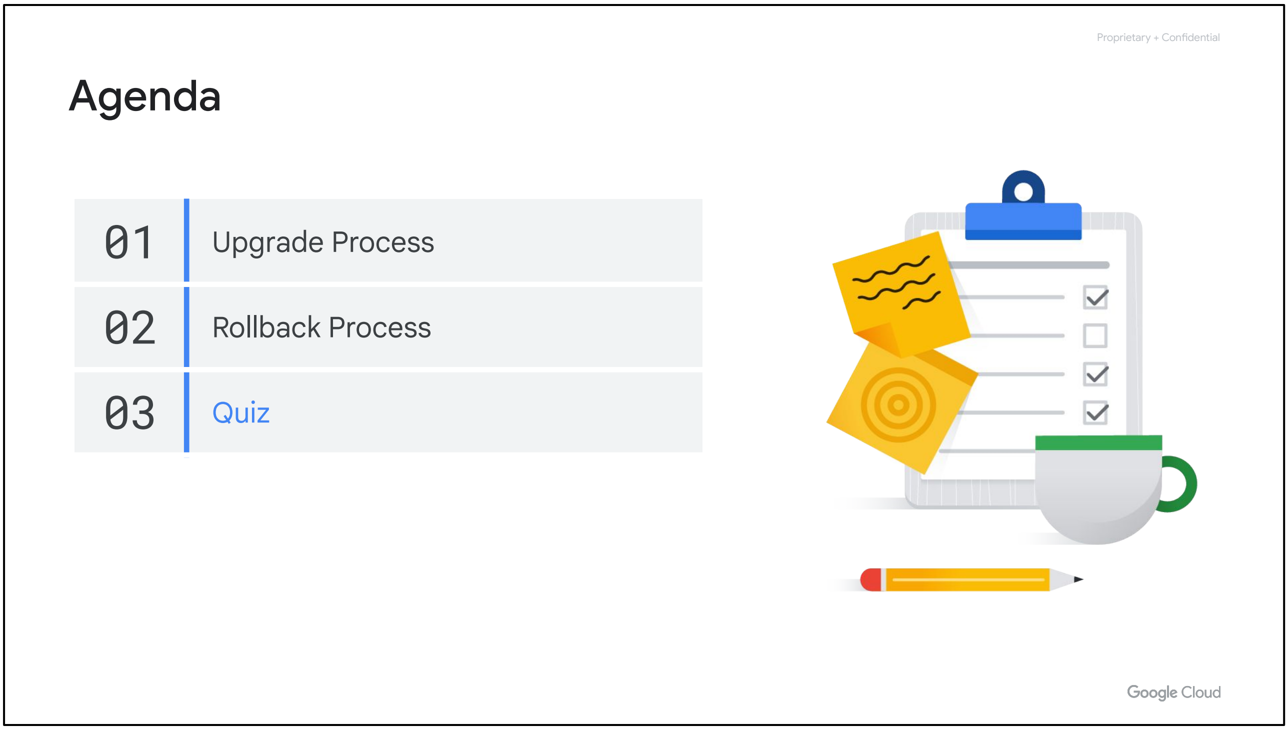


References

Rollback steps may vary by software version and the target version to roll back to. Before you decide to roll back, it is important to consult the official documentation for details.

The steps to roll back might vary based on the source and target version of the hybrid software distribution.

Consult the rollback process documentation for your version of Apigee hybrid.

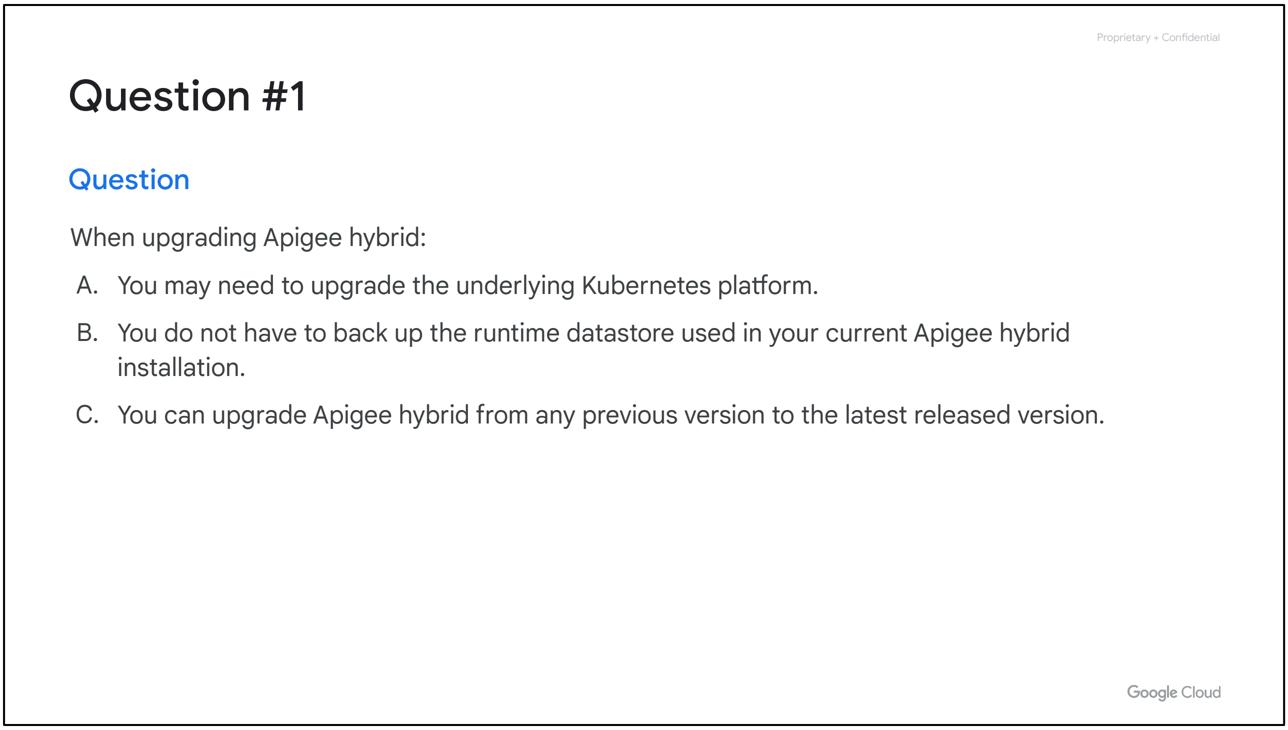


Agenda

01 Upgrade Process

02 Rollback Process

03 Quiz



Question #1

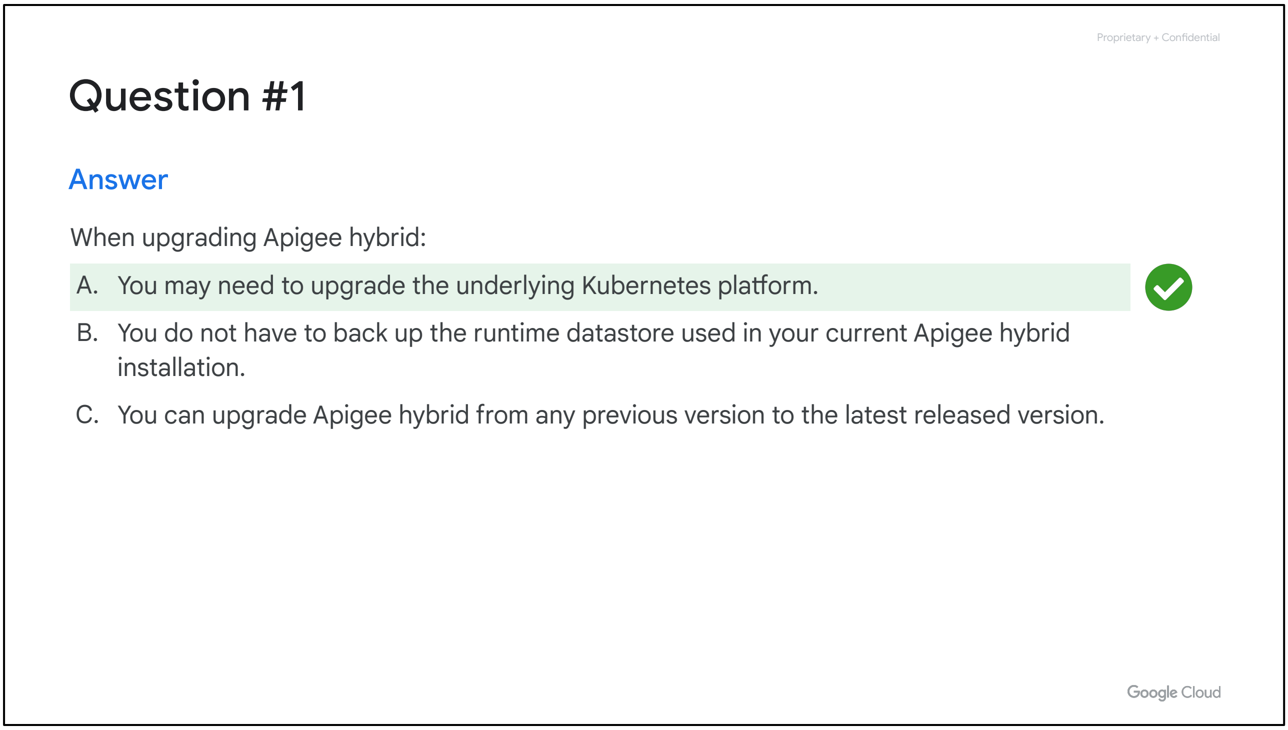
Question

When upgrading Apigee hybrid:

A. You may need to upgrade the underlying Kubernetes platform.

B. You do not have to back up the runtime datastore used in your current Apigee hybrid installation.

C. You can upgrade Apigee hybrid from any previous version to the latest released version.



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Question #1

Answer

When upgrading Apigee hybrid:

A. You may need to upgrade the underlying Kubernetes platform. ✓

B. You do not have to back up the runtime datastore used in your current Apigee hybrid installation.

C. You can upgrade Apigee hybrid from any previous version to the latest released version.

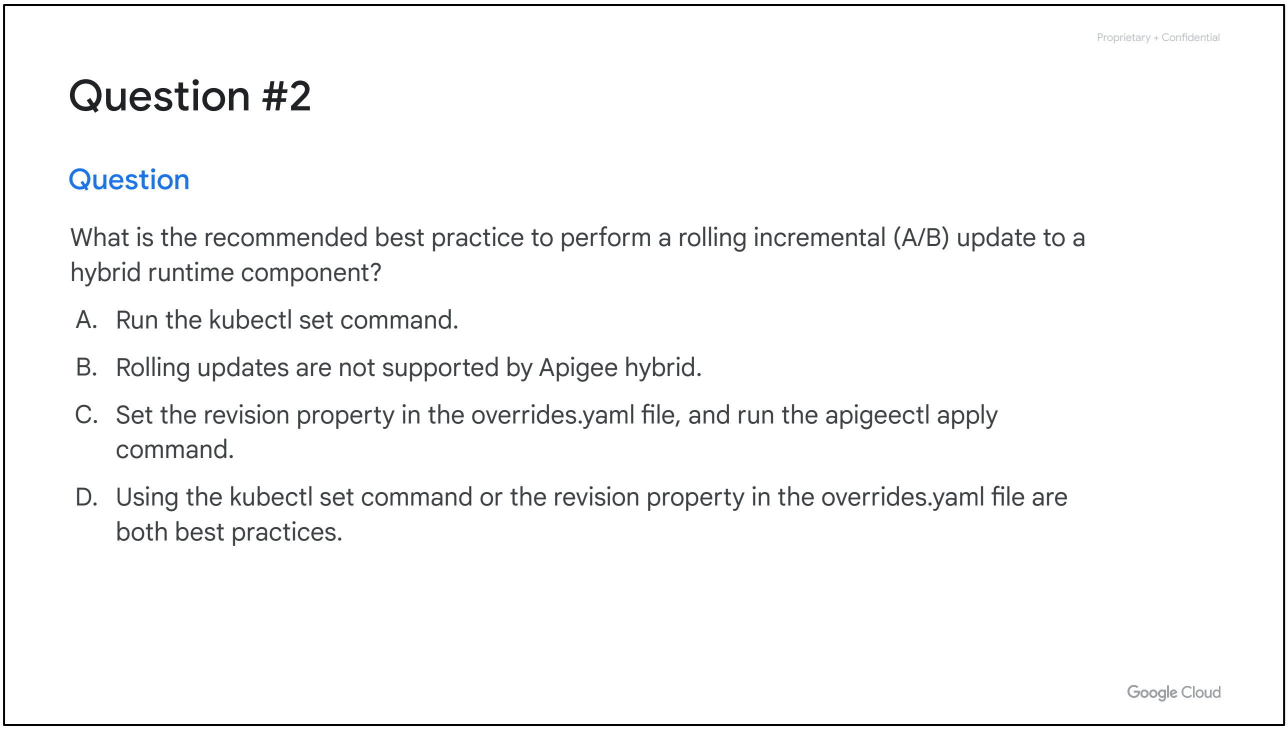
Google Cloud

Explanation:

A. Correct! The underlying Kubernetes platform may need to be upgraded to meet the version requirement of the Apigee hybrid software that is being upgraded.

B. Incorrect. It is a recommended best practice to always back up the runtime datastore used in your current Apigee hybrid installation.

C. Incorrect. Depending on the version of your current hybrid installation, you may have to first upgrade to an intermediate version before you upgrade to the latest released version of Apigee hybrid.



Question #2

Question

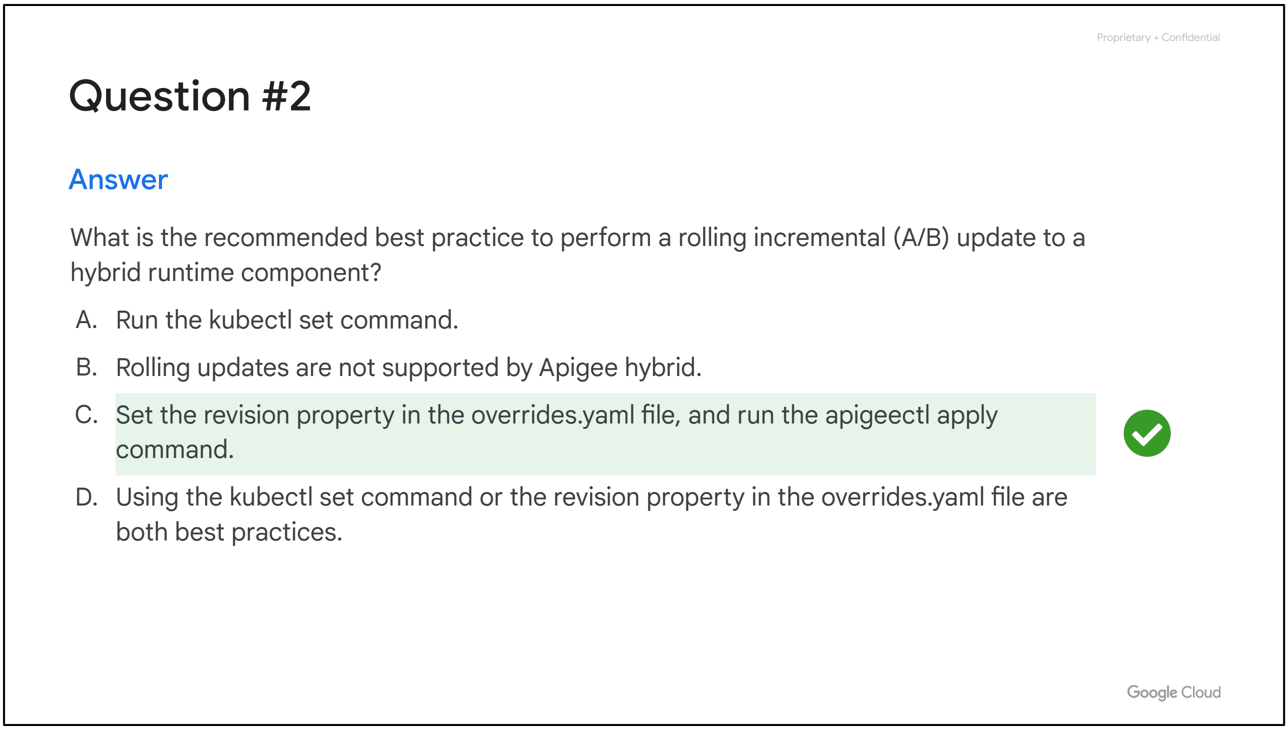
What is the recommended best practice to perform a rolling incremental (A/B) update to a hybrid runtime component?

A. Run the kubectl set command.

B. Rolling updates are not supported by Apigee hybrid.

C. Set the revision property in the overrides.yaml file, and run the apigeectl apply command.

D. Using the kubectl set command or the revision property in the overrides.yaml file are both best practices.



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Question #2

Answer

What is the recommended best practice to perform a rolling incremental (A/B) update to a hybrid runtime component?

A. Run the kubectl set command.

B. Rolling updates are not supported by Apigee hybrid.

C. Set the revision property in the overrides.yaml file, and run the apigeectl apply command. ✓

D. Using the kubectl set command or the revision property in the overrides.yaml file are both best practices.

Google Cloud

Explanation:

A. Incorrect. Updating the resource outside of the overrides.yaml file is not a best practice as the config changes can be lost in a future software install or upgrade.

B. Incorrect. Apigee hybrid does support rolling updates.

C. Correct! It is a best practice to set the revision property in the overrides.yaml file along with the updated config changes and run the apigeectl apply command.

D. Incorrect. The best practice is to set the revision property in the overrides.yaml file.

Question #3

Question

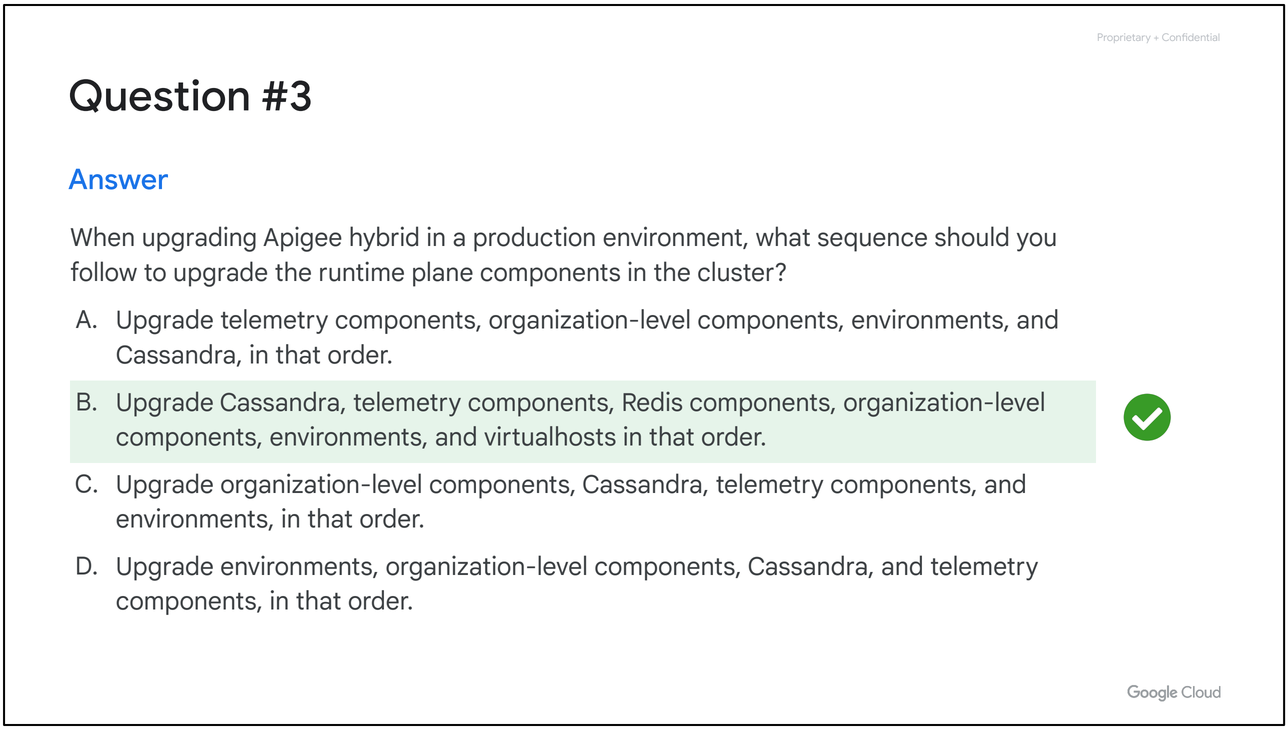
When upgrading Apigee hybrid in a production environment, what sequence should you follow to upgrade the runtime plane components in the cluster?

A. Upgrade telemetry components, organization-level components, environments, and Cassandra, in that order.

B. Upgrade Cassandra, telemetry components, Redis components, organization-level components, environments, and virtualhosts in that order.

C. Upgrade organization-level components, Cassandra, telemetry components, and environments, in that order.

D. Upgrade environments, organization-level components, Cassandra, and telemetry components, in that order.



Question #3

Answer

When upgrading Apigee hybrid in a production environment, what sequence should you follow to upgrade the runtime plane components in the cluster?

A. Upgrade telemetry components, organization-level components, environments, and Cassandra, in that order.

B. Upgrade Cassandra, telemetry components, Redis components, organization-level components, environments, and virtualhosts in that order. ✓

C. Upgrade organization-level components, Cassandra, telemetry components, and environments, in that order.

D. Upgrade environments, organization-level components, Cassandra, and telemetry components, in that order.

Explanation:

A. Incorrect. When upgrading the hybrid runtime components, you should upgrade the datastore component (Cassandra) first, then the telemetry components (logger, metrics), then the Redis components, followed by the organization-level components (MART, Watcher, Apigee Connect), the environment components (Runtime, Synchronizer, UDCA), and virtualhosts components.

B. Correct! This is the correct sequence to upgrade the hybrid runtime components in the cluster. Upgrade the datastore component (Cassandra) first, then the telemetry components (logger, metrics), then the Redis components, followed by the organization-level components (MART, Watcher, Apigee Connect), the environment components (Runtime, Synchronizer, UDCA), and virtualhosts components.

C. Incorrect. When upgrading the hybrid runtime components, you should upgrade the datastore component (Cassandra) first, then the telemetry components (logger, metrics), then the Redis components, followed by the organization-level components (MART, Watcher, Apigee Connect), the environment components (Runtime, Synchronizer, UDCA), and virtualhosts components.

D. Incorrect. When upgrading the hybrid runtime components, you should upgrade the datastore component (Cassandra) first, then the telemetry

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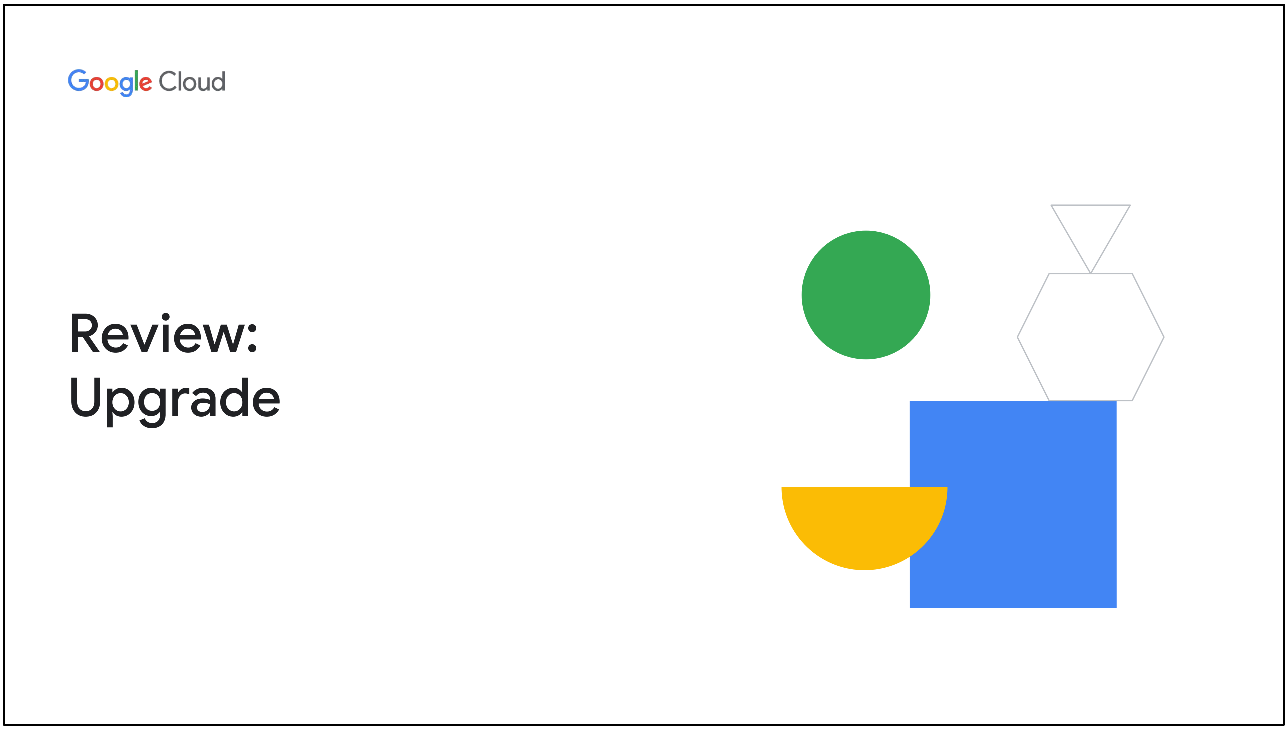

Review: Upgrade

In this module, you learned how to upgrade the Apigee hybrid runtime plane to a newer version of the software distribution.

You also learned about the rollback process in case you need to roll back Apigee hybrid due to errors in the newer version.

In the next module, you will learn how Apigee hybrid logs system informational and error messages and how you can use analytics and metrics data to monitor and troubleshoot Apigee hybrid.