

Logging and Monitoring



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

Finally, we will discuss the Apigee support model and how you can request support for issues related to Apigee hybrid.

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01	Logging
02	Metrics
03	Analytics
04	Monitoring and Troubleshooting
05	Demo: Monitoring Apigee Hybrid



In this lecture, you will learn how Apigee hybrid logs messages from the runtime plane and how you can view those messages for troubleshooting purposes.

In later lectures, we will discuss how hybrid metrics and analytics are collected and reported and how you can use these capabilities to monitor Apigee hybrid.

We will then view a demo on monitoring Apigee Hybrid.

Agenda

06 | Apigee Support

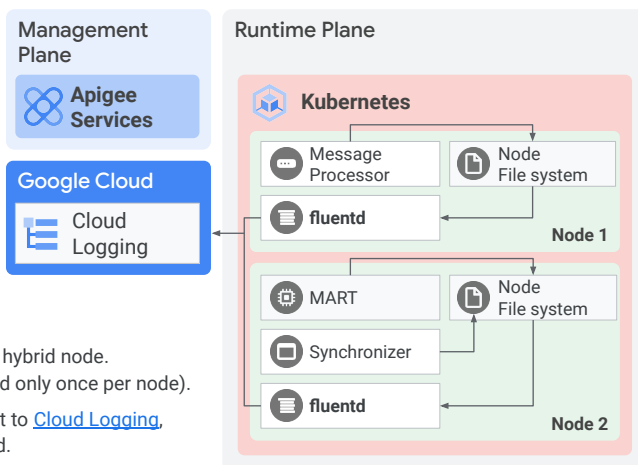
07 | Quiz



And we will discuss how you can leverage the Apigee support process to get help with your Apigee hybrid installation.

Logging in hybrid

- All Apigee hybrid services in your Kubernetes cluster generate [operational log information](#) that can be used to help troubleshoot failures.
- If a pod's status indicates a problem, you can look at the log files for that pod to gain insight into the issue.
- Each runtime plane service writes log data to stdout/stderr, and Kubernetes writes this data to the host filesystem.
- A [logs collector](#) for hybrid runs on each hybrid node. The collector is a [DaemonSet](#) (replicated only once per node).
 - It collects the log data and exports it to [Cloud Logging](#), where it can be viewed and analyzed.



Google Cloud

All of the Apigee hybrid services that run in your Kubernetes cluster generate log information.

This log information is useful for troubleshooting and debugging a given service or pod.

If a pod's status indicates a problem, you can look at the log files for that pod to gain insight into the issue.

Apigee support may request you to provide this log information to diagnose and solve a problem.

Let's review how logging works in Apigee hybrid.

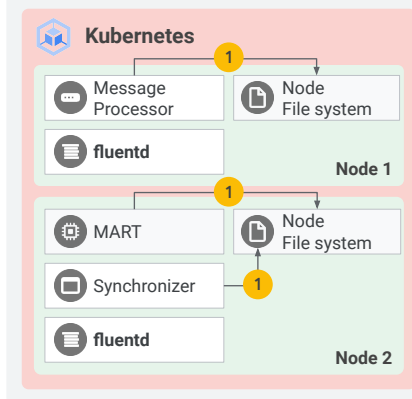
Logging operation

1. Hybrid runtime services write log data to stdout/stderr on their node's file system.

Management Plane



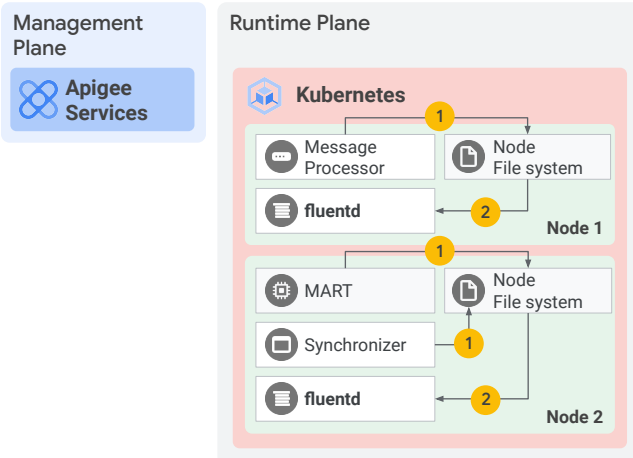
Runtime Plane



Each runtime plane service in Apigee hybrid writes log data to stdout/stderr, which Kubernetes saves to the host filesystem.

Logging operation

1. Hybrid runtime services write log data to stdout/stderr on their node's file system.
2. The logs collector fluentd extracts the log data.



A logs collector for hybrid runs on each node in the cluster.

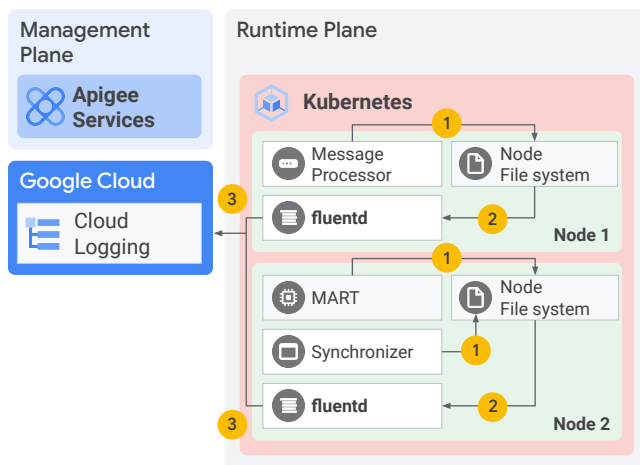
The collector is a Kubernetes DaemonSet that has one pod replica per node.

Apigee hybrid uses fluentd, which is an open source data collector application. Fluentd enables you to unify data collection and consumption.

Fluentd collects the written log data from the host file system.

Logging operation

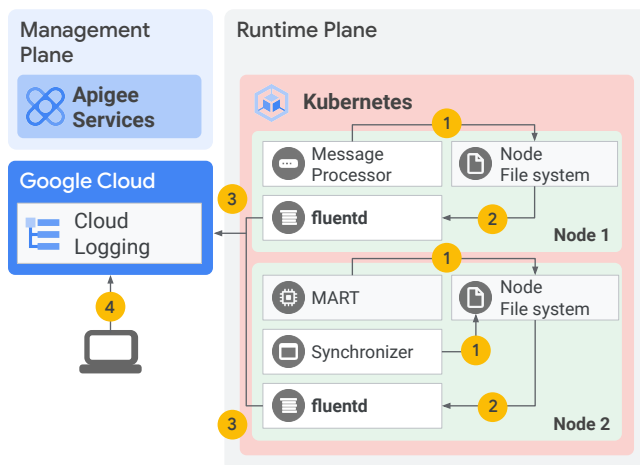
1. Hybrid runtime services write log data to stdout/stderr on their node's file system.
2. The logs collector fluentd extracts the log data.
3. Fluentd sends the log data to Cloud Logging associated with your cloud account.



The fluentd collector exports the logs to the Cloud Logging instance associated with your account on Google Cloud.

Logging operation

1. Hybrid runtime services write log data to stdout/stderr on their node's file system.
2. The logs collector fluentd extracts the log data.
3. Fluentd sends the log data to Cloud Logging associated with your cloud account.
4. You use the Google Cloud Console to access the log data.



You access the log data via the Cloud Logging UI in the Google Cloud Console.

Viewing logs

You can view log data for any hybrid runtime component by using the [kubectl logs](#) command or on Cloud Logging in Google Cloud Console.

- Viewing logs directly:

You can view the logs that are written to each pod's file system directly using the [kubectl logs](#) command:

```
$ kubectl logs {pod_name} -n {namespace}
```

For example: `$kubectl logs apigee-mp-hybrid-docs-test-blue-6fb96f5b9-2k8hp -n apigee`

- Viewing logs in the [Google Cloud console](#):
 - In the Query builder resource drop-down list, select [Kubernetes Container](#), the name of your cluster, your namespace, and the hybrid component container to view logs for that component.
 - Add and then run the query to view log entries in the query results.

On GKE, Apigee hybrid uses the default logging mechanism for all runtime plane components.

You can view log data by using the `kubectl logs` command to directly query the hybrid runtime pod.

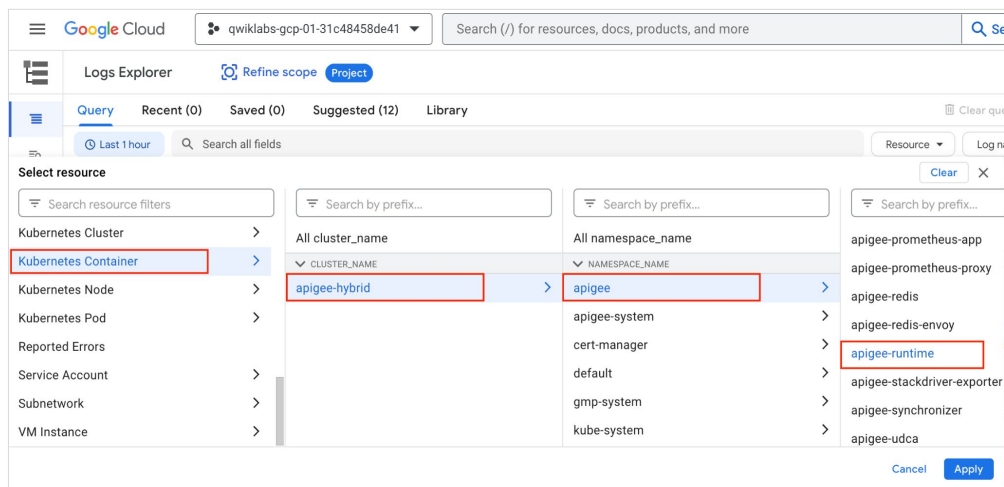
You must provide the pod name and pod namespace to the command.

You can also view logs in the Cloud Logging UI section of the Google Cloud console.

Default retention period for log files is 30 days. This can be changed.

Log rotation by default occurs when the log file exceeds 10 MB.

Viewing logs in the Google Cloud console



Google Cloud

To view hybrid runtime component logs in Cloud Logging, you select the Kubernetes Container as the audited resource type.

You then select your cluster, the namespace in the cluster that contains the hybrid component, and the specific component whose logs you want to view.

In the example shown, the apigee-runtime or message processor component logs will be shown in Logs Explorer.

Audit logs

- Apigee hybrid leverages [Cloud Audit Logs](#) to create audit log entries.
- Apigee hybrid writes [Admin Activity](#) audit logs, which record operations that modify the configuration or metadata of a resource.
 - Admin Activity audit logs cannot be disabled.
- If enabled, Apigee hybrid writes [Data Access](#) audit logs. These logs contain API calls that read the configuration or metadata of resources within the project.
 - Data access audit logs are disabled by default.
- Audit log entries can be viewed in Cloud Logging, the Cloud Logging API, or the gcloud command-line tool.



Audit logs help you track activity on the resources in your project. Apigee hybrid uses Cloud Audit Logs in Google Cloud to write admin activity logs.

The admin activity audit logs record operations that modify the configuration or metadata of a resource and cannot be disabled.

You can also enable data access audit logs in Apigee hybrid. These logs record API calls that read the configuration or metadata of resources or update user-provided resource data.

Data access audit logs are disabled by default because they can be very large.

Both the admin activity and data access audit logs (if enabled), can be viewed by using Cloud Logging or the gcloud command line tool.

[Audit logging](#)

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05	Demo: Monitoring Apigee Hybrid



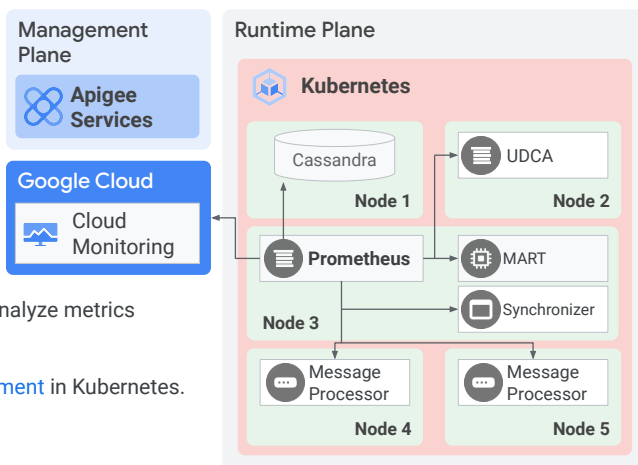
Metrics are an important feature used to monitor the health of a system.

In this lecture, you will learn how metrics are generated by the Apigee hybrid runtime plane components.

Later in this module, you will learn how to use these metrics for monitoring purposes.

Metrics collection

- Apigee hybrid collects operations metrics that you use to monitor the health of hybrid services.
- Apigee hybrid uses the [Prometheus](#) add-on for [metrics collection](#). After collection, the metrics data is sent to Cloud Monitoring.
- Using the Cloud Monitoring console, you can view, search, and analyze metrics and manage alerts.
- Metrics is implemented as a [Deployment](#) in Kubernetes.



Google Cloud

Apigee hybrid uses Prometheus to collect metrics from all the runtime plane components in the cluster.

Prometheus is an open source monitoring toolkit that is deployed in your Kubernetes cluster as an operator add-on when you install Apigee hybrid.

Prometheus scrapes application metrics from all hybrid services and sends the metrics to Cloud Monitoring.

There is one Prometheus server running per cluster.

Let's review how metrics collection works in Apigee hybrid.

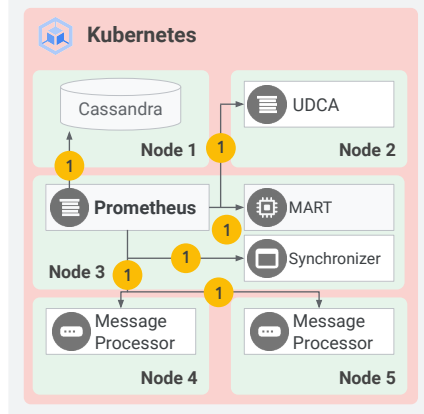
Metrics operation

1. **Prometheus** scrapes metrics data every few seconds from all runtime services via HTTP and stores it.

Management Plane



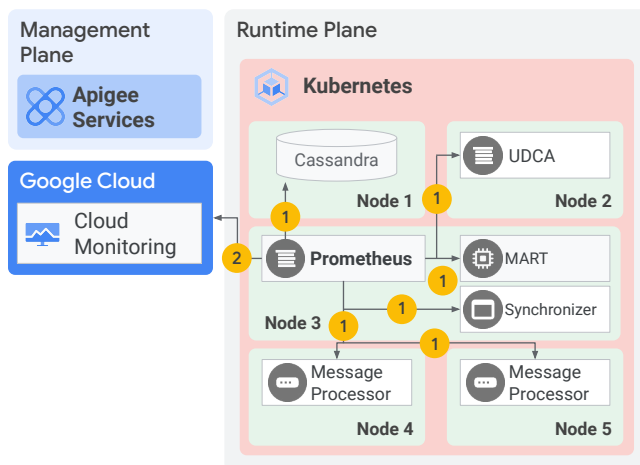
Runtime Plane



Prometheus scrapes metrics data via HTTP endpoints every few seconds from all the runtime services in the cluster and then stores it.

Metrics operation

1. [Prometheus](#) scrapes metrics data every few seconds from all runtime services via HTTP and stores it.
2. It periodically sends the collected metrics data to the Cloud Monitoring service associated with your account in Google Cloud.

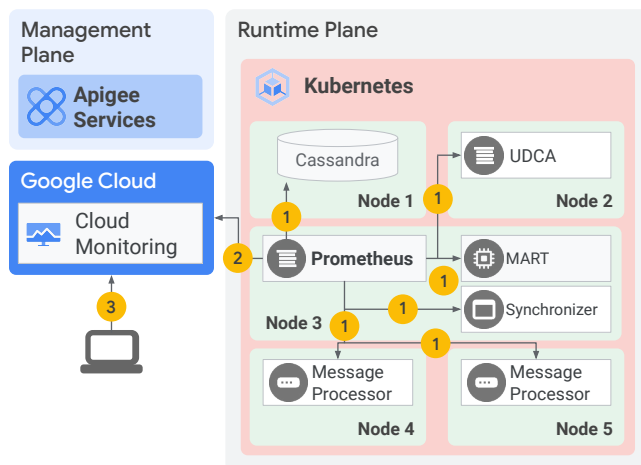


It then periodically sends the collected metrics data to the Cloud Monitoring service running in Google Cloud.

The metrics data is associated with your Google Cloud account and project.

Metrics operation

1. [Prometheus](#) scrapes metrics data every few seconds from all runtime services via HTTP and stores it.
2. It periodically sends the collected metrics data to the Cloud Monitoring service associated with your account in Google Cloud.
3. You access the metrics data via the Cloud Monitoring UI in the Google Cloud console.



You can then access the metrics data via the Cloud Monitoring UI in the Google Cloud console.

Configuring hybrid for metrics collection

- To configure hybrid for metrics collection, specify the following in the overrides.yaml config file:
 - [project-id](#) is the Google Cloud project ID.
 - [region](#) identifies the Google Cloud region where the apigee-metrics service sends data.
 - [service_account_file](#) is the path to the service account key file. The service account associated with the key must have the [Monitoring Metrics Writer](#) role.
- To disable metrics collection, set the [enabled](#) property to [false](#) in the overrides.yaml configuration file.

```
...
gcp:
  region: region
  projectID: project-id
metrics:
  serviceAccountPath: service_account_file
  enabled: true
...
```

To configure metrics collection for your hybrid runtime components, edit your overrides.yaml file and provide the Google Cloud project ID associated with your hybrid project, and the Google Cloud region where metrics should be collected. This is also the region where the Apigee hybrid runtime component logs are sent.

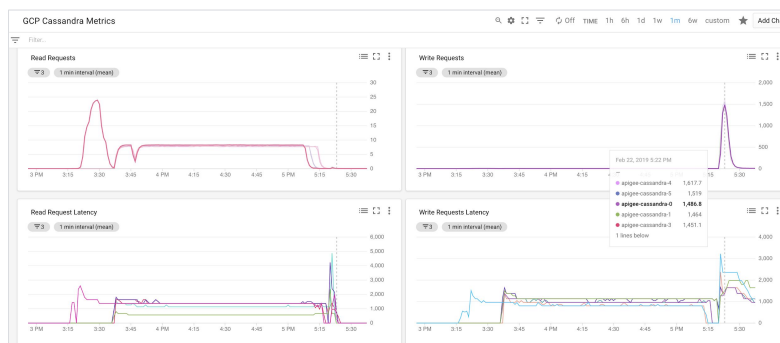
You must also provide the path to the service account key file that was created for the metrics component during hybrid installation.

Metrics collection is enabled by default. To disable it, set the enabled property to false.

After these changes are made, use the *apigeectl* command with the telemetry flag to apply them to your cluster.

Viewing metrics

- You can use the [Cloud Monitoring Metrics Explorer](#) in the Google Cloud console to select metrics to view.
- The selected metrics over various time periods can then be viewed in a dashboard.
- Apigee hybrid provides various metrics for Cassandra, UDCA, and other runtime components.



Google Cloud

You can view the metrics generated by Apigee hybrid by using the Cloud Monitoring metrics explorer in the Google Cloud console.

Using the metrics explorer, you can create dashboards to plot the various metrics for each hybrid runtime component.

You identify the runtime component by specifying the resource type and name.

Cloud Monitoring then generates a dashboard for the selected metric for that resource or component.

[Viewing metrics](#)

Useful hybrid metrics

Listed below are some useful hybrid runtime metrics used to monitor the state of Cassandra and other components:

- [Apigee proxy/target metrics](#): Proxy and target request/response counts, latencies, and policy latency
- [Apigee server metrics](#): Various metrics for the apigee-runtime, synchronizer, and UDCA components, including request/response latencies, fault counts, server thread counts, server nio, and request/response counts.
- [Apigee UDCA metrics](#): Metrics for disk usage by data files, upstream server latencies, upload latencies, files count, etc.
- [Apigee Cassandra metrics](#): JVM memory used, pending compaction tasks, client request latencies, etc.
- [Apigee upstream metrics](#): Latency of the upstream Apigee server application (control plane), upstream request and response count from runtime server components like synchronizer, etc.

View the full [list of metrics](#) that can be monitored for the Apigee hybrid runtime components.

Apigee hybrid generates many useful metrics that you can use to monitor the health of your runtime plane.

These include API proxy and target metrics that provide data on API request and response latencies and traffic counts.

Metrics are also available for the individual hybrid runtime components.

For the Cassandra component, metrics on JVM memory usage, compaction tasks, etc. are all collected.

The [full list of metrics](#) is available on the Apigee hybrid documentation website.

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In this lecture, you will learn about Apigee analytics and the reporting capabilities available in Apigee hybrid.

Analytics

- Apigee hybrid analytics collects and calculates information that flows through API proxies.
- You can visualize this data with graphs and charts in the hybrid UI or use the Apigee APIs to download the data for offline analysis.
- Hybrid analytics collects a broad spectrum of API metadata, such as response time, request latency, target errors, and application information.
- Data retention: The length of time that the analytics data is retained; [differs by offering](#).



Apigee Analytics collects and aggregates a large amount of information that flows through your API proxies.

You can visualize this data with graphs and charts in the Apigee hybrid UI, or you can use the Apigee APIs to download the data for offline analysis.

Apigee API Analytics collects and analyzes a broad spectrum of data that flows across API proxies, including response time, request latency, request size, and target errors.

The complete list of data collected by analytics is available on the Apigee documentation website.

For a complete listing of data collected by analytics, see [Analytics metrics, dimensions, and filters reference](#).

Visibility into API performance and usage

View trends on your API traffic, proxy, and target performance, top consuming developers and applications, API response times, error analysis, etc.



Google Cloud

The Apigee hybrid UI provides a set of predefined dashboards that you can use to view analytics data.

Here are 3 sample dashboards.

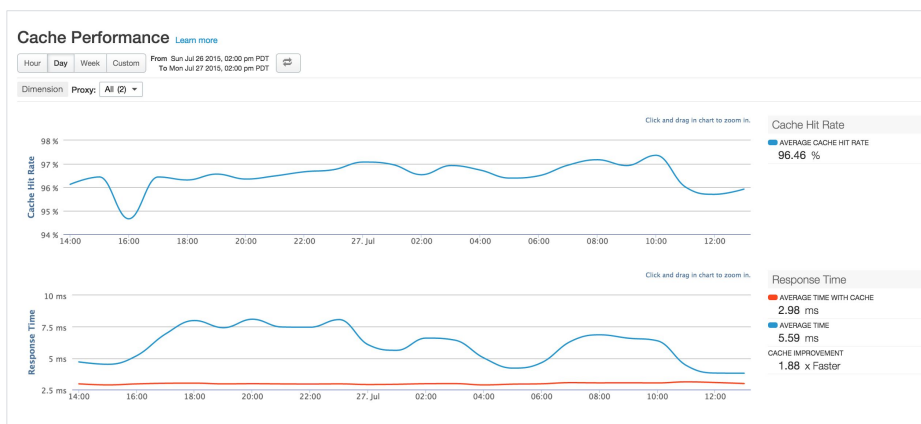
The proxy performance dashboard includes charts for various metrics such as total traffic received and average response time.

The target performance dashboard includes charts for metrics such as traffic by target server and target response times.

The error analysis dashboard includes charts for metrics such as proxy errors, target errors, and errors by response code.

Improve API response latency

Measure cache performance using the cache performance dashboard.



Google Cloud

To improve API response times and reduce latency, your API proxies can use the cache policies available in Apigee hybrid.

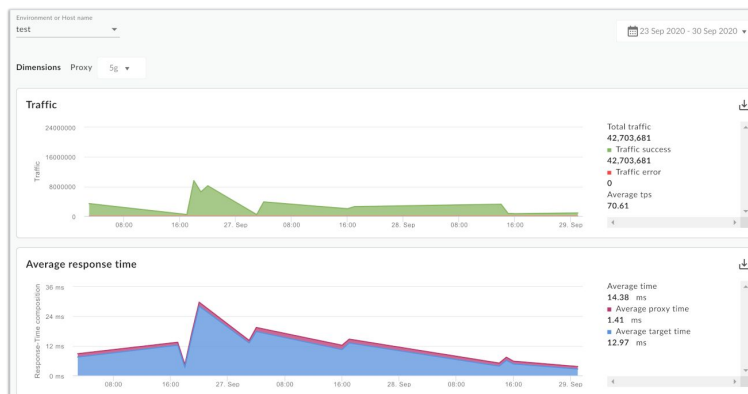
The cache performance dashboard enables you to see how well your cache strategy is working.

It includes charts that plot various metrics such as the cache hit rate, total cache hits, and API response time with cache.

Accessing analytics data

The hybrid UI provides a set of predefined dashboards to view analytics data.

- Proxy Performance
- Cache Performance
- Error Code Analysis
- Latency Analysis
- Target Performance
- Developer Engagement
- Traffic Composition
- Device usage
- GeoMap



Example: Proxy performance

Google Cloud

Apigee hybrid analytics currently includes a set of dashboards that you can use to track the performance of your APIs..

In addition to the performance dashboards, analytics also includes developer engagement and traffic composition dashboards that plot the number of active app developers, as well as top 10 apps, developers, API products, and proxies.

The error code analysis dashboard gives you a view into errors from your proxies, target servers, errors by response code etc., and provides valuable insight into the source of errors from your APIs.

The Device usage dashboard plots information about the devices and user agents that are being used to access your APIs. It lets you spot trends in the device types being used to access your APIs.

The Geomap dashboard tracks traffic and error patterns across geographical locations. This dashboard helps you analyze API trends by location and focus on locations and the errors that may be occurring.

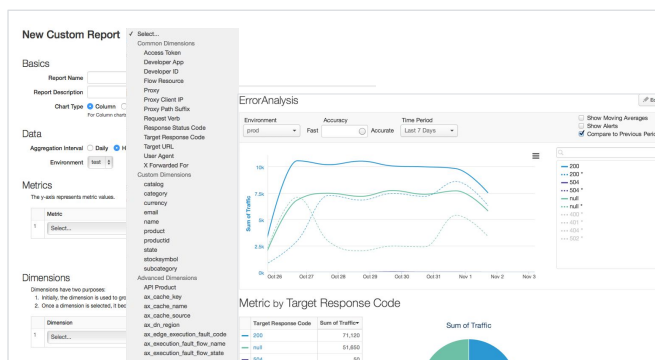
[Analytics Overview](#)

Custom reports

Custom reports let you **drill down** into specific API request/response metadata.

You create a custom report by selecting any of the dimensions and metrics built into hybrid by:

- Selecting the data you want to see, using **metrics** such as transactions per second or response time.
- Grouping the data in meaningful ways using **dimensions** such as API proxy, API product, or developer.
- Optionally limiting the data returned using **filters**.



Apigee hybrid supports the creation of custom reports. Custom reports enable you to drill down into specific API metrics data for analysis.

Use the Apigee hybrid UI to create a custom report that includes any of the built-in Apigee dimensions and metrics.

Metrics API

- Apigee hybrid exposes a RESTful [metrics API](#) that can be used to download analytics data.
- You can use this API to automate certain analytics functions, such as [retrieving data periodically](#) using an automation client or script.
- You can also use the API to [build your own](#) visualizations in the form of custom widgets that can then be embedded in portals or custom apps.

```
$ curl  
https://apigee.googleapis.com/v1/organizations/{org_name}/environments/{env_name}/stats/  
apiproxy?select=sum(message_count)&timeRange=  
=6/24/2020%2000:00~6/24/2020%2023:59&timeUnit=  
t=hour -H "Authorization:Bearer $TOKEN"
```

Example API call returns the sum of requests (message count) per API proxy, in a 24-hour period, grouped by hour.

Apigee hybrid provides a Metrics API that can be used to automate certain analytics functions, such as retrieving metrics periodically using an automation client or script.

You can also use the API to build your own visualizations in the form of custom widgets that you can embed in portals or custom apps.

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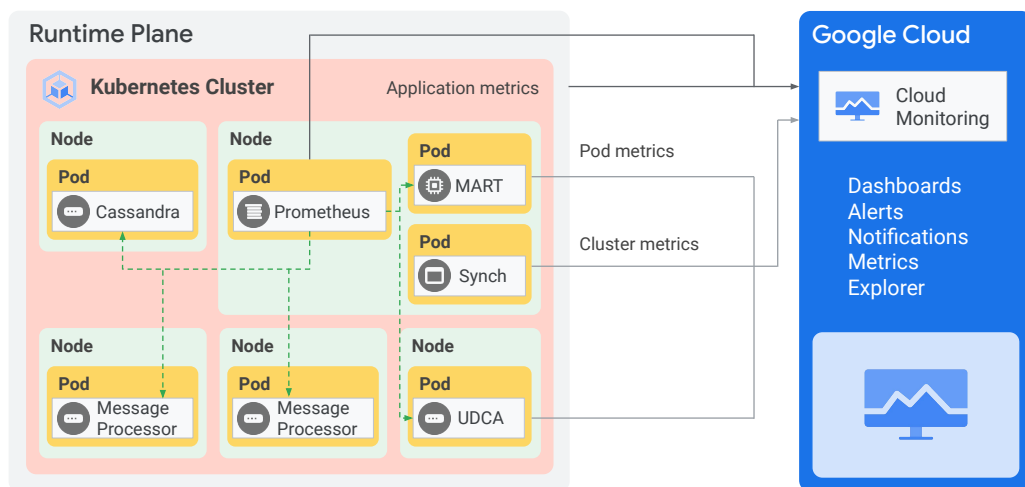
01	Logging
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In this lecture, we will discuss monitoring and troubleshooting Apigee hybrid.

You will learn how to troubleshoot issues in the runtime plane. You will also view a demo on how to monitor Apigee Hybrid.

Monitoring context



Google Cloud

Monitoring the Apigee hybrid runtime plane involves checking the health of your Kubernetes cluster and the health of the pods that are running in the cluster.

There are several metrics that can be used for cluster and pod monitoring.

The metrics generated by the cluster and the runtime pods are sent to Google Cloud, where you can view and monitor them using dashboards in the Cloud Monitoring UI.

Monitoring metrics

Several metrics of the Kubernetes hybrid runtime can be monitored.

They can generally be separated into 2 main groups: [Cluster monitoring](#) and [Pod monitoring](#).

Cluster Monitoring

- Monitor the health of the entire cluster to make sure that nodes are operating normally.
- Determine resource usage of the cluster and gauge cluster capacity.

To monitor cluster health, Kubernetes provides some useful metrics to measure [node resource utilization](#), including:

- CPU utilization: The fraction of allocatable CPU that is currently in use on the instance, and also request and limit utilization
- Memory utilization: The fraction of the allocatable memory that is currently in use on the instance
- Storage: Local ephemeral storage bytes used by the node
- Network bandwidth

When monitoring the overall health of your Kubernetes cluster, you determine whether the nodes in the cluster are operating normally and whether there is sufficient capacity.

Many cluster metrics are available to gauge node resource utilization, such as CPU, memory, disk and network bandwidth utilization.

Pod monitoring metrics

Metrics for monitoring pods can be separated into three categories:

- **Kubernetes metrics**
 - Pod count: Actual/desired number of pods
 - Pod volume utilization: The fraction of the volume that is currently being used by the instance
 - Pod request latency
- **Container metrics**
 - CPU utilization: The fraction of CPU request and limit utilization
 - Memory limit utilization: The fraction of the memory limit that is currently in use on the instance
 - Restart count: Number of times the container has restarted
- **Application metrics**
 - Hybrid generates many [metrics](#) that can be used to monitor the runtime components.



To monitor the pods in your cluster, you can use Kubernetes metrics that track the number of pods in the cluster and their storage volume utilization.

This can help you determine whether the number of pods running does not match the desired count, which indicates node or cluster resource constraints.

Container metrics like CPU utilization provide the fraction of requested CPU and the amount currently in use by the container.

Similar container metrics are also available for memory utilization. Both of these metrics can be used to gauge the resource usage, capacity, and health of your cluster.

As discussed in a previous lecture, Apigee hybrid generates many application metrics for each of the runtime components in the cluster.

You can use these metrics to monitor the health of those components and of the proxies that process the API traffic flowing through the cluster.

<https://cloud.google.com/apigee/docs/hybrid/v1.10/metrics-view.html>

Cloud Monitoring

Metrics generated and collected by the hybrid runtime are sent to Cloud Monitoring, where you can visualize them and monitor the health of the system.

The screenshot displays the GKE Dashboard with various monitoring sections. The 'Clusters' section shows one cluster, 'apigee-hybrid', with 0 alerts, 3 container restarts, 251 error logs, 43.96% CPU utilization, 16.57% memory utilization, and 0% disk utilization. The 'Workloads' section lists several components including 'cert-manager', 'cert-manager-cainjector', 'cert-manager-webhook', 'istio-ingressgateway', and 'istiod', each with their respective resource usage and alert counts.

Clusters							
Name	Alerts	Labels	Container restarts	Error logs	CPU utilization	Memory utilization	Disk utilization
apigee-hybrid	0	Location: us-central-1	3	251	43.96% of 2.75 CPU	16.57% of 5.77 GiB	0% of 2.14 TiB

Workloads							
Name	Alerts	Labels	Container restarts	Error logs	CPU utilization	Memory utilization	Disk utilization
cert-manager	0	Cluster: apigee-hybrid	0	0	0 CPU	22.28 MiB	0% of 7.82 GiB
cert-manager-cainjector	0	Cluster: apigee-hybrid	0	0	0 CPU	63.74 MiB	0% of 7.82 GiB
cert-manager-webhook	0	Cluster: apigee-hybrid	0	0	0 CPU	12.6 MiB	0% of 7.82 GiB
istio-ingressgateway	0	Cluster: apigee-hybrid	0	6	5.88% of 0.2 CPU	13.39% of 256 MiB	0% of 643.92 GiB
istiod	0	Cluster: apigee-hybrid	3	3	2.36% of 1 CPU	1.17% of 4 GiB	0% of 455.34 GiB

Apigee hybrid collects various metrics from the runtime components and sends them to Cloud Monitoring on Google Cloud.

Cloud Monitoring provides monitoring dashboards, alerts, and notification

- View and analyze metric data using predefined dashboards for resources and services that you use.
- Create a custom dashboard to analyze Apigee hybrid metrics by creating charts for each metric.
- Create alerts using policies with hybrid runtime metrics based on threshold conditions.
- Create notifications based on alerts to take action when they are triggered.

Cloud Monitoring is a service that collects and ingests metrics, events, and metadata. It generates insights into this data via dashboards and alerts.

You can use these predefined dashboards or create custom ones to view and analyze the metrics data from your Kubernetes cluster.

Using custom dashboards, you can analyze metrics from the Apigee hybrid runtime components and create alerts and notifications based on thresholds you define.

An alert notification enables you to review and take action to resolve the condition that triggered the alert.

Monitoring strategy: 3 pillars

People	Processes	Tools
<ul style="list-style-type: none">• Highly skilled technical staff• Operational management expertise• Sysadmin, DB, Cloud Exp, Data center, Automation• 24/7 global coverage• Employee development and curriculum	<ul style="list-style-type: none">• Capacity Planning• Event and Incident Management• Change Management• Release Management• Segregation of Duties	<ul style="list-style-type: none">• Config management/orchestration• Real-time and historic API health visibility• API security and compliance tracking• Component and process monitoring

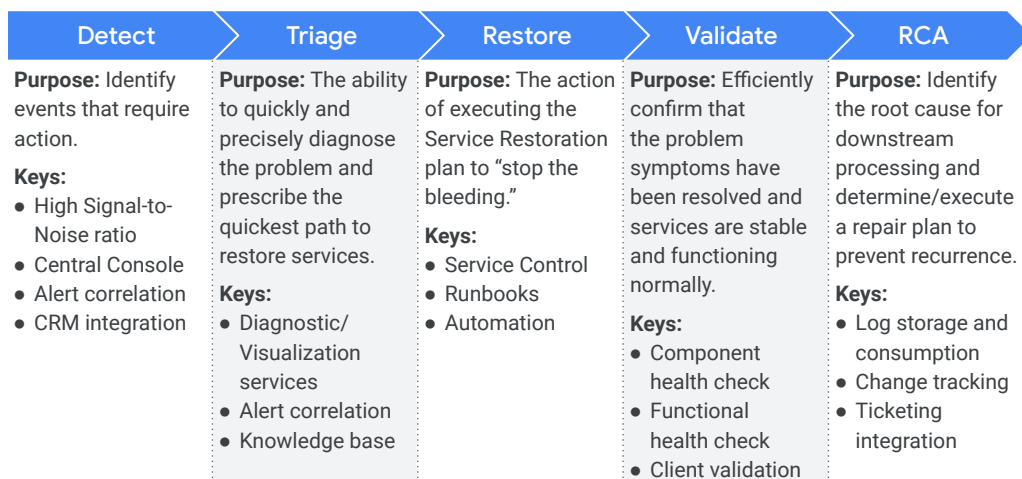
A well-defined monitoring strategy relies on trained personnel, well documented processes, and having the right tools in place.

Personnel are typically system administrators with experience in cloud operations, database management, devOps automation, and general operations.

Processes to manage your hybrid operations should include event and incident management, change and release management, and capacity planning.

To support your Apigee hybrid operations tasks, you need tools for configuration management, system observability and monitoring, and security and compliance tracking.

Support incident workflow



As part of your monitoring and troubleshooting process, adopting a well-defined support and incident workflow is critical.

The process should cover various phases in troubleshooting an issue, from detection, triage, service restoration and validation to root cause analysis.

Each phase incorporates distinctive capabilities.

It is important to have a central tool or console to detect and triage issues with the platform. A well-designed tool will have alert generation and integration with CRM tools to manage customer reporting and also visualization and diagnostic capabilities.

Using runbooks and automation is a repeatable best practice when restoring services. Component and functional health checks are essential pieces of a service validation strategy after the service has been restored.

A root cause analysis must always be performed for service outages in production environments. It helps document the cause and effect of the problem and helps to implement procedures to prevent recurrence.

Standardized actionable alerts and automation

Actionable alert	Playbooks	Automation	People
<ul style="list-style-type: none">• Service• Tags• Metric• Trigger• Host• Playbook	<ul style="list-style-type: none">• Problem characteristic• Triggers• Resolution steps• Escalation (to another playbook or human)	Automatic execution of playbooks based on triggers.	<ul style="list-style-type: none">• Focus on complex problems.• Focus on actionable alerts, playbook, and automation.

An alert that is generated by your monitoring system must have sufficient information that makes it actionable.

Details in the alert notification should include the metric that triggered the alert, service information, and other details that help the operator take corrective action.

A best practice is to create playbooks that document the problem, any triggers, and steps to resolve or escalate the issue. This helps to create a well defined, repeatable process for operators to follow when similar issues arise in the future.

In general, sending a notification of problems is not enough. Defining actionable alerts and playbooks to resolve the problems with automation is required and should be part of your monitoring and troubleshooting strategy.

Troubleshooting APIs

Some API calls are failing, or you are experiencing intermittent errors or latency.



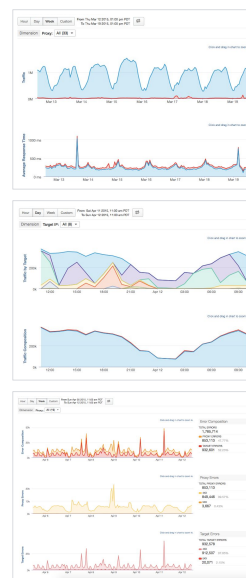
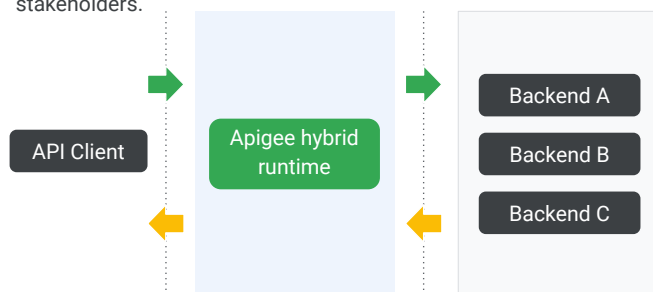
Let's review some common troubleshooting scenarios.

Assume there are some requests to your API proxy that are failing intermittently or have increased latency.

Start with Apigee analytics

When issues arise, it is important to effectively diagnose the problem in order to solve it.

Apigee Analytics allows you to determine whether the problem is located within the hybrid's boundaries. You can quickly identify the proxies and target endpoints that are having problems and expedite an escalation to specific stakeholders.



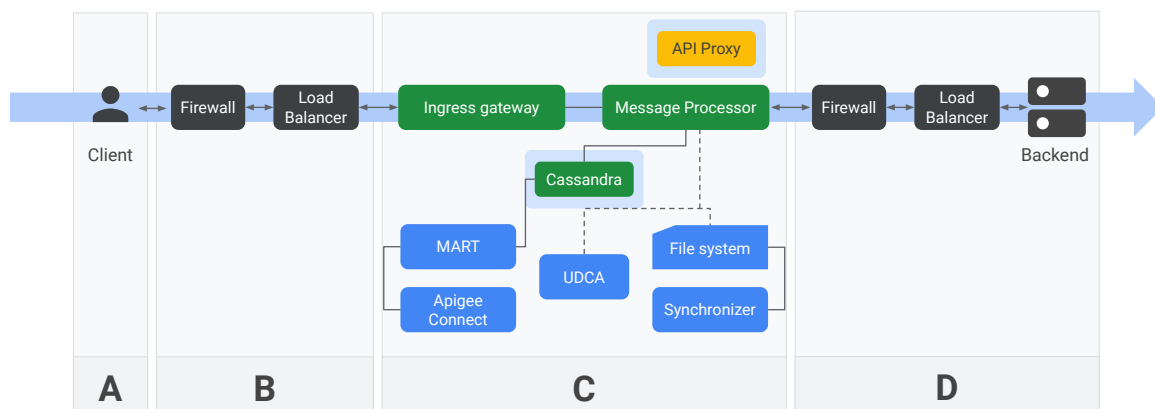
Apigee analytics is one of the tools that you can use to troubleshoot issues with your API proxies.

It is easy to access and use the various analytics dashboards in the Apigee hybrid UI.

You can review the error analysis, the API proxy and target performance, and latency dashboards to troubleshoot errors or latency issues with your API proxy.

Using the charts in these dashboards, you can determine the source of the errors or latency to determine whether the issue is from the target backend or the API proxy itself.

The runtime critical path



When monitoring your API management platform, it is important to focus on the runtime critical path.

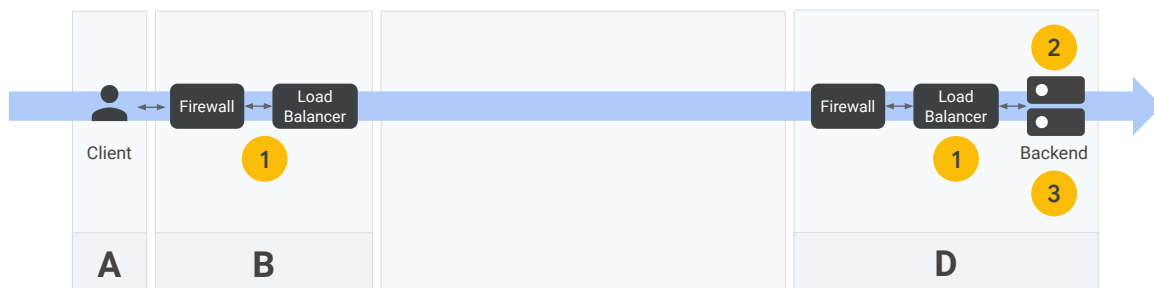
This includes the calling client application, any firewall and load balancers in front of the ingress gateway external to the cluster, the runtime message processor component that processes the API request, any firewall and load balancers in your network, and your backend system.

The components that you manage within your infrastructure should support a high level of uptime SLA and must be continuously monitored.

API runtime traffic interruption or high latency

API response time can be affected by multiple factors. Consider these key items when determining the source of the problem:

1. Northbound or southbound connectivity problems
2. Backend connectivity latency and target servers response time
3. Large payload



Google Cloud

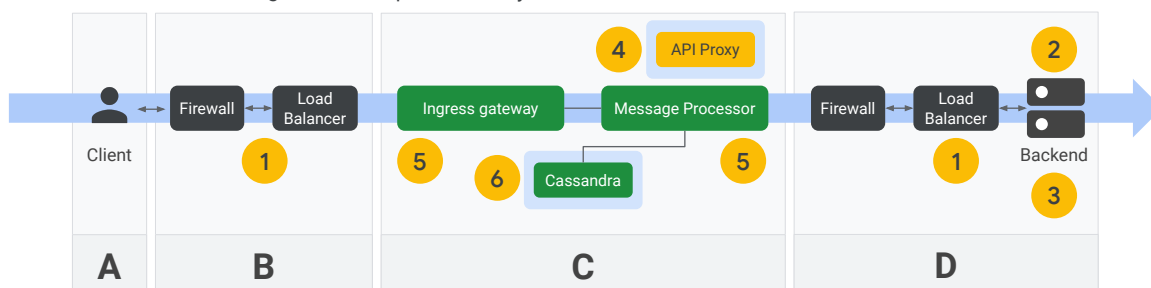
Issues with high latency or traffic interruption can be investigated at various places in the runtime critical path.

For connectivity issues between the client applications and the hybrid runtime plane, check any firewall or load balancer configuration you may have in front of the ingress gateway.

For connectivity and latency issues between the API proxy and the target backend servers, perform the check on any network objects that may also lie within your backend network.

API runtime traffic interruption or high latency

4. API Proxy complexity, processing time, or implementation issues:
 - Poor-performing code deployed to environment
 - Excessive logic or responsibility being executed in the Gateway
 - Capacity (CPU, RAM, Disk or number of R, MP, CS) to meet API traffic and throughput requirements
5. Ingress gateway/MP down or unresponsive
6. Cassandra ring down or response latency



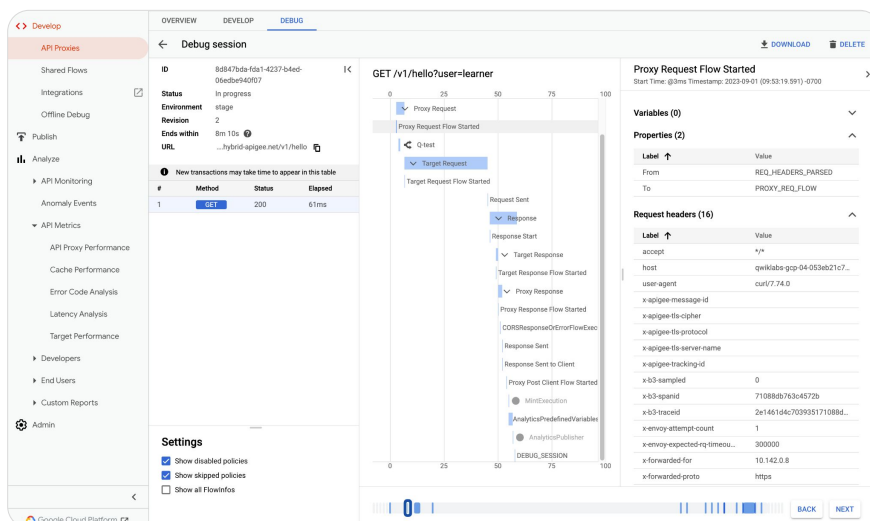
Google Cloud

Of course there may be other issues outside of the network that cause traffic interruption or latency.

An unexpectedly large payload could cause the backend service to react unpredictably. You can mitigate this issue by implementing payload validation in your API proxy.

Other issues related to API proxy complexity or runtime resource capacity can be investigated by examining the API logic and current resource allocations in your cluster.

Use Debug to troubleshoot and monitor issues

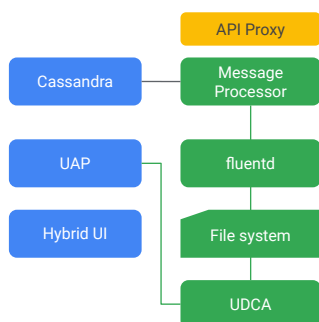


The debug feature in Apigee hybrid is a useful tool that enables you to troubleshoot and monitor issues in your API proxy logic.

Using debug, you can probe the policies in your API proxy as they process the request and response data that flows through the proxy.

The debug tool displays the value of request and response metadata and any data you store in flow variables in your proxy. This enables you to view how this data is modified by your proxy logic and aids in debugging issues with the API.

Troubleshooting analytics



Consider these factors when troubleshooting analytic reports visualization and data capture:

- Connectivity between the Message Processor and UDCA data collection pods
- Connectivity between UDCA and UAP in the management plane
- Streaming of Analytics data to fluentd
- Pod file system capacity
- Permissions issues during creation of a directory on the file system
- Error during upload of datasets to UAP

For a list of UDCA log errors, review this page: [UDCA logs](#)

Troubleshooting the analytics service involves checking connectivity between some of the runtime components that are used to stream and collect analytics data.

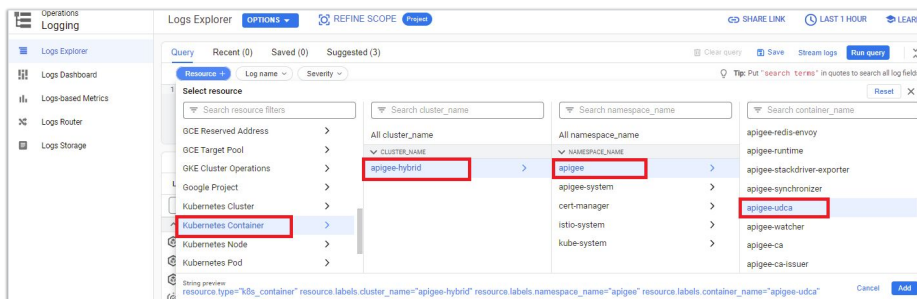
The connections involved are between the runtime message processor and the Universal Data Collection Agent or UDCA components in the runtime plane and between UDCA and the Unified Analytics Platform or UAP component in the management plane.

Pod file system capacity and directory permissions can also contribute to issues with the analytics service in Apigee hybrid.

<https://cloud.google.com/apigee/docs/hybrid/v1.10/udca-logs.html>

Troubleshooting UDCA

- To troubleshoot UDCA in Apigee hybrid, view the pod log files.
- Use the `kubectl logs {udca_pod_name} -n {namespace}` command to view log entries.
- UDCA logs can also be viewed in Cloud Logging Logs Explorer.



Kubernetes Container -> {hybrid cluster name} -> {namespace} -> apigee-udca

Google Cloud

To troubleshoot UDCA operation, you can view the pod logs directly or within the Cloud Logging UI in the Google Cloud console.

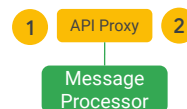
In the Cloud Logging UI, use the Kubernetes container filter to select the resource by selecting your hybrid cluster, namespace and the apigee-udca runtime component.

You can then view the log entries generated by the UDCA runtime component.

Troubleshooting API proxy deployments

Consider the following items when troubleshooting API proxy deployment failures:

1. Error in API proxy implementation
2. API proxy bundle size



Let's discuss a few troubleshooting scenarios.

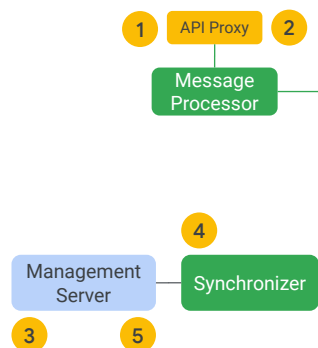
One of the common issues that arise is an error during API proxy deployment. Errors can be due to the proxy implementation logic or the size of the API proxy bundle.

The size and other product limits are documented on the Apigee hybrid resources website.

Troubleshooting API proxy deployments

Consider the following items when troubleshooting API proxy deployment failures:

1. Error in API proxy implementation
2. API proxy bundle size
3. Management server availability
4. Connectivity issues between Management Server and Synchronizer, or service account misconfiguration
5. Missing API proxy dependencies, including KVMs and target servers



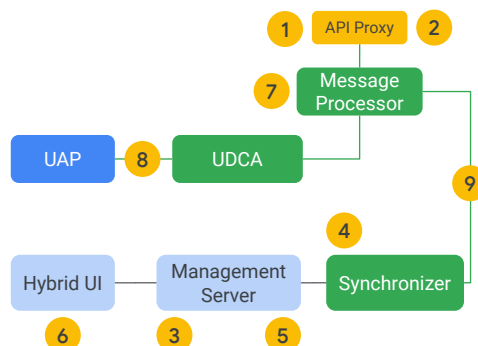
Other errors due to management service availability, or connectivity issues between the management service and the runtime plane components, although rare, are possible.

Errors can also be due to missing API proxy configuration dependencies such as key value maps and target servers. Make sure to configure these objects as part of your proxy development lifecycle in all the hybrid runtime environments where they are needed.

Troubleshooting API proxy deployments

Consider the following items when troubleshooting API proxy deployment failures:

6. Runtime pods sync status error in the hybrid UI
7. MP state: Unavailable, restarting, pod sync state not yet updated, or in error state
8. Connectivity between UDCA and UAP component in the management plane
9. MP-to-synchronizer connectivity issues or synchronizer failure.



Another possible source of errors is that the runtime Synchronizer, Message Processor, or UDCA pods are not successfully running or there are connectivity issues between the synchronizer or UDCA components and the management plane.

To troubleshoot, you need to look at the individual component pod log files to determine the cause of the error.

[More issues with API proxy deployment](#)

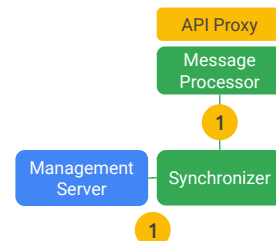
Troubleshooting the Message Processors

Consider the following items when troubleshooting Message Processor (MP) errors:

1. One or more apigee-runtime (MP) pods are not in [Ready](#) state:

```
$ kubectl describe pod -n {namespace} {runtime-pod-name}
Readiness probe failed: HTTP probe failed with statuscode: 500
```

- The error is typically because no data is available to the MP
- Usually caused by connectivity issues with the synchronizer, or between the synchronizer and the management plane.



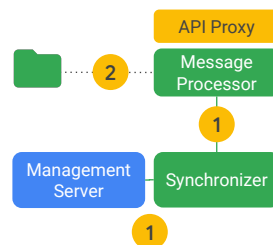
The message processor runtime component deploys API proxies and executes proxy logic.

A message processor pod can sometimes indicate that it is not in a ready state. This can be caused by connectivity issues with the synchronizer runtime component or between the synchronizer component and the management plane.

To troubleshoot, make sure that the synchronizer is up and running and that the service account used to configure the synchronizer for the environment is valid.

Troubleshooting the Message Processors

2. Readiness probe fails due to invalid encryption key. Running the describe command above returns:
- `Readiness probe failed: Probe hybrid-encryption-key-validation-probe failed`
- Supported encryption key lengths are 16 or 24 or 32 bytes, and the key's value must be base64-encoded.
 - Make sure this is properly configured in the overrides.yaml file.



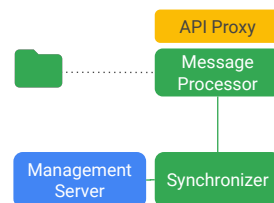
For errors due to the validation of encryption keys, make sure that the configured key is base64-encoded and that the key length is supported by Apigee hybrid.

Additional details and log entries for troubleshooting MP issues are documented [here](#).

Troubleshooting the Message Processors

Test the runtime pod operation using port-forwarding:

- Get the list of apigee-runtime (MP) pods in the production environment:
\$ `kubectl get pods -n apigee -l env=prod,app=apigee-runtime`
- For a given runtime pod, set up port forwarding:
\$ `kubectl port-forward -n apigee {podname} 8443:8443`
- In another terminal window, use a utility such as **curl** to send a request to any deployed API proxy in the *prod* environment, and check the response:
\$ `curl -k -v https://0:8443/lab1-test/200`



To help isolate a problem with API proxies, check whether you can make an API proxy call directly from inside the apigee-runtime pod bypassing the ingress gateway.

To accomplish this, first get the list of all the runtime pods in the apigee namespace for your environment.

Set up port forwarding to the specific pod by providing the name of the runtime pod.

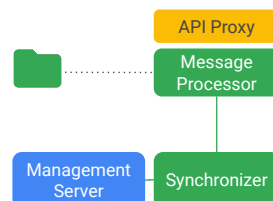
Call a deployed API proxy by using the curl command line utility on the forwarded port and using the basepath URL of the proxy.

The response from the proxy will indicate whether it is functioning as expected.

Troubleshooting the Message Processors

Test the runtime pod operation using port-forwarding:

- Set up [port forwarding](#) on port 8843 to call the management API on the MP to list information about the deployed proxies:
\$ curl -k https://0:8843/v1/classification/tree
- Enable [DEBUG mode](#) for the runtime pod to include additional information in pod logs:
\$ curl "https://0:8843/v1/logsessions?sessions=debug" -X POST -v -k
- Check runtime pod logs:
\$ kubectl logs -f -n apigee {podname}



You can also call the management API on the runtime message processor pod to send a request to the classification tree API. The response from this API will list information about all the deployed proxies.

To help with further troubleshooting, you can enable DEBUG mode to include more detailed information in the apigee-runtime message processor pod logs by making an API call to the logsessions management API.

After you finish debugging an issue, you should reset the logging mode back to INFO, using the same API call with the sessions parameter set to info.

Troubleshooting Synchronizer

Consider the following items when troubleshooting synchronizer errors:

1. MP to synchronizer connectivity issues, or synchronizer failures.

Check runtime pod logs:

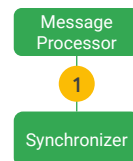
```
$ kubectl logs -f -n {namespace} {runtime-pod-name}
```

Check synchronizer pod logs:

```
$ kubectl logs -f -n {namespace} {synchronizer-pod-name}
```

If the synchronizer for a hybrid environment is not running, restart it using the following command:

```
$ apigeectl apply -f overrides/overrides.yaml --env {env}
```



To troubleshoot issues with the synchronizer component, you can view the synchronizer pod logs for the hybrid environment in which the issue occurs.

Use the `kubectl logs` command with the pod name.

Additional details and log entries for troubleshooting Synchronizer issues are documented [here](#).

Troubleshooting Synchronizer

Consider the following items when troubleshooting synchronizer errors:

2. Connectivity issues between Management Server and Synchronizer.

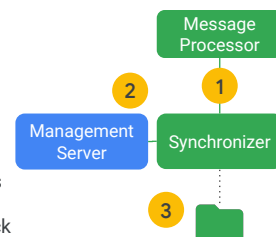
Check the [version.properties](#) for potential mismatch with the contract folder name:

```
$ kubectl exec -it -n {namespace} {synchronizer-pod-name} -- /bin/bash
```

```
$ cat /opt/apigee/var/log/apigee-synchronizer/versions.properties
```

If the value of the [active.version](#) property does not match the contract folder name, check synchronizer logs to troubleshoot further.

3. Make sure the required [synchronizer configuration properties](#) are provided with correct values.



To troubleshoot synchronization issues with the management plane, check the `versions.properties` file to confirm that the current active version matches the folder name that contains the downloaded contract data.

To do this, use the `kubectl` command to start a shell on the synchronizer pod and provide the name of the pod.

Then compare the `active.version` property with the contract folder name to confirm that they match. If they do not match, check the synchronizer logs for details to debug the issue further.

Also confirm that the configuration properties for the synchronizer component have correct values as per the hybrid configuration reference documentation.

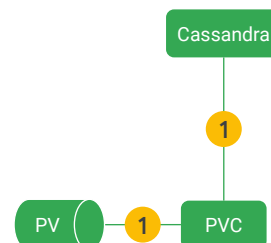
<https://cloud.google.com/apigee/docs/hybrid/v1.10/config-prop-ref.html#synchronizer>

Troubleshooting Cassandra

Consider the following items when troubleshooting Cassandra errors:

1. During startup, one or more Cassandra pods stuck in Pending state indicate that the pod could not be created: `$ kubectl get pods -n {namespace}`

NAME	READY	STATUS	RESTARTS	AGE
apigee-cassandra-0	0/1	Pending	0	10m



In Apigee hybrid, Cassandra is a stateful component in the runtime plane with external storage attached and uses Persistent Volume Claims, or PVCs.

You may sometimes see that a Cassandra pod is stuck in a pending state during startup. This indicates that Kubernetes cannot schedule the pod on a node.

This may happen because the node doesn't have sufficient resources, such as CPU or memory, available to create the pod.

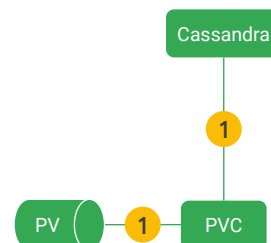
Another possible reason is that the pod is waiting for the persistent volume to be created.

Troubleshooting Cassandra

By running the `kubectl describe pod` command, you can get more details on the possible causes:

- **Insufficient CPU or memory:** Resize the cluster to add additional nodes, or re-create the Cassandra nodepool with a larger machine type.
- **Persistent Volume not created:** Check the status of the persistent volume claim to determine the cause of the error, using these commands:

```
$ kubectl -n {namespace} get pvc  
$ kubectl -n {namespace} describe pvc {pvc-name}
```



If the error is due to the underlying *StorageClass*, follow instructions here to [change the default storage class](#).

You can get more details on the source of the error by running the `kubectl describe` command, providing the pod name and namespace.

For errors due to insufficient resources, you can resize the runtime data nodepool in the cluster or use larger machine types for the Cassandra pods.

For errors due to persistent volumes, use the `kubectl describe` command on the `PersistentVolumeClaim` resource to further investigate the cause of the issue.

<https://cloud.google.com/apigee/docs/hybrid/v1.10/cassandra-config.html>

Troubleshooting Cassandra

2. One or more Cassandra pods is in [CrashLoopBackoff](#) state, which indicates that the pod could not be created:

```
$ kubectl get pods -n {namespace}
```

NAME	READY	STATUS	RESTARTS	AGE
apigee-cassandra-0	0/1	CrashLoopBackoff	0	0m

Check the [Cassandra error log](#) to diagnose the problem:

```
$ kubectl logs {cassandra-pod} -n {namespace}
```

- If errors indicate previous data center differences, try deleting the old or stale PVCs from the cluster:
\$ kubectl -n {namespace} delete pvc {cassandra-pvc-name}
- If errors indicate that the Truststore directory is not found, verify the path to the Cassandra key and certificate files in the overrides.yaml file.

During startup, the Cassandra pods are sometimes stuck in the CrashLoopBackoff state.

You can determine this by running the kubectl get pods command. This indicates that Kubernetes cannot create the pod.

Use the kubectl logs command to check the Cassandra pod error log for more details on the error.

If an error indicates data center differences, the pod has a stale persistent volume attached.

To resolve this issue, delete the old or stale PersistentVolume claims. For new installations, delete all the PVCs and retry the Cassandra setup.

For errors that indicate that the truststore directory is not found, verify that the key and certificates that are configured in your overrides.yaml configuration file are valid.

Troubleshooting Cassandra

3. Underlying node failure could prevent the Cassandra pod from getting to a *Running* state.

Check the node status:

```
$ kubectl get nodes -n {namespace}
```

NAME	STATUS	ROLES	AGE	VERSION
Gke-apigee-hybrid-default-pool-a7cb264c-rlwf	NotReady	<none>	8d	v1.13.2

If a node that runs a Cassandra pod fails, the pod status will stay in a pending state and the node will indicate a status of NotReady.

You can determine the status of the node by using the `kubectl get nodes` command.

Troubleshooting Cassandra

To fix underlying Cassandra node issues, perform these steps:

1. Using `nodetool`, remove the failed instance from the corresponding Cassandra pod:

```
$ kubectl exec -it {cassandra-pod} -- nodetool status  
$ kubectl exec -it {cassandra-pod} -- nodetool removenode deadnode_hostID
```
2. The Cassandra pod has node affinity, so to prevent it from starting back up on the failed node, delete the persistent volume claim:

```
$ kubectl delete pvc {volumeClaim_name} -n {namespace}
```

To fix a failed Cassandra node, use the `nodetool` command and provide the name of the cassandra pod to check the node status and remove the node.

Next, remove the pod's `PersistentVolumeClaim` to prevent the Cassandra pod from attempting to start up on the failed node because of node affinity.

To do this, run the `kubectl delete pvc` command and provide the name of the PVC.

Additional details and log entries for troubleshooting Cassandra issues are documented [here](#).

Troubleshooting Cassandra

3. Update the volume template with the newly added hostname value.

Apply the changes to create the [PersistentVolume](#) for the new node:

```
$ kubectl apply -f volume-template.yaml
```

```
apiVersion: v1
kind: PersistentVolume
metadata:
  name: cassandra-data-3
spec:
  capacity:
    storage: 100Gi
  accessModes:
    - ReadWriteOnce
  persistentVolumeReclaimPolicy: Retain
  storageClassName: local-storage
  local:
    path: /apigee/data
  nodeAffinity:
    "required":
      "nodeSelectorTerms":
        - "matchExpressions":
            - "key": "kubernetes.io/hostname"
              "operator": "In"
              "values":
                ["gke-apigee-hybrid-default-pool-a7cb264c-rfz2"]
```

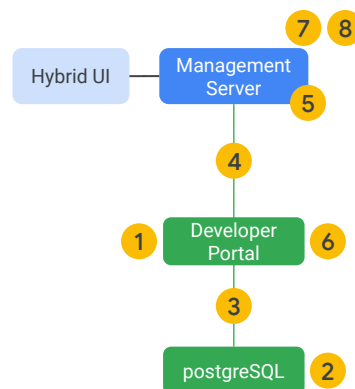
Update the volume template in your hybrid configuration file to use the new node hostname, and apply the configuration to your cluster by using the `kubectl apply` command and providing the name of the volume template configuration file.

Troubleshooting the developer portal

Apigee hybrid supports an Integrated Developer portal hosted in the management plane and a Drupal 9–based portal hosted by the customer.

Some of the common areas of focus for the [D9 developer portal](#):

1. Developer Portal unavailable
2. Developer Portal data store unavailable
3. Developer Portal unable to connect to the database
4. Developer Portal unable to connect to Management Server
5. Management Server unavailable (hybrid management plane)
6. Developer Portal username/password used to connect to the Management Server does not work
7. Apps, Developer, or related data not found
8. Changes or deprecation of APIs or API products



The Apigee Drupal 9 developer portal is installed and managed by you; therefore, you must maintain and troubleshoot any issues with the portal.

The Apigee Integrated developer portal is hosted and maintained by Google in the management plane on Google Cloud.

You need to monitor the Drupal 9 developer portal and troubleshoot any issues that may cause the service to become unavailable.

Any misconfiguration with the credentials that the portal uses to access its local database or connectivity issues to the database can cause the portal to become unavailable.

The developer portal also makes management API calls to the Apigee hybrid management server in the hybrid management plane. Make sure that there are no connectivity issues and that the portal is configured with the correct credentials to access the management plane.

Data synchronization issues between the portal and the management plane can cause Apigee entities to be unavailable. Verify that the synchronization jobs are correctly configured in the developer portal.

Diagnostic collector

- Captures diagnostic data.
- Stores diagnostic data in Google Cloud storage buckets.
- You invoke the Diagnostic collector with the **apigeectl diagnostic** command.
- Diagnostics collector captures these types of data:
 - Changing Log levels
 - Jstack
 - POD configuration yaml
 - PS -ef output
 - TCP dump
 - TOP output

The Diagnostic collector is a tool that captures diagnostic data on the Kubernetes components of an Apigee hybrid instance on demand, and stores them in Google Cloud storage buckets. You invoke the Diagnostic collector with the `apigeectl diagnostic` command.

Diagnostics collector captures these types of data:

- Changing Log levels.
- Jstack.
- POD configuration yaml.
- PS -ef output.
- TCP dump.
- TOP output.

When the Diagnostic collector captures the data, it is uploaded to a storage bucket in your Google Cloud project. You can view the stored data in the Google Cloud Console. You can optionally choose to share this data with Google Apigee Support when you create a support ticket, however, no user runtime data or sensitive information is captured in the data collected by the Diagnostic collector.

Prerequisites for running Diagnostic collector

Before using the Diagnostic collector, you must complete the following prerequisites:

- Create a Google Cloud Storage bucket
- Create a service account with the Storage Admin role (**roles/storage.admin**)

There are a few prerequisites that you must complete before running Diagnostic collector. You must create a Google Cloud Storage bucket with a unique name in your Google Cloud project. You can create and manage buckets with gsutil commands or using the Google Cloud Console. You must also create a service account with the Storage Admin role (**roles/storage.admin**) in your project, and download the service account .json key file. The service account can have any unique name.

Using Diagnostic collector

The sequence to use the Diagnostic collector is:

1. Configure the Diagnostic stanza in your `overrides.yaml`.

In order to use Diagnostic collector, you must first configure the Diagnostic stanza in your `overrides.yaml` file to select the type of information, the Apigee container, and the individual pods you want diagnostic data from.

For more information on configuring the `overrides.yaml`, see [Configuring overrides.yaml for Diagnostic collector](#).

Using Diagnostic collector

The sequence to use the Diagnostic collector is:

1. Configure the Diagnostic stanza in your `overrides.yaml`.
2. Run Diagnostic collector with the following `apigeectl` command:

```
$ apigeectl diagnostic -f overrides.yaml
```

Next, run Diagnostic collector.

Using Diagnostic collector

The sequence to use the Diagnostic collector is:

1. Configure the Diagnostic stanza in your `overrides.yaml`.
2. Run Diagnostic collector with the following `apigeectl` command:

```
$ apigeectl diagnostic -f overrides.yaml
```
3. Check the logs:
 - a. Get the pods in the `apigee-diagnostic` namespace:

```
$ kubectl get pods -n apigee-diagnostic
```
 - b. Make note of the pod with the name containing `diagnostic-collector`.
 - c. Check the logs:

```
$ kubectl -n apigee-diagnostic logs -f POD_NAME
```

Once you have run Diagnostic collector, get the pods in the `apigee-diagnostic` namespace. Make a note of the name of the Diagnostic collector pod name, then, check the logs, replacing `POD_NAME` with the name of the Diagnostic collector pod.

Using Diagnostic collector

The sequence to use the Diagnostic collector is:

1. Configure the Diagnostic stanza in your `overrides.yaml`.
2. Run Diagnostic collector with the following `apigeectl` command:

```
$ apigeectl diagnostic -f overrides.yaml
```
3. Check the logs:
 - a. Get the pods in the `apigee-diagnostic` namespace:

```
$ kubectl get pods -n apigee-diagnostic
```
 - b. Make note of the pod with the name containing `diagnostic-collector`.
 - c. Check the logs:

```
$ kubectl -n apigee-diagnostic logs -f POD_NAME
```
4. After you have collected the data, delete the Diagnostic collector:

```
$ apigeectl diagnostic delete -f overrides.yaml
```

Finally, after you have collected the data, delete the Diagnostic collector. You cannot run it again until you have deleted it.

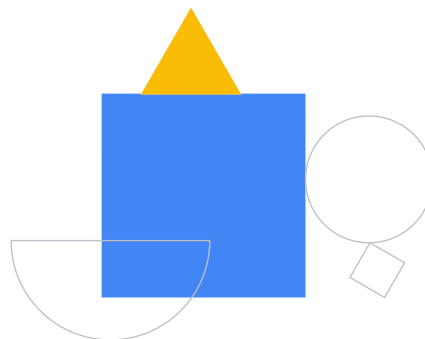
Agenda

01	Logging
02	Metrics
03	Analytics
04	Monitoring and Troubleshooting
05	Demo: Monitoring Apigee Hybrid



Demo

Monitoring Apigee Hybrid



Google Cloud

https://storage.googleapis.com/cloud-training/T-APIHYB-B/v2.0/demo_scripts/Module%208%20Demo%20script%20-%20Monitoring%20Apigee%20hybrid.pdf

It is a best practice to monitor the health of your Kubernetes cluster, its resources, and the Apigee hybrid runtime services it runs.

This demo provides the basics of logging and monitoring of your Google Kubernetes Engine cluster (GKE) using tools available in Google Cloud.

Agenda

06	Apigee Support
07	Quiz



In this lecture we discuss the role of Apigee support and how you can request and receive support on Apigee hybrid.

Global support and Cloud operations presence

- 7 Global Service Centers
 - **US:** Sunnyvale, Denver, Chicago
 - **EU:** London
 - **APAC:** Bangalore, Sydney, Tokyo
- 24/7 Follow-the-sun model

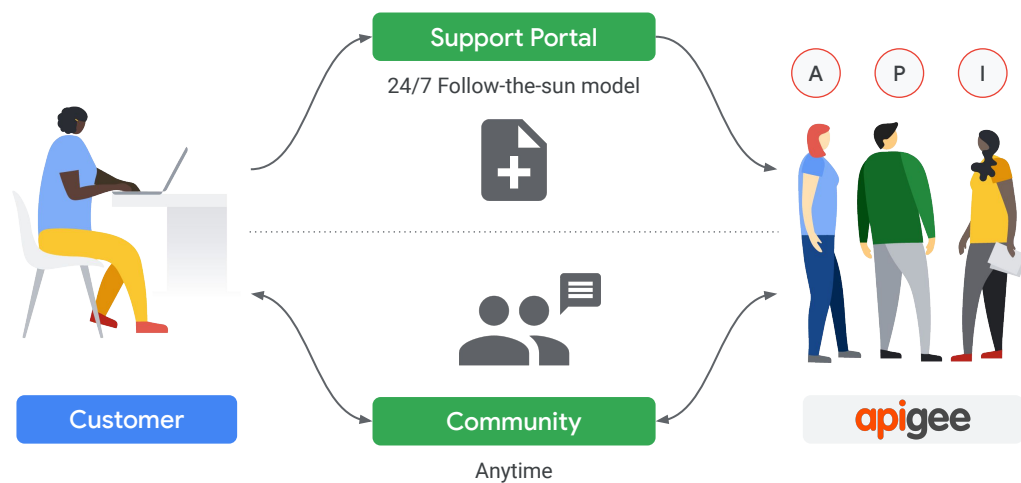


Google Cloud

Google Cloud has multiple service centers that provide continuous support for Apigee products.

You can receive support from any of these teams based on your location and time zone.

Support channels

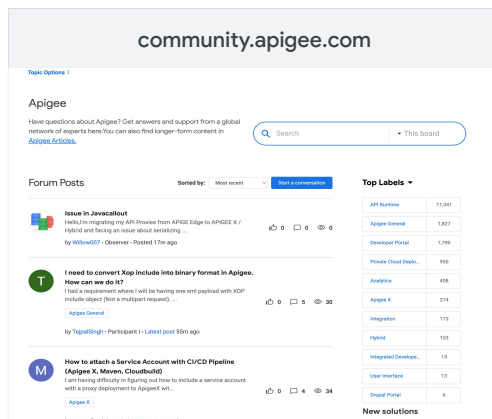
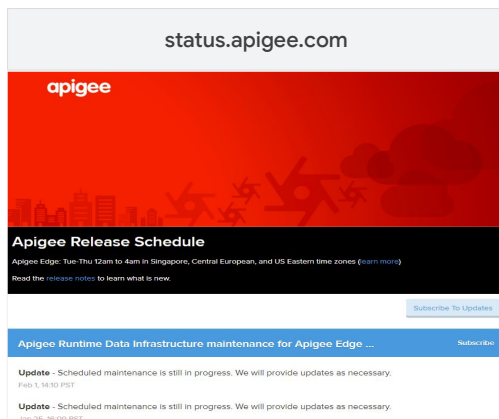


You can initiate support requests in the Apigee support portal by filing a support ticket.

In the widely used Apigee community portal, you can get answers to your technical questions on Apigee products and services.

Links to access these resources are provided in upcoming slides in this lecture.

Openness and transparency



The Apigee status portal provides continuous updates on product releases, scheduled maintenance, and any service outages.

You can subscribe to receive email notifications from the status portal whenever Apigee creates, updates, or resolves an incident.

The Apigee community portal is an excellent resource for answers to technical questions on Apigee products and services.

You can also ask questions and receive answers from Apigee solution architects and other members of the community.

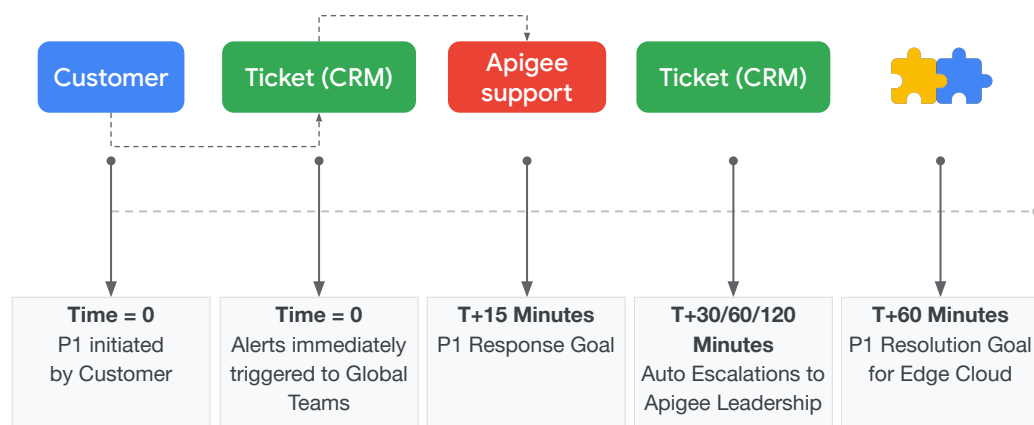
Speed of execution



When handling a support request, Apigee support personnel provide timely responses based on the priority of the request and your support plan.

They engage with Apigee product engineering and operations teams as needed to help resolve your issue.

Mission-critical support



Here is a sample timeline for a P1 priority support request with an enterprise support plan.

The initial response goal when a support ticket is created is 15 minutes, with a resolution goal of 60 minutes.

The enterprise and mission-critical support plans also include escalation of the support request to Apigee leadership.

When raising a ticket...

Do's

- Do let us know what the business impact is (priority).
- Do reference the existing ticket number to speed things up.
- Do give us your email and phone number (in case it's easier to call).
- Do include in the ticket: organization/environment/proxies/regions/relevant traces/timeframe /cURL request/response

Don'ts

- Don't include multiple issues in a ticket.
- Don't give us just a single line.
- Don't be shy about contacting us; we are here to support you!

Here are some best practices to follow when creating a support request.

You should always include the business impact of the issue, because it helps determine the priority of the request.

Reference any existing request ticket numbers and provide your contact information in the request.

Include all relevant technical information that will help the support team triage the issue.

Try not to combine multiple issues in the same request. Create separate support requests and provide relevant information as needed.

Apigee support services

Service	Apigee Enterprise Support
Scope of Support	Apigee product-specific break/fix questions
Product and Documentation Updates	Included
Severity 1 Issues Standard Hours of Operation	24/7 Follow-the-sun model
Severity 2 issues Standard Hours of Operation	Monday through Friday, 8 am to 5 pm (in customer's local time zone)
Method of Contact Support	Portal/Web
Root Cause Analysis for Severity 1 Incidents	Included*

- Apigee support spec-sheet: [Apigee Edge Cloud Support Services](#)
- Apigee support portal: [Support | Apigee](#)
- Apigee release notes: [Apigee hybrid release notes](#)
- Apigee release process: [Apigee hybrid release process](#)
- Supported software: [Apigee hybrid supported platforms](#)

* Not guaranteed for single-customer events and impact to non-Enterprise+ customers

Apigee support has well-defined plans that include support services and performance goals.

This includes the scope of support provided, initial response and resolution goals, service request delivery, support channels, and methods of contact.

The links provided have full details on the scope of Apigee support services.

Apigee hybrid entitlements

- Apigee hybrid depends on the Kubernetes platform version as listed in the [documentation](#).

Pricing plan	Hybrid	Max Orgs	Max Environments per Org	Anthos vCPUs
Standard	Not included	N/A	N/A	N/A
Enterprise	Included	25	85	300
Enterprise Plus	Included	25	85	800

- For the full list of Apigee entitlements by pricing plan, see [Apigee API Management pricing](#).
- In addition, refer to the [Apigee hybrid product limits](#).

Based on your pricing plan, Apigee currently includes hybrid entitlements.

Note that these entitlements can change with future product releases.

Apigee hybrid is only included in the Enterprise and Enterprise Plus pricing plans.

In addition, hybrid product limits are documented on the Apigee website.

These are technical limits on various hybrid entities and resources that are either currently enforced or planned to be enforced on the hybrid platform.

<https://cloud.google.com/apigee/docs/hybrid/v1.10/upgrade.html>

<https://cloud.google.com/apigee/pricing>

<https://cloud.google.com/apigee/docs/api-platform/reference/limits#hybrid>

Links

Apigee Homepage

cloud.google.com/apigee

Documentation

<https://cloud.google.com/apigee/docs>

Resources

cloud.google.com/apigee/resources

Community

community.apigee.com

cloud.google.com/community

Training

cloud.google.com/training

Events

cloud.google.com/events

Apigee API Platform Learning Guide

apigee.page.link/learning-guide

Many resources are available to you as you work with Apigee services.

Follow these links to learn more about Apigee products and services, read documentation, access training materials, and learn about upcoming Google Cloud events.

Agenda

06 | Apigee Support

07 | Quiz



Question #1

Question

Which analytics features are supported in Apigee hybrid? Select three.

- A. Track operational performance of API proxies.
- B. Measure adoption of the API program by application developers.
- C. Customize existing analytics dashboards in the hybrid UI.
- D. Create custom reports.

Question #1

Answer

Which analytics features are supported in Apigee hybrid? Select three.

- A. Track operational performance of API proxies.
- B. Measure adoption of the API program by application developers.
- C. Customize existing analytics dashboards in the hybrid UI.
- D. Create custom reports.



Explanation:

- A. Correct! The hybrid analytics dashboards in the hybrid UI and APIs enable operational oversight of the API proxies by tracking various metrics like traffic count and API latency.
- B. Correct! The hybrid UI and API enable business stakeholders to measure the overall success of the API program, including API adoption.
- C. Incorrect. The out-of-the-box existing dashboards cannot be customized in the hybrid UI.
- D. Correct! Apigee hybrid analytics supports custom reports.

Question #2

Question

To properly monitor the health of the Apigee hybrid runtime plane, which metrics should be monitored?

- A. Kubernetes cluster and node metrics
- B. Pod and container metrics
- C. Hybrid application workload metrics
- D. Metrics for the Kubernetes cluster, node, pod, container and application workloads

Question #2

Answer

To properly monitor the health of the Apigee hybrid runtime plane, which metrics should be monitored?

- A. Kubernetes cluster and node metrics
- B. Pod and container metrics
- C. Hybrid application workload metrics
- D. Metrics for the Kubernetes cluster, node, pod, container and application workloads



Explanation:

- A. Incorrect, although cluster and node metrics should be monitored for resource usage and capacity.
- B. Incorrect, although pod and container metrics should be monitored for actual and desired counts, latency, volume usage, and resource usage.
- C. Incorrect, although application workload metrics should be monitored for API traffic counts, request/response latencies, Cassandra tasks, memory usage, etc.
- D. Correct! All of these metrics should be monitored to gauge the health of the hybrid runtime plane.

Question #3

Question

Which is a valid critical path of components to troubleshoot when there are issues in the runtime execution of an API proxy?

- A. Synchronizer, Message Processor, UDCA
- B. Ingress gateway, Message Processor, Cassandra
- C. Message Processor, fluentd, UDCA
- D. Apigee Connect, MART, Cassandra

Question #3

Answer

Which is a valid critical path of components to troubleshoot when there are issues in the runtime execution of an API proxy?

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- B. Ingress gateway, Message Processor, Cassandra
- C. Message Processor, fluentd, UDCA
- D. Apigee Connect, MART, Cassandra



Explanation:

- A. Incorrect. Troubleshoot these components for API proxy deployment issues.
- B. Correct! These components form the critical path for API proxy runtime execution. For passthru or simple proxies Cassandra might not be in the path.
- C. Incorrect. Troubleshoot these components for analytics or trace data issues.
- D. Incorrect. Troubleshoot these components for API and application-related data configuration issues.

Review: Logging and Monitoring



In this module, you learned how Apigee hybrid logs system informational and error messages and how you can use analytics and metrics to monitor and troubleshoot Apigee hybrid.

You also viewed a demo on monitoring Apigee Hybrid.

Finally, you learned about the Apigee hybrid support model and how you can request support for issues related to Apigee hybrid.