Google Cloud Platform

Google Cloud Status Dashboard

This page provides status information on the services that are part of Google Cloud Platform. Check back here to view the current status of the services listed below. If you are experiencing an issue not listed here, please contact Support. Learn more about what's posted on the dashboard in this FAQ. For additional information on these services, please visit cloud.google.com.

Google BigQuery Incident #18022

BigQuery Streaming API failing

Incident began at **2016-11-08 16:00** and ended at **2016-11-08 20:00** (all times are **US/Pacific**).

DATE	TIME	DESCRIPTION
✅ Nov 11, 2016	13:14	Small correction to the incident report. The resolution time of the incident was 20:00 US/Pacific, not 20:11 US/Pacific. Similarly, total downtime was 4 hours.
✅ Nov 11, 2016	12:14	SUMMARY:

On Tuesday 8 November 2016, Google BigQuery's streaming service, which includes streaming inserts and queries against recently committed streaming buffers, was largely unavailable for a period of 4 hours and 11 minutes. To our BigQuery customers whose business analytics were impacted during this outage, we sincerely apologize. We will be providing an SLA credit for the affected timeframe. We have conducted an internal investigation and are taking steps to improve our service.

DETAILED DESCRIPTION OF IMPACT:

On Tuesday 8 November 2016 from 16:00 to 20:11 US/Pacific, 73% of BigQuery streaming inserts failed with a 503 error code indicating an internal error had occurred during the insertion. At peak, 93% of BigQuery streaming inserts failed. During the incident, queries performed on tables with recently-streamed data returned a result code (400) indicating that the table was unavailable for querying. Queries against tables in which data were not streamed within the 24 hours preceding the incident were unaffected. There were no issues with non-streaming ingestion of data.

ROOT CAUSE:

The BigQuery streaming service requires authorization checks to verify that it is streaming data from an authorized entity to a table that entity has permissions to access. The authorization service relies on a caching layer in order to reduce the number of calls to the authorization backend. At 16:00 US/Pacific, a combination of reduced backend authorization capacity coupled with routine cache entry refreshes caused a surge in requests to the authorization backends, exceeding their current capacity. Because BigQuery does not cache failed authorization attempts, this overload meant that new streaming requests would require re-authorization, thereby further increasing load on the authorization backend. This continual increase of authorization requests on an already overloaded authorization backend resulted in continued and sustained authorization failures which propagated into streaming request and query failures.

REMEDIATION AND PREVENTION:

Google engineers were alerted to issues with the streaming service at 16:21 US/Pacific. Their initial hypothesis was that the caching layer for authorization requests was failing. The engineers started redirecting requests to bypass the caching layer at 16:51. After testing the system without the caching layer, the engineers determined that the caching layer was working as designed, and requests were directed to the caching layer again at 18:12. At 18:13, the engineering team was able to pinpoint the failures to a set of overloaded authorization backends and begin remediation.

The issue with authorization capacity was ultimately resolved by incrementally reducing load on the authorization system internally and increasing the cache TTL, allowing streaming authorization requests to succeed and populate the cache so that internal services could be restarted. Recovery of streaming errors began at 19:34 US/Pacific and the streaming service was fully restored at 20:11.

To prevent short-term recurrence of the issue, the engineering team has greatly increased the request capacity of the authorization backend.

In the longer term, the BigQuery engineering team will work on several mitigation strategies to address the currently cascading effect of failed authorization requests. These strategies include caching intermediary responses to the authorization flow for the streaming service, caching failure states for authorization requests and adding rate limiting to the authorization service so that large increases in cache miss rate will not overwhelm the authorization backend.

In addition, the BigQuery engineering team will be improving the monitoring of available capacity on the authorization backend and will add additional alerting so capacity issues can be mitigated before they become cascading failures. The BigQuery engineering team will also be investigating ways to reduce the spike in authorization traffic that occurs daily at 16:00 US/Pacific when the cache is rebuilt to more evenly distribute requests to the authorization backend.

Finally, we have received feedback that our communications during the outage left a lot to be desired. We agree with this feedback. While our engineering teams launched an all-hands-on-deck to resolve this issue within minutes of its detection, we did not adequately communicate both the level-of-effort and the steady progress of diagnosis, triage and restoration happening during the incident. We clearly erred in not communicating promptly, crisply and transparently to affected customers during this incident. We will be addressing our communications — for all Google Cloud systems, not just BigQuery — as part of a separate effort, which has already been launched.

We recognize the extended duration of this outage, and we sincerely apologize to our BigQuery customers for the impact to your business analytics.

DATE	TIME	DESCRIPTION
✅ Nov 08, 2016	20:21	The issue with the BigQuery Streaming API should have been resolved for all affected tables as of 20:07 US/Pacific. We will conduct an internal investigation of this issue and make appropriate improvements to our systems to prevent or minimize future recurrence. We will provide a more detailed analysis of this incident once we have completed our internal investigation.
✅ Nov 08, 2016	20:00	We're continuing to work to restore the service to the BigQuery Streaming API. We will add an update at 20:30 US/Pacific with further information.
❌ Nov 08, 2016	19:44	We are continuing to investigate the issue with BigQuery Streaming API. We will add an update at 20:00 US/Pacific with further information.
❌ Nov 08, 2016	19:00	We have taken steps to mitigate the issue, which has led to some improvements. The issue continues to impact the BigQuery Streaming API and tables with a streaming buffer. We will provide a further status update at 19:30 US/Pacific with current details
❌ Nov 08, 2016	18:30	We are continuing to investigate the issue with BigQuery Streaming API. The issue may also impact tables with a streaming buffer, making them inaccessible. This will be clarified in the next update at 19:00 US/Pacific with current details.
❌ Nov 08, 2016	18:00	We are still investigating the issue with BigQuery Streaming API. There are no other details to share at this time but we are actively working to resolve this. We will provide another status update by 18:30 US/Pacific with current details.
❌ Nov 08, 2016	17:30	We are still investigating the issue with the BigQuery Streaming API. Current data indicates that all projects are affected by this issue. We will provide another status update by 18:00 US/Pacific with current details.
❌ Nov 08, 2016	17:28	We are investigating an issue with the BigQuery Streaming API. We will provide more information by 17:30 US/Pacific.