Google Apps Incident Report

Access to Google Services - April 17, 2013

Prepared for Google Apps customers

The following is the incident report for the Google services access disruption that occurred on April 17, 2013. We understand this service issue has impacted our valued customers and users, and we apologize to everyone who was affected.

Issue Summary

From 5:00 a.m. to 8:00 a.m. PT, some users received errors when trying to access Gmail, Drive, Talk, Google Sync, the Admin panel, and the Cloud Console, and to a lesser extent Groups, Sites, and Contacts. At the peak of the outage, this issue affected 50% of the Admin panel and 60% of Google Sync login requests. The percentages of affected users for other services were lower such as 0.18% users for Gmail. The root cause was an issue in the system that manages login requests for Google services.

Actions and Root Cause Analysis

Background: When users log in to Google services with their user name and password, these logins are managed by the user authentication system. The authentication system then grants users access to services such as Gmail and Drive.

On April 16, a misconfiguration of this user authentication system caused a fraction of the login requests to be unintentionally concentrated on a relatively small number of servers. At the time the misconfiguration occurred, monitoring systems detected a load increase and alerted Google Engineering at 1:08 a.m. PT on April 17. However, the alert cleared and the authentication system operated normally under the current load conditions.

At 5:00 a.m. as login traffic increased, the misconfigured servers were unable to process the load. This began to cause errors for some users logging in to Google services. The request load, exacerbated by retry requests from users and automated systems such as IMAP clients, initially appeared as the cause of the login errors. At 5:48 a.m., the Engineering team determined that the root cause was not excess traffic but insufficient capacity. By 6:22 a.m., they provisioned many more servers to process login requests, and this resolved the errors in the authentication system. By 6:30 a.m. most affected users regained login access to their services and the number of errors continued to drop. Login access returned to normal for the remaining affected users by 8:00 a.m.

Corrective and Preventative Measures

The Google Engineering team conducted an internal review and analysis of the April 17 event. They are taking the following actions to address the underlying causes of the issue and to help prevent recurrence:

- Correct the misconfiguration in the authentication system which caused the load concentration. This has been completed.

- Improve alerts which detect increased load concentration caused by any misconfiguration of the authentication system.
- Add monitoring that assesses system configuration, compares expected peak load vs. capacity, and ensures that the authentication system always has adequate capacity.
- Improve the internal oncall engineering documentation for responses to load-related alerts.
- Modify the retry behavior of large-scale services, such as Gmail, so that they do not amplify load-related outages.

Google is committed to continually and quickly improving our technology and operational processes to prevent service disruptions. We appreciate your patience and again apologize for the impact to your organization. We thank you for your business and continued support.

Sincerely,

The Google Apps Team