



Service Organization Controls (SOC) 3 Report

**Report on the Google Apps for Work, Google Drive for Work,
Google Apps for Education, Google Cloud Platform, and
Other Google Services System**

**Relevant to Security, Availability, Processing Integrity, and
Confidentiality**

For the Period 1 May 2015 to 30 April 2016



**Assertion of Management Regarding the Effectiveness of Its Controls
Over the Google Apps for Work, Google Drive for Work, Google Apps for Education,
Google Cloud Platform, and Other Google Services System
Based on the Trust Services Principles and Criteria for Security, Availability, Processing
Integrity, and Confidentiality**

Google Inc. (the Company) maintained effective controls over the security, availability, processing integrity, and confidentiality of its Google Apps for Work, Google Drive for Work, Google Apps for Education, Google Cloud Platform, and Other Google Services System to provide reasonable assurance that:

- the Google Apps for Work, Google Drive for Work, Google Apps for Education, Google Cloud Platform, and Other Google Services System was protected against unauthorized access, use, or modification to meet the entity's commitments and system requirements
- the Google Apps for Work, Google Drive for Work, Google Apps for Education, Google Cloud Platform, and Other Google Services System was available for operation and use to meet the entity's commitments and system requirements
- the Google Apps for Work, Google Drive for Work, Google Apps for Education, Google Cloud Platform, and Other Google Services System processing was complete, valid, accurate, timely, and authorized to meet the entity's commitments and system requirements
- the Google Apps for Work, Google Drive for Work, Google Apps for Education, Google Cloud Platform, and Other Google Services System information designated as confidential was protected to meet the entity's commitments and system requirements

during the period 1 May 2015 through 30 April 2016 based on the security, availability, processing integrity, and confidentiality principles set forth in the American Institute of Certified Public Accountants' (AICPA) TSP section 100, *Trust Services Principles, Criteria, and Illustrations for Security, Availability, Processing Integrity, Confidentiality, and Privacy*.

The included System Description of the Google Apps for Work, Google Drive for Work, Google Apps for Education, Google Cloud Platform, and Other Google Services System identifies the aspects of the System covered by our assertion.

GOOGLE Inc.

29 July 2016



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Report of Independent Accountants

To the Management of Google Inc.:

We have examined management's assertion that Google Inc. (referred to hereafter as "Google") during the period 1 May 2015 through 30 April 2016, maintained effective controls to provide reasonable assurance that:

- the Google Apps for Work, Google Drive for Work, Google Apps for Education, Google Cloud Platform, and Other Google Services System was protected against unauthorized access, use, or modification to meet the entity's commitments and system requirements
- the Google Apps for Work, Google Drive for Work, Google Apps for Education, Google Cloud Platform, and Other Google Services System was available for operation and use to meet the entity's commitments and system requirements
- the Google Apps for Work, Google Drive for Work, Google Apps for Education, Google Cloud Platform, and Other Google Services System processing was complete, valid, accurate, timely, and authorized to meet the entity's commitments and system requirements
- information within the Google Apps for Work, Google Drive for Work, Google Apps for Education, Google Cloud Platform, and Other Google Services System designated as confidential was protected to meet the entity's commitments and system requirements

based on the criteria for security, availability, processing integrity and confidentiality in the American Institute of Certified Public Accountants' (AICPA) TSP Section 100, *Trust Services Principles and Criteria, for Security, Availability, Processing Integrity, Confidentiality, and Privacy*. This assertion is the responsibility of Google Inc.'s management. Our responsibility is to express an opinion based on our examination.

Our examination was conducted in accordance with attestation standards established by the AICPA and, accordingly, included (1) obtaining an understanding of Google Inc.'s relevant security, availability, processing integrity and confidentiality controls, (2) testing and evaluating the operating effectiveness of the controls and (3) performing such other procedures as we considered necessary in the circumstances. We believe that our examination provides a reasonable basis for our opinion.

Because of inherent limitations in controls, error or fraud may occur and not be detected. Furthermore, the projection of any conclusions, based on our findings, to future periods is subject to the risk that the validity of such conclusions may be altered because of changes made to the system or controls, the failure to make needed changes to the system or controls or deterioration in the degree of effectiveness of the controls.



In our opinion, management's assertion referred to above is fairly stated, in all material respects, based on the aforementioned criteria for security, availability, processing integrity, and confidentiality.

Ernst & Young LLP

29 July 2016



System Description of the Google Apps for Work, Google Drive for Work, Google Apps for Education, Google Cloud Platform, and Other Google Services System

Google Overview

Google Inc. (“Google”) is a global technology service provider focused on improving the ways people connect with information. Google’s innovations in web search and advertising have made Google’s web site one of the most viewed Internet destinations and its brand among the most recognized in the world. Google maintains one of the world’s largest online index of web sites and other content, and makes this information freely available to anyone with an Internet connection. Google’s automated search technology helps people obtain nearly instant access to relevant information from their vast online index.

Google offers Internet-based services and tools that user entities can access to communicate, collaborate, and work more efficiently. The following Google product offerings automatically saves all work performed by user entities (also referred to as customers) in the cloud and enable user entities to work securely, regardless of where they are in the world and what device they are using.

The protection of user-provided or user-entered data in Google’s product offerings is in scope for this report. This includes the production processing locations used by these services and the related information systems and processes.

The boundary of the information system is defined by the products listed below, the infrastructure and services that support those product offerings, and the related production data center facilities that host those product offerings.

Google Apps for Work, Google Drive for Work (Google Apps Unlimited and Team Managed) and Google Apps for Education, hereafter described collectively as “Google Apps,” include:

	Google Apps for Work	Google Drive for Work (Google Apps Unlimited*)	Google Drive for Work (Team Managed)	Google Apps for Education
Gmail	✓	✓		✓
Google Calendar	✓	✓		✓
Google Classroom				✓
Google Contacts	✓	✓		✓
Google Docs	✓	✓	✓	✓



	Google Apps for Work	Google Drive for Work (Google Apps Unlimited*)	Google Drive for Work (Team Managed)	Google Apps for Education
Google Drive	✓	✓	✓	✓
Google Forms	✓	✓	✓	✓
Google Groups	✓	✓		✓
Google Hangouts	✓	✓	✓	✓
Google Sheets	✓	✓	✓	✓
Google Sites	✓	✓		✓
Google Slides	✓	✓	✓	✓
Google Talk	✓	✓		✓
Google Tasks	✓	✓		✓
Google Vault	✓	✓		✓
Google Admin Console	✓	✓		✓
Google Apps Script	✓	✓		✓
Admin Software Development Kit (“SDK”) Application Programming Interfaces (“APIs”)	✓	✓		✓
Product APIs	✓	✓		✓
Inbox by Gmail	✓	✓		✓
Google Keep	✓	✓	✓	✓

* Google Apps Unlimited is the premium version of Google Apps for Work. In addition to everything available in Google Apps for Work, it includes unlimited storage space and Google Apps Vault for everyone in user’s organization. It also offers additional Drive administration, auditing, and reporting features.



Google Cloud Platform allows businesses and developers to build and run their applications on Google's Cloud using the following services, hereafter described collectively as "Google Cloud Platform":

- Google App Engine
- Google BigQuery
- Google Cloud Datastore
- Google Cloud SQL
- Google Cloud Storage
- Google Compute Engine
- Google Genomics
- Google Cloud Dataflow
- Google Cloud Bigtable
- Google Container Engine
- Google Cloud Dataproc
- Google Container Registry

Google social and communication services, hereafter described collectively as "Other Google Services", include:

- Google Now
- Google+
- Google Chrome Sync
- Google Springboard

Google's product offerings including Google Apps, Google Cloud Platform, and Other Google Services provide the unique advantage of leveraging the resources of Google's core engineering team while also having a dedicated team to develop solutions for the corporate market. As a result, these Google offerings are positioned to innovate at a rapid rate and provide the same level of service that users are familiar with on google.com.

Google Apps, Google Cloud Platform, and Other Google Services are targeted to small and medium businesses and large corporations alike. These products provide what business organizations typically require, including the following:

- Multi-user collaboration
- Security and compliance features
- Seamless upgrades

The products are comprised of communication, productivity, collaboration, and security tools that can be accessed virtually from any location with Internet connectivity. This means every employee and each user entity they work with can be productive from anywhere, using any device with an Internet connection.

The Google Apps, Google Cloud Platform, and Other Google Services covered in this system description consist of the following services:

Gmail

Gmail is a cloud-based email service providing web browser and mobile interfaces. Gmail provides customizable email addresses which include the user entity's own domain, mail search



tools, and integrated chat. Users can compose and manage email, and filter for spam and viruses. It is fully integrated with other Google services such as Calendar, Groups, Google+, and Drive.

Google Calendar

Google Calendar is a cloud-based calendaring service providing web browser and mobile interfaces. Calendar is an application that enables individuals and corporations to coordinate and schedule people, meeting rooms, and other resources. Users can create events, send invitations, share schedules, and track RSVPs. It is fully integrated with other Google services such as Gmail, Drive, Google+, and Hangout.

Google Classroom

Google Classroom is a cloud-based school communication and assignment management tool. It allows users to create and join classroom groups as teachers and students, distribute and grade assignment as a teacher, or view and submit assignments as a student. Classroom is only available to Apps for Education users.

Google Contacts

Google Contacts is a cloud-based contacts service providing web browser and mobile interfaces. It allows users to import, store, and organize contact information about people and businesses with whom they communicate. Not only can each contact contains basic information such as names, email addresses, and phone numbers, but can also include extended information like physical address, employer, department, or job title. Users can also create personal groups of contacts to email many people at once. It is fully integrated with other Google services such as Gmail, Drive, Google+, and Groups.

Google Docs

Google Docs is an online word processor that lets users create and format text documents and collaborate with other users in real time. Documents can be private or shared, and multiple people can edit the same document at the same time. Comments can also be left in the document, and documents can be exported to other file formats.

Google Drive

Google Drive is a cloud-based storage solution, where users can create, share, collaborate and keep their files. It provides the sharing controls for files and folders, including Google Docs, Sheets, and Slides, as well as any other file type. Drive comes with desktop and mobile apps, making it much easier to upload, synchronize and access files from any device. It is fully integrated with other Google services such as Groups, Hangouts, and Gmail.



Google Forms

Google Forms is an online data collection tool that lets users collaboratively build and distribute surveys, polls, and quizzes. Google Forms provides real-time analysis of structured form response data through integration with Google Sheets.

Google Groups

Google Groups is a cloud-based rostering service providing web browser and mobile interfaces. It allows online creation and management of user groups. Groups users can engage in discussions about a specific subject, organize meetings, conferences or social events among members of a group, find people with similar hobbies, interests or background, share file and calendar events, read groups posts through email, the online interface or both, and more. It is fully integrated with other Google services such as Gmail, Drive, and Calendar.

Google Hangouts

Google Hangouts is a real-time communication and messaging application that allows users to send and receive messages, photos and videos, and make one-to-one and group video calls of up to 15 users at a time. It is available on mobile and desktop devices and is fully integrated with Google products such as Gmail, Drive, Google+, and Calendar.

Google Sheets

Google Sheets is an online spreadsheet application that lets users create and format spreadsheets and simultaneously work with other users. Spreadsheets can be private or shared, and multiple people can edit the same spreadsheet at the same time. Comments can also be left in the spreadsheet, and spreadsheets can be exported to other file formats.

Google Sites

Google Sites is a cloud-based publishing service providing web browser and mobile browser interfaces. It allows the creation of site pages to share and collaborate on documents, videos, schedules, and more. It can be published as an internal or an external facing web site. It is fully integrated with other Google services such as Drive and Groups.

Google Slides

Google Slides is an online presentation application that allows users to show off their work in a visual way and present to audiences. Presentations can be private or shared, and multiple people can edit the same presentation at the same time. Comments can also be left in the presentation, and presentations can be exported to other file formats.

Google Talk

Google Talk is an application that enables text, video and voice communications. Users can initiate a chat, invite friends to a chat and place phone calls to any landline or mobile phone number included in Gmail contacts.



Google Tasks

Google Tasks is an online application that allows users to create task lists and tasks. It is integrated with Gmail and the Google Calendar applications.

Google Vault

Google Vault is corporate solution that provides additional storage and searching tools to manage critical information and preserving important corporate data. Vault helps protect user entities with easy-to-use searches so they can quickly find and preserve data to respond to unexpected customer claims, lawsuits, or investigations during the electronic discovery (eDiscovery) process. Additionally, Vault gives Google Apps user entities the extended management and information governance capabilities to proactively archive, retain, and preserve Gmail and on-the-record chats. With the ability to search and manage data based on terms, dates, senders, recipients, and labels, Vault helps user entities find the information they need, when they need it.

Google Admin Console

Google Admin Console, formerly Google Apps Control Panel, is a cloud-based user and device administrative service used to configure the different applications, perform user management, utilize admin tools, etc. Users can initiate transactions, such as creating user accounts to give users access to various Google Apps services and managing Google services settings.

Google Apps Script

Google Apps Script is a JavaScript cloud scripting language that provides easy ways to automate tasks across Google products and third party services. Users can define the set of transactions their scripts can initiate and process.

Inbox by Gmail

Inbox by Gmail is the Gmail next generation inbox designed to help people keep track of everything they need to get back to at a later time. Inbox by Gmail is available on Android, iOS, and web.

Google Keep

Google Keep is a cross-platform product for taking notes to capture ideas, auto-organize them, and suggest actions to get things done. Keep can help record to do items, make lists, record audio notes, or take photos. Reminders can be added to remind the user of a note at a certain time or place. Google Keep synchronizes across all devices so it's accessible wherever the user is.



Admin SDK

The Administrative Tools for Google Apps within the Admin SDK are used to manage users, groups, devices and apps, create custom usage reports, and migrate email and groups to Google Apps.

- [Admin Settings API](#)
The Admin Settings API allows administrators of Google Apps domains to retrieve and change the settings of their domains in the form of Google Data API feeds. These domain settings include many of the features available in the Google Apps Admin Console.
- [Directory API](#)
Google Apps and reseller administrators can use the Directory API to manage Mobile and Chrome OS devices, groups, group aliases, members, organizational units, users, and user aliases.
- [Domain Shared Contacts API](#)
The Domain Shared Contacts API allows client applications to retrieve and update external contacts that are shared to all users in a Google Apps domain.
- [Apps Email Audit API](#)
The Email Audit API allows Google Apps administrators to audit a user's email, email drafts, and archived chats.
- [Calendar Resource API](#)
The Calendar Resource API allows Google Apps administrators to retrieve and manage the Google Calendar resources of their domains in the form of Google Data API feeds.
- [Email Settings API](#)
The Email Settings API allows website administrators to offer their users co-branded versions of a variety of personalized Google applications, such as Google mail.
- [Groups Migration API](#)
The Groups Migration API lets account-level administrators migrate emails from public folders and distribution lists to Google Groups discussion archives.
- [Groups Settings API](#)
The Groups Settings API allows account-level administrators to manage the group settings for their Google Apps account.



- Enterprise License Manager API

The Enterprise License Manager API allows administrators to assign, update, retrieve, and delete user licenses.

- Reports API

The Reports API lets the account administrators to customize usage reports

- Reseller API

The Reseller API can be used by authorized reseller administrators and resellers' service integrators to place customer orders and manage Google Apps monthly post-pay subscriptions.

- SAML-based SSO API

SAML-based Single Sign-On ("SSO") service provides partner companies with full control over the authorization and authentication of hosted user accounts that can access web-based applications like Gmail or Google Calendar.

Product APIs

- GMail Representational State Transfer ("REST") API

The Gmail REST API is a RESTful API that can be used to access Gmail mailboxes and send mail. For most web applications (including mobile apps), the Gmail API is the best choice for authorized access to a user's Gmail data for Google Apps users.

- Drive REST API

The Drive REST API is a RESTful API that can be used to Create, Open, Search, and Share contents in Google Drive for Google Apps users.

- Calendar API

The Calendar API is a RESTful API that allows client applications to access and edit Google Calendar data for Google Apps users.

- Contacts API

The Contacts API can be used to create new contacts, edit, or delete existing contacts, and query for contacts that match particular criteria for Google Apps users.

- Tasks API

The Tasks API provides access for searching, reading, and updating Google Tasks content and metadata for Google Apps users.'

- Sites API

The Sites API allows client applications to access, publish, and modify content within a Google Site, create and delete sites. The API is available to both Google Account and Google Apps users.



- Sheets API

The Sheets API enables developers to create applications that read and modify the data in Google Sheets.

- Apps Activity API

The Apps Activity API allows client applications to retrieve information about a user's Google Apps activity. Currently, the API supports retrieving activity from the Google Drive service regarding changes to a user's Google Drive files. This provides additional functionality on top of the existing Drive API for an app to perform tasks such as displaying activity on a user's files, tracking changes to specific files or folders, and alerting a user to new comments or changes to files.

Google App Engine

Google App Engine is Google's Platform-as-a-Service ("PaaS") offering used to build web applications on Google's infrastructure. Google App Engine enables users to build and host web apps on the same systems that power Google applications. App Engine offers fast development and deployment, simple administration with no need to worry about hardware, patches or backups, and effortless scalability. Google App Engine users can define the set of transactions their applications can initiate and process.

Google BigQuery

Google BigQuery is a fully managed data analysis service that enables businesses to analyze Big Data. It features highly scalable data storage that accommodates up to hundreds of terabytes. It enables companies to import multi-terabyte datasets, query interactively and securely share the results within their organization.

Google Cloud Datastore

Google Cloud Datastore provides a managed, NoSQL, schemaless database for storing non-relational data. Cloud Datastore automatically scales with users and supports transactions, as well as robust queries.

Google Cloud SQL

Google Cloud SQL stores and manages data using a fully-managed, relational MySQL database. It is a highly available hosted SQL-based storage solution that allows users to create, configure and use relational databases that live in Google's infrastructure. Cloud SQL is tightly integrated with Google App Engine, Compute Engine, Cloud Storage and other Google services.

Google Cloud Storage

Google Cloud Storage is a service for storing and accessing user data on Google's infrastructure. The service combines the performance and scalability of Google's cloud with



advanced security and sharing capabilities. Users can define the set of transactions their applications can initiate and process.

Google Compute Engine

Google Compute Engine offers scalable and flexible virtual machine computing capabilities in the cloud. Google Compute Engine allows users to solve large-scale processing and analytic problems on Google's computing, storage, and networking infrastructure. Users can launch virtual machines on-demand, manage network connectivity using a simple but flexible networking solution and access a variety of data storage alternatives from their virtual machines.

Google Genomics

Google Genomics provides an API to store, process, explore, and share DNA sequence reads, reference-based alignments, and variant calls, using Google's cloud infrastructure.

Google Cloud Dataflow

Google Cloud Dataflow is a fully managed service for strongly consistent, parallel data-processing pipelines. It provides an SDK for Java with composable primitives for building data-processing pipelines for batch or continuous processing. This service manages the life cycle of Google Compute Engine resources of the processing pipeline(s). It also provides a monitoring user interface for understanding pipeline health.

Google Cloud Bigtable

Google Cloud Bigtable is a fast, fully managed, highly-scalable NoSQL database service. It is designed for the collection and retention of data from 1TB to hundreds of PB.

Google Container Engine

Google Container Engine, powered by the open source container scheduler Kubernetes, enables users to run containers on Google Cloud Platform. Container Engine takes care of provisioning and maintaining the underlying virtual machine cluster, scaling their application, and operational logistics such as logging, monitoring, and cluster health management.

Google Cloud Dataproc

Google Cloud Dataproc is a fast, easy to use, managed Spark and Hadoop service for distributed data processing. It provides management, integration, and development tools for unlocking the power of rich open source data processing tools. With Cloud Dataproc, users can create Spark/Hadoop clusters sized for their workloads precisely when they need them.

Google Container Registry

Google Container Registry is a private Docker image storage system on Google Cloud Platform. The registry can be accessed through an HTTPS endpoint, so users can pull images from their machine, whether it's a Google Compute Engine instance or their own hardware.



Google Now

Google Now provides personalized and contextual suggestions and recommendations via mobile, desktops, and wearable devices. Google Now delivers customized and highly relevant information users care about automatically based on the settings they choose. Simple cards bring the information such as weather, traffic, and stock prices that users want to help manage the user's day.

Google+

Google+ is a social networking platform that is fully integrated with other Google products. Users create and are able to manage their own Google+ profile. Google+ allows users to create and share content with each other. It also enables users to select and organize people into groups for optimal sharing across various Google products and services.

Google Chrome Sync

Chrome Sync is a service that synchronizes Chrome browser data with Google servers, allowing users to maintain the same browsing experience across devices. It uses real time updates to allow logged-in users to use and modify bookmarks, passwords, settings, and other data across any device running Chrome Browser.

Google Springboard

Google Springboard is a cloud-based service providing search and assist capabilities across Google Apps customers. Google Springboard will provide users in an organization a means to search for information and get proactive assistance. Google Springboard integrates with Google services such as Gmail, Drive, Calendar, and Groups.

Infrastructure

The Google Apps, Google Cloud Platform, and Other Google Services system runs in a multi-tenant, distributed environment. Rather than segregating user data to one machine or set of machines, user data is distributed amongst a shared infrastructure. This is achieved through a Google distributed file system designed to store extremely large amounts of data across many servers. Structured data is then stored in large distributed databases, built on top of this file system.

Data Centers and redundancy

Google maintains policies and standards for physical security to help protect production and corporate servers, network devices, and network connections within Google data centers.

Redundant architecture exists such that data is replicated in real-time to at least two (2) geographically dispersed data centers. The data centers are connected through multiple encrypted network links and interfaces. This provides high availability by dynamically load balancing across those sites. If one server or data center should fail, the workload will automatically shift to the other active servers. Google uses a dashboard that provides details



such as resource footprint, central processing unit capacity, and random-access memory availability to monitor resource availability across their data centers and to validate that data has been replicated to more than one location.

Authentication and access

Strong authentication and access controls are implemented to restrict administrative access to Google Apps, Google Cloud Platform, and Other Google Services production systems, internal support tools, and customer data. Access authorization in the Google Apps, Google Cloud Platform, and Other Google Services system is enforced at all relevant layers of the system. Machine-level access restrictions rely on a Google-developed distributed authentication service based on Secure Socket Layer (“SSL”) certificates, which helps positively identify the resource access requester. This service also offers encryption to enhance data confidentiality in transit.

Google follows a formal process to grant or revoke access to Google resources. Both user and internal access to customer data is restricted through the use of unique user IDs. Unique user IDs, strong passwords, One-Time-Passwords (“OTP”) and periodic reviews of access lists are implemented to help ensure internal access to customer data is appropriate and authorized. Access to corporate machines, production machines, network devices and support tools is managed via an access group management system. Membership in these groups must be approved by respective group administrators. User groups are reviewed annually.

Data

Google provides controls at each level of data storage, access, and transfer. Google has established training programs for privacy and information security to support data confidentiality. All employees are required to complete these training programs annually. All product feature launches that include new collection, processing, or sharing of user data are required to go through an internal design review process. Google has also established incident response processes to report and handle events related to confidentiality. Google establishes agreements, including non-disclosure agreements, for preserving confidentiality of information and software exchange with external parties.

Network Architecture and Management

The Google Apps, Google Cloud Platform, and Other Google Services system architecture utilizes a fully redundant network infrastructure. Google has implemented perimeter devices to protect the Google network from external attacks. Network monitoring mechanisms are in place to prevent and disconnect unauthorized access to the Google network from unauthorized devices.

People

Google has implemented a process-based service quality environment designed to deliver the Google Apps, Google Cloud Platform, and Other Google Services products to customers. The fundamentals underlying the services provided are the adoption of standardized, repeatable processes, the hiring and development of highly skilled resources, and leading industry practices. Google’s repeatable process model includes key infrastructure and product-related



processes and controls over security, availability, process integrity, and confidentiality.

Formal organizational structures and policies exist and are available to Google employees on the Company's intranet. The intranet provides drill-down functionality for identifying employees in the functional operations team. Google has developed and documented formal policies, procedures, and job descriptions for operational areas including data center operations, security administration, system and hardware change management, hiring, training, performance appraisals, terminations, and incident escalation. These policies and procedures have been designed to segregate duties and enforce responsibilities based on job functionality. Policies and procedures are reviewed and updated as necessary.