



National Cyber Security Centre (NCSC) Cloud Security Principles

Google Workspace Mapping

This document is designed to provide guidance for public sector and enterprise organisations (“**regulated entity**”) by the National Cyber Security Centre (“**NCSC**”) to consider [Cloud Security Principles](#) (“**framework**”) in the context of Google Workspace and the Google Cloud Services Contract.

We focus on the following requirements of the framework: Cloud Security Principles 1 - 14. For each paragraph, we provide commentary to help you understand how you can address the requirements using the Google Cloud services and the Google Cloud Services Contract.

The Shared Responsibility Model In the pre-cloud IT model, organisations maintained full responsibility for their environment. They managed everything from the networking and infrastructure to the security controls and applications. In the cloud IT model, management of the IT environment, including responsibilities for security and compliance, is shared between the customer and its cloud service provider. This is often referred to as the Shared Responsibility Model. Google Cloud’s part in the shared responsibility model includes providing services on a highly secure and controlled platform and offering a wide array of security features customers can benefit from. Shared responsibility enables our customers to allocate resources more effectively to their core competencies and concentrate on what they do best. The shared responsibility model does not remove the accountability and risk from customers using Google Cloud services, but it does help relieve the burden as we manage and control system components and physical control of facilities; it also shifts a portion of the cost of security and compliance onto Google Workspace and away from our customers. The different responsibilities held by Google and its customers are discussed in further detail in our [Google Workspace data protection implementation guide](#).

Terms

- (Alpha) - Refers to a service that is in alpha at the time this document is published. Refer to the links provided to understand the current release status of the service.
- (Beta) - Refers to a service that is in beta at the time this document is published. Refer to the links provided to understand the current release status of the service.
- Service - refers to Google Cloud services that you use to provide a solution on the platform.

#	Framework reference	Google Cloud commentary	Google Cloud Services Contract reference
1	Principle 1: Data in Transit Protection		
2	User data transiting networks should be adequately protected against tampering and eavesdropping. This should be achieved through a combination of:		
3	1. network protection - denying your attacker the ability to intercept data	<p><u>Security of Google’s infrastructure</u></p> <p>Google manages the security of our infrastructure. This is the security of the hardware, software, networking and facilities that support the Services. Given the one-to-many nature of our service, Google provides the same robust security for all our customers. Data in transit inside a physical boundary controlled by or on behalf of Google is generally authenticated.</p> <p>Additionally, Google has implemented network and host based tools to detect and respond to potential security incidents.</p> <p>Intrusion detection is intended to provide insight into ongoing attack activities and provide adequate information to respond to incidents. Google’s intrusion detection involves:</p> <ol style="list-style-type: none"> 1. Tightly controlling the size and make-up of Google’s attack surface through preventative measures; 2. Employing intelligent detection controls at data entry points; and 3. Employing technologies that automatically remedy certain dangerous situations. <p>For our customers, Google provides detailed information about our security practices so that customers can understand them and consider them as part of their own risk analysis.</p>	Data Security; Security Measures (Data Processing Amendment)



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		<p>More information is available at:</p> <ul style="list-style-type: none"> • Our infrastructure security page • Our security whitepaper • Our cloud-native security whitepaper • Our infrastructure security design overview page • Our security resources page <p>Please review Google Infrastructure Security Design Overview Solutions regarding defense-in-depth techniques deployed across our infrastructure.</p>	
4	2. encryption - denying your attacker the ability to read data	<p>Security by default</p> <p>At Google, we take the following proactive steps to assist you:</p> <p>Encryption at rest. Google encrypts customer data stored at rest by default, with no additional action required from you. More information is available at: Encryption at rest in Google Cloud.</p> <p>Encryption in transit. Google encrypts and authenticates all data in transit at one or more network layers when data moves outside physical boundaries not controlled by Google or on behalf of Google.</p> <p>Google uses encryption in transit to protect your data being intercepted while data moves between your site and the cloud provider or between two services.</p> <p>This protection is achieved by encrypting the data before transmission; authenticating the endpoints; and decrypting and verifying the data on arrival. For example, Transport Layer Security (TLS) is often used to encrypt data in transit for transport security, and Secure/Multipurpose Internet Mail Extensions (S/MIME) is used often for email message security. More information is available at How Google Workspace uses encryption to protect your data.</p>	Data Security; Security Measures (Data Processing Amendment)
5	Principle 2: Asset Protection and Resilience		
6	2.1 Physical location and legal jurisdiction		
7	In order to understand the legal circumstances under which your data could be accessed without your consent you must identify the locations at which it is stored, processed and managed.	<p>Locations</p> <p>To provide you with a fast, reliable, robust and resilient service, Google may store and process your data in Google or its subprocessors facilities, however, Google provides you with the ability to choose where to store your data. Once you choose a specific</p>	Data Location (Data Processing Amendment)



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	You will also need to understand how data-handling controls within the service are enforced, relative to UK legislation. Inappropriate protection of user data could result in legal and regulatory sanction, or reputational damage.	<p>region, Google will not store it outside your chosen region(s).</p> <ul style="list-style-type: none"> Information about the location of Google's facilities and where individual services can be deployed is available on our Choose a geographic location for your data - Google Workspace Admin Help. Information about the location of Google's subprocessors' facilities is available on our Google Workspace Terms of Service. <p>Google provides the same contractual commitments and technical and organizational measures for your data regardless of the country / region where it is located. In particular:</p> <ul style="list-style-type: none"> The same robust security measures apply to all Google facilities, regardless of country / region. Google makes the same commitments about all its subprocessors, regardless of country / region. <p><u>Use of your information</u> Google commits to only access or use your data to provide the Services ordered by you and will not use it for any other Google products, services, or advertising.</p> <p><u>Privacy and Non-Public Personal Information</u> Google will comply with privacy laws and regulations applicable to it in the provision of the Services.</p> <p>In addition, you can define additional safeguards through organisation policy service. The policy constraint defines the set of locations where location-based Workspace resources can be created. See What data is covered by a data region policy for more information.</p>	<p>Protection of Customer Data</p> <p>Processing of Data; Roles and Regulatory Compliance (Data Processing Amendment)</p>
8	2.2 Data Center Security		
9	Locations used to provide cloud services need physical protection against unauthorised access, tampering, theft or reconfiguration of systems. Inadequate protections may result in the disclosure, alteration or loss of data.	<p>This is addressed in the Data Processing Amendment where Google makes commitments to protect your data, including regarding data center and network security and data security.</p> <p>Google anticipates physical threats to its data centers and has implemented countermeasures to prevent or limit the impact from these threats.</p> <p>Google Data centers maintain secure external perimeter protections. All data centers employ electronic card key access control systems that are linked to a system alarm. Access to perimeter doors, shipping and receiving, and other critical areas is logged,</p>	Data Security; Security Measures (Data Processing Amendment)



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		<p>including unauthorized activity. Failed access attempts are logged by the access control system and investigated as appropriate. Authorized access throughout the business operations and data centers is restricted based on an individual's job responsibilities. The fire doors at the data centers are alarmed and can only be opened from the inside. CCTV cameras are in operation both inside and outside the data centers. The positioning of the cameras has been designed to help cover strategic areas including, among others, the perimeter, doors to the data center building, and shipping/receiving. Security operations personnel manage the CCTV monitoring, recording and control equipment. Cameras record on site via digital video recorders 24 hours a day, 7 days a week.</p> <p>For more information on Google data centers refer to below:</p> <ul style="list-style-type: none"> • Google's Data Processing Amendment describes the security measures that Google will implement and maintain. • Google Cloud Security White Paper for details on our data center security. • Information on Data Center Security. • Please review Google Infrastructure Security Design regarding defense-in-depth techniques deployed across our infrastructure. 	
10	2.3 Data at Rest Protection		
11	To ensure data is not available to unauthorised parties with physical access to infrastructure, user data held within the service should be protected regardless of the storage media on which it's held. Without appropriate measures in place, data may be inadvertently disclosed on discarded, lost or stolen media.	<p><u>Data Center Security</u> Refer to Row 4 for more information about encryption at rest and Row 9 for data center security.</p> <p><u>Data Backup</u> Regulated entities can use Spinbackup with Cloud Storage as part of their backup routine. Refer to our Disaster Recovery Building Blocks and Disaster Recovery Scenarios for Data articles for more information about how you can use the services for data backup.</p> <p>Google will comply with all national data protection regulations applicable to it in the provision of the Services.</p> <p>In addition, Google makes commitments to protect your data, including regarding security, access and transfer in the Data Processing Amendment.</p>	N/A
12	2.4 Data Sanitization		
13	The process of provisioning, migrating and de-provisioning resources should not result in unauthorised access to user data.	<u>Deletion</u>	Deletion on Termination (Data Processing Amendment)



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	Inadequate sanitisation of data could result in: <ol style="list-style-type: none"> your data being retained by the service provider indefinitely your data being accessible to other users of the service as resources are reused your data being lost or disclosed on discarded, lost or stolen media 	<p>On termination of the contractual relationship, Google will comply with your instruction to delete customer data from Google systems.</p> <p>Google has strict policies and procedures to govern the management of the equipment lifecycle within its production data centers. Any disk that did, at any point in its lifecycle, contain customer data is subject to a series of data destruction processes before leaving Google's premises, and would need to be authorized by the appropriate operations manager before release.</p> <p>For more information, please see: How Google Workspace uses encryption to protect your data.</p>	Security measures (Data Processing Amendment)
14	2.5 Equipment disposal		
15	Once equipment used to deliver a service reaches the end of its useful life, it should be disposed of in a way which does not compromise the security of the service, or user data stored in the service.	Refer to Row 13 for more information on equipment disposal.	N/A
16	2.6 Physical Resilience and Availability		
17	Services have varying levels of resilience, which will affect their ability to operate normally in the event of failures, incidents or attacks. A service without guarantees of availability may become unavailable, potentially for prolonged periods, regardless of the impact on your business.	<p>Google Availability and Resilience</p> <p>Google embeds redundancy as part of its architecture and failure is expected and corrected continuously. Google's highly redundant infrastructure also helps protect our customers from data loss. For more information, refer to our Architecture Framework.</p> <p>Google Cloud services are available in locations across North America, South America, Europe, Asia, and Australia. These locations are divided into regions and zones. You can choose where to locate your applications to meet your latency, availability, and durability requirements. Refer to our whitepaper on Infrastructure design for availability and resilience for more details.</p> <p>Under the shared responsibility model, certain architectural decisions made by the customer can impact the availability of workloads on Google Cloud. Detailed guidance is available for each service to enable customers to design and implement appropriate levels of availability in their deployments - see example below:</p> <ul style="list-style-type: none"> Using load balancing for highly available applications <p>Additionally, the SLAs contain Google's commitments regarding availability of the Services. They are available on the Google Workspace Terms of Service.</p>	Services
18	Principle 3: Separation Between Users		



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19	A malicious or compromised user of the service should not be able to affect the service or data of another.	<p>Google makes commitments to protect your data, including regarding security, access and transfer in the Data Processing Amendment.</p> <p>To keep data private and secure, Google logically isolates each customer's data from that of other customers.</p> <p>The owner of a service can use access management features provided by the infrastructure to specify exactly which other services can communicate with it. For example, a service may want to offer some APIs solely to a specific whitelist of other services. That service can be configured with the whitelist of the allowed service account identities and this access restriction is then automatically enforced by the infrastructure.</p> <p>Google engineers accessing services are also issued individual identities, so services can be similarly configured to allow or deny their accesses. All of these types of identities (machine, service, and employee) are in a global namespace that the infrastructure maintains. End user identities are handled separately. Refer to Google's inter-service management Google Infrastructure Security Design Overview - Inter-service Access Management for more information.</p> <p>Ownership You retain all intellectual property rights in your data, the data you derive from your data using our services and your applications. See How Google protects your organization's security and privacy - Google Workspace Admin Help.</p>	<p>N/A</p> <p>Security Measures; Data Storage, Isolation and Logging (Data Processing Amendment)</p>
20	Principle 4: Governance framework		
21	The service provider should have a security governance framework which coordinates and directs its management of the service and information within it. Any technical controls deployed outside of this framework will be fundamentally undermined. Having an effective governance framework will ensure that procedure, personnel, physical and technical controls continue to work through the lifetime of a service. It should also respond to changes in the service, technological developments and the appearance of new threats.	<p>Google recognizes that regulated entities need to review our internal controls, systems and data security and privacy protections for the services as part of their risk assessment. To assist, Google undergoes several independent third-party audits on at least an annual basis to provide independent verification of our operations and internal controls. Google commits to comply with the following key international standards during the term of our contract with you:</p> <ul style="list-style-type: none"> • ISO/IEC 27001:2013 (Information Security Management Systems) • ISO/IEC 27017:2015 (Cloud Security) • ISO/IEC 27018:2014 (Cloud Privacy) • ISO/IEC 27701:2019 (PII) • SOC 1 • SOC 2 • SOC 3 	Certifications and Audit Reports



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		<p>Google provides comprehensive external documentation and whitepapers detailing our security infrastructure and operational model. Google also maintains an internal ISMS and evidence of its effectiveness is provided via ISO/IEC 27001 certification.</p> <p>You can review Google's current certifications and audit reports at any time.</p> <ul style="list-style-type: none">• Google's ISO certifications are available on our Compliance Resource Center.• Google's SOC reports are available to customers under NDA and can be requested from your Google Cloud account representative.	
22	Principle 5: Operational Security		
23	5.1 Configuration and Change Management		
24	You should have an accurate picture of the assets which make up the service, along with their configurations and dependencies.	<p>This is a customer consideration.</p> <p>Google provides following tools to assist you for configuration management:</p> <ul style="list-style-type: none">• Configuration Manager assists with<ul style="list-style-type: none">○ Configure which users, groups, and other data to synchronize.○ Set up rules to omit data, such as users or groups, from a sync.○ Set up notifications and logging.• Admin Console assists with<ul style="list-style-type: none">○ Customers control who uses which Google services from their account.○ Customers configuration of services in usage• Google Workspace Updates blog - keeps customers informed of new updates to Google Workspace services.• What's new in Google Workspace - support page with detailed roadmap of product updates.	N/A
25	Changes which could affect the security of the service should be identified and managed. Unauthorised changes should be detected.	<p>This is a customer consideration. Refer to row 24 for more information about tools provided to customers to manage and monitor configuration changes.</p> <p>Google also provides customers with robust logging services that can be configured to meet customer security requirements.. See example below.</p> <p><u>Audit Logging</u> Admin Audit Logs - you can use the Admin audit log to see a record of actions performed in your Google Admin console. For example, you can see when an administrator added a user or turned on a Google Workspace service.</p>	N/A



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		Google Cloud services write audit log entries to these logs to help you answer the questions of "who did what, where, and when?" within your Google Cloud resources.	
26	Where change is not effectively managed, security vulnerabilities may be unwittingly introduced to a service. And even where there is awareness of the vulnerability, it may not be fully mitigated.	<p>This is a customer consideration.</p> <p>Google offers our tools and services to our customers to assist with deploying management guardrails to help avoid and monitor erroneous configuration. Refer here for more information.</p>	N/A
27	5.2 Vulnerability Management		
28	Service providers should have a management process in place to identify, triage and mitigate vulnerabilities. Services which don't, will quickly become vulnerable to attack using publicly known methods and tools.	<p>Google's vulnerability management team is responsible for tracking and following up on vulnerabilities. Once a vulnerability requiring remediation has been identified, it is logged, prioritized according to severity, and assigned an owner. The vulnerability management team tracks such issues and follows up frequently until they can verify that the issues have been remediated.</p> <p>Google administrates a vulnerability management process that actively scans for security threats using a combination of commercially available and purpose-built in-house tools, intensive automated and manual penetration efforts, quality assurance processes, software security reviews and external audits.</p> <p>Refer to our security whitepaper on security monitoring and vulnerability management.</p>	N/A
29	5.3 Protective Monitoring		
30	A service which does not effectively monitor for attack, misuse and malfunction will be unlikely to detect attacks (both successful and unsuccessful). As a result, it will be unable to quickly respond to potential compromises of your environments and data.	<p><u>Google Monitoring</u></p> <p>Google's security monitoring program is focused on information gathered from internal network traffic, employee actions on systems and outside knowledge of vulnerabilities.</p> <p>At many points across our global network, internal traffic is inspected for suspicious behavior, such as the presence of traffic that might indicate botnet connections. This analysis is performed using a combination of open-source and commercial tools for traffic capture and parsing.</p> <p>A proprietary correlation system built on top of Google technology also supports this analysis.</p> <p>Network analysis is supplemented by examining system logs to identify unusual behavior, such as attempted access of customer data.</p>	



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		<p>Google security engineers place standing search alerts on public data repositories to look for security incidents that might affect the company's infrastructure. They actively review inbound security reports and monitor public mailing lists, blog posts, and wikis.</p> <p>Automated network analysis helps determine when an unknown threat may exist and escalates to Google security staff, and network analysis is supplemented by automated analysis of system logs.</p> <p><u>Security products</u></p> <p>In addition to the tools and practices available to you outside Google, you can choose to use tools provided by Google to enhance and monitor the security of your data. Information on Google's security products is available here.</p> <p><u>Performance reports</u></p> <p>You can monitor Google's performance of the Services (including the SLAs) on a regular basis using the functionality of the Services.</p> <p>For example:</p> <ul style="list-style-type: none"> • The Status Dashboard provides status information on the Services. • Admin Console Reports allow you to examine potential security risks, measure user collaboration, track who signs in and when, analyze administrator activity, and much more. • Access Transparency is a feature that enables you to review logs of actions taken by Google personnel regarding your data. Log entries include: the affected resource, the time of action, the reason for the action (e.g. the case number associated with the support request); and data about who is acting on data (e.g. the Google personnel's location). 	Ongoing Performance Monitoring
31	5.4 Incident Management		
32	Unless carefully pre-planned incident management processes are in place, poor decisions are likely to be made when incidents do occur, potentially exacerbating the overall impact on users. These processes needn't be complex or require large amounts of description, but good incident management will minimise the impact to users of security, reliability and environmental issues with a service.	<p>Google has a rigorous incident management process for security events that may affect the confidentiality, integrity, or availability of systems or data. If an incident occurs, the security team logs and prioritizes it according to its severity. Events that directly impact customers are assigned the highest priority. This process specifies courses of action, procedures for notification, escalation, mitigation, and documentation.</p> <p>Google's security incident management program is structured around the NIST guidance on handling incidents (NIST SP 800-61). Key staff are trained in forensics and handling</p>	<p>Significant Developments</p> <p>Data Incidents (Data Processing Amendment)</p>



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		<p>evidence in preparation for an event, including the use of third-party and proprietary tools.</p> <p>Testing of incident response plans is performed for key areas, such as systems that store sensitive customer information. These tests take into consideration a variety of scenarios, including insider threats and software vulnerabilities. To help ensure the swift resolution of security incidents, the Google security team is available 24/7 to all employees. If an incident involves customer data, Google or its partners will inform the customer and support investigative efforts via our support team.</p> <p>Google will make information about developments that materially impact Google's ability to perform the Services in accordance with the SLAs available to you. More information is available on our Google Workspace Terms of Service page.</p> <p><u>Security breaches</u> Google will notify you of data incidents promptly and without undue delay. More information on Google's data incident response process is available in our Data incident response whitepaper.</p>	
33	Principle 6: Personnel Security		
34	<p>Where service provider personnel have access to your data and systems you need a high degree of confidence in their trustworthiness. Thorough screening, supported by adequate training, reduces the likelihood of accidental or malicious compromise by service provider personnel.</p> <p>The service provider should subject personnel to security screening and regular security training. Personnel in these roles should understand their responsibilities. Providers should make clear how they screen and manage personnel within privileged roles</p>	<p><u>Company principals</u> Information about Google Cloud's leadership team is available on our Media Resources page.</p> <p><u>Employee background checks</u> Before they join our staff, Google will verify an individual's education and previous employment, and perform internal and external reference checks. Where local labor law or statutory regulations permit, Google may also conduct criminal, credit, immigration, and security checks. The extent of these background checks is dependent on the desired position.</p> <p><u>Security training for all employees</u> All Google employees undergo security training as part of the orientation process and receive ongoing security training throughout their Google careers. During orientation, new employees agree to our Code of Conduct, which highlights our commitment to keep customer information safe and secure. Depending on their job role, additional training on specific aspects of security may be required. For instance, the information security team instructs new engineers on topics like secure coding practices, product design and automated vulnerability testing tools. Engineers also attend technical presentations on security-related topics and receive a security newsletter that covers new threats, attack patterns, mitigation techniques and more.</p>	Personnel Security; Security Measures (Data Processing Amendment)



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		<p><u>Internal security and privacy events</u> Google hosts regular internal conferences to raise awareness and drive innovation in security and data privacy, which are open to all employees. Security and privacy is an ever-evolving area, and Google recognizes that dedicated employee engagement is a key means of raising awareness. One example is "Privacy Week," during which Google hosts events across global offices to raise awareness of privacy in all facets, from software development, data handling and policy enforcement to living our privacy principles. Google also hosts regular "Tech Talks" focusing on subjects that often include security and privacy.</p>	
35	Principle 7: Secure Development		
36	Services should be designed and developed to identify and mitigate threats to their security. Those which aren't may be vulnerable to security issues which could compromise your data, cause loss of service or enable other malicious activity.	<p>The security of a cloud service consists of two key elements;</p> <p><u>Security of Google's infrastructure</u></p> <p>Google manages the security of our infrastructure. This is the security of the hardware, software, networking and facilities that support the Services.</p> <p>Given the one-to-many nature of our service, Google provides the same robust security for all our customers.</p> <p>Google provides detailed information to customers about our security practices so that customers can understand them and consider them as part of their own risk analysis.</p> <p>More information is available at:</p> <ul style="list-style-type: none">• Our infrastructure security page• Our security whitepaper• Our cloud-native security whitepaper• Our infrastructure security design overview page• Our security resources page <p>In addition, you can review Google's SOC 2 report. The focus of this report is to evaluate an organization's information systems relevant to security, availability, processing integrity, confidentiality, and privacy.</p>	Significant Developments



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		<p><u>Security of your data and applications in the cloud</u></p> <p>You define the security of your data and applications in the cloud. This refers to the security measures that you choose to implement and operate when you use the Services.</p> <p>(a) <u>Security products</u></p> <p>In addition to the other tools and practices available to you outside Google, you can choose to use tools provided by Google to enhance and monitor the security of your data. Information on Google's security products is available on our Cloud Security Products page.</p> <p>(b) <u>Security resources</u></p> <p>Google also publishes guidance on:</p> <ul style="list-style-type: none"> • Security best practices • Security use cases. (i.e. how do I configure a secure by design environment for my cloud deployments). 	
37	Principle 8: Supply Chain Security		
38	<p>The service provider should ensure that its supply chain satisfactorily supports all of the security principles which the service claims to implement.</p> <p>Cloud services often rely upon third party products and services. Consequently, if this principle is not implemented, supply chain compromise can undermine the security of the service and affect the implementation of other security principles.</p>	<p>Google works with third parties to support our business and operations. Google requires our subcontractors to meet the same high standards that we do. In particular, Google requires our subcontractors to comply with our contract with you and will remain liable to you for any subcontracted obligations.</p> <p>To enable regulated entities to retain oversight of any subcontracting and provide choices about the services regulated entities use, Google will:</p> <ul style="list-style-type: none"> • provide information about our subcontractors (including their function and location); • provide advance notice of changes to our subcontractors; and • give regulated entities the ability to terminate if they have concerns about a new subcontractor. <p>For more information around Google's supply chain efforts, refer to our Responsible Supply Chain report.</p>	Google Subcontractors



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39	Principle 9: Secure User Management Your provider should make the tools available for you to securely manage your use of their service. Management interfaces and procedures are a vital part of the security barrier, preventing unauthorised access and alteration of your resources, applications and data.		
40	9.1 Authentication of users to management interfaces and support channels		
41	<p>In order to maintain a secure service, users need to be properly authenticated before being allowed to perform management activities, report faults or request changes to the service.</p> <p>These activities may be conducted through a service management web portal, or through other channels, such as telephone or email. They are likely to include such functions as provisioning new service elements, managing user accounts and managing consumer data.</p> <p>Service providers need to ensure that all management requests which could have a security impact are performed over secure and authenticated channels. If users are not strongly authenticated then an imposter may be able to successfully perform privileged actions, undermining the security of the service or data.</p>	<p>This is a shared responsibility between Google and the customer.</p> <p><u>Authenticated Users</u> Google maintains policies and procedures that enforce data access permissions. Two factor authentication is required for all employee access to all company and customer resources. Google provides (under NDA) customers with a SOC 2 report that includes testing of Google's access controls.</p> <p>Additionally, Google native authentication requires a minimum 8 character complex password. Tenants can set the maximum or increase the minimum. A built-in Password Monitor is visible to the end user upon password creation and to the System Administrators of the tenant, who can decide to force a password change on any user that is later detected to have a password that is weak.</p> <p>Google's native authentication has protections in place that would detect a brute force attack and challenge the user to solve a Captcha and would auto lock the account if suspicious activity is detected. The tenant's System Administrators can reset that account for the end user.</p> <p>Google encrypts and authenticates all data in transit at one or more network layers when data moves outside physical boundaries not controlled by Google or on behalf of Google. For more information refer: Encryption in Transit.</p> <p>For customers, Google offers our tools and services such as Cloud Identity and Access Management which helps to prevent unauthorized access by controlling access rights and roles for Google Cloud resources.</p>	Data Security; Security Measures (Data Processing Amendment)
42	9.2 Separation and access control within management interfaces		
43	Many cloud services are managed via web applications or APIs. These interfaces are a key part of the service's security. If users are not adequately separated within management interfaces, one user may be able to affect the service, or modify the data of another.	Google's internal data access processes and policies are designed to prevent unauthorized persons and/or systems from gaining access to systems used to process your data.	Data Security; Security Measures (Data Processing Amendment)



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	<p>Your privileged administrative accounts probably have access to large volumes of data. Constraining the permissions of individual users to those absolutely necessary can help to limit the damage caused by malicious users, compromised credentials or compromised devices.</p> <p>Role-based access control provides a mechanism to achieve this and is likely to be a particularly important capability for users managing larger deployments.</p> <p>Exposing management interfaces to less accessible networks (e.g. community rather than public networks) makes it more difficult for attackers to reach and attack them, as they would first need to gain access to one of these networks.</p>	<p>For Google employees, access rights and levels are based on their job function and role, using the concepts of least-privilege and need-to-know to match access privileges to defined responsibilities. Google employees are only granted a limited set of default permissions to access company resources, such as employee email and Google's internal employee portal. Requests for additional access follow a formal process that involves a request and an approval from a data or system owner, manager, or other executives, as dictated by Google's security policies. Approvals are managed by workflow tools that maintain audit records of all changes.</p> <p>For customers, Google offers our tools and services such as Cloud Identity which helps to prevent unauthorized access by controlling access rights and roles for Google Cloud resources.</p>	
44	Principle 10: Identity and Authentication		
45	<p>All access to service interfaces should be constrained to authenticated and authorised individuals.</p> <p>Weak authentication to these interfaces may enable unauthorised access to your systems, resulting in the theft or modification of your data, changes to your service, or a denial of service.</p> <p>Importantly, authentication should occur over secure channels. Email, HTTP or telephone are vulnerable to interception and social engineering attacks.</p>	Refer to Row 41 and Row 43 for more information on authentication and access management.	N/A
46	Principle 11: External Interface Protection		
47	<p>All external or less trusted interfaces of the service should be identified and appropriately defended. If some of the interfaces exposed are private (such as management interfaces) then the impact of compromise may be more significant.</p> <p>You can use different models to connect to cloud services which expose your enterprise systems to varying levels of risk.</p>	<p>This is a customer consideration.</p> <p>Google provides our customers with the tools to monitor their workloads and perform their own assessments.</p> <p>Google Workspace allows customers to regulate API access to its services via the App Access Control functionality.</p> <p>For example:</p> <ul style="list-style-type: none"> The Status Dashboard provides status information on the Services. Admin Console Reports allow you to examine potential security risks, measure user collaboration, track who signs in and when, analyze administrator activity, and much more. 	N/A



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#	Framework reference	Google Cloud commentary	Google Cloud Services Contract reference
		<ul style="list-style-type: none"> Access Transparency is a feature that enables you to review logs of actions taken by Google personnel regarding your data. Log entries include: the affected resource, the time of action, the reason for the action (e.g. the case number associated with the support request); and data about who is acting on data (e.g. the Google personnel's location). 	
48	Principle 12: Secure Service Administration		
49	<p>Systems used for administration of a cloud service will have highly privileged access to that service. Their compromise would have significant impact, including the means to bypass security controls and steal or manipulate large volumes of data.</p> <p>The design, implementation and management of administration systems should follow enterprise good practice, whilst recognising their high value to attackers.</p>	<p>This is addressed in the Data Processing Amendment where Google makes commitments to protect your data, including regarding access control and privilege management.</p> <p>Refer to Row 41 and Row 43 for more information on privileged access management.</p>	Data Security (Data Processing Amendment)
50	Principle 13: Audit Information For Users		
51	You should be provided with the audit records needed to monitor access to your service and the data held within it. The type of audit information available to you will have a direct impact on your ability to detect and respond to inappropriate or malicious activity within reasonable timescales.	<p>Google recognizes that you need visibility into who did what, when, and where for all user activity on our service.</p> <ul style="list-style-type: none"> Refer to row 30 for further information. 	N/A
52	Principle 14: Secure Use of the Service		
53	The security of cloud services and the data held within them can be undermined if you use the service poorly. Consequently, you will have certain responsibilities when using the service in order for your data to be adequately protected.	<p>This is a shared responsibility between Google and the customer.</p> <p>Refer to Row 1 for more information around how Google secures our cloud services.</p> <p>For our customers, Google provides detailed information about our security practices so that customers can understand them and consider them as part of their own risk analysis.</p> <p>More information is available at:</p> <ul style="list-style-type: none"> Our infrastructure security page Our security whitepaper Our cloud-native security whitepaper Our infrastructure security design overview page Our security resources page <p>Please review Google Infrastructure Security Design Overview Solutions regarding defense-in-depth techniques deployed across our infrastructure.</p>	N/A



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