# System and Organization Controls 3 Report

# Report on Alibaba Cloud's

# Public Cloud Services System

# Relevant to Security, Availability, and Confidentiality

# For the Period January 1, 2020 - September 30, 2020

pwc

# Report of Independent Service Auditor

**To the Management of Alibaba Cloud Computing Ltd.:**

*Scope*

We have examined Alibaba Cloud Computing Ltd.'s and its affiliates' (including but not limited to Alibaba Cloud (Singapore) Private Limited, Alibaba.com (Europe) Limited, Alibaba Cloud US LLC, Alibaba Cloud (India) LLP, and Alibaba Cloud (Malaysia) Sdn. Bhd., Alibaba Cloud Computing Ltd. and its affiliates, which are collectively referred to as the "Service Organization" or "Alibaba Cloud") accompanying assertion titled "Management of Alibaba Cloud's Assertion Regarding the Cloud Services System" ("assertion") that the controls within Alibaba Cloud's cloud services system (the "system") were effective throughout the period from January 1, 2020 to September 30, 2020, to provide reasonable assurance that Alibaba Cloud's service commitments and system requirements were achieved based on the trust services criteria relevant to security, availability, and confidentiality ("applicable trust services criteria") set forth in TSP section 100, *2017 Trust Services Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy* (AICPA, *Trust Services Criteria*).

*Service Organization's Responsibilities*

Alibaba Cloud is responsible for its service commitments and system requirements and for designing, implementing, and operating effective controls within the system to provide reasonable assurance that Alibaba Cloud's service commitments and system requirements were achieved. Alibaba Cloud has also provided the accompanying assertion about the effectiveness of controls within the system. When preparing its assertion, Alibaba Cloud is responsible for selecting, and identifying in its assertion, the applicable trust service criteria and for having a reasonable basis for its assertion by performing an assessment of the effectiveness of the controls within the system.

*Service Auditor's Responsibilities*

Our responsibility is to express an opinion, based on our examination, on whether management's assertion that controls within the system were effective throughout the period to provide reasonable assurance that the Service Organization's service commitments and system requirements were achieved based on the applicable trust services criteria. Our examination was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. Those standards require that we plan and perform our examination to obtain reasonable assurance about whether management's assertion is fairly stated, in all material respects. We believe that the evidence we obtained is sufficient and appropriate to provide a reasonable basis for our opinion.

Our examination included:

- Obtaining an understanding of the system and the Service Organization's service commitments and system requirements;
- Assessing the risks that controls were not effective to achieve Alibaba Cloud's service commitments and system requirements based on the applicable trust services criteria;
- Performing procedures to obtain evidence about whether controls within the system were effective to achieve Alibaba Cloud's service commitments and system requirements based on the applicable trust services criteria.

Our examination also included performing such other procedures as we considered necessary in the circumstances.

*Inherent Limitations*

There are inherent limitations in the effectiveness of any system of internal control, including the possibility of human error and the circumvention of controls.

Because of their nature, controls may not always operate effectively to provide reasonable assurance that the Service Organization's service commitments and system requirements were achieved based on the applicable trust services criteria. Also, the projection to the future of any conclusions about the effectiveness of controls is subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

*Opinion*

In our opinion, management's assertion that the controls within Alibaba Cloud's cloud services system were effective throughout the period from January 1, 2020 to September 30, 2020, to provide reasonable assurance that Alibaba Cloud's service commitments and system requirements were achieved based on the applicable trust services criteria is fairly stated, in all material respects.

PricewaterhouseCoopers

Hong Kong, China

November 20, 2020

**Management of Alibaba Cloud's Assertion Regarding the Cloud Services System Throughout the Period from January 1, 2020 to September 30, 2020**

We are responsible for designing, implementing, operating and maintaining effective controls within Alibaba Cloud Computing Ltd.'s and its affiliates' (including but not limited to Alibaba Cloud (Singapore) Private Limited, Alibaba.com (Europe) Limited, Alibaba Cloud US LLC, Alibaba Cloud (India) LLP, and Alibaba Cloud (Malaysia) Sdn. Bhd., Alibaba Cloud Computing Ltd. and its affiliates, which are collectively referred to as the "Service Organization" or "Alibaba Cloud") cloud services system (the "system") throughout the period from January 1, 2020 to September 30, 2020, to provide reasonable assurance that Alibaba Cloud's service commitments and system requirements relevant to security, availability and confidentiality were achieved. Our description of the boundaries of the system is presented in Attachment A and identifies the aspects of the system covered by our assertion.

We have performed an evaluation of the effectiveness of the controls within the system throughout the period from January 1, 2020 to September 30, 2020 to provide reasonable assurance that Alibaba Cloud's service commitments and system requirements were achieved based on the trust services criteria relevant to security, availability, and confidentiality ("applicable trust services criteria") set forth in TSP section 100, *2017 Trust Services Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy* (AICPA, *Trust Services Criteria*). Alibaba Cloud's objectives for the system in applying the applicable trust services criteria are embodied in its service commitments and system requirements relevant to the applicable trust services criteria. The principal service commitments and system requirements related to the applicable trust services criteria are presented in Attachment B.

There are inherent limitations in any system of internal control, including the possibility of human error and the circumvention of controls. Because of these inherent limitations, a service organization may achieve reasonable, but not absolute, assurance that its service commitments and system requirements are achieved.

We assert that the controls within the system were effective throughout the period from January 1, 2020 to September 30, 2020 to provide reasonable assurance that Alibaba Cloud's service commitments and system requirements were achieved based on the applicable trust services criteria.

Alibaba Cloud Computing Ltd.

November 20, 2020

**Attachment A –Description of Alibaba Cloud's Cloud Services System**

## ***System Overview***

### *Background*

Alibaba Cloud, a business unit of Alibaba Group (NYSE:BABA) ("Alibaba" or the "Group"), provides a comprehensive suite of global cloud computing services to our global customers and partners as well as Alibaba Cloud's own e-commerce ecosystem. The cloud services provided by Alibaba Cloud are powered by self-developed cloud services platform and technologies. Alibaba Cloud aims to turn cloud computing into a state-of-the-art computing infrastructure by investing heavily in technical innovation to continually improve the computing capabilities and economies of scale of its services. The cloud services are widely used by a variety of industries, including finance, government, games, e-business, mobile services, medical services, or multimedia. Besides the cloud services, Alibaba Cloud also provides Internet of Things (IoT) platform for a wide range of fields including intelligent life, intelligent city, intelligent manufacturing and intelligent agriculture, etc. Alibaba Cloud is dedicated to being a builder of IoT infrastructure. It is critical to the users of Alibaba Cloud's IoT Platform that the data storage and processing of the IoT platform allows the integration with Application Programming Interface (API) and other Alibaba Cloud services to enjoy a comprehensive suite of services. It features a rule engine for rapid data collection, storage, and application development. Through the efforts to build an industry-wide and integrated development platform of cloud and device terminals, set up an entire industrial chain of the IoT, and establish global wide IoT standards, Alibaba Cloud continues building an IoT ecosystem, platform and infrastructure, to speed up the integration of the physical world and digital world, and to promote the development from IoT to Internet of Intelligences (IoI).

## ***Boundaries of the System***

### *Services Provided*

Alibaba Cloud is committed to building a public, open, and secure cloud computing service platform. The following public cloud services are in scope for this report:

1. ActionTrail
2. Alibaba Cloud Content Delivery Network
3. Alibaba Cloud DNS
4. Alibaba Cloud DNS PrivateZone
5. Alibaba Content Security Service
6. AlibabaMQ for Apache Kafka
7. AlibabaMQ for Apache RocketMQ
8. AlinPlat
9. AnalyticDB for MySQL
10. AnalyticDB for PostgreSQL
11. Anti-DDoS Pro (Anti-DDoS Premium)
12. API Gateway
13. Application Configuration Management
14. Application Real-Time Monitoring Service
15. Apsara Devops
16. Apsara File Storage NAS
17. ApsaraDB for MongoDB
18. ApsaraDB for MySQL
19. ApsaraDB for OceanBase
20. ApsaraDB for PolarDB
21. ApsaraDB for PostgreSQL
22. ApsaraDB for Redis
23. ApsaraDB for SQL Server

24. ApsaraDB RDS for PPAS
25. ApsaraVideo Live
26. Auto Scaling
27. Bastionhost
28. Cloud Config
29. Cloud Enterprise Network
30. Cloud Firewall
31. Cloud Security Scanner
32. Cloud Web Hosting
33. CloudMonitor
34. Container Registry
35. Container Service for Kubernetes
36. Data Encryption Service
37. Data Management
38. Data Transmission Service (Lightning Cube)
39. Database Backup
40. Dataphin
41. DataV
42. DataWorks
43. dbaudit
44. Dedicated Host
45. Direct Mail
46. Dynamic Route for CDN
47. ECS Bare Metal Instance
48. Elastic Block Storage
49. Elastic Compute Service
50. Elastic Container Instance
51. Elastic GPU Service
52. Elastic High-Performance Computing
53. Elastic IP Address
54. Elasticsearch
55. E-MapReduce
56. Enterprise Distributed Application Service
57. Express Connect
58. Fireware Security Scanner
59. Fraud Detection
60. Function Compute
61. Identity as a service
62. Intelligent Speech Interaction
63. Key Management Service
64. Link ID² (IoT Device ID)
65. Link IoT Edge
66. Link IoT Platform
67. Link Living (Feiyan Platform)
68. Log Service (SLS)
69. Machine Learning Platform for AI
70. MaxCompute
71. NAT Gateway
72. Object Storage Service
73. OCR
74. Operation Orchestration Service
75. Quick BI
76. Realtime Compute for Apache Flink

77. Resource Access Management
78. Resource Management
79. SCDN
80. Security Center
81. Sensitive Data Discovery and Protection
82. Server Load Balancer
83. Short Message Service
84. Simple Application Server
85. Super Computing Cluster
86. Tablestore
87. Virtual Private Cloud
88. VPN Gateway
89. Web Application Firewall

Alibaba Cloud public cloud services in scope for this report are grouped into categories and brief descriptions for each of the services are provided below. A complete list of Alibaba Cloud services available to customers is provided in the Alibaba Cloud official website. Customers shall consult extensive online documentation for additional information.

**Analytics**

Dataphin: Dataphin is designed to help users create and manage intelligent and unified data assets and empower innovation. It provides a comprehensive one-stop solution including data integration, warehouse modelling, identity and profile distilling, asset management, and data services.

DataWorks: DataWorks is a "out-of-the-box" Big Data platform product launched as a one-stop Big Data development, data permission management, offline job scheduling to support complex underlying cluster establishment and Operations & Management.

DataV: DataV is a data visualization tool, featuring geographic information systems allowing for interpretation of data to understand relationships, patterns, and trends.

Elasticsearch: Alibaba Cloud Elasticsearch is a cloud-based Service that offers built-in integrations such as Kibana, commercial features, and Alibaba Cloud Virtual Private Cloud (VPC), Cloud Monitor, and Resource Access Management.

E-MapReduce: E-MapReduce (EMR) is used as a big data processing solution that runs on the Alibaba Cloud platform. EMR is built on Alibaba Cloud ECS instances and is based on open-source Apache Hadoop and Apache Spark. EMR allows use the Hadoop and Spark ecosystem components to analyze and process data.

Log Service (SLS): Log Service is a real-time data logging service that has been developed by Alibaba Group supporting collection, consumption, shipping, search, and analysis of logs. It improves the capacity of processing and analysing large amounts of logs.

MaxCompute: MaxCompute is a general purpose, fully managed, multi-tenancy data processing platform used for large-scale data warehousing. MaxCompute supports various data importing solutions and distributed computing models, enabling users to effectively query massive datasets, reduce production costs, and ensure data security.

Quick BI: Quick BI is used for the performance of data analytics, exploration, and reporting on mass data with drag-and-drop features and a rich variety of visuals. It empowers enterprise users to view and explore data and make informed, data-driven decisions.

Realtime Compute for Apache Flink: Realtime Compute for Apache Flink offers a one-stop, high-performance platform that enables real-time big data processing based on Apache Flink.

**Artificial Intelligence**

Intelligent Speech Interaction: Intelligent Speech Interaction is suitable for various scenarios, including intelligent Q&A, intelligent quality inspection, real-time subtitling for speeches, and transcription of audio recordings. Intelligent Speech Interaction allows users to use self-learning platform to improve speech recognition accuracy and provides a comprehensive management console and easy-to-use SDKs.

Machine Learning Platform for AI: Machine Learning Platform for AI provides end-to-end machine learning services, including data processing, feature engineering, model training, model prediction, and model evaluation.

OCR: Optical Character Recognition (OCR) includes industry note recognition, asset type certificate recognition, general card recognition etc., for specific use.

**Cloud Communication**

Short Message Service: Short Message Service (SMS) provides the APIs and SDK to developers to send messages all around the world. The system supports One-Time-Password (OTP), transaction notifications, push notifications and promotional campaigns as well as supports both domestic and international messaging.

**Content Delivery**

Alibaba Cloud Content Delivery Network: Alibaba Cloud Content Delivery Network (CDN) is used to deliver content to users from the nodes that are nearest to them, accelerating the response to user requests and increasing the response rate. CDN can also resolves the delivery latency problem that is usually caused by distribution, bandwidth, and server performance issues.

Dynamic Route for CDN: Dynamic Route for CDN (DCDN) is a content delivery acceleration service to accelerate static and dynamic content delivery. This service provides an all-purpose solution to resolve issues of high latencies, packet losses, and service instability.

SCDN: SCDN aims to accelerate the website while providing exclusive resources to ensure that customers are isolated from each other and the business is more secure; to provide high QPS carrying capacity to prevent various behaviours that harm the website. It is also applicable to all websites that need to balance content acceleration and security at the same time.

**Database**

AnalyticDB for MySQL: AnalyticDB for MySQL is a high-performance data warehousing service that is secure, stable, and easy to use. AnalyticDB for MySQL uses a distributed computing architecture that enables it to use the elastic scaling capability of the cloud to compute tens of billions of data records in real time.

AnalyticDB for PostgreSQL: AnalyticDB for PostgreSQL is an online Massively Parallel Processing data warehousing service based on the open source Greenplum Database that can be utilized for performance monitoring services.

ApsaraDB for MongoDB: ApsaraDB for MongoDB is a secure, reliable, and elastically scalable cloud database service for automatic monitoring, backup, and recovery by time point.

ApsaraDB for MySQL: ApsaraDB for MySQL is one of the most popular open-source databases in the world. As a key component of the open-source software bundle LAMP (Linux, Apache, MySQL, and Perl/PHP/Python), MySQL has been widely applied to different scenarios.

ApsaraDB for OceanBase: ApsaraDB for OceanBase is a relational database service developed by Alibaba Group for high-throughput, high-concurrency, and high-availability scenarios. ApsaraDB for OceanBase uses the Paxos protocol and maintains multiple data replicas. Users can build a financial-grade database by deploying PC servers in a distributed architecture.

ApsaraDB for PolarDB: ApsaraDB for PolarDB is designed for business-critical database applications that require fast performance, high concurrency, and automatic scaling.

ApsaraDB for PostgreSQL: PostgreSQL enables OLTP databases that handle enterprise-level SQL statements, supports NoSQL data types such as JSON, XML and hstore, and supports GIS data processing.

ApsaraDB for Redis: ApsaraDB for Redis is an automated and scalable tool for developers to manage data storage shared across multiple processes, applications or servers.

ApsaraDB for SQL Server: ApsaraDB for SQL Server offers excellent performance when handling complex SQL queries, and fully supports applications built on .NET framework.

ApsaraDB RDS for PPAS: ApsaraDB for PPAS is a database service that has been jointly developed by Alibaba Cloud and EnterpriseDB, and is compatible with Oracle. The service enables easy data migration and supports Oracle PL/SQL, data types, advanced functions, and table partitioning.

Database Backup: Database Backup Service is used to perform real-time backups when any modification online data. Backup data is saved to OSS in real time in order to reduce Recovery Point Objective to several seconds.

Data Management: Data management (DMS) supports unified management of multiple databases, providing an easy-to-use portal for the centralized management of databases and servers to ensure more secure data, more efficient management and clearer data value.

Data Transmission Service (Lightning Cube): Data Transmission Service (DTS) is used for continuous data replication with high availability or for the migration of data between data storage types, such as relational database, NoSQL, and OLAP.

Tablestore: Tablestore is a distributed NoSQL data storage service built on Alibaba Cloud's Apsara distributed computing system that enables seamless expansion of data size and access concurrency through data sharing and server load balancer technologies, providing storage of and real-time access to massive structured data.

**Developer Services**

Apsara Devops: Apsara Devops is a developer platform with Projects, Thoughts, Flow, Codeup, Packages, and Testhub together to support developers' work.

Application Real-Time Monitoring Service: Application Real-Time Monitoring Service (ARMS) is an end-to-end Alibaba Cloud monitoring service for Application Performance Management (APM) used to quickly develop real-time business monitoring capabilities using the frontend monitoring, application monitoring, and custom monitoring features provided by ARMS.

CloudMonitor: CloudMonitor is used to collect monitor metrics of Alibaba Cloud resources and custom metrics. The service can be used to detect the availability of the subscribed services and allows the users to set alarms on specific metrics. CloudMonitor enables the user to view and understand the usage, status and health of the cloud resources used so that you can act promptly to ensure the availability of applications when an alarm is triggered.

**Elastic Computing**

Auto Scaling: Auto Scaling is a service to automatically adjust computing resources based on the volume of user requests. When the demand for computing resources increase, Auto Scaling automatically adds ECS instances to serve additional user requests, or alternatively removes instances in the case of decreased user requests.

Container Registry: Container Registry provides a secure image hosting platform that supports stable containerized image build creation across global regions, and easy image permission management through the image lifecycle.

Container Service for Kubernetes: Container Service for Kubernetes (ACK) is a high-performance container management service, based on Docker and Kubernetes, that provides containerized application lifecycle management.

Dedicated Host: Dedicated Host (DDH) is a fully managed server hosting service that Alibaba Cloud provides for enterprise users. DDH offers dedicated physical resources, flexible deployment options, rich configurations, and high cost-effectiveness. Each tenant can use dedicated physical resources that are not shared with other tenants.

ECS Bare Mental Instance: ECS Bare Metal Instance features both the elasticity of a virtual server and the high-performance and comprehensive features of a physical server. The next-generation virtualization technology of these instances excels in supporting standard ECS and nested virtualization technology.

Elastic Container Instance: Elastic Container Instance (ECI) is a serverless container instance service that allows customers to run containers without managing servers.

Elastic Compute Service: Elastic Compute Service (ECS) is an online computing service that offers elastic and secure virtual cloud servers to cater to cloud hosting needs.

Elastic GPU Service: Elastic GPU Service (EGS) is a GPU-based computing service ideal for scenarios such as deep learning, video processing, scientific computing, and visualization.

Elastic High-Performance Computing: Elastic High-Performance Computing (E-HPC) is an end-to-end public cloud service that provides customers with a fast, elastic, and secure cloud compute platform that interconnects with Alibaba Cloud products.

Function Compute: Function Compute is a fully managed event-driven compute service that allows customers to focus on writing and uploading code without the need to manage infrastructure such as servers. Function Compute provides compute resources for flexible and reliable running of codes.

Operation Orchestration Service: Alibaba Cloud Operation and Maintenance Orchestration Service (OOS) is a comprehensive cloud-based automated Operation and Maintenance (O&M) platform that provides management and execution of O&M tasks.

Simple Application Server: Simple Application Server is a computing service that provides one-click application deployment and supports all-in-one services such as domain name resolution, website publishing, security, application O&M, and application management.

Super Computing Cluster: Super Computing Cluster (SCC) servers improve network performance and increase the acceleration ratio of large-scale clusters. SCC servers boast all the advantages of Elastic Bare Metal instances and feature high-quality network performance with high bandwidth and low latency. SCC servers cater to high-performance computing for artificial intelligence, science/engineering computing, and audio/video processing.

**Enterprise Applications**

Alibaba Cloud Domain Name System: Alibaba Cloud Domain Name System (DNS) is used to translate human-readable domain names into machine readable IP addresses for intercommunication. It routes user requests to the corresponding websites or application servers.

Application Configuration Management: Application Configuration Management (ACM) is used as a centralize management platform for application configurations.

AlibabaMQ for Apache Kafka: AlibabaMQ for Apache Kafka is a fully-managed Apache Kafka service which manages complex infrastructure-related operations for users, such as the configuration, maintenance, upgrading, and monitoring of users' workloads, allowing users to focus on perfecting your streaming data pipelines and applications.

AlibabaMQ for Apache RocketMQ: AlibabaMQ for Apache RocketMQ is a professional message middleware as a core product in the enterprise-level Internet architecture. It supports reliable message-based asynchronous communication among microservices, distributed systems, and serverless applications. This service can be used to easily create a scalable distributed system with loose coupling and high availability.

API Gateway: API Gateway provides API lifecycle management services used for API publishing, management, maintenance, and monetization. API Gateway can be used to share functions and data with partners and third-party developers.

Cloud Web Hosting: Cloud Web Hosting is a virtual server used for storing and hosting website content, built on ECS.

Direct Mail: Direct Mail is used to send email notifications and batch emails.

Enterprise Distributed Application Service: Enterprise Distributed Application Service (EDAS) is the core product of Alibaba Cloud's enterprise Internet architecture solutions. It provides a multifunctional solution for the enterprise-level cloud computing market.

Resource Management: Alibaba Cloud Resource Management Service includes a series of resource management products that support enterprise IT governance. The resource management service supports users to build a suitable resource organization relationship according to their business needs, and this service can organize and manage all users' resources using directories, resource folders, accounts, and resource groups.

**Internet of Things**

AlinPlat: AlinPlat closely connect and coordinate factory equipment, production lines, products, supply chains, and customers to provide companies with a reliable basic platform and rich upper-level industrial applications, combined with comprehensive industrial support, to help companies complete digital transformation.

Fireware Security Scanner: Fireware Security Scanner has non-intrusive, multi-dimensional security risk detection for IoT device firmware to help users identify software security vulnerabilities, early detection of weak passwords, certificate risks, privacy leaks, improper configuration and other security risks, and help users improve the security protection of device firmware level, reduce the recall, repair, update, and upgrade costs after product release.

Link ID² (IoT Device ID): Alibaba Cloud LinkID² is an IoT device identity authentication system that provides device security authentication, secure connection, business data encryption, key management and other end-to-end trusted access ability for IoT systems through trusted computing and cryptography.

Link IoT Edge: Link IoT Edge fully integrates cloud and edge computing and has native support for Alibaba Cloud. It is compatible with a large variety of IoT application layer data collection protocols and enables cloud applications to seamlessly use edge capabilities.

Link IoT Platform: Alibaba Cloud IoT Platform allows IoT companies stable communication between devices and the IoT Platform. IoT Platform also provides various security measures that guarantee individual device security as well as secure communication between devices and the IoT platform. Its data storage and processing capabilities allow for the integration of APIs and other Alibaba Cloud services. It is highly customizable.

Link Living (Feiyan Platform): The Living Internet of Things platform is Alibaba Cloud IoT's Internet of Things platform for consumer smart devices to solve the problems of device connection, App control, device message push, voice control, and voice control that are often encountered in the intelligent devices. A complete set of configuration solutions are provided to greatly reduce the development cost of "equipment-cloud-app".

**Media Services**

ApsaraVideo Live: ApsaraVideo Live is a live streaming platform for both audio and video based on leading content hosting, delivery networks and large-scale distributed real-time transcoding technology. ApsaraVideo Live provides high-definition and uninterrupted live audio and video services that are convenient and accessible, with low latency and high concurrency.

**Network**

Alibaba Cloud DNS PrivateZone: Alibaba Cloud DNS PrivateZone is an Alibaba Cloud private domain name resolution and management service based on VPCs. PrivateZone can be used to resolve private domain names to IP addresses in one or more specified VPCs.

Cloud Enterprise Network: Cloud Enterprise Network (CEN) provides a hybrid and distributed global network ideal for enterprise users with high demand on network coverage. CEN can be used to facilitate communication between VPC to VPC and VPC to IDC. Routing information in CEN can be learned and distributed automatically, which allows CEN to achieve fast routing convergence and improved network quality and security.

Elastic IP Address: Elastic IP Address decouples ECS and public IP address resources, supporting independent public IP address resources that can be bound to Alibaba Cloud VPC-type ECS instances, NAT gateway, and Intranet Server Load Balancer. In addition, they can be dynamically unbound, which decouples public IP addresses from ECS instances, NAT gateway, and Sever Load Balancer, meeting the needs for flexible management.

Express Connect: Express Connect is used for network communication between different Cloud network environments, including connecting multiple VPC intranets and communicating over leased lines across regions and users.

NAT Gateway: NAT Gateway is an enterprise-class public network gateway, providing proxy services (SNAT and DNAT), up to 10 Gbps forwarding capacity, and cross-zone disaster recovery. NAT Gateway helps establish an Internet gateway for a VPC by configuring SNAT and DNAT entries, allowing more flexible use of network resources.

Server Load Balancer: Server Load Balancer (SLB) is a server load balancing service that is used to distribute incoming traffics among several Cloud servers. SLB extends the external service capability of application systems by traffic distribution. It improves the availability of application systems by eliminating a single point of failure.

Virtual Private Cloud: VPC helps customers to build up and isolated network environment. Customers can control their own virtual network, select the IP address range, setting up different network segments, and configuring the routing table and network gateway.

VPN Gateway: VPN Gateway is used to transmit encrypted traffic between Alibaba Cloud VPCs and enterprise data centers, enterprise office networks, or Internet platforms over the Internet. This service can be used to establish reliable and secure connections for data transmission.

**Security**

ActionTrail: ActionTrail is used to implement security analytics, resource change tracking, and to facilitate compliance audits by collecting API calling records of cloud services (including API call records triggered in the console). It standardizes the operation records and saves them to specified OSS buckets as files.

Alibaba Content Security Service: Alibaba Content Security provides intelligent identification services of multimedia content risks via deep learning, which can not only help users reduce the risks of pornography, violence, terrorism, and political-related violations, but also greatly reduce the cost of manual review.

Anti-DDoS Pro (Anti-DDoS Premium): Anti-DDoS service is based on Alibaba Cloud's global scrubbing centers, combined with intelligent DDoS detection and protection systems developed at Alibaba, automatically mitigates attacks and reinforce the security of users' applications, reduce the threat of malicious attacks.

Bastionhost: Bastionhost enables to manage asset O&M permissions in a centralized manner, monitor all O&M operations, and reproduce O&M scenarios in real time to facilitate identity authentication, access control, and operation audit. Bastionhost can be used to troubleshoot issues, such as difficulties in the management of various assets, unclear responsibilities and authorities, and difficulties in the backtracking of O&M events.

Cloud Config: Cloud Config monitors and tracks the changes to users' resource configurations, presenting users with an overview of the changes over time. Cloud Config allows users to set compliance rules for the configurations of users' Alibaba Cloud resources. Cloud Config applies the rules to check the configurations and sends alerts when non-compliant configurations are detected.

Cloud Firewall: Alibaba Cloud Firewall centrally manages the policies that control the traffic from the Internet to users' businesses, the traffic between VPC networks, the traffic on Express Connect instances, and the traffic generated by VPN-based remote access. Cloud Firewall is embedded with an Intrusion Prevention System and can detect outbound connections from users' assets. Alibaba Cloud Firewall can also visualize network traffic, access between businesses, and store network traffic logs generated within the last six months.

Cloud Security Scanner: Cloud Security Scanner (CSS) utilizes data, white hat penetration testing, and machine learning to provide an all-in-one security solution for domains and other online assets. CSS detects web vulnerabilities, illicit content, website defacement, and backdoors to prevent possible financial loss caused by damage to brand reputation.

dbaudit: dbaudit has Intelligent analysis of database communication flow, and fine-grained audit of database access behaviour. Through the audit traceability of the full amount of database behaviours, real-time measurement of dangerous attacks, and intelligent warning of risk statements, database audit will provide the most secure monitoring guarantee for users' most sensitive database assets.

Data Encryption Service: Data Encryption Service is based on a hardware encryption machine certified by the National Cryptographic Bureau and provides a solution for cloud data encryption and decryption.

Fraud Detection: Fraud Detection is a smart, lightweight, and mature business risk control solution provided for enterprise users to quickly mitigate business risks and reduce losses.

Identity as a service: Application Identity Service (IDaaS) is a centralized identity management service that provides a unified application portal, user directory, single sign-on, centralized authorization, and behaviour auditing services for government and enterprise customers. IDaaS supports common identity federation protocols and can also be connected with other identity sources to achieve unified identity authority management and application access control.

Key Management Service: Alibaba Cloud Key Management Service (KMS) is a fully managed service to create, delete and manage encrypted keys to protect your data. For common key management scenarios, users can use APIs or Alibaba Cloud management console to produce and manage Customer Master Keys (CMKs).

Resource Access Management: Resource Access Management (RAM) is an identity and access control service which enables the users to centrally manage users (including employees, systems or applications) and securely control their access to resources through permission levels.

Security Center: Security Center is a flagship security product that integrates both Server Guard and Threat Detection Service. It is a unified security management system that recognizes, analyzes, and alerts of security threats in real-time. With security capabilities, users can automate security operations, responses, and threat tracing to secure cloud and local servers and meet regulatory compliance requirements.

Sensitive Data Discovery and Protection: Sensitive Data Discovery and Protection (SDDP) automatically discovers sensitive data in a large amount of user-authorized data, and detects, records, and analyses sensitive data consumption activities. SDDP detects security compliance violations and predicts risks to help user prevent data leakage and meet the General Data Protection Regulation requirements.

Web Application Firewall: Web Application Firewall (WAF) is a Cloud firewall service that protects core website data and safeguards the security and availability of customers' site. With Alibaba Big Data Cloud capabilities and underlying security, WAF prevents web-based attacks including SQL injection, XSS, malicious BOT, command execution vulnerabilities, and other common web attacks.

**Storage**

Apsara File Storage NAS: Apsara File Storage NAS is a file storage service for Alibaba Cloud ECS instances, Alibaba Cloud E-HPC and Container Service. It provides a distributed file system with unlimited capacity and performance scaling, with a single namespace, multi-party sharing, high reliability, and high availability.

Elastic Block Storage: Elastic Block Storage is a block-level data storage service attached to ECS instances and features low latency, persistence, and high reliability. Block Storage enables automatic replication within the same zone to avoid data loss caused by hardware failures and guarantee the stability and continuity of users' workloads.

Object Storage Service: Object Storage Service (OSS) is a Cloud storage service oriented towards unstructured data. The service is horizontally scalable. OSS supports API access and offers a wide array of programming language support and tool services.

### *Infrastructure*

Alibaba Cloud offers available, secure, and reliable cloud computing infrastructure by taking the following measures: setting up cloud data centers across multiple regions and zones globally, delivering good network access experience, providing cloud products with high availability infrastructure and multi-replica data redundancy based on the Apsara distributed cloud OS, upgrading products, fixing vulnerabilities through hotfix dynamical patching technology, and ensuring operation and maintenance security. Alibaba Cloud data centers are deployed across multiple regions worldwide, with each region supporting multiple zones. Customer workloads can be deployed across regions and zones to implement a high availability architecture.

Alibaba Cloud is dedicated to providing stable and reliable computing and data processing capabilities and enabling an interconnected world. Alibaba Cloud has 71 availability zones in 25 regions across the globe from the west to east. Alibaba Cloud uses multiple telecom service providers for backbone connectivity and multiple co-location management providers for data center facility management.

The scope of locations covered in this report includes the data centers in the following regions:

- Beijing, China
- Chengdu, China
- Guangzhou, China
- Hangzhou, China
- Heyuan, China
- Hohhot, China
- Huzhou, China
- Langfang, China
- Qingdao, China
- Shanghai, China
- Shenzhen, China
- Ulanqab, China
- Zhangjiakou, China
- Hong Kong, China
- Singapore
- Mumbai, India
- Jakarta, Indonesia
- Frankfurt, Germany
- Tokyo, Japan
- Sydney, Australia
- London, United Kingdom
- Silicon Valley, United States
- Virginia, United States
- Kuala Lumpur, Malaysia
- Dubai, United Arab Emirates

***Control Environment***

Alibaba Cloud organizationally aligns with the control environment of Alibaba and leverages some aspects of the control environment at the Group level. Alibaba Cloud defines and implements the internal controls by setting the core values and code of conducts aligning with Group. The roles and responsibilities of each division is clearly defined. The policies, procedures and standards are established, documented and communicated within the organization. Alibaba Cloud has established a risk management framework to identify, analyse and manage risks within the company and related to the services provided. The risk assessments and systematic management monitoring activities are conducted on a regular basis.

***People***

Alibaba Cloud organizational structure was established at all levels with clear reporting lines. Roles and responsibilities for each division are clearly defined. Alibaba Cloud is led by Alibaba Cloud Chief Executive Officer who reports directly to the Chief Executive Officer of the Group. Alibaba Cloud Security Division is responsible for building the cloud security defence eco-system, designing, developing and operating the cloud security products and managing cloud security and compliance. The head of Alibaba Cloud Security Division acts as Chief Information Security Officer of Alibaba Cloud, who is responsible for cloud security eco-system, cloud security management and compliance. The industry compliance and standard team of the Security Division is responsible for managing cloud computing-related external standard compliance, communicating with external regulators, building an information security management system and internal inspection procedures, establishing risk identification and assessment processes, and conducting regular risk assessments. The cloud security team of the Security Division is responsible for security management of cloud products and systems which defines the security standards and benchmark for cloud security operation.

***Information Security Governance***

Alibaba Cloud has implemented an Information Security Strategy for security management including processes and systems. The policies and standards for the information security have been defined and documented to guide the operations. The roles and responsibilities for information security have been clearly defined and communicated within the organization.

***Data***

Data is classified into different data types such as customer data, business data, and company data. Alibaba Cloud's Data Security Management ensures that data security is managed and controlled throughout the data lifecycle that covers data gathering, transmission, processing, exchange, storage, and destruction. Each stage of the data security lifecycle has its associated security management requirements and technologies.

Alibaba Cloud customers retain control and ownership of all Customer Data. Customers are responsible for the development, operation, maintenance, and use of the content of all Customer Data. Alibaba Cloud helps customers ensure the confidentiality, integrity, and availability of their data. Alibaba Cloud's infrastructure security measures and security mechanisms of virtualization technology help prevent customers' cloud resources from unauthorized access and ensures the segregation among multiple tenants in a cloud computing environment. Alibaba Cloud also provides services for customers to encrypt and back up their data. On terminating services to cloud service customers, Alibaba Cloud deletes data assets of customers in a timely manner using data erasure techniques that meet industry standards.

***Processes and Procedures***

Alibaba Cloud has established policies, processes and procedures to formulate control activities and support the achievement of security, availability and confidentiality commitments, relevant laws and regulations, and other system requirements. These processes and procedures cover the following areas:

- Data Security Management
- Infrastructure and Virtualization Security
- Identity and Access Management
- Asset Management
- Customer Authentication and Access Management
- Cryptography and Key Management
- Physical and Environmental Security
- Endpoint Security
- Threat and Vulnerability Management
- Security Incident Management
- Problem Management
- Change Management
- Business Continuity Management
- Vendor Management
- Audit and Compliance
- Interoperability and Portability

Alibaba Cloud uses subservice organizations to provide Heating, Ventilation & Air-conditioning (HVAC) for data centers. Alibaba Cloud requires these subservice organizations to implement HVAC mechanisms such as temperature and humidity monitoring and controls.

The compliance of these subservice organizations with Alibaba Cloud's requirements is periodically reviewed and verified through Alibaba Cloud's vendor management controls in place. A service agreement is signed between Alibaba Cloud and these subservice organizations to define their responsibilities and obligations. In addition, the Service Quality Warranty Letter attached to the agreement specifies Alibaba Cloud's requirements on these subservice organizations' service availability level, business relationship and service scope, as well as information security requirements. These Subservice Organizations submit a service level monthly report to Alibaba Cloud, covering services provided during the past month, major incidents, summary of maintenance performed, and any feedback to Alibaba Cloud. Alibaba Cloud assesses Subservice Organizations' service level and issues an assessment report on a monthly basis, to ensure all Alibaba Cloud's requirements are appropriately met.

## Attachment B - Principal Service Commitments and System Requirements

Alibaba Cloud strives to provide customers with consistent, reliable, secure, and compliant cloud computing services, helping customers ensure the security, confidentiality and availability of their systems and data. Alibaba Cloud is responsible for designing, implementing and operating effective controls over the systems and services to provide reasonable assurance that Alibaba Cloud's service commitments and system requirements are achieved. The services commitments to Alibaba Cloud's customers (user entity) are communicated in the form of Alibaba Cloud Security White Paper, Product Service Level Agreement ("Product SLA"), Membership Agreements, Privacy Policy, description of the service offering of Alibaba Cloud and contracts. The details of Product SLA, Membership Agreement and other legal documents can be found at Alibaba Cloud Legal Document Centre.

Alibaba Cloud has also established various communication channels for customer support including but not limited to live chat, ticket, email, suggestion posting, etc. Any potential issues that could impact the customers are also communicated with customers by global customer support team through established mechanisms.

Moreover, Alibaba Cloud adheres to international standards and best practices. The details related to security and compliance are communicated with customers at Alibaba Cloud Trust Center.

The security of applications built on Alibaba Cloud is the joint responsibility of Alibaba Cloud and user entities. Alibaba Cloud is responsible for the security of the underlying cloud service platform and providing security services and capabilities to customers, while customers are responsible for the security of applications and data hosted on Alibaba Cloud. Alibaba Cloud's customers should assess their objectives in choosing the services and designing the on-cloud architecture with consideration of both Alibaba Cloud's controls in place and the configurations and operational controls required as part of their security responsibilities. When designing and providing the services, to achieve the service commitments to its customers and comply with the relevant laws and regulatory requirements, Alibaba Cloud has established system and operational requirements in the form of policies, standards, manuals and procedures which are documented and communicated in organisational wide approaches.