

Product Comparison

Alibaba Cloud for AWS Professionals

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Overview

Alibaba Cloud for AWS Professionals

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1. Objective

This document is intended to help professionals, such as engineers, architects, and operations and maintenance (O&M) personnel, who are familiar with AWS services to understand how to navigate through Alibaba Cloud services. This document compares Alibaba Cloud with AWS in terms of products, characteristics, and solution architecture to reveal the similarities and differences between the two cloud providers regarding concepts, terminologies, and implementation. In addition, it provides quick-reference mappings of AWS products, concepts, and terminology to the

corresponding products, concepts, and terminology on Alibaba Cloud. This section provides a general overview of the services provided by the two cloud providers. For more information, please navigate to the relevant categories for specific products.

2. Why Alibaba Cloud

Founded in 2009, Alibaba Cloud provides a comprehensive set of cloud computing services with global coverage to help you develop your businesses. Alibaba Cloud is the cloud computing branch of Alibaba Group, serving the internal demands of Alibaba's extensive e-commerce ecosystem, including Taobao, Tmall, and Alipay. According to the Gartner's report *Market Share Analysis: Public Cloud Services, Worldwide, 2016*, Alibaba Cloud is the third largest cloud service provider globally. Alibaba Cloud is also the leader of the Chinese market, with more than 40 cloud computing products and services, spanning across 18 data center regions globally.

3. Portal websites

Like AWS, Alibaba Cloud has two portals, namely the **Chinese Portal** and **Global Portal**, which provide services for enterprises and individuals who are registered in China and abroad, respectively. The Global Portal consists of a bilingual console (English and Chinese) and a multilingual website (English, Chinese, and Japanese). On either portal, users can browse and read about Alibaba Cloud products and services, as well as register or log on to the portal to purchase and manage their cloud services. Because laws and security regulations vary from region to region and from country to country, the Chinese portal differs from the global portal to some extent in terms of products, solutions, support services, and marketplace product offerings. Due to exchange rates and local tax rates, prices on the Chinese portal and global portal may vary as well. For pricing details, see [Pricing on Chinese Portal](#) and [Pricing on Global Portal](#).

To launch services in China and internationally, you do not need to have separate accounts on the Chinese Portal and Global Portal. For more information, see [6.1 Accounts](#).

4. Regions and zones

AWS resources are distributed globally in multiple positions, and these positions are marked by regions and zones. A region is a cluster of data centers. Each region represents a geographically separate area, and may be composed of multiple separate zones.

Alibaba Cloud uses the same concept and terminologies: regions and zones. Regions are located in different cities around the world, whereas zones are physical areas within the same region but with independent power grids and networks.

For the full list of our regions and zones, see [Regions and Zones](#).

Element	AWS Term	Alibaba Cloud Term
Cluster of data centers and services	Region	Region

Abstracted data center	Availability zone	Zone
Edge node	Edge Network Location	Edge node

Note: The availability of regions and zones do not apply to all products of Alibaba Cloud. The zones of some services are transparent to users, such as for Object Storage Service (OSS) and Elastic Compute Service (ECS) images, while other services run on multiple regions by default, such as DNS and CDN.

5. Endpoints

An endpoint is the web address (URL) of your service, which can be accessed by a client application. To reduce the network latency of application requests, most AWS services are provided with endpoints to optimize user requests.

Alibaba Cloud uses the same design to provide endpoints for most services. For the list of endpoints of Object Storage Service, see [OSS Endpoints](#).

Element	AWS Term	Alibaba Cloud Term
Entry point to a service	Endpoint	Endpoint

6. Accounts, constraints, and pricing

6.1 Accounts

Like AWS, Alibaba Cloud users are required to create and configure accounts before purchasing and using Alibaba Cloud services. For details about operating procedure, see [Create an Alibaba Cloud Account](#). After the procedure is complete, you can log in to Alibaba Cloud console and purchase services. You only need one Alibaba Cloud account to operate globally and within China. This greatly simplifies billing, account management, and service deployments for products and services that are launched internationally.

To purchase an ECS server that is located within the Mainland China territory, you will need to comply with China's real-name authentication requirements. For more information, see [Real-name Registration](#). The order generated based on the services you purchase will be sent to your account. You can query and download the billing on the [Billing Management Page](#).

6.2 Service constraints

Alibaba Cloud sets default service purchase quotas and constraints on accounts, which are similar to the account constraints on AWS. These limits are set to ensure optimized performance and security for users. Some of the quotas can be increased by opening a ticket on the [Console](#). Visit [ECS Limits](#)

to familiarize and understand the quotas and constraints set for ECS products and services.

6.3 Pricing

Like AWS, Alibaba Cloud employs different billing methods and prices for different services, allowing you to choose the proper billing model for your needs. The two main types of billing methods are Subscription and Pay-As-You-Go. Subscription is more economical for long term usage, while Pay-As-You-Go is better for small-scale, experimental usage of Alibaba Cloud products. For details about pricing, see [Pricing Page](#).

7. Resource management interfaces

7.1 Web based console

The AWS web based console is an important entry point for AWS to manage service resources. Alibaba Cloud also provides a web based console on which users create, manage, and monitor their resources. You can also use the **Management Terminal** on the console to connect directly to Alibaba Cloud servers. For details about the web based console, visit the [Console Page](#).

7.2 Rest API

Both AWS and Alibaba Cloud provide REST APIs for most functions provided by the console.

7.3 Command line interface (CLI)

Like AWS, Alibaba Cloud provides a CLI through which users can interact with and manage cloud computing services and resources. AWS provides an Amazon CLI tool, while Alibaba Cloud provides an **Alibaba Cloud CLI tool**. The CLI tools provide standard CLIs for most cloud computing services and are compatible with mainstream OSs, including Windows, Linux, and Mac OS X.

Element	AWS Term	Alibaba Cloud Term
Web-based console	Console	Console
REST API	API	API
Command line interface	Amazon CLI	Alibaba Cloud CLI

8. Types of cloud services

The following sections compare general cloud computing services and the relevant characteristics of AWS and Alibaba Cloud, respectively. Generally speaking, cloud services are composed of a set of basic services, falling into computing, storage, network, and database services. Basic AWS and Alibaba Cloud services include:

Category	AWS	Alibaba Cloud
Computing	Elastic Compute Cloud (EC2), EC2 Elastic GPUs, Auto Scaling, Elastic Container Service (ECS)	Elastic Compute Service (ECS), Elastic GPU Service (EGS), Auto Scaling, Container Service
Storage	Amazon Simple Storage Services (S3), DynamoDB, SimpleDB, CloudFront, Elastic File System (EFS)	Object Storage Service (OSS), Table Store, Alibaba Cloud CDN, Network Attached Storage (NAS)
Network	Virtual Private Cloud (VPC), Direct Connect, Direct Connect, NAT Gateway, ELB, Elastic IP Addresses, VPN Gateway	Virtual Private Cloud (VPC), Express Connect, Express Connect, NAT Gateway, SLB, Elastic IP, VPN Gateway
Database	Relational Database Service (RDS), ElastiCache, DynamoDB, Database Migration Services (DMS)	ApsaraDB for RDS, ApsaraDB for Redis, ApsaraDB for MongoDB, HybridDB for PostgreSQL, Data Transmission Service (DTS)

Upper layer services can be created on these basic services through user platforms. Typically, these upper layer services fall into:

- Security Services

These services are employed to protect user data, applications, and services as well as to prevent malicious attacks. For example, AWS provides AWS Shield Standard/Advanced and AWS WAF, and Alibaba Cloud offers Anti-DDoS Basic/Pro, Web Application Firewall, and Server Guard.

- Management Services

These services are employed to help users trace cloud applications and manage application permissions and keys. For example, AWS has CloudWatch, Identity and Access Management (IAM), and Key Management Service (KMS), and Alibaba Cloud has CloudMonitor, Resource Access Management, and Key Management Service.

- Domains & Websites

These services are employed to provide users with products and services for website development. This includes Domain Name System (DNS) services, domain names purchasing and management, and website building tools. Examples include AWS Route 53 and Alibaba Cloud Web Hosting, DNS, and Domains.

- Big Data Analytics Services

These services are employed to process a massive amount of data. AWS products include AWS Kinesis, and EMR, and Alibaba Cloud products include MaxCompute, E-MapReduce, DataWorks, and DataV.

- Application Services

These services are used to optimize cloud providers' application architectures. For example, AWS has SNS and Alibaba Cloud has Message Service.

- Media Services

These services are employed to help users to create media application and platform on cloud. For example, AWS has Elemental MediaLive and Elastic Transcoder, and Alibaba Cloud has ApsaraVideo Live and ApsaraVideo for Media Processing.

9. Services

The following table provides a one-to-one mapping of the services provided by AWS and Alibaba Cloud (global portal):

- Compute

Description	AWS	Alibaba Cloud
Virtual Servers	Elastic Compute Cloud (EC2)	Elastic Compute Service (ECS)
GPU Servers	EC2 Elastic GPUs	Elastic GPU Service (EGS)
Auto Scale	Auto Scaling	Auto Scaling
Container Management	Elastic Container Service (ECS)	Container Service

- Storage & CDN

Description	AWS	Alibaba Cloud
Object Storage	Amazon Simple Storage Services (S3)	Object Storage Service (OSS)
NoSQL Database	DynamoDB ,SimpleDB	Table Store
Content Delivery	CloudFront	Alibaba Cloud CDN
Shared File Storage	Elastic File System (EFS)	Network Attached Storage (NAS)

- Networking

Description	AWS	Alibaba Cloud
Networking	Virtual Private Cloud (VPC)	Virtual Private Cloud (VPC)
Dedicated Network	Direct Connect	Express Connect
NAT Gateway	NAT Gateway	NAT Gateway
Load Balancing	Elastic Load Balancing (ELB)	Server Load Balancer (SLB)

Elastic IP	Elastic IP Addresses	Elastic IP
Cross-premises Connectivity	VPN Gateway	VPN Gateway

- Databases

Description	AWS	Alibaba Cloud
Relational Database	Relational Database Service (RDS)	ApsaraDB for RDS
Caching	ElastiCache	ApsaraDB for Redis
Elastic Data Warehouse	RedShift	HybridDB for PostgreSQL
NoSQL - Document Storage	N/A	ApsaraDB for MongoDB
Database Migration	Database Migration Services (DMS)	Data Transmission Service (DTS)

- Security

Description	AWS	Alibaba Cloud
DDoS Mitigation	AWS Shield - Standard	Anti-DDoS Basic
DDoS Mitigation	AWS Shield - Advanced	Anti-DDoS Pro
Mobile Security	N/A	Mobile Security
Web Application Security	Web Application Firewall (WAF)	Web Application Firewall
Instance Security	N/A	Server Guard
Certificate Service	Certificate Manager	SSL Certificates Service

- Monitoring & Management

Description	AWS	Alibaba Cloud
Monitoring	CloudWatch	CloudMonitor
Authentication and Authorization	Identity & Access Manager (IAM)	Resource Access Management
Encryption	Key Management Service	Key Management Service
Resource Orchestration	CloudFormation	Resource Orchestration Service

- Domains & Websites

Description	AWS	Alibaba Cloud
Web Applications	Elastic Beanstalk	Web Hosting

Domain Name	Route 53	Domains
Domain Name System (DNS)	Route 53	Alibaba Cloud DNS

- Analytics

Description	AWS	Alibaba Cloud
Big Data Processing	Amazon EMR	MaxCompute ,E-MapReduce
Data Visualization	N/A	DataV
Development Platform	N/A	DataWorks

- Application Service

Description	AWS	Alibaba Cloud
Notification Service	Amazon Simple Notification Service (SNS)	Message Service
API Service	API Gateway	API Gateway
Log Service	Amazon Kinesis Data Firehose	Log Service
Email Sending and Receiving	Amazon Simple Email Service	DirectMail

- Media Services

Description	AWS	Alibaba Cloud
Live Video Streaming	AWS Elemental MediaLive	ApsaraVideo Live
Media Transcoding Service	AWS Elastic Transcoder	ApsaraVideo for Media Processing

Compute

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This article discusses the main differences and similarities between AWS and Alibaba Cloud compute services. It covers the following products:

Feature	AWS	Alibaba Cloud
Virtual Servers	Elastic Compute Cloud (EC2)	Elastic Compute Service (ECS)
Block Storage	EBS	ECS Disk
Automatic Scaling	Auto Scaling	Auto Scaling
Container Service	EC2 Container Service (ECS)	Container Service
High Performance Computing	High Performance Computing (HPC)	Elastic High Performance Computing (E-HPC)

1. Virtual servers

Both AWS EC2 and Alibaba Cloud ECS provide virtual servers for cloud computing. Virtual servers, or virtual machines, provide IaaS services to users. Alibaba Cloud and AWS servers share similar terminologies and concepts, as shown in the following table:

Feature	Amazon EC2	Alibaba Cloud ECS
Virtual machine	Instance	Instance
Images	Amazon Machine Image	Images
Temporary Instance Type	Spot instance	Spot instance
Firewall	Security Group	Security Group
Automatic Instance Scaling	Auto Scaling	Auto Scaling
Persistent Block Storage of Instances	Elastic Block Store	Cloud Disk
Local Mount Disk	Instance storage	Local disk
Shared Block Storage	N/A	Shared Block Storage
Disk Volume Backup	Snapshot	Snapshot
VM Import	RAW, OVA, VMDK, and VHD	RAW, VHD
Deployment Location	Zone	Zone

1.1 Login instance

AWS and Alibaba Cloud allows you to connect to your virtual server through SSH protocol. Alibaba Cloud also allows you to connect directly to the server using the Management Terminal on the console.

Connecting through SSH protocol: Alibaba Cloud ECS and AWS EC2 differ in login instance methods. Though both servers provide SSH keys for login, Alibaba Cloud allows an SSH key to be created after an instance startup is successful and a login after the instance is bound. Furthermore, Alibaba Cloud ECS provides the username + password login method for users who are not familiar with SSH keys.

Connecting by Management Terminal: Besides the method of connecting to your virtual machine by SSH client tools, Alibaba Cloud provides an easy way to allow users to connect to ECS directly by Management Terminal (also called VNC) on the console. VNC connection is a better option if you are checking the boot procedure, configuring BIOS during startup, reconfiguring the firewall, or troubleshooting when the instance malfunctions.

Alibaba Cloud ECS and AWS EC2 employ the same method to categorize VM instances by specifications and types, but the categorization differs in terms of CPU, memory, storage performance, and network capability. AWS EC2 categorizes instances by configuration, while Alibaba Cloud ECS categorizes instances into different families by application scenarios. Each family is composed of different instance types. Learn more about Alibaba Cloud ECS instance families at [Alibaba Cloud ECS Instance Families](#).

Alibaba Cloud ECS provides multiple types of instance families and configurations to meet business requirements and performance requirements in different scenarios. The following table lists AWS EC2 instance types and Alibaba Cloud ECS instance families.

TargetGroup	Scenario	AWS EC2 Instance Type	Alibaba Cloud ECS Instance Family
Entry Level	General Type	t2	t5
EnterPrise Level	General type	m4, m5	g5
	Computing instance	c4, c5	c5
	High-frequency computing instance	c5	c4, cm4, ce4, hfc5
	Memory instance	r4	r5, re4
		x1	se1
	Big data instance	d2	d1
	Local SSD instance	i2, i3	i1, i2
	Instance of high capability of packet forwarding	N/A	sn1ne, sn2ne, se1ne
	GPU visualization computing instance	g2, g3	ga1
	GPU computing instance	p2, p3	gn4, gn5

	FPGA computing instance	f1	f1
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1.2 Instance images

Instance image refers to the running environment template for virtual machine instances. AWS EC2 and Alibaba Cloud ECS use images to create instances. AWS instance images are referred to as Amazon Machine Images (AMIs), and Alibaba Cloud instance images are simply referred to as Images.

When an instance is created, Alibaba Cloud ECS provides four types of images for users to choose from: public images, cloud marketplace images, user shared images, and custom images. AWS EC2 provides official AMI templates, custom AMIs, cloud marketplace AMIs, and community AMIs.

Public images are system images provided by Alibaba Cloud ECS for users, which are similar to the AWS official AMI templates.

Cloud marketplace images are provided by third-party ISV partners on the Alibaba Cloud Marketplace. Beside the OS, cloud marketplace images may be preinstalled with other software and services.

Like the custom AMIs of AWS, Alibaba Cloud custom images are created by users based on snapshots or the current state of an instance. Custom images can be shared to other specific Alibaba Cloud users by using the image sharing function of Alibaba Cloud ECS.

The community AMIs of AWS is available to all AWS accounts, a feature which is currently not supported on Alibaba Cloud ECS.

Like EC2 AMIs of AWS, ECS images are a type of regional resource. Custom images and shared images can be used only in the same region. To use the images in a different region, you need to replicate them to that region first.

Category	AWS	Alibaba Cloud
Basic	EBS magnetic media	Basic cloud disk
Intermediate	General SSD (gp2)	Ultra cloud disk
Advanced (I/O Optimized)	PIOPS (io1)	SSD cloud disk

Additionally, Alibaba Cloud also provides two types of local block storage for instances, which feature low access latency, high random IOPS, and high I/O throughput: local NVMe SSD and SATA HDD. These ECS type families with local block disk are similar to AWS EC2 of local storage.

Instance pricing model: Alibaba Cloud ECS provides pay-as-you-go and yearly/monthly subscription options. The pay-as-you-go model is similar to that of AWS EC2, which is a post-paid based payment. The yearly/monthly purchase is a payment and settlement method used in the prepaid model.

Similar to AWS EC2 Spot Instance, Alibaba Cloud ECS currently provides billing models for spot instances. For more information on Alibaba Cloud Spot instances, see [Alibaba Cloud Spot instances](#).

Instance configuration modification: The yearly/monthly instances of Alibaba Cloud ECS support anytime upgrade and renewal for configuration downgrading, allowing users to conveniently adjust the ECS specifications according to server loads and business requirements.

2. Automatic scaling

Auto Scaling is a feature that automatically adjusts computing resources based on the volume of user requests. Both AWS and Alibaba Cloud support automatic scaling, and the products share the same name (Auto Scaling). Auto Scaling enables users to set automatic scaling policies according to actual business circumstances and add/release ECS instance resources to meet business requirements.

Both Alibaba Cloud Auto Scaling and AWS Auto Scaling support the following scaling modes:

- Custom mode: Add/release compute instances, such as AWS EC2 and Alibaba Cloud ECS, manually.
- Scheduled mode: Users configure periodic tasks to add/release compute instances according to a schedule.
- Dynamic mode: Auto Scaling is performed automatically by monitoring compute resources. AWS adds/releases EC2 instances based on the CloudWatch scaling policy, while Alibaba Cloud adds/releases ECS instances based on the CloudMonitor scaling policy.

Function Feature	Amazon Auto Scaling	Alibaba Cloud Auto Scaling
Custom mode	Supported	Supported
Scheduled mode	Supported	Supported
Dynamic mode	Supported	Supported

AWS Auto Scaling is enabled by Amazon CloudWatch and is available for use at no additional fees. However, the usage of the Amazon EC2 instance added by Auto Scaling, and Amazon CloudWatch service fees, still apply and are billed separately.

Similar to AWS, Alibaba Cloud Auto Scaling is offered to customers at no extra cost. You will only be charged for the usage of the ECS instances automatically created or manually added to Auto Scaling.

3. Container service

AWS EC2 Container Service (ECS) and Alibaba Cloud Container Service are container orchestration services that simplify container management and application scaling. Both services replace the need to install, operate, and scale your container cluster infrastructure.

Alibaba Cloud Container Service enables you to efficiently run and manage Docker applications on a distributed cluster of Alibaba Cloud ECS instances. Being a fully-managed service, Container Service helps you to focus on your applications rather than managing container infrastructure.

AWS ECS and Alibaba Cloud Container Service use the same service model. With Alibaba Cloud

Container Service, users can deploy, manage, and expand Docker containers with ease. Alibaba Cloud Container Service supports App lifecycle management using Docker containers, provides a variety of App publishing methods and continuous delivery capabilities, supports microservice architecture, and integrates with Server Load Balancer, Security Group, Cloud Disk, and Resource Access Management.

Like Amazon Elastic Container Registry, Alibaba Cloud Container Service provides an image warehouse (Container registry) hosted by Alibaba Cloud, allowing access to official Alibaba Cloud images and those of Docker, and enables accelerated access to official Docker images.

Amazon ECS and Alibaba Cloud Container Service differ in their pricing models. Amazon ECS provides two different pricing models: Fargate Launch Type Model and EC2 Launch Type Model.

Like the second pricing model of Amazon ECS, Alibaba Cloud Container Service is free of charge. Resources used in collaboration with Container Server (including Server Load Balancer and ECS) are charged separately. ECS instances or Server Load Balancer instances automatically created from the Container Service or manually added are billed by their respective prices.

4. High performance computing

AWS High Performance Computing (HPC) and Alibaba Cloud Elastic High Performance Computing (E-HPC) are optimized compute resources created by using parallel computing and aggregating multiple computing capabilities.

AWS and Alibaba Cloud both provide high performance computing capabilities that allow users to solve complex, compute intensive challenges in the field of science, engineering, and business.

However, Alibaba Cloud E-HPC provides an all-in-one high performance computing service which we call HPCaaS. E-HPC supports Infrastructure as a Service (IaaS) with high-performance CPU and heterogeneous computing GPU instances, Platform as a Service (PaaS) with high-performance computing software stack, and Software as a Service (SaaS) with application template customization.

There are two different ways to help you deploy and manage an HPC cluster on AWS. One is using a fully-managed service offered by AWS, such as AWS Batch, Lambda, and Step Functions, while another way is by using third-party software.

Unlike AWS HPC, Alibaba Cloud E-HPC provides a fully-managed control panel that allows user to deploy an HPC cluster, manage users, upload job data, and submit the user job.

To launch or scale up HPC clusters on AWS, users can benefit from automation using AWS Auto Scaling. Alibaba Cloud E-HPC also provides auto scaling capability to allow user to scale up/down the cluster ECS nodes automatically.

Every AWS service provides encryption and options to grant granular permissions for each user while maintaining the ability to share data across approved users.

Similar to AWS HPC, Alibaba Cloud E-HPC is protected by multi-tenant security isolation of the highest level that is provided by ECS, EGS, and VPC. Furthermore, E-HPC service also allows user to manage user permissions and passwords with the E-HPC console.

AWS users only need to pay for the services they consume, and once the resources have been stopped, there are no additional costs or termination fees.

Like AWS, E-HPC is billed for the resources that you created: ECS, E-HPC, Network Attached Storage (NAS), and Internet traffic of login nodes. E-HPC is free of charge during the test invitation phase.

These two services can be compared as follows:

Function Feature	Amazon HPC	Alibaba Cloud E-HPC
Cluster Deployment and Management	Third-party software	E-HPC Console
User Management	Third-party software	E-HPC Console
Auto Scale	Supported	Supported
Secure	Supported	Supported

Storage & CDN

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This article discusses the main differences and similarities between AWS and Alibaba Cloud of storage & Content Delivery Network (CDN) services. It covers the following products:

Feature	AWS	Alibaba Cloud
Object storage	Simple Storage Service(S3)	Object Storage Service(OSS)
Content Delivery Network	CloudFront	CDN
File Storage	Elastic File System (EFS)	Network Attached Storage (NAS)
NoSQL Database	DynamoDB	Table Store

1. Object storage

This section compares AWS Simple Storage Service S3 and the distributed Object Storage Service (OSS) of Alibaba Cloud.

Object storage is a type of data storage where data are managed as objects, instead of blocks or files. Typically, object storage is used to store large files that are dominated by read operations. Like AWS S3, Alibaba Cloud OSS boasts high reliability, cost effectiveness, and scalability. Users can request data of any amount, regardless of time or location.

To distinguish between scenarios requiring different data access frequencies, Alibaba Cloud OSS categorizes storage types into Standard, Infrequent Access, and Archive, which are equally reliable but have different availability, shortest storage time, and storage overhead. For details, see [Introduction to Storage Types](#).

1.1 Service models

The following table compares the basic functions and terminologies of AWS S3 vs Alibaba Cloud OSS:

Function Feature	Amazon S3	Alibaba Cloud OSS
Deployment unit	Bucket	Storage space
Object identifier	Key	Key
Object metadata	Metadata	Object meta

Object version control	Supported	Not supported
Object lifecycle management	Supported	Supported
Update event notification	Supported	Supported
Storage type	Standard, Infrequent Access, Glacier, and low redundancy storage	Standard, Infrequent Access, and Archive
Deployment location	Region	Region

1.1.1 Storage space (bucket)

Similar to AWS S3, Alibaba Cloud OSS uses buckets to store data. As the place where data is stored, a bucket is configured with a region, access permission, and lifecycle to meet user requirements. An AWS S3 bucket must be named in accordance with the DNS standard. Similarly, a bucket of Alibaba Cloud OSS must be named in line with certain standards. Bucket names of AWS S3 and Alibaba Cloud OSS must be globally unique, and they should not be nested.

By setting a bucket ACL, Alibaba Cloud OSS authenticates a user to see whether the user has access permission for a bucket, thereby implementing access control by storage space levels.

Buckets of Alibaba Cloud OSS do not currently support version control, though it is supported by AWS S3. Alibaba Cloud OSS will support this feature soon, please stay tuned for more information.

The following table compares the features and terminologies of the deployment unit functions belonging to AWS S3 and Alibaba Cloud OSS:

Function Feature	Amazon S3	Alibaba Cloud
Object storage	Simple Storage Service(S3)	Alibaba Cloud OSS
Deployment Unit	Bucket	Storage space (bucket)
Bucket ACL	Supported	Supported
Lifecycle Management	Supported	Supported
Max Bucket Quantity	100	30
Storage Type	Standard, Standard IA, and Glacier	Standard, Infrequent Access, and Archive
Version Control	Supported	Not Supported
Deployment Location	Region	Region

1.1.2 Object

Like AWS S3, Alibaba Cloud OSS stores file data in buckets. The file data is composed of a Key-Value and Object Meta pair. The Key is unique within a bucket, the Value stores object content, and the Object Meta is a pair of key values which describe object properties, including last modification time, size, and custom information.

Similar to AWS S3, Alibaba Cloud OSS does not place a limit on the quantity of objects in a bucket. For large files, Alibaba Cloud OSS supports segment-by-segment uploading. The max file size cannot exceed 48.8 TB.

1.2 Security

1.2.1 Object permission management (Object ACL)

Alibaba Cloud OSS and AWS S3 use similar methods to manage object permissions. Each Alibaba Cloud OSS object can be configured with read and write permissions for the root account or any sub-account. By default, access permissions inherit bucket ACL properties. Users can set an ACL to Private-Read-Write, Public-Read, or Public-Read-Write. You are strongly discouraged from using the Public-Read-Write permission, and are should use it cautiously.

In addition, in combination with Alibaba Cloud Security Token Service (STS), OSS can employ the temporary security credentials of STS to implement object access, without exposing the account AccessKey, thereby achieving highly secure access control.

1.2.2 Data security management

Alibaba Cloud OSS provides similar data encryption functions as AWS S3 to protect data during transmission and storage. Users can protect data in transmission by encrypting it through a client.

Alibaba Cloud OSS uses AES256 algorithms to implement data encryption on a server. After data is uploaded to OSS, the server encrypts the data and stores it on OSS. If a user downloads the data, the OSS decrypts the data and returns original data to the user.

1.3 Object management

1.3.1 Object lifecycle management

Alibaba Cloud OSS and AWS S3 provide similar lifecycle management functions. Alibaba Cloud OSS provides conversion and expiration operations for object lifecycles, allowing users to set matching rules, countdown times, and a schedule for objects, based on which the OSS degrades the storage type of the objects or deletes the objects that have expired.

Alibaba Cloud OSS categorizes storage types into Standard, Infrequent Access, and Archive, which correspond to the Standard, Standard IA, and Glacier types on AWS S3.

1.3.2 Event notification

Both Alibaba Cloud OSS and AWS S3 provide event notification functions. To enable users to receive notifications in case of an event in the storage space, Alibaba Cloud OSS allows users to create event notification rules. Based on these rules, a message will be sent to a target after the corresponding event.

Alibaba Cloud OSS has a different message push target from AWS S3. The OSS allows an event message to be sent to a specified URL over HTTP or a topic of Alibaba Cloud Message Service. Users can obtain event messages after subscribing to the topic.

1.4 OSS image processing service (Image service)

Alibaba Cloud OSS provides easy-to-use image processing functions for image files. After a user uploads images to OSS, the user can process the images through the RESTful API, for example, converting the image format, zooming, cropping, rotating, or adding watermarks. The following table compares the features and terminologies of the object function between AWS S3 and Alibaba Cloud OSS:

Function Feature	Amazon S3	Alibaba Cloud OSS
Storage object	Object	Object
Object ACL	Supported	Supported
Max object size	5T	48.8T
Data reliability	99.999999999%(11s 9)	99.999999999%(10s 9)
Object metadata	Metadata	Object meta
Object lifecycle management	Supported	Supported
Object version control	Supported	Not Supported
Update event notification	Supported	Supported
Cross-region Replication	Supported	Supported
Object append write	Not Supported	Supported
Concurrent or segment upload	Supported	Supported
High consistency	YES	YES
Data encryption	Encrypted on client and server	Encrypted on client and server
Request protocol	HTTP/HTTPS	HTTP/HTTPS/Bit Torrent
Image processing function	Not Supported	Supported

1.5 Service level agreement (SLA)

Both AWS S3 and Alibaba Cloud OSS provide service availability guarantees. For KPIs that do not reach the guarantee standard, the cloud providers will provide compensation according to the time the service is unavailable. For details about the Alibaba Cloud OSS SLA, see [Alibaba Cloud OSS Service Level Agreement](#).

1.6 Pricing

Amazon S3 offers a free usage tier for each month, where users only pay for the resources they consumed that exceed a predefined limit. The pricing for your S3 is dependent on the storage usage by storage type and size, request type and quantity, storage management fees, data transferred “out” of Amazon S3, and data transfer acceleration fees. Like Amazon S3, Object Storage Service (OSS) fees are calculated based on the total volume of storage used, the amount of data transferred, and number of API requests made. Learn more about OSS Pricing.

2. Content delivery

Content delivery network refers to the network of edge or proxy servers, which cache data in order to accelerate access to certain files. AWS CloudFront and Alibaba Cloud CDN are two global content delivery network (CDN) vendors that provide network of Edge Locations and Edge Nodes distributed globally. This section compares the AWS CloudFront and Alibaba Cloud CDN in different dimensions.

2.1 Service model

Similar to AWS CloudFront, Alibaba Cloud CDN publishes source content to an edge node over a transmission network that is composed of edge nodes deployed globally. In combination with a precise scheduling system, the CDN improves users’ web request speed.

2.2 Basic functions

The following table compares the basic features and terminologies of content delivery network between AWS CloudFront and Alibaba Cloud CDN:

Function Feature	Amazon CloudFront	Alibaba Cloud CDN
Source Station Type	S3 domain name, custom domain name	OSS domain name, custom domain name, and IP address
Automatic Compression	Supported	Supported
Cache Request Type	Default: GET, HEAD Optional: OPTIONS	GET
Transparently Transmitted Request Type	Configurable, the following options are supported: 1) GET, HEAD; 2) GET, HEAD, OPTIONS; 3) GET, HEAD, OPTIONS, PUT, POST, PATCH, DELETE	The following requests are supported but not configurable: GET, POST, HEAD, PUT, DELETE, OPTIONS
Cache Refresh	Not supported	supported
Cache Failure	supported	Not supported
HTTP Jump to HTTPS	Supported	Supported
CDN Cache TTL	Supported	Supported

Configuration		
Access Log	S3	Console
Geographic Location Limit	Supported	Not Supported

2.2.1 Source station type

Alibaba Cloud CDN can be configured as an origin site, including OSS domain name, custom origin domain name, and IP address.

AWS CloudFront accelerates delivery of S3 domain name or custom origin domain name configurations.

2.2.2 Data compression

To reduce transmission content and accelerate delivery speed, both Alibaba Cloud CDN and AWS CloudFront provide the data compression function.

2.2.3 Cache request type

Alibaba Cloud CDN caches GET requests, and transmits POST/HEAD/PUT/DELETE/OPTIONS requests to the origin site transparently. Unlike Alibaba Cloud CDN, AWS CloudFront caches GET and HEAD requests by default, and caches OPTIONS requests selectively, depending on the requirements of CloudFront users.

2.2.4 Cache refresh

In certain scenarios, for example, origin site updates or static content modifications, users may need to refresh the CDN cache manually. Alibaba Cloud CDN allows users to pull the latest content from the origin site manually to refresh the CDN content. Alibaba Cloud CDN supports URL refresh, directory refresh, and URL push. AWS CloudFront does not support refreshing specified cache content.

2.2.5 Cache invalidation

In certain scenarios, users may need to remove CDN cache content in advance. On AWS CloudFront, users set cache objects to the Invalidation state and pull the latest content from the origin site to access the objects or access objects based on a file name that carries a version of the objects using the object version management function. Alibaba Cloud CDN does not currently support forcibly configuring cache invalidation.

2.2.6 Access log

Alibaba Cloud CDN and AWS CloudFront provide log download/combination tools. Alibaba Cloud CDN implements log download on the console, but AWS CloudFront stores logs in S3 buckets for users to download.

2.2.7 Geographic location restriction

To specify the regions where content is delivered, AWS CloudFront allows users to set a whitelist and blacklist of countries. Where data can be delivered is determined based on the whitelist and blacklist. Alibaba Cloud CDN does not support this function.

2.3 Security

The following table compares the security functions and terminologies of content delivery network between AWS CloudFront and Alibaba Cloud CDN:

Function Feature	Amazon CloudFront	Alibaba Cloud CDN
Full Link HTTPS	Supported	Supported
Integrated Certificate Management	Yes	Yes
Access Authentication	Supported	Supported
Sub-account Access Control	Supported	Supported
WAF Security Defense	Supported	Supported

2.3.1 Https

Similar to AWS CloudFront, Alibaba Cloud CDN supports full link HTTPS speedup. Alibaba Cloud users can select a certificate using the certificate service or upload a custom certificate/private key and query and update the certificate in online mode.

The two cloud providers support redirect HTTP to HTTPS. Alibaba Cloud CDN supports HTTP and HTTPS, redirect HTTP to HTTPS, and redirect to HTTP or HTTPS.

Alibaba Cloud CDN does not currently support SNI back-to-source.

2.3.2 Access authentication

AWS CloudFront and Alibaba Cloud CDN support access authentication for private content. Alibaba Cloud CDN uses signature URL through which a user initiates a request to the CDN. Upon receiving the request, the CDN node checks the request for its validity and rejects invalid requests. Alibaba Cloud CDN supports three models of signature encryption methods.

AWS CloudFront creates Origin Access Identity user (Trusted Signer), and authorizes the Trusted Signer with the right to access private content. When a user who meets the permission requirement requests to access the private content, an App delivers a Signed URL or Set-Cookie headers. The user clicks the Signed URL or Set-Cookie, and AWS CloudFront checks the request for its validity using a key and rejects invalid requests.

2.3.3 Sub-account access control

Like AWS CloudFront, Alibaba Cloud CDN authorizes sub-accounts with a policy to access CDN resources based on the Resource Access Management (RAM) service, thereby limiting or authorizing permissions on the CDN resources.

2.3.4 WAF security defense

AWS CloudFront and Alibaba Cloud CDN can combine with WAF to implement security defense.

2.4 Streaming media

Alibaba Cloud CDN supports live streaming, on-demand, RTMP video scenarios, and provides video transcoding, slicing, and playback functions.

The following table compares the streaming media functions of AWS CloudFront and Alibaba Cloud CDN:

Function Feature	Amazon CloudFront	Alibaba Cloud CDN
Live Streaming	Supported	Supported
On-demand Videos	Supported	Supported
Video Transcoding	Supported	Supported
Format	Microsoft Smooth, HLS, HDS or MPEG-DASH, and RTMP	HLS, RTMP

2.5 Pricing

AWS CloudFront offers two types of pricing model: On-demand pricing and reserved capacity pricing. The costs for CloudFront comprises of data transfer fees out to Internet/region and the request fees of all HTTP/HTTPS methods.

The pricing of Alibaba Cloud CDN comprises of data transfer traffic and HTTPS requests for secure acceleration. There are two billing methods for data transfer fees: Pay-By-Bandwidth and Pay-By-Traffic. You can also subscribe to one or more Traffic Packages for a year.

For the duration of the resource package, fees are deducted for your use of the traffic quota. For traffic exceeding the quota, fees are billed based on the existing billing rules.

3. File storage

AWS and Alibaba Cloud both provide file storage services. In this section we are going to compare and contrast Amazon Elastic File System (Amazon EFS) with Alibaba Cloud Network Attached Storage (NAS).

3.1 Service model

An Amazon Elastic File System (Amazon EFS) is accessed by EC2 instances running inside VPC. Amazon EFS allow users to create and configure file systems. You can mount EFS file system on EC2 instance through a standard file system interface and file system access semantic.

Like Amazon EFS, you can access the Alibaba Cloud NAS file system through standard POSIX interfaces when using Alibaba Cloud ECS instances or other nodes such as HPC or Docker.

Function Feature	Amazon EFS	Alibaba Cloud NAS
Access Point	Mount target	Mount Point
Storage Capacity	Petabyte scale	10 PB (Capacity-type), 1 PB (Performance-type)*
Scale Up/Down	Supported (automation)	Supported
Performance	Supported	Supported
Cross Instance Access	Supported	Supported
Multiple Client Access	Supported	Supported
Access Control	Supported	Supported
Protocol	NFSv4.0, v4.1	NFSv3, NFSv4, >SMB2.0*
Compute Node	EC2	ECS, HPC, Docker

3.2 Performance

There are two performance modes that Amazon EFS offers: General Purpose and Max I/O. Users can choose the preferred performance mode according to specific use cases.

Throughput on Amazon EFS scales as a file system grows. And Amazon EFS offers a burstable performance capability for high throughput levels in short periods of time.

Like Amazon EFS, Alibaba Cloud NAS also offers two performance modes: capacity-type and performance-type*. Each model offers different performance and storage capability.

Total throughput for each performance-type* file system (MB/s) = minimum [0.6MB/s * capacity of file system (GB) + 600MB/s, 20GB/s]

Total throughput for each capacity-type file system (MB/s) = minimum [0.15MB/s * capacity of file system (GB) + 150MB/s, 10GB/s]

The upper limit of the storage capacity of an SSD performance-type file system is 1 petabyte, and that of a capacity-type file system is 10 petabytes.

Performance	Amazon EFS	Alibaba Cloud NAS
Latency	Millisecond-level	Millisecond-level
Total throughput for Each File System	1-3GB/s, Burst up to 10+ GB/s	10 GB/s (Capacity-type), 20 GB/s (Performance-type)*
Concurrent Clients per File	Several thousand	10,000+

System		
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- As of January 2018, SMB for Windows and performance type NAS (all SSD) are only available on the Mainland China portal. These two features will be launched on the International portal soon.

3.3 Security

Amazon EFS offers four levels of access control to consider for Amazon EFS file systems, with different mechanisms used for each.

Like Amazon EFS, Alibaba Cloud NAS also provided multiple security mechanisms including support for network isolation (VPC) and user isolation (classic network), file system standard access and group permissions control, and RAM master account and sub-account authorization. These features are implemented to ensure complete data security in the file system.

3.4 Migration

Amazon EFS File Sync provides a fast and simple way for you to securely sync data from existing on-premises or in-cloud file systems into Amazon EFS file systems. Users need to download and deploy a File Sync agent into the source environment, configure the source and destination file systems, and start the sync.

Alibaba Cloud NAS also provides migration tool named nasimport. It supports migration to Alibaba Cloud NAS from a wide variety of source storage including:

- Local data centers
- Alibaba Cloud OSS
- Third-party storage services (Amazon S3, Baidu Object Storage, Tencent Cloud COS, Jinshan Object Storage, UPYUN, Qiniu, and HTTP links)

Learn more about [Nasimport Tools](#).

3.5 Pricing

With Amazon EFS, you pay only for the storage used by your file system. You don't need to provision storage in advance and there is no minimum fee or setup cost.

Like Amazon EFS, Alibaba Cloud NAS fees are calculated based on the total volume of storage used per month. There is no minimum fee and there are no set-up charges. There are also no charges for bandwidth or requests. Furthermore, NAS provides a storage plan for users who want to create a NAS file system. By purchasing a storage plan ahead of time, you realize significant cost savings compared to Pay-As-You-Go storage fee per GB.

Learn more about [Alibaba Cloud NAS pricing](#).

4. Nosql database

Amazon DynamoDB and Alibaba Cloud Table Store are two similar fully managed cloud NoSQL database services. With cloud based NoSQL database service, users do not have to care about hardware provisioning, setup and configuration, replication, partition, software patching, and cluster scaling.

4.1 Service model

Amazon DynamoDB is a fully managed NoSQL database service whose service-side latencies are typically within a single-digit millisecond. With a distributed database cluster, DynamoDB provides unlimited storage space and it automatically scales up and down.

DynamoDB supports both document and key-value data structures. Like other database systems, DynamoDB stores data in tables. A table is a collection of items, and each item is a collection of attributes. Once you have created a DynamoDB table, use the AWS SDKs to write, read, modify, and query items in DynamoDB.

Similarly, Alibaba Cloud Table Store is a fully managed NoSQL database service based on automatic data partitioning and load balancing technologies. Based on SSD technology, this cloud NoSQL database service enables you to store large quantities of structured and semi-structured data with real-time access. Table Store also features strong consistency and single-digit millisecond latency. You can query Table Store by RESTful API, web-based Management Console, or SDKs.

Function Feature	Amazon DynamoDB	Alibaba Cloud Table Store
Data Model	Amazon DynamoDB	Alibaba Cloud Table Store
Latency	Single-digit milliseconds	Single-digit milliseconds
Scale	Any	Any
Storage Medium	SSD	SSD
Data Partition	Supported	Supported
Data structure	Document/ Key-value	Structured and semi-structured
Access method	SDKs, the Management Console and API	RESTful API and SDKs

4.2 Data model

A table is a collection of data in Amazon DynamoDB. Each table contains multiple items. An item is a group of attributes and can have its own distinct attributes. Each item is composed of one or more attributes. Most of the attributes are scalar, which means that they can have only one value. Some of the items have a nested attribute (address).

In order to determine the partition for each item, you must specify the primary key in each table. A primary key can be either a partition key or a partition key & sort key.

DynamoDB also allows user to define up to 5 global secondary indexes and 5 local secondary indexes in each table to improving data access. DynamoDB supports nested attributes up to 32 levels deep. Like Amazon DynamoDB, the data model of Alibaba Cloud Table Store is described by Table, Row, Primary Key, and Attribute. A table is a set of rows, and a row consists of the Primary Key and Attribute. The Primary Key and Attribute consist of names and values.

A table must define at least a Primary Key. And the first primary key will be the partition key.

Each Attribute column can contain multiple versions, and each version (that is, the timestamp) corresponds to a value, which is different from that of a Primary Key column.

4.2.1 Version control

Unlike Amazon DynamoDB, Alibaba Cloud Table Store provides version management for each attribute columns. The version is a timestamp defined by the number of milliseconds that have elapsed since 01/01/1970 00:00:00 UTC. When you read from each row, you can specify the maximum number of versions per attribute column, or the version range. The earlier versions will be discarded when the number of version exceeds the value of Max Versions.

4.2.2 Time to live (TTL)

Similar to Amazon DynamoDB, Alibaba Cloud offers TTL attribute which provide a mechanism to set a specific timestamp for expiring items from your table. Table Store clears any data asynchronously that exceeds the TTL.

The following table compares the data model of each service:

Data Model	Amazon EFS	Alibaba Cloud Table Store
Schema	Schema-less	Schema-less
Data Unit	Table	Table
Data Record	Item	Row
Unique Identifier	Partition key /Partition key and sort key	Primary Key
Primary Key Type	String, number, or binary	String, integer, or binary
Secondary Indexes	Supported	Not Supported
Nested Attribute	Supported	Not Supported
Versioning	Not Supported	Supported
TTL	Supported	Supported

4.3 Performance

You need to specify the throughput capacity in terms of read capacity units and write capacity units when creating a table or index in Amazon DynamoDB. And if your read or write requests exceed the throughput settings for a table, DynamoDB can throttle that request.

DynamoDB provides the three mechanisms for managing throughput:

DynamoDB Auto Scaling: By setting a DynamoDB auto scaling, the table will increase and decrease the throughput to adjust the request.

Provisioned Throughput: By defining the throughput manually, DynamoDB will throttle your application if it exceeds your provisioned throughput settings.

Reserved Capacity: You pay a one-time upfront fee and commit to a minimum usage level over a period of time.

Like AWS DynamoDB, the read/write throughput of Alibaba Cloud Table Store is measured by read/write capacity units (CUs). Table Store provides two options for managing throughput:

Reserved throughput: Set the reserved read/write throughput to a value greater than 0, and Table Store will assign and reserve enough resources for the table according to this configuration to guarantee low resource costs.

Additional throughput: If the actual consumed read/write throughput exceed the reserved read/write throughput, Table Store will give an additional throughput automatically to meet user' s requests.

Performance	Amazon DynamoDB	Alibaba Cloud Table Store
Read Capacity Units(per second)	Strongly consistent read: 4 KB/item	4 KB/item
Write Capacity Units(per second)	1 KB/item	4 KB/item

4.4 Security

AWS provides authentication and access control for Amazon DynamoDB by integrating with AWS Identity and Access Management (IAM) for fine-grained access control for users within your organization. You can assign unique security credentials to each user and control each user' s access to services and resources. You can also obtain temporary security credentials from AWS Security Token Service (AWS STS) by using web identity federation.

Alibaba Cloud Table Store also offers user-level data isolation, access control and permission management. With Resource Access Management (RAM) and Security Token Service (STS), Table

Store enable users to access the tables through subaccounts with different permissions and grant users temporary access authorization.

4.5 Backup and restore

Amazon DynamoDB provides on-demand backup and restore capability. You can back up and restore your DynamoDB table data with a single click in the AWS Management Console or with a single API call.

Unlike Amazon DynamoDB, Alibaba Cloud Table Store automate the backup and restore process. Table Store manages data with multiple cloud data backups across different servers in different racks. When any node of the backups fails, the other servers with backup copies will immediately restore to achieve virtually zero data loss.

4.6 Pricing

Amazon DynamoDB offers a free tier limit. Users only need to pay for the resources they consumed exceeding the limits. The DynamoDB fees depend on indexed data storage, throughput type, Capability Units consumption, the traffic of data transfer “out” , and the storage size of the table for backup and restore operations.

Like DynamoDB, Alibaba Cloud Table Store pricing is divided into four parts: data storage that exceed free quota, the reserved read/write throughput, the additional read/write throughput and the Internet downstream traffic. Learn more about [Table Store Pricing](#).

Networking

Alibaba Cloud for AWS Professionals

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By using cloud networking products, you can isolate your cloud infrastructure, extend request processing capabilities, and connect physical networks to Virtual Private Cloud (VPC). For example, you can establish stable and secure networking environments by leveraging dedicated network connections and VPC. No matter if you want to implement a multi-cloud architecture, or to fully migrate your services from AWS to Alibaba Cloud, this document introduces the comparison of the servicing capabilities of the networking products provided by AWS and Alibaba Cloud.

1. Networking products

The following table shows the comparison of the networking products of AWS and Alibaba Cloud. Both have similar servicing capabilities, but are vary in terms of depth and width.

AWS	Alibaba	Description
Amazon VPC	Virtual Private Cloud	Helps you construct a logically isolated networking environment where you can customize your own IP address range, subnets, route tables, and network gateways.
AWS Direct Connect	Express Connect	Enables you to establish a dedicated network connection from your on-premise data environment to cloud services, between cross-regional VPCs, and between cross-account VPCs. This service improves the flexibility of your network topology and the quality of cross-network communications.
Elastic Load Balancing	Server Load Balancer	Distributes traffic across multiple cloud servers to improve the servicing capabilities of your applications. It can also improve the availability and fault tolerance capability of your applications by eliminating the single point of failure
Amazon Route 53	Alibaba Cloud DNS	A highly available and scalable Domain Name System (DNS) service and DNS management service. It provides businesses and developers with a stable, secure, and intelligent way to route end users to websites or applications by translating

		domain names or applications into IP addresses. DNS management is also supported.
Amazon CloudFront	CDN	A global content delivery network (CDN) service that delivers content to the location closest to the user that is requesting the content. This increases the response speed and content delivery rate. Additionally, it resolves the delivery latency problem due to distributions, bandwidth, and server performance, greatly improving scenarios such as site speed increase and on-demand and live video streaming.
Amazon API Gateway	API Gateway	An API hosting service that enables you to publish, manage, maintain, and sell APIs. It helps you easily and quickly achieve microservice aggregation, frontend and backend system separation, and system integration at low costs and low risks. Functions and data of this service are open to partners and developers.

2. VPC

Amazon VPC and Alibaba Cloud VPC have similar architectures, usage scenarios, and features. Both services let you establish logically isolated sections of a networking environment. You can logically isolate private networks from each other.

2.1 Feature Comparison

Amazon VPC vs. Alibaba Cloud VPC

Feature	Amazon VPC	Alibaba Cloud VPC
Support for other resources	You can use AWS resources such as Elastic Load Balancing (ELB), Amazon ElastiCache, Amazon RDS, and Amazon Redshift by provisioning them with IP addresses in your VPC	You have full control over your VPC, including specifying its IP address range, and configuring route tables and network gateways. You can use Alibaba Cloud resources

		such as Elastic Compute Service (ECS), Relational Database Service (RDS), and Server Load Balancer (SLB) in your VPC.
Security policies	You can connect your VPC with your on-premise infrastructure using an encrypted VPN connection. This extends your existing security and management policies to your VPC instances as if they were running within your infrastructure. You can associate VPC security groups with the instances on EC2-Classic.	You can use security groups to classify instances in your VPC into different security domains and define different security policies for each security domain. You can also use Resource Access Management (RAM) to manage permissions in your VPC.
ClassicLink	Supported	Supported
Elastic network interface	Supported	Supported
Dynamic Host Configuration Protocol (DHCP)	Supported	Supported

2.2 Costs

AWS VPC will bill you if you use additional services such as NAT gateways, VPN gateways, and elastic IP addresses. However, additional services are not listed as independent services. Therefore, if such services are used, you may not know if the services will be billed. Alibaba Cloud VPC is a service provided free of charge. Additional services are listed independently, and are billed separately to users. The billing method of AWS NAT gateways differs from that of Alibaba Cloud NAT gateways. An AWS NAT gateway bills you for each "NAT Gateway-hour" that your NAT gateway is provisioned and available. For data processing, you will be billed for each Gigabyte processed through the NAT gateway, regardless of the source and destination of the traffic. Alibaba Cloud supports PayByTraffic and PayByBandwidth billing.

Billing method	Amazon	Alibaba Cloud
Pay-As-You-Go: You are billed for the traffic.	Total fees = NAT gateway configuration fee + data processing fee (+ data transmission fee)	Total fees = NAT gateway instance usage fee + NAT bandwidth package fee (Price of renting an IP address × Number of IP addresses × Period of use + Unit price of bandwidth × Amount of outbound traffic).
Pay-As-You-Go: You are billed for the bandwidth you use.	N/A	Total fees = NAT gateway instance usage fee + NAT bandwidth package fee (Price of renting an IP address × Number of IP

		addresses × Period of use + Bandwidth fee per day × Period of using the NAT bandwidth package)
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3. Load balancing

The load balancing service distributes traffic across multiple cloud servers to improve the servicing capabilities of your applications. It can also improve the availability and the fault tolerance capability of your applications by eliminating single point of failure. Amazon Elastic Load Balancing (ELB) and Alibaba Cloud Server Load Balancer (SLB) are slightly different in architecture and usage scenarios. Amazon Elastic Load Balancing supports Classic Load Balancer, Network Load Balancer, and Application Load Balancer. Alibaba Cloud supports Layer 4 and Layer 7 load balancing services.

3.1 Feature Comparison

Elastic Load Balancing vs. Server Load Balancer

Feature	Amazon ELB	Alibaba Cloud SLB
Supported protocols	TCP, SSL, HTTP, and HTTPS.	TCP, UDP, HTTP, and HTTPS.
HTTP 2.0	Supported	Coming soon.
Forwarding of domain names and URLs	Supported	Supported
Active/Standby server	N/A	Supported
IPv6	Supported	Coming soon
Whitelist	N/A	Supported
Runtime condition check	Supported	Supported.
Runtime monitoring	Amazon ELB allows you to monitor your application performance in real time by using Amazon CloudWatch metrics and request tracing.	Alibaba Cloud SLB provides operation logs, health check logs, API access logs, and access logs of Layer 7 load balancing. It also provides comprehensive metrics and alarm methods. You can receive notifications of the alarms by phone, email, SMS, and DingTalk.
Security	You can create and manage the security groups assigned to your load balancer. This helps provide more VPC connections and more security options. You can also create an internal load balancer.	You can create and manage the security groups assigned to your load balancer. This helps provide more VPC connections and more security options. Alibaba Cloud SLB is equipped with Alibaba Cloud Security to prevent DDoS and Challenge

		Collapsar attacks.
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3.2 Costs

Billing method	Amazon	Alibaba Cloud
Instance	\$/instance/hour	\$/instance/hour
LCU	\$/LCU/hour	N/A
Bandwidth	N/A	\$/Mbit/s/hour

The AWS concept LCU refers to Load Balancer Capacity Unit. AWS bills you for the outbound traffic from your EC2 instance, instance usage (billed on an hourly basis), and data processing. AWS focuses the pricing of Amazon ELB on the costs of load balancing. The pricing of Internet bandwidth for all cloud-based products are the same. Alibaba Cloud bills you for instance usage, traffic, and bandwidth. Compared with AWS, the billing method provided by Alibaba Cloud is simpler.

4. Dedicated Network Connections

You can have high-speed, stable, and secure private communications between different network environments. For example, cross-regional and cross-account connectivity between VPCs on the cloud, and the connection between your on-premise data environment and the cloud. Dedicated network connections help improve the flexibility of your network topology and the quality of cross-network communications.

4.1 Feature Comparison

AWS Direct Connect vs. Alibaba Cloud Express Connect

Feature	AWS Direct Connect	Alibaba Cloud Express Connect
Dedicated network connection	AWS Direct Connect enables you to establish a dedicated network connection from your on-premise data environment to AWS. By using AWS Direct Connect, you can establish private connectivity between AWS and your data center, office, or colocation environment. This generally reduces network costs, increases bandwidth throughput, and provides a more consistent network experience than Internet-based connections.	Alibaba Cloud Express Connect enables you to physically connect your on-premise infrastructure to Alibaba Cloud using physical leased lines. After that you can create a virtual border router (VBR) and router interfaces to connect your data center to your Alibaba Cloud VPC.
Dedicated network	Supported	Supported

connection by using the Border Gateway Protocol (BGP)		
VPC connectivity	You can use AWS Direct Connect to establish a private virtual interface directly from your on-premise data environment to your Amazon VPC. This provides a private, high bandwidth network connection between your network and your VPC. By using multiple virtual interfaces, you can establish private connectivity to multiple VPCs while maintaining full network isolation.	You can create a router interface on the router of each VPC and use Alibaba Cloud's backbone transmission network to establish a high-speed channel, achieving secure, reliable, and convenient communications between multiple VPCs.

4.2 Costs

Billing method	Amazon	Alibaba Cloud
Subscription	Supported	Supported
Bandwidth	Supported	Supported
Traffic	Supported	Not Supported
Port leasing fee	Supported	Supported

The billing method of Alibaba Cloud Express Connect differs from that of AWS Direct Connect. Alibaba Cloud bills you on a daily or monthly basis. The charges on this service in China differ from that in other countries. AWS bills you for the traffic and port leasing. The charges on using AWS Direct Connect for communications within the same region are different from the charges on using the service for communications between regions.

DataBase

Alibaba Cloud for AWS Professionals

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1. Objective

To help professionals understand the differences and commonalities between the two, the database services provided by AWS and Alibaba Cloud are compared in this document. Whether you plan to migrate from AWS to Alibaba Cloud, or you plan to use both AWS and Alibaba Cloud in a multi-cloud model, this document will help you understand Alibaba Cloud's database services.

Alibaba Cloud provides database services in various types. In each service type, different and unique products are provided. This document will focus on comparing the important service types between Alibaba Cloud and AWS as show in the table below.

Service Type	AWS Product	Alibaba Cloud Product
Relational Databases	Amazon RDS ; Amazon Aurora	ApsaraDB for RDS ; DRDS ; ApsaraDB for POLARDB (in public beta)
NoSQL	Amazon DynamoDB;Amazon SimpleDB	ApsaraDB for MongoDB ; ApsaraDB for HBase

Caching	Amazon ElasticCache	ApsaraDB for Redis ; ApsaraDB for Memcache
Hybrid analytic database	Amazon Redshift	HybridDB
Searching and time series database	N/A	HiTSDDB(in public beta)
Database services	Aws Database Migragion Service	DTS

2. Relational Databases

Alibaba Cloud RDS

Alibaba Cloud Relational Database Service(RDS) ensures you do not have data lossage. It is easier for you to manage, operate, and extend relational databases. Currently Alibaba Cloud supports relational database services of MySQL, SQL Server, PostgreSQL, PPAS (PostgreSQL Advanced Edition, compatible with Oracle) protocols. Each RDS has two physical nodes for master-slave hot standby. You can customize the access IP address whitelist, prevent DDoS attacks and get warning of SQL injections. Compared to your self-built databases, RDS has advantages such as low cost, high efficiency, high reliability, flexibility, and ease of use. RDS can help you solve time-consuming database management tasks and allows you to focus more on your business.

Alibaba Cloud RDS is currently provided in 18 regions including Qingdao, Hangzhou, Beijing, Hong Kong, Shenzhen, Silicon Valley, Singapore, Germany, Japan, Dubai, and India.

Amazon Relational Database Service (Amazon RDS) allows you easily to configure, operate, and extend relational databases on the cloud. It can provide economical and practical scalable capacity while automatically performing time-consuming management tasks. This allows you to focus on applications so as to provide them with the required high performance, high availability, security, and compatibility. AWS RDS supports MySQL, Oracle, Microsoft SQL Server, PostgreSQL, and Amazon Aurora relational databases.

AWS RDS is provided in 18 regions including: California, Japan, India, Singapore, Beijing, Canada, London, São Paulo, and Germany.

2.1 Functional comparison

Alibaba Cloud RDS V.S. AWS RDSThe following table shows the comparison of the basic functions and terminologies of Alibaba Cloud RDS and AWS RDS

Features	Sub-features	AWS RDS	Alibaba Cloud RDS
Region	Multi-zone	Supported	Supported
Billing method	Prepayment	Supported	Supported
	Pay-As-You-Go	Supported	Supported

Compatibility	MySQL compatibility	Amazon Aurora is an enterprise relational database compatible with MySQL protocol	PASS, perfectly compatible with Oracle and MySQL, and 100% compatible with MySQL syntax
	VPC & Classic	VPC	VPC & Classic
Scalability	Highest configuration	Supports up to 32-core, 244 GB Supports up to 40,000 of IOPS and 16 TB of storage	Supports up to 64-core, 512 GB Supports up to 120,000 of IOPS and 3 TB of storage for high availability version
	MySQL read-only instances	Supported	Supported
	MySQL read/write splitting	N/A	Supported
Reliability	Data reliability (SLA)	99.9999%	99.9999%
Performance monitoring	Custom alerts	Supported	Supported
	IOPS monitoring	Supported	Supported
Diagnosis and optimization	Online log query	Supported	Supported
Security	SQL auditing	N/A	Supported
	Data security: time point recovery	Supported	Supported
	Access security	Encryption at Rest and in Transit/VPC isolation	SSL link encryption/TDE data encryption/IP whitelist/Anti-DDoS
	Account security (avoid permission escalation)	Supported	Supported

2.2 Availability

With the master/slave architecture, when the master instance is unavailable, Alibaba Cloud RDS will be automatically migrated to the backup instance or slave instance. Data will be automatically synchronized on applications running on two instances in different zones so as to improve the availability. The data on the RDS server is built on the RAID, and the data backup is stored on the OSS. The RDS provides an automatic backup mechanism. Users can set a backup cycle and initiate backup at any time according to the service features. Local disaster recovery and remote disaster recovery mechanisms are also provided. Remote disaster recovery for MySQL Alibaba Cloud RDS is currently in public beta release.

AWS RDS zone deployment provides high availability and persistence for database instances. When configuring a multi-zone database instance, AWS RDS synchronously replicates the data to backup instances in other zones. AWS RDS uses AWS S3 storage for data backup. When a failure occurs, Amazon RDS will automatically replace the computing instance used for the deployment.

2.3 Security

Alibaba Cloud RDS supports TLS 1.2 SSL protocol, and the data written to disk is encrypted. Alibaba Cloud ApsaraDB RDS also provides SQL auditing, so that you can perform real-time tracking accesses to and operations on the instance. Basic DDos protection is also provided to monitor the traffic of the network access point in real time. If an attack is identified, the source IP address will be cleaned or blacklisted. It supports whitelist IP configuration, which controls risks directly from the source, and intercepts SQL injections, brute-force attacks, and other types of database attacks.

Amazon RDS allows you to encrypt your database with a key that is managed through the AWS Key Management Service (KMS). On a database instance running with Amazon RDS encryption, Amazon RDS encrypts the data that is stored statically on the underlying storage with automatic backups, read-only replicas, and snapshots. Amazon RDS supports using SSL to protect transmitted data. Also, AWS recommends users to run database instances in VPC, as this allows them to isolate their database in their own virtual network and connect to their local IT infrastructure using industry-standard encrypted IPsec VPNs. Users can configure a firewall and control network access to database instances.

2.4 Scalability

Alibaba Cloud RDS supports elasticity, you can scale the storage according to the real-time demands of your applications, which guarantees resource usage. A single Alibaba Cloud RDS instance has up to 20,000 of IOPS and 2 TB of storage. You can also upgrade memory and disk space based on your actual needs. RDS supports an instance of up to 64-core and 512 GB, and up to 120,000 of IOPS. 3 TB of storage are supported for high availability version. Up to 1,000 server IP addresses can be connected to Alibaba Cloud RDS instance. The risks are controlled directly from the source.

AWS RDS supports deployment of computing and memory resources up to 32-core and 244 GB. As content increases, other storage can be pre-configured, and up to 40,000 of IOPS and 16 TB of storage can be pre-configured for each database instance. For pre-configured IOPS storage, you need to pay for the configured resources no matter if they are used within the month.

2.5 Ease of use

You can customize specifications through the Alibaba Cloud console or APIs. Along with the changes in the database pressure and data storage capacity, you can flexibly adjust the instance specification, and the RDS will not interrupt the data link service in the upgrade period. Alibaba Cloud is responsible for routine maintenance and management of the RDS, including but not limited to such work as hardware/software fault processing and database patch update, so as to ensure normal

operation of the RDS. You can also independently add, delete, restart, backup, recover and do other management operations on database through the Alibaba Cloud console.

With AWS RDS, you can create instances through the console, APIs, and the AWS command line interface. You can also use the console to change database instance backup policies, and add, restart and delete databases. AWS RDS automates software patching to ensure that the relational database software used in the deployed project has the latest patches installed and is up to date.

2.6 Pricing

Alibaba Cloud ApsaraDB offers different payment options to satisfy your individual needs. You can select Pay-As-You-Go or monthly subscription payment options. Alibaba Cloud RDS is charged based on the total storage used, the volume of data transferred, and the number of API requests. Storage and data transmission are linearly charged. The exact price is based on the customized plan, which you choose.

Amazon RDS is charged based on on-demand instances or reserved instances. Amazon RDS provides a variety of instance types for you so as to meet different relational database use cases. The exact price depends on the Amazon RDS database engine the you choose. [View the price list.](#)

3. Non-relational Databases

Alibaba Cloud MongoDB supports two deployment architectures: ReplicaSet and Sharding. ApsaraDB for MongoDB is fully compatible with the MongoDB protocol and can provide stable, reliable, and auto scaling database services. It also provides disaster recovery, backup, recovery, monitoring and alarm functions. It is widely used in Internet applications, IoT, games, finance, and other fields.

AWS DynamoDB is a fast and flexible NoSQL database service. It is a fully-hosted cloud database that supports document and key-value storage models. It has a flexible data model, reliable performance, and automatic throughput expansion capabilities, which allows it to be used in areas such as mobile, web, gaming, advertising computing, and the IoT.

3.1 Functional comparison

The following table compares the basic functions and terminologies of Alibaba Cloud MongoDB VS AWS DynamoDB.

Product features	AWS DynamoDB	Alibaba Cloud MongoDB
High availability	Supported	Supported
Horizontal scaling	Supported	Supported
Resource access management	Supported	Supported
Audit logs	Not Supported	Supported
Automatic backup	Supported	Supported

Cloning and recovery	Not Supported	Supported
Second-level monitoring	Supported	Supported
Index recommendation	Supported	Supported

3.2 High Availability

Alibaba Cloud MongoDB uses a three-node replica set high-availability architecture to provide extremely high service availability. The ApsaraDB for MongoDB service uses a three-node replica set high-availability architecture. The three data nodes are located on different physical servers and automatically synchronize data. The primary and secondary nodes provide services. When the primary node fails, the system automatically selects a new primary node. When the secondary node is unavailable, the standby node takes over the services. Amazon DynamoDB also has high availability, and can automatically synchronize data replicas between three data centers in a given AWS region. This helps protect your data, as it now will not be affected by individual machine failures or even individual data center crashes.

3.3 Security

Alibaba Cloud MongoDB

Backup and recovery mechanisms: Automatically backs up data every day, providing a strong disaster tolerance capability. Data at any time point within the past seven days can be recovered for free to prevent data misoperations and minimize business loss.

VPC network isolation: Instances are deployed on a VPC built on the physical network using the OverLay technology, and the network isolation is performed at the TCP layer.

Anti-DDoS: Real-time monitoring of network access is enabled. The source IP address will be cleaned in the event of high-traffic attacks. If the cleaning turns out ineffective, malicious IP addresses will be redirected to a black hole.

Whitelist configuration: Supports a maximum of 1,000 white list rules and performs risk control from the access source.

Security auditing: MongoDB supports log auditing and update operations and slow query log auditing.

Resource access management: RAM system is introduced, which supports permission access control.

AWS DYnamoDB

Backup and recovery mechanisms: For protecting and storing data, supports fully automatic on-

demand backup, restore and time-point recovery. API backup and recovery operations are also supported.

- Identity verification:

- AWS account root user:

When you first create your AWS account, you initially use a single-point login identity with full access to all AWS services and resources in your account.

- IAM user + IAM role:

IAM user is an identity in your AWS account that has specific custom permissions (for example, permission to create tables in DynamoDB).
IAM role is an IAM identity with specific permissions that can be created in your account. With an IAM role, you can obtain the temporary access key to AWS services and resources.

Resource access management: Valid credentials are used to authenticate your own requests, while you must also have permissions to create or access Amazon DynamoDB resources.

Static encryption: AWS-hosted encryption keys stored in AWS Key Management Service (AWS KMS) are used to protect the data in Amazon DynamoDB.

3.4 Ease of use & Scalability

Alibaba cloud MongoDB provides instance information like CPU utilization, IOPS, number of connections, and disk space for real-time monitoring and early warning, so that you can understand the instance status at all times.

It provides a visual management platform, which performs high-frequency and high-risk operations, such as instance restart, backup, and data recovery, in a one-click manner. Perfect performance monitoring shares most of the operation and maintenance work.

It provides database kernel management, proactively performs upgrades and quickly repairs defects, which frees users from daily version management. It optimizes MongoDB parameter configuration and maximizes utilization of system resources.

ApsaraDB MongoDB supports auto scaling. You can change the configuration of your instance if the current configuration is too high or cannot meet the performance requirements of your application. The configuration change process is completely transparent and will not affect your business.

Amazon DynamoDB can display key operational metrics in the AWS management console. This service can also be integrated with Amazon CloudWatch so that you can view the request throughput and latency of each Amazon DynamoDB table and easily track their resource consumption.

AWS DynamoDB is fully hosted. You no longer need to worry about management tasks such as hardware or software pre-configuration, setting and configuration, software patching, reliable distributed cache clustering, or partitioning of data across multiple instances based on scaling requirements.

Through using DynamoDB Auto Scaling, resources can be extended or resized according to the actual usage by the database. Amazon DynamoDB supports cross-region replication and can automatically replicate DynamoDB tables across AWS regions. Globally distributed applications can be built using cross-region replication to reduce data access delays and improve traffic management.

3.5 Pricing

Alibaba Cloud ApsaraDB for MongoDB offers different payment options to suit your individual needs. You can select Pay-As-You-Go or monthly subscription payment options. Instance price and storage price are included. The exact price is based on the customized plan which the user choose. See [Pricing](#) for more information

DynamoDB only charges for the pre-configured resources, and can pre-configure resources to achieve the target usage rate of read and write capacity, and then automatically expand the your capacity according to usage, and charge according to the usage. [Detailed pricing information.](#)

4. Highspeed cache (Redis)

Redis is an open source in-memory database structure service that can be used as a database, high-speed cache, and message queue proxy. It is a key-value storage system that supports strings, lists, collections, and other data types.

Alibaba Cloud ApsaraDB for Redis is compatible with the open source Redis protocol standard and provides a persistent in-memory database. At the same time, ApsaraDB for Redis provides network security on the cloud, which is scalable and maintenance-free. It provides master/slave replication and multi-AZ deployment. It enables better data availability.

AWS Redis is hosted on Amazon ElastiCache and is also compatible with the open source Redis protocol. It supports horizontal scaling and vertical scaling to meet changing application requirements.

4.1 Functional comparison

The following table compares the basic functions and terminologies of Alibaba Cloud Redis VS AWS ElastiCache Redis

Product features	AWS ElastiCache Redis	Alibaba Cloud Reids
Security encryption	Dynamic and static encryption	Whitelist and SSL encryption
Warm upgrade	Supported	Supported

Online migration	Supported	Supported
SLA	Master node + multiple read-only replica, automatic switch	Dual-replica, high availability, second-level switch
Backup recovery	Supported	Supported
Task control	Supported	Supported
Performance	Unknown	Cluster: 1 million QPS Dual-replica: 80,000-100,000 QPS
Monitoring	Supported	Supported
Specification	Optimization: 60 GB, 128 GB, 203 GB, 470 GB Standard: 512 MB, 2 GB, 4 GB, 8 GB, 16 GB, 32 GB, 64 GB, 156 GB	Cluster specifications: 16 GB, 32 GB, 64 GB, 128 GB, 256 GB, 512 GB Dual-replica specification: 256 GB, 1 GB, 2 GB, 4 GB, 8 GB, 16 GB, 32 GB
Compatibility	Compatible with open source Redis data formats, Redis APIs, and can be used with Redis clients.	Compatible with open source Redis protocol, providing Redis hosting. Compatible with various existing functions + various customers.

4.2 Availability

Alibaba Cloud Redis has very high availability, and dual-replica and cluster version instances have a master/slave node architecture. This prevents service interruption caused by SPOF. It automatically detects node failures and replaces faulty nodes, enabling second-level switch after failure. It also supports automatic detection and recovery of hardware failures.

Amazon ElastiCache' s Redis cluster mode provides high availability through automatic failover support, which is achieved by detecting master node failures and promoting replica to the master node with minimal impact.

4.3 Security

Alibaba Cloud Redis provides an automatic backup feature that ensures persistent data storage using a memory and hard disk storage model. It has a high data disaster recovery capability, and supports one-click data recovery, anti-DDoS, and real-time detection and removal of large-volume attacks. It also supports a whitelist configuration of over 1000 IP addresses. Kernel optimization is also performed for the Redis source code, and security vulnerabilities are repaired. It prevents memory overflow.

Amazon ElastiCache for Redis, in combination with Amazon VPC, isolates the cluster within the user-selected range of IP addresses, and applications connected through which control access to the cluster through cache security group. It supports continuous monitoring of known security

vulnerabilities in open source Redis, operating systems, and hardware, applies security-related patches in a timely manner, and provides dynamic and static encryption and Redis AUTH for secure inter-node communications.

Ease of use/O&M

4.4 Ease of use/O&M

Alibaba Cloud Redis is compatible with open source Redis commands, and the Redis client can easily establish a connection with ApsaraDB for Redis to perform data operations. It provides instance information such as CPU, number of connections, and disk space for real-time monitoring and alarm, and supports customized monitoring and alarm configuration functions. The console supports data backup and recovery functions. The database kernel version management can actively upgrade and quickly fix defects, enabling easy O&M.

Amazon ElastiCache based on Redis is a Web service that manages, monitors, and runs Redis nodes and is compatible with the open source Redis protocol. You can use ElastiCache clusters to create snapshots for subsequent recovery of Redis clusters.

4.5 Scalability

ApsaraDB for Redis supports product configurations with multiple memory specifications. You can freely upgrade the memory specification to fit their business volume. It supports flexible expansion of the storage and throughput performance of the database system under the cluster architecture; the expansion is smooth and has no impact on the services provided.

In Amazon ElastiCache for Redis, as applications continue to increase, you can easily expand their Redis data. It supports online cluster scaling to expand and reduce Redis clusters without downtime, which automatically adapts to changing needs. It is used for expanding read capacity.

4.6 Costs

Alibaba Cloud Redis supports prepayment and Pay-As-You-Go. ApsaraDB for Redis only charges an instance type fee when you create an instance. No additional fees are charged. The intranet traffic generated by ApsaraDB for Redis instances is free of charge. That is, the data transmitted between ECS and ApsaraDB for Redis is free of charge.

Similarly, ElastiCache for Redis supports both prepayment and Pay-As-You-Go. ElastiCache for Redis charges not only the cost of the instances, but also the additional backup storage. Data transfer between the same zone is free, while data transfer between EC2 and ElastiCache nodes across different zones in the same region will be charged.

5 Data Migration

Like the AWS Database Migration Service, Alibaba Cloud Data Transmission (DTS) is a data stream

service provided by Alibaba Cloud that supports data exchanges between RDBMS (relational database), NoSQL, OLAP, and other data sources. It provides data transmission capabilities like data migration, real-time data subscription, and real-time data synchronization. With DTS, you can smoothly complete data migration while the source database continues normal operations. In addition, DTS also supports real-time subscription of incremental RDS instance data. Through data subscription, you can achieve service scenarios such as lightweight cache updates, asynchronous message notification, and customized data synchronization.

5.1 Functional comparison

The following table compares the basic functions and terminologies of Alibaba Cloud DTS with AWS DMS

Functions	AWS DMS	Alibaba Cloud DTS
Full migration	Supported	Supported
Incremental migration	Supported	Supported
Bidirectional replication	Imperfect	Supported
Data validation	Unknown	Supported
Supported database types	10	6
Hot migration	Supported	Supported
Resource access management	Not Supported	Supported
ETL	Not Supported	Supported
Data synchronization	Supported	Supported
Data subscription	Not Supported	Supported
Monitoring	Supported	Supported

5.2 Reliability/security

To reduce the impact of data migration on the application, Alibaba Cloud DTS supports Migration Without Stopping Services. With the Migration without Stopping Services, the application downtime for data migration can be reduced to minutes. At the same time DTS will continuously monitor all tasks in the system; if any task fails, it will restart the task from the breakpoint, and service will not be impacted. The underlying structure of DTS is a service cluster. Whenever a node in the cluster fails or goes faulty, the control center initiates the failover of all the tasks on the node to another node in seconds, ensuring a link stability of up to 99.95%.DTS provides 24 x 7 data accuracy validation for some transmission links to quickly locate and correct any data that is inaccurate. This ensures reliable data transmission. Also, each DTS module adopts a secure transmission protocol and secure token authentication. It also has an automatic breakpoint transmission mechanism to ensure the reliability of data transmission.DTS supports RAM main and sub-account systems to allow you to create and

manage DTS instances with a sub-account leading to dramatic increase in business security.

The AWS Database Migration Service is highly recoverable and self-healing. It can continuously monitor source and target databases, network connectivity, and replicate instances. In the case of an outage, this service automatically restarts the migration process and continues migrating from where it left off. The DMS can support reading and writing encrypted databases and can replicate data by encrypting data sources.

5.3 Ease of use

Without the deployment, after the purchase, the transmission task can be activated and started through configuration. DTS provides a visual management interface. The DTS console shows the link transmission status and progress, transmission performance, and other information for you to easily manage their own transmission links. To solve link interruptions from network or system exceptions, DTS provides resumable data transfer feature for links and regularly monitors the states of all links state. Once a link exception is found, it tries to repair or restart it automatically. If you are required to get involved with the repairs, you can initiate the link restart on the console after the link is repaired.

AWS DMS also requires no drivers or applications to be installed. In the AWS Management Console, it takes only a few minutes to set up a migration task. You can define the parameters for the DMS to perform the migration in the migration task. This includes setting up the connection to the source and target databases and selecting the replication instance to perform the migration process. When the migration begins, the DMS manages all complexities of the migration process, including automatically replicating the data changes in the source database during the migration. It also provides an end-to-end view of the data replication process, including diagnostics and performance data for each node in the replication queue.

5.4 Scalability

DTS supports multiple transmission modes, including data migration, real-time data subscription and real-time data synchronization. The real-time data subscription and real-time data synchronization are both real-time data transmission methods. The real-time data synchronization supports one-way and two-way synchronization between two data sources, enabling application scenarios such as remote data disaster recovery, remote multiple active standbys (units), application proximity access, query report streaming, and real-time data warehouse.

DMS also supports data migration and data synchronization. Data subscription is not yet supported, but the AWS Schema Conversion Tool can automatically convert the source database architecture and most of the database code (including views, stored procedures, and functions) to a format compatible with the target database, so that the migration of heterogeneous databases can be predicted. The DMS does not recommend using the two-way replication feature. When the source node is different from the target node, the DMS will ensure the transaction integrity. However, for a table where the update from the source to the target is logically independent, then two-way replication is the best choice.

5.5 Pricing

Alibaba Cloud Data Transmission Service (DTS) provides three functions: data migration, data synchronization, and data subscription. Each function has different billing methods. Data migration: Only supports Pay-As-You-Go. The configuration expense and public network traffic fee are billed. The configuration expense is billed only for the normal running duration of an incremental migration. Data subscription: Supports both subscription and Pay-As-You-Go. The configuration expense of the subscription channel, data traffic fee, and public network traffic fee are billed. Data synchronization: Supports both subscription and Pay-As-You-Go. Only the configuration expenses of the synchronization operation are billed. Currently, these three functions only charge configuration costs, data traffic and public network traffic are not charged. The exact price is based on the customized plan, which you choose. See [Pricing](#) for more information.

For AWS Database Migration Service, you only need to pay for the computing resources and additional log storage space used during the migration. On-demand instance payment: For on-demand instances, you only pay for database migration capacity on an hourly basis without having to prepay long-term costs.

Storage cost: USD 0.115 per month per GB for general (SSD) storage (single-zone)

USD 0.230 per month per GB (multi-zone)

Data transmission: All data passed into the AWS Database Migration Service is free, and direct data transmission between DMS, AWS RDS Database, and AWS EC2 instances in the same zone is also free. See [Pricing](#) for more information

Security

Alibaba Cloud for AWS Professionals

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This article discusses the main differences and similarities between AWS and Alibaba Cloud security services. It covers the following products:

Feature	AWS	Alibaba Cloud
Web Application Firewall (WAF)	AWS WAF	Alibaba Cloud WAF
Anti-DDoS	AWS Shield	Anti-DDoS
Certificate Service	AWS Certificate Manager	Alibaba Cloud SSL Certificates Service
Mobile Security	N/A	Mobile Security
Server Security	N/A	Server Guard (Server Security)

1. WAF

Alibaba Cloud WAF is a web application firewall that can protect web applications from vulnerability attacks such as SQL injections, XSS, and malicious bot attacks. Alibaba Cloud WAF shares many

similar functionalities and technologies with AWS WAF, but it also boasts unique advantages in its defense capabilities.

1.1 Service mode comparison

AWS WAF can be deployed on the AWS CloudFront (CDN), a web server, or a load balancer of a Web server. Alibaba Cloud WAF is deployed by configuring the domain name resolution service.

1.2 Access control

Before deploying AWS WAF, you need to create a Web ACL and define rules. Alibaba Cloud WAF allows ACL rule configuration after a domain name is configured and supports the combination of different HTTP fields, such as IP, URL, Referer, and User-Agent to implement precise access control. The access control policies can be applied to scenarios such as anti-leeching and website management background protection.

1.3 Web attack defense

AWS WAF provides simple Web application protection policies to defend against SQL attacks and cross-site scripting attacks. Alibaba Cloud WAF protects against TOP 10 common threats such as OWASP, provides high/medium/low policies according to different website businesses for GET, POST and other common HTTP requests, includes website stealth that avoids site addresses being exposed to attackers, and implements regular patch updates for zero-day vulnerabilities and global patch updates.

1.4 Business risk control

Data risk control is a Big Data capability of WAF based on Alibaba Cloud, and is implemented for specific business scenarios using an industry leading risk engine and man/machine identification techniques. Alibaba Cloud WAF's Big Data ability is developed through our experience in providing world-class security to customers. This includes hosting more than 37% of China-based websites, maintaining the most popular accessed IP database in China, and mitigating more than 800 million attacks every day.

Generally, data risk control can effectively protect key businesses against spoofing behaviors, including but not limited to spam registration, SMS verification code flooding attacks, library hitting and brute force password cracking, malicious buying, robotic ticket buying, and junk email.

1.5 Console configuration

Like AWS WAF Management Console, Alibaba Cloud WAF console supports domain name configuration and combination of different policies to implement access control, which is as precise as that of AWS WAF.

Alibaba Cloud WAF also provides robust and friendly visualized console for attacks analysis and

monitoring, including business analysis and security overview. Business analysis looks at recent access to different domain names. Security overview provides a general score which is obtained based on the severity of recent attacks, attacker threat, and protection rules and policies. Recent web attacks and CC attacks are displayed graphically, and common attack risks are warned in advance and are reported.

1.6 Pricing

AWS WAF pricing is based on the number of web access control lists (web ACLs) that you create, the number of rules that you add per web ACL, and the number of web requests that you receive. There are no upfront commitments for AWS WAF. Alibaba Cloud WAF pricing is based on a monthly subscription that comes in different packages with different feature specifications. Learn more about Alibaba Cloud WAF Pricing.

1.7 Feature comparison

The comparison of AWS and Alibaba Cloud WAF services can be summarized as follows:

Feature	AWS WAF	Alibaba Cloud WAF
Deployment Modes	Deploy on AWS CloudFront or ELB in front of the Web server	Deployed between the client CDN and load balancer and configured with domain name resolution service to facilitate connection
Configure Web ACL Policy	Supported	Supported
Custom Rules	Supported	Supported
Types of Web Attacks	SQL detection and prevention, SQL injection, cross site scripting (XSS), and other common attacks	Common OWASP vulnerabilities, including SQL injection, XSS, Webshell uploading, backdoor isolation, command injection, illegal HTTP protocol requests, common Web server vulnerability attacks, unauthorized access to core files, path traversing, and scan protection.
HTTP Flood Protection	Supported	Supported
Risk Warning	Not Supported	Supported
Rules Configuration	Supported	Supported
Attacks Monitoring	Supported	Supported
Security Report	Supported	Supported
Business Analysis	Not Supported	Supported

2. Distributed denial of service (DDoS) protection service

To safeguard data and applications from DDoS attacks, Alibaba Cloud and AWS both provide cloud-based anti-DDoS services to ensure the application availability and performance of properties on the cloud. In this section, we discuss the Amazon Shield and Alibaba Cloud Anti-DDoS security services.

2.1 Service model comparison

Like AWS Shield Standard and Advanced, Alibaba Cloud provides free and enterprise-level DDoS protection services that fall under two tiers: Anti-DDoS Basic and Anti-DDoS Pro.

Tier	AWS Shield	Alibaba Cloud Security
Basic	AWS Shield Standard	Alibaba Cloud Anti-DDoS Basic
Advanced	AWS Shield Advanced	Alibaba Cloud Anti-DDoS Pro

AWS Shield Standard and Alibaba Cloud Anti-DDoS Basic, both with no additional costs, provide protection in the face of network layer (layer 3) and transport layer (layer 4) DDoS attacks. As for web application protection, users can subscribe to Alibaba Cloud WAF service to minimize web attacks such as HTTP/HTTPS flood and DDoS attacks.

Similar to AWS Shield, Alibaba Anti-DDoS Pro provides protection for layer 3/layer 4/layer 7 DDoS attacks. However, the two services differ in their technology.

AWS Shield Advanced employs routing techniques to distribute attacks to different AWS nodes to protect against large DDoS attacks.

Alibaba Cloud Anti-DDoS Basic supports redirection technologies. The primary protection method is automatic cleaning, supplemented by active mitigation. The service hosts the complete attack protection operation on behalf of a user.

Unlike AWS Shield Advanced, Alibaba Cloud Anti-DDoS Pro users need to resolve the domain name to the Anti-DDoS Pro IP address for non-web services. Anti-DDoS Pro then directs all public network traffic to the Anti-DDoS server room. The user access traffic is forwarded to the source station IP by protocol based port forwarding. Meanwhile, the malicious attack traffic is cleaned and filtered through the Anti-DDoS Pro service, and normal traffic is returned to the source station IP.

2.2 Black hole policies

Alibaba Cloud Anti-DDoS has a specific concept termed black hole. Black hole refers to the restriction of server access when the attack traffic to a server exceeds a specified threshold. Users can configure the black hole threshold for the server, and Alibaba Cloud will block external network access to the server.

For Alibaba Cloud Anti-DDoS Basic, default threshold settings apply to ECS, Server Load Balancer,

and EIP. Besides the default black hole threshold, Anti-DDoS Pro provides a higher capacity for DDoS mitigation.

2.3 Large DDoS defense

Like AWS Shield Advanced, Alibaba Cloud Anti-DDoS Pro has large DDoS mitigation capability. Alibaba Cloud Security provides up to 300 Gbps (Mainland China) and 100 Gbps (Hong Kong and Singapore) DDoS mitigation, which can mitigate SYN flood, ACK flood, ICMP flood, UDP flood, NTP flood, SSDP flood, DNS flood, HTTP flood, and CC attacks.

2.4 Monitoring & Reporting

Monitoring and reporting are important parts of security services. Both AWS Shield and Alibaba Cloud Anti-DDoS provides network flow monitoring, which inspects abnormal traffic packets automatically.

In Alibaba Cloud Anti-DDoS Pro, the network traffic is monitored in real time. It also provides a detailed security report of past attacks.

2.5 Deployment architecture

AWS Shield Advanced can be deployed on Amazon CloudFront and Amazon Route 53 edge sites. By deploying on Amazon CloudFront, web application security can be ensured.

The deployment architecture of the Anti-DDoS Pro is as follows:

Network traffic route: Anti-DDoS Pro (entry-level anti-DDoS) —> CDN (static resource acceleration) —> WAF (middle layer and application layer protection) —> Source Station (ECS/SLB/VPC/IDC...). This architecture will remain unchanged even if any product is removed.

2.6 Pricing

Like AWS Shield Standard, Anti-DDoS Basic provides protection for DDoS attacks at no additional costs.

AWS Shield Advanced requires a 1-year subscription commitment and charges a monthly fee, plus a usage fee based on data transfer out from Amazon CloudFront, Elastic Load Balancing (ELB), and Amazon Elastic Compute (EC2).

Anti-DDoS Pro is a paid service with a usage fee based on the protection capacity and carrier network. It provides two kinds of payment method: Pre-paid, Post-paid. Learn more about Anti-DDoS billing methods.

2.7 Feature comparison

AWS Shield features and terminology map to those of Alibaba Cloud Anti-DDoS as follows:

Feature	AWS Shield	Alibaba Cloud Anti-DDoS
Type of DDoS Attacks	UDP reflection attacks, SYN flood, DNS query flood, HTTP flood/cache-busting (layer 7) attacks	SYN flood, UDP flood, ACK flood, ICMP flood, DNS query flood, NTP reply flood, HTTP flood attack, and Web application attacks
Application Layer Protection	Supported (combined with AWS WAF)	Supported
Large DDoS Mitigation Capability	Supported (AWS Shield Advanced)	Supported (Anti-DDoS Pro)
Protection Capacity	Capacity do not disclosed	Anti-DDoS Basic provide 500Mbps ~ 5Gbps capacity for different regions Anti-DDoS Pro can defend against up to 300Gbps capacity
Technical Architecture	Routing techniques (Shield Advanced)	Defense room (Anti-DDoS Pro)
Service Integration	EC2, ELB, CloudFront, Route53	Supports services inside and outside of the cloud

3. Certificate service

Similar to AWS Certificate Manager (ACM), Alibaba Cloud SSL Certificates Service allows users to purchase, provision, and manage SSL/TLS certificates on Alibaba Cloud.

3.1 Service model

Alibaba Cloud SSL Certificates Service provides certificate purchasing, deploying, and revocation. After the certificate is issued, users can deploy digital certificates with a single click to other Alibaba Cloud services.

3.2 Services integration

AWS users cannot use AWS Certificate Manager (ACM) to directly install ACM Certificate on the AWS based website or application. ACM is integrated with following services to deploy ACM Certificates on the cloud: Elastic Load Balancing, Amazon CloudFront, AWS Elastic Beanstalk, Amazon API Gateway, and CloudFormation. For example, to serve secure content on CloudFront over SSL/TLS, you need to install SSL/TLS certificates on either the CloudFront distribution or on the backend content source.

Like ACM, if you have purchased Alibaba Cloud's CDN, Anti-DDoS Pro IP, WAF, or Server Load Balance, you need to enable HTTPS-secured visiting to these cloud products in advance. Then use the Alibaba Cloud SSL Certificates Service to deploy your purchased digital certificates to these products through one-click deployment.

3.3 Renewal

ACM attempts to automatically renew ACM Certificates before they expire except for certificates associated with Route 53 private hosted zones. If ACM is unable to automatically renew the certificate, it will send notifications to users to require manual renewal.

You need to renew certificates manually on Alibaba Cloud Certificates Service. After renewal and review are complete, a new certificate will be issued. You can install this new certificate on your server to replace the expiring certificate.

3.4 Pricing

SSL/TLS certificates provisioned through AWS Certificate Manager are free. You pay only for the AWS resources you create to run your application.

Alibaba Cloud Certificates Service not only provides free, trusted certificates, but also provide purchasing highly-secure certificates straight from the Alibaba Cloud platform.

3.5 Feature comparison

AWS ACM features and terminologies maps to that of Alibaba Cloud SSL Certificates Service as follows:

Feature	AWS Certificate Manager (ACM)	Alibaba Cloud SSL Certificate
Using Existing Certificate	Supported	Supported
Import Third-Party Certificates	Supported	Supported
Free Certificates	Supported	Supported
Paid Certificates	Not Supported	Supported
Renewal	Supported	Supported
Integrated Services	AWS Elastic Beanstalk, CloudFormation, CloudFront, APIs on API Gateway	Alibaba Cloud CDN, Anti-DDoS Pro, WAF, and Server Load Balancer
Automatic Deployment	Supported	Supported
Management	Management console, ACM API, SDK, CLI	Console

4. Mobile security

AWS does not provide security services specifically for mobile applications. Alibaba Cloud's Mobile Security provides security services for the full lifecycle of mobile app delivery, including risk detection,

security protection, and threat intelligence.

4.1 Risk detection

Risk detection is implemented by uploading an APK package to scan for malicious codes and vulnerabilities. The scan result includes details of vulnerabilities, such as vulnerability quantity, names, types, and repair suggestions.

4.2 Security protection

Security protection is meant to harden apps and connect security components. Apps are hardened to provide SO shelling, and DEX files are shelled to prevent against different types of analysis tools. This feature adds security components and applies ongoing components to newly uploaded apps to prevent attacks, client information leakage, and forged requests.

4.3 Threat intelligence

Threat intelligence detects forgery and risks of network-wide apps based on big data, and keeps an eye on network disks of forums to implement multidimensional forgery detection.

4.4 Pricing

Alibaba Cloud Mobile Security Service is available in two versions: Basic Edition (Free Trial) and Professional Edition (Paid Version). For Professional Edition, Mobile Security service fee is based on two types of services: Vulnerability Scan and Application Hardening.

5. Server guard

At present, AWS has not launched a security product that covers host security. Alibaba Cloud's Server Guard is a lightweight agent installed on a server. Server Guard associates with cloud threat intelligence to implement vulnerability management, baseline detection, exception detection, and asset management, thereby creating an in-depth defense system.

5.1 Vulnerability management

Detect system software CVE vulnerabilities, Windows vulnerabilities, Web-CMS vulnerabilities and other high-risk vulnerabilities.

5.2 Baseline detection

Baseline detection checks for account security, weak passwords, and configuration risks.

5.3 Intrusion detection

By analysis of user behavior, intrusion detection detects off-site login and transaction information, brute force password cracking, and website backdoors.

5.4 Pricing

The basic version of Server Guard is currently available free of charge. When you purchase an ECS instance, you simply need to agree to our license agreement, before logging in to the Server Security Management Console. The advanced version of Server Guard, which offers additional features for enterprises, will be available in mid-2018 and will be a paid service.

Big Data

Alibaba Cloud for AWS Professionals

This article discusses the main differences and similarities between AWS and Alibaba Cloud in big data services. We mainly discuss the following service types and products:

1. Data collection
2. Data computing
3. Data analysis
4. Data visualization
The comparison covers the products as shown in the table below.

Feature	AWS	Alibaba Cloud
Data collection	AWS Kinesis	Alibaba Cloud Log Service Alibaba Cloud DataHub
Data computing	AWS Elastic MapReduce AWS Redshift	Alibaba Cloud E-MapReduce Alibaba Cloud MaxCompute
Data analysis	AWS QuickSight	Alibaba Cloud Quick BI
Data visualization	N/A	Alibaba Cloud DataV

1. Data collection

Both AWS Kinesis and Alibaba Cloud Log Service & DataHub can be used to extract and collect data to their own cloud environment or the corresponding data models. However, each service uses a different service model.

1.1 Service models

The following table compares the basic functions and terminologies of AWS Kinesis vs Alibaba Cloud DataHub & Alibaba Cloud Log Service.

Feature	AWS Kinesis	Alibaba Cloud Log Service	Alibaba Cloud DataHub(public beta by china site)
Client support & collection methods	Native Agent	Native Agent	Native Agent
	Open-source client	Open-source client	Open-source client
	API	Over 30 collection ends, such as Logstash and Fluent.	Multiple collection ends, such as mobile devices, applications, website service, and sensors.
	N/A	API/SDK	API/SDK
Client expansion	N/A	Supported	Supported
Retention days	1 ~ 7 days	1 ~ 365 days	7 days
Stream computing support	Open source stream computing engine, +Kinesis Analytics	Open source stream computing engine, ARMS and StreamCompute (which will be launched on the international site later), and CloudMonitor.	Supports stream computing engine, StreamCompute.
Deployment Location	Region	Region (global)	Region (public beta)
Shipping destination	S3/RedShift/ES	OSS/MaxCompute/T able Store	OSS/MaxCompute/a nd so on
Size	1 MB	3 MB	1 MB
Throughput	5 MB/s, 5000 records/s.	No upper limit, elastic.	Supports up to several TB of daily data input with single topic, with each shard supporting several hundred GB of daily data input.
Delay	S3/ES: 60~900/sRedshift: >60s	OSS/Table Store: 60~900/s.MaxComp ute: 15 min.	Maximum delay: 5 min.
Storage cost	USD 0.02/GB	USD 0.01/GB	Public beta, free for the time being.
ETL support	Lambda	JSON/CSV/ParquetF	Connected to

		unction computer	MaxCompute and Blink platform, Alibaba Cloud DataHub supports all ETL tools on these two platforms.
Pricing strategy	Kinesis pricing	Log Service pricing	Public beta, free for the time being.
Security	Supports customization of permissions, group, and access control of users and roles.	HTTPS + Transmission signature + Multi-tenant isolation + Access control	Provides enterprise-level multi-layer security protection and multi-user resource isolation mechanism.Provides various authentication and authorization mechanisms, as well as whitelist and primary/subaccount features.

1.2 Main functions

AWS Kinesis is a cloud service provider that supports stream computing. It enables users to collect and process data in real time. AWS Kinesis provides multiple core capabilities to economically and effectively process the corresponding data flow. It also has the flexibility to allow you to choose the tools that best fit the application needs. By default, the time record of added data flow can be accessed within a maximum of 24 hours after being added. You can increase the data retention period to seven days by enabling extended data retention. The maximum data block size in A record is 1 MB. You can use REST API or Kinesis Producer Library(KPL) to send data to AWS Kinesis.

Alibaba Cloud Log Service provides all-in-one solutions for log collections, log processing, and real-time log analysis. The collection method LogHub supports client, web page, protocol, SDK/API (mobile apps and games) and many other log collection methods. All log collection methods are implemented based on Restful API, apart from which you can use API/SDK to implement new collection methods. The maximum data block size supported by Alibaba Cloud Log Service is 3 MB. You can choose a data retention period from 1 to 365 days. It also supports rich ETL and elastic for throughput (without upper limit). Alibaba Cloud DataHub is currently in public beta release, and is only targeted at the Chinese market. The international version will be developed later. Alibaba Cloud DataHub can continually collect, store, and process data from mobile devices, application software, website services, sensors, and other units that generate streaming data. The maximum data block size supported by Alibaba Cloud DataHub is 1 MB. You can choose a data retention period of seven days. DataHub supports all ETL tools on these two platforms by connecting to MaxCompute and Blink platform.

1.3 Data Shipping

AWS Kinesis can use AWS Kinesis Firehose to load streaming data to data storage, which can then load data to AWS S3, AWS Redshift, or AWS Elasticsearch Service.

Alibaba Cloud Log Service can use LogShipper to deliver the collected data to Alibaba Cloud's storage products such as OSS, Table Store, and MaxCompute in real time. You only need to complete configuration on the console. In addition, LogShipper provides a complete status API and automatic retry function. LogShipper can also be used in concert with E-MapReduce(Spark, Hive) and MaxCompute to conduct offline computing. DataHub service also supports distributing streaming data to various cloud products, such as MaxCompute (formerly known as ODPS) and OSS. The price of AWS Kinesis Streams is based on two core aspects: Shard Hour and PUT Payload Unit, and an optional dimension: Extended Data Retention. Data is retained for 24 hours by default. You are charged for an additional rate on each shard hour incurred by your stream once you enable extended data retention. AWS Kinesis Streams uses a provisioning model, which means you must pay for the provided resources, even if you choose not to use some or all of them. The price of AWS Kinesis Firehose is based on the data transmission volume. Alibaba Cloud Log Service uses the Pay-As-You-Go pricing method, and you are charged based on the volume of resources used at different stages of monthly prices. If you have a free credit line for your log service, you are not charged for the volume within the credit line, and are only charged for the exceeding part. In addition, there are resource packs available to provide you better offers. Alibaba Cloud DataHub is currently at the public beta stage, and is free currently.

2. Data computing

After collecting data to the corresponding cloud environment, these products can convert data, filter the data, and then compute on the data based on your needs.

2.1 Service comparison

The following table compares the basic functions and terminologies of AWS Elastic MapReduce vs Alibaba Cloud E-MapReduce.

Item	AWS Elastic MapReduce	Alibaba Cloud E-MapReduce
Open source database	Apache Hadoop and Apache Spark	Apache Hadoop and Apache Spark
Service integration	Yes	Yes
Scaling	Manual	Manual
Deployment Location	Zonal	Zonal
Pricing model	Hourly	Hourly
Deployment unit	Cluster	Cluster
Dimensional unit	Node (master, core, and task nodes)	Node (master and slave nodes, scalable)
Unit of Work	Step	Job

Computing model	MapReduce, Apache Hive, Apache Pig, Apache Spark, Spark SQL, and PySpark.	MapReduce, Apache Hive, Apache Pig, Apache Spark, Spark SQL, Hbase, and so on.
Customized	Pilot operation	Pilot operation

The following table compares the basic functions and terminologies of AWS Redshift vs. Alibaba Cloud MaxCompute.

Item	AWS Redshift	Alibaba Cloud MaxCompute
Computing level	EB level	EB level
Data source	AWS S3, DynamoDB Activity Log, Kinesis, web app server...	Application-generated data(ApsaraDB for RDS/OSS/AnalyticDB/SLS...), existing data center (Oracle DB), independent data set (Hadoop Cluster)...
Supply unit	Nodes	N/A (full management)
Data security	Uses VPC to isolate clusters, and KMS to manage keys.	Provides multi-layer sandbox protection/monitoring, project-based data protection mechanism, package authorization, Trusted mode, as well as RAM and ACL authorizations.
Zoom	Manual	Auto
Backup management	Snapshots	Cluster disaster recovery
Deployment Location	Zonal	region
Data format	TEXTFile, SequenceFile, RCFile, AVRO, Parquet, ORC, and so on.	TEXTFile, SequenceFile, RCFile, AVRO, Parquet, ORC, and so on.
Ecological connectivity	JDBC and ODBC.	JDBC, ODBC, R, Python Pandas, and IntelliJ IDEA.
Community compatibility	PostgreSQL compatible	Standard SQL, MR, and Tunnel statements.

2.2 Main functions

Amazon EMR provides a managed Hadoop framework that makes it easy, fast, and cost-effective to run data process frameworks. Amazon EMR consumes and processes real-time data from Amazon Kinesis, Apache Kafka, or other data streams with Spark Streaming. Amazon EMR performs streaming analytics in a fault-tolerant way and writes results to AWS S3 or HDFS. Amazon EMR can be used to quickly and cost-effectively perform data transformation workloads (ETL) such as, sort, aggregate, and join, on large datasets.

Alibaba Cloud E-MapReduce is a big data processing system solution running on Alibaba Cloud platform. E-MapReduce is built on Alibaba Cloud Elastic Compute Service (ECS) based on open source Apache Hadoop and Apache Spark. It facilitates usage of the other peripheral systems (for example, Apache Hive, Apache Pig and HBase) in the Hadoop and Spark ecosystems to analyze and process their own data. Moreover, you can also export and import data to other cloud data storage systems and database systems easily, such as Alibaba Cloud OSS and Alibaba Cloud ApsaraDB for RDS. AWS Redshift data house is an enterprise level relational database query and management system. AWS Redshift supports multiple types of applications, including business intelligence (BI), reports, data and analytic tools, to establish client connection. AWS Redshift Spectrum allows you to store and process data at any time as needed. Alibaba Cloud MaxCompute is the largest big data cloud service platform in China, and provides massive data storage, massive data computing, as well as data exchange among multiple organizations. Alibaba Cloud MaxCompute is a large distributed computing system independently developed by Alibaba Group. MaxCompute supports multi-cluster dual-active disaster recovery. You don't have to concern about the infrastructure stability, which allows you to concentrate on your own business. MaxCompute also ensures data consistency and continuity of its services. Alibaba Cloud MaxCompute provides users with a comprehensive set of big data development tools to improve data import and export solutions, as well as various classic distributed computing models to quickly solve massive data computation, effectively reduce enterprise cost, and safeguard data security. Alibaba Cloud MaxCompute has better support on ecological connectivity and community compatibility. In terms of data format support, Alibaba Cloud MaxCompute and AWS Redshift are basically tied. They both have their own security policies, but security policies of Alibaba Cloud MaxCompute are more extensive. In terms of data backup, AWS Redshift's automatic snapshot function can continuously back up data from the clusters to AWS S3. Snapshots are automatically created in a continuous and incremental manner. AWS Redshift stores your snapshots for a customized period, which can be 1 to 35 days. For Alibaba Cloud MaxCompute, data is stored in Apsara system's clusters. Apsara Distributed File System in Apsara system is in triplicate, and uses a multi-master mechanism to ensure the masters' availability, and data reliability. Apsara Distributed File System guarantees both high data availability and high service availability. Alibaba Cloud MaxCompute also supports timed data backup. In addition, MaxCompute has also developed the next generation engine MaxCompute 2.0. Using the internal big data platform of Alibaba Group and Alibaba Cloud, MaxCompute 2.0 features high performance and low cost, which are the most fundamental indicators of a computing platform. We have also been constantly optimizing the architecture and performance. In terms of language support, we have launched NewSQL, a new generation big data language that combines both Imperative and Declarative advantages. With regards to multi-machine collaboration, we have deployed more than 10 clusters, and data operation is subject to smart scheduling among clusters. MaxCompute also has the multi-cluster disaster tolerance capability to ensure financial-level stability. In terms of computing model, MaxCompute supports batch MR, DAG-based processing, interactive, memory computing, cluster learning and many other computing models, and achieves open-source compatibility by collaborating with computing platforms.

2.3 High scalability

Service model of Alibaba Cloud E-MapReduce is very similar to that of AWS EMR. Taking full advantage of the open source big data ecosystems, including Hadoop, Spark, Hive, Storm, and Pig, E-MapReduce provides users with an all-in-one big data processing and analysis solution that covers clusters, jobs and data management. When using these two services, users may create a cluster that contains multiple nodes. This service allows creation of one master node and a variable number of work nodes.

Both AWS EMR and Alibaba Cloud E-MapReduce support manual node quantity adjustment within a cluster after launching the cluster. How to manage the cluster size as well as the scaling operations are made by the user or administrator that monitors the cluster's performance and usage. Users of these two products are charged by the number of nodes provided. Comparing the Apache Spark models used in concert with AWS EMR and Alibaba Cloud E-MapReduce, if an AWS Redshift user wants to scale up/down a cluster, for example, to increase resources during high-usage period, or reduce cost during low-usage period, the user must do it manually. MaxCompute provides higher flexibility and security, extensive functions, integrated architecture, elastic scaling methods, and a variety of supported tools. In addition, DataWorks is closely linked with MaxCompute and provides MaxCompute with all-in-one solutions for data synchronization, task development, data workflow development, data management, data O&M, and other functions. For details, see [DataWorks](#) (formerly known as Data IDE). AWS EMR supports on-demand pricing as well as short-term and long-term discounts. Both AWS EMR and E-MapReduce use hourly pricing. When purchasing E-MapReduce clusters, Alibaba Cloud ECS is purchased automatically, so you do not need to prepare ECS in advance. If you are entitled to a discount for ECS, you enjoy the same discount when purchasing ECS here. For details, refer to [E-MapReduce pricing descriptions](#). AWS Redshift pricing options include:

1. On-Demand pricing: no upfront costs. You pay an hourly rate based on the type and number of nodes in your cluster.
2. Amazon Redshift Spectrum pricing: enables you to run SQL queries directly against all of your data in AWS S3. You pay for the number of bytes scanned.
3. Reserved Instance pricing: to save cost by committing to using Redshift for a certain period of time.

MaxCompute offers two pricing options:

1. Volume-based post payment: taking the volume of resources consumed by jobs as the measurement indicator, you pay after execution of the jobs.
2. The CU-based pre-payment: You can reserve a certain quantity of resources in advance. CU-based pre-payment is only supported on Alibaba Cloud big data cloud platform. For detailed pricing descriptions, refer to [MaxCompute](#).

3. Data analysis

Computes, processes, and analyzes the collected big data, and converts it into information that is useful to the enterprise, to provide value for enterprise planning, product R&D, and market condition survey.

3.1 Service comparison

The following table compares the basic functions and terminologies of Alibaba Cloud Quick BI vs. AWS QuickSight.

Item	AWS QuickSight	Alibaba Cloud Quick BI
Data connection	Strong relational database, multidimensional database, NoSQL database, Hadoop & local files.	Relational database, multidimensional database, NoSQL database, Hadoop & local files, Alibaba ecosystem.
Data model	Cube support, system time cycle (date, week, month, quarter, year), offline data source acceleration (ApsaraDB for RDS acceleration, high cost).	Cube support, system time cycle (date, week (7 types), month, quarter, year, MTD, QDT, YTD, fiscal year), offline data source acceleration (computation acceleration, full coverage, low cost).
Report generation	Standard table, composite electronic reports.	Standard table, composite electronic reports (Excel proficiency).
Data visualization	Data components (14 types), visual screen creation, widget filtering (time, drop down, button).	Data components (16 types), visual screen creation, widget filtering (time, drop down, text, button, comparison, comment).
Dashboard & sharing	Supported	Supported
Permission management	Assigns ADMIN or User roles.	Includes organization permission management and row-level permission management.
Data view	Mobile and web terminals, DirectMail.	Mobile and web terminals, portal creation, DingTalk account support, DirectMail.
System capability	Professionalism (enterprise level BI), easy-to-use (good web page interaction), integration (third-party embedding supported).	Professionalism (enterprise level BI), easy-to-use (excellent web page interaction), integration (third-party embedding supported).

3.2 Main functions

Both AWS QuickSight and Alibaba Cloud Quick BI are cloud-computing-based business analysis services that can:

- provide smart data modeling.

- integrate the scale advantage and flexibility of cloud computing into business analysis to solve business pain points.
- help enterprises complete data analysis and data animation.
- provide highly efficient capabilities and methods for business digitization.

QuickSight uses SPICE (Super-fast, Parallel, In-memory Calculation Engine) to provide quick-response query performance, and allows quick interactive analysis on various AWS data sources. Alibaba Cloud QuickBI is a built-in intelligent query acceleration engine that realizes real-time online analysis on massive amount of data. Without large amount of data preprocessing, Quick BI can smoothly analyze massive amount of data, which significantly improves the analysis efficiency. In addition, Quick BI support multiple data sources, including Alibaba Cloud data sources and Alibaba Group ecosystem related data sources.

Both AWS QuickSight and Alibaba Cloud Quick BI supports Cube (multidimensional database, or multidimensional data cube). When using Cube, you can compress the required data, especially when processing large data sizes. For example, FineCube for FineBI can avoid data modeling and increase data processing speed. In terms of offline data acceleration, Alibaba Cloud Quick BI uses computation acceleration with full coverage, at a lower cost than ApsaraDB for RDS acceleration used by AWS QuickSight. In addition, Alibaba Cloud Quick BI supports a wider range of data types within the system time cycle. They both support standard Table, but Alibaba Cloud' s compliance electronic report (Excel proficiency) has a better performance. Of course, the standard version only contains the worksheet function, and only advanced versions has the electronic report function. Data visualization: AWS QuickSight uses a technology called AutoGraph, which chooses the most appropriate visual type based on data attributes (such as numbers and data types) you select. Alibaba Cloud Quick BI supports extensive data visualization effects to meet data presentation demands of different scenarios. Besides, it automatically recognizes data features and smartly recommends an appropriate visualization solution. In terms of permission management: When creating an AWS QuickSight account, this account has the ADMIN permission by default. AWS QuickSight users can invite other users and assign to them the ADMIN or USER roles. Alibaba Cloud Quick BI' s security-control data permission management includes internal organization member management, and supports administrative-level data permissions, to meet different permission requirements for different users. In terms of data sharing and data view: AWS QuickSight allows users to use the sharing icon on the service interface to share analysis results, dashboards, and tables. Before sharing something with others, users can choose the recipient (email address, user name, or group name), permission level and other options. Similarly, Alibaba Cloud Quick BI supports sharing worksheets/spreadsheets, dashboards, and data portals to other logged-on users, and publishing dashboards to the Internet for access by non-logged-on users. Data view support: Both Alibaba Cloud Quick BI and AWS QuickSight support data view at the mobile terminal, web terminal, and through DirectMail. Alibaba Cloud Quick BI also supports DingTalk account, which is convenient for DingTalk users. Alibaba Cloud Quick BI also supports data portal creation, and allows users to drag-and-drop dashboards to create a data portal, embed links to dashboards, and conduct basic settings for templates and the menu bar.

3.3 System capability

Both AWS QuickSight and Alibaba Cloud Quick BI support enterprise level BI and third-party integration. Alibaba Cloud Quick BI offers flexible report integration solutions, which allow you to embed reports created from Alibaba Cloud Quick BI into your own system, and directly access the reports from your system without logging on to Alibaba Cloud Quick BI. Quick BI is easy-to-use. With an intelligent data modeling tool, Quick BI greatly reduces data acquisition cost and makes it much easier to use. Besides, the drag-drop operation and the extensive visual chart controls allow you to easily complete data perspective analysis, self-service data acquisition, business data profiling, report making, and data portal creation.

Both AWS QuickSight and Alibaba Cloud Quick BI are priced based on the number of users and the subscription duration, and both of them provide two editions (standard edition and enterprise edition) with different pricing options. Annual subscription is required by AWS QuickSight. The purchased Alibaba Cloud Quick BI instance can last for at most one year. You can select the number of users and the service length. When your Quick BI instance is going to expire, the system sends a message to remind you to renew your Quick BI instance in time.

4. Data visualization

DataV is a powerful and easy-to-use data visualization tool, which has extensive geographical presentation functions and user-friendly interfaces.

4.1 Application scenario

- Presentation: presents business performance data (investor relationship, public relations, exhibitions, road shows, and reception).
- Monitoring: uses data to boost business growth (real-time monitoring, alert, and quick response support).
- Data-driven: discovers hidden data value (real-time presentation of multidimensional data may bring new responsibilities).

4.2 Main functions

4.2.1 Templates for different solutions

DataV provides multiple templates for diversified scenarios, such as the control center, geographic analysis, real-time monitoring, and operation presentation, which can be used after slight customization from the client. You can design high quality visual presentations without help from professional designers.

4.2.2 Open and extensive visualization component library

Apart from the basic charts, DataV is good at combining data and geographical information, such as map-based traffic routes, heat maps and scatter charts. DataV also allows you to draw geographic tracks, geographic lines, heat maps, geographic blocks, 3D maps, and 3D globes that involve massive amounts of data, and to overlay geographic data. The topographic maps, tree charts, and other distinctive charts are also available to you.

4.2.3 Support for various data sources

DataV can be connected to various data sources, including Alibaba Cloud AnalyticDB, ApsaraDB for RDS, and API, and supports dynamic

requests. Static data stored in CSV and JSON files is also supported.

4.2.4 User-friendly interface With

graphic interface and configuration widgets, you only drag and drop to create professional visualization projects, which requires very limited programming skills.

4.2.5 Flexible publishing and

adaptation DataV projects can be published as web pages, or published with password or access token to control access and security information displayed on the dashboard. For better display effects on spliced screens, DataV is optimized to improve resolution.

4.2.6 Support for internal

deployment There are scenarios that data may be subject to very high level of confidentiality and cannot be posted online, or the network access is restricted. In such cases, internal deployment solution may be used. After editing the dashboard interface from the cloud version of DataV editor, you can compress the content of your edits into a single file, download it to your local DataV Server, and then connect it to your local database and publish it locally.

4.2.7 Tools for dashboard

broadcasting and splicing DataV also provides a lightweight solution for dashboard broadcasting and splicing. Distinct from traditional solutions, Mscreen ensures each interface is stably run as an independent process and can be spliced together to form a customized solution for single channel output of signal.

4.2.8 Component customization DataV provides a secondary development environment that allows developers to integrate their own JavaScript components into DataV solutions. Users can configure the data source and styles of customized components, just like local components. Developers can also sell their component libraries at Alibaba Cloud Marketplace.

4.3 Pricing

DataV offers two product editions for public cloud users: Basic Edition and Enterprise Edition. Prices and feature details are listed as follows.

Item	Basic (USD 360 Annually)	Enterprise (USD 3,000 Annually)
Sharing - share projects publicly	Yes	Yes
Sharing - share with password	N/A	Yes
Sharing - share with access token	N/A	Yes
Sharing - transfer projects to another user	Available only when target user is using Enterprise Edition.	Available only when target user is using Enterprise Edition.
Projects and templates - available templates	5	All templates (updating)
Projects and templates - available projects	5	20
Data source - ApsaraDB for RDS for MySQL	Yes	Yes
Data source - Analytic DB	Yes	Yes
Data source - MySQL Compatible Database	Yes	Yes

Data source - CSV	Yes	Yes
Data source - API	Yes	Yes
Data source - Static JSON	Yes	Yes
Data source - DataV Data Proxy Service	Yes	Yes
Data source - ApsaraDB for RDS for PostgreSQL	N/A	Yes
Data source - ApsaraDB for RDS for SQLServer	N/A	Yes
HybirdDB for PostgreSQL	N/A	Yes
Data source - Alibaba Cloud API Gateway	N/A	Yes
Data source - Table Store	N/A	Yes
Data source - Alibaba Cloud intranet IP	N/A	Yes
Data source - OSS	N/A	Yes
Data source - Alibaba Cloud Log Service	N/A	Yes
Data source - Oracle	N/A	Yes
Data source - SQLserver	N/A	Yes
Visualization widgets - basic charts	Yes	Yes
Visualization widgets - basic maps	Yes	Yes
Visualization widgets - advanced maps	N/A	Yes
Visualization widgets - ECharts	N/A	Yes

Migration Service

Alibaba Cloud provides cloud migration and implementation services for enterprise customers. Alibaba Cloud migration services include "Application Migration," "Data Migration" and "Big Data Implementation."

[Apply Now](#)

Our current services as are listed as below.

Application Migration

Through the Alibaba Cloud migration tool, you can migrate physical or virtual servers to Alibaba Cloud. The Alibaba Cloud Migration Tool is applicable to the following scenarios:

- Migrate physical servers to Alibaba Cloud ECS console
- Migrate virtual machines to Alibaba Cloud ECS console
- Migrate from another cloud platform, such as Amazon Web Services (AWS), Microsoft Azure, Tencent Cloud, or Huawei Cloud to the Alibaba Cloud ECS console.

Data Migration

- Migrate your relation database to Alibaba Cloud RDS (Source: Oracle, PG, DB2, SQL Server, MySQL, Target: RDS\DRDS). Includes full migration and incremental migration.
- Migrate your FTP, File Server, AWS S3 to Alibaba Cloud OSS Storage.

Big Data Implementation

- Support for the Big Data structure conversion to Alibaba Cloud MaxCompute.
- Support for relational database (including Oracle, DB2, PG, SQL Server, MySQL, RDS, DRDS) migration to MaxCompute.
- Support for the implementation of Big Data Warehouse Solution. Includes: data warehouse modeling, data incremental synchronization management, and incremental data consolidation program implementation.

Migration Technical Guide

AWS Migration to Alibaba Cloud

This document is intended to help professionals, such as engineers, architects, and operations and maintenance (O&M) personnel who are responsible for migrating work load from AWS services to Alibaba Cloud services.

It briefly shows the mapping between AWS cloud services and Alibaba Cloud services, and provides the tools and technical guide links needed during the migration process.

Compute

Description	AWS	Alibaba Cloud	Tool
Virtual Servers	Elastic Compute Cloud (EC2)	Elastic Compute Service (ECS)	Alibaba Cloud Migration Tool

Further Reading

Migrate to Alibaba Cloud by using Cloud Migration tool

Cloud Migration Tool FAQ

Notes for importing custom images

Convert image file format

Storage

Description	AWS	Alibaba Cloud	Tool
Object Storage	Amazon Simple Storage Services (S3)	Object Storage Service (OSS)	OSSImport
Shared File Storage	Elastic File System (EFS)	Network Attached Storage (NAS)	NASImport
NoSQL Database	DynamoDB, SimpleDB	Table Store	Coming soon

Further Reading

Use OSSImport to migrate data

Migrate data from Amazon S3 to Alibaba Cloud OSS

Use NASImport to migrate data to NAS

Use NASImport in Windows

Databases

Description	AWS	Alibaba Cloud	Tool
Relational Database	Relational Database Service (RDS)	ApsaraDB for RDS	Data Transmission Service (DTS)
Caching	ElastiCache	ApsaraDB for Redis	Data Transmission

			Service (DTS)
Elastic Data Warehouse	RedShift	HybridDB for PostgreSQL	Coming soon

Further Reading

Migrate data from AWS RDS for MySQL to ApsaraDB RDS with mysqldump

Migrate data from AWS RDS for MySQL to ApsaraDB RDS with DTS

Migrate data from on-premises MySQL to RDS for MySQL

Migrate data from on-premises Oracle to RDS for MySQL

Migrate data from on-premises SQL Server to ApsaraDB RDS for SQL Server

Migrate data to ApsaraDB for RDS SQL Server 2008 R2

Migrate data to ApsaraDB for RDS SQL Server 2012/2016

Migrate data from on-premises MongoDB to ApsaraDB for MongoDB

Migrate data from on-premises Redis to ApsaraDB for Redis

Analytics

Description	AWS	Alibaba Cloud	Tool
Elastic search service	Amazon Elasticsearch	Elasticsearch	N/A
Big Data Processing	Amazon EMR	MaxCompute, E-MapReduce	N/A

Further Reading

Elasticsearch index migration from AWS to Alibaba Cloud