Alibaba Cloud Compare Platforms

Alibaba Cloud for AWS Professionals

Alibaba Cloud for AWS Professionals

Overview

Alibaba Cloud for AWS Professionals

Contents

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 16 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

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 sever 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)	99.99999999%(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		

- 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 EFS	Alibaba Cloud NAS
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.

Security

Alibaba Cloud for AWS Professionals

Contents

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 neet 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 c 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, Sever Loader 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/TSL 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.