Product Comparison

Alibaba Cloud for AWS Professionals

MORE THAN JUST CLOUD | Alibaba Cloud

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 100 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 Amzone 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(Preemptible 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. QCOW2, VMDK, VDI, VHD (vpc), VHDX, qcow1 or QED format images can be converted to VHD or RAW format images

		for import.
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 Amazon 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 Amazon 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. Amazon 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 Amazon EC2 instance types and Alibaba Cloud ECS instance families.

TargetGroup	Scenario	Amazon EC2 Instance Type	Alibaba Cloud ECS Instance Family
Entry Level	General Type	t2 , t3	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,d1ne
	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,f2

1.2 Instance images and Create instance

Instance image refers to the running environment template for virtual machine instances. Amazon 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. Amazon 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.

Alibaba Cloud ECS images and Amazon EC2 AMI are both regional resources 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	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 Amazon EBS of local storage.In terms of block storage performance, Amazon EBS Provisioned IOPS SSD (io1) supports up to 32,000 random IOPS read and write performance on a single disk. Alibaba Cloud' s latest ESSD cloud disk provides up to 1 million random IOPS read and write performance on a single disk.

Instance pricing model: Alibaba Cloud ECS provides pay-as-you-go and yearly/monthly subscription options. Amazon EC2 only supports 1 or 3 years of RI. The pay-as-you-go model is similar to that of Amazon 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 Amazon 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 Amazon 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

Amazon Elastic 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 topic compares the storage and content delivery network services of Alibaba and AWS. It covers the services in the following table.

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 Alibaba Cloud Object Storage Service (OSS).

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 undergo many read operations. Like AWS S3, Alibaba Cloud OSS is highly reliability, cost-effective, and scalable. Users can request data of any size, at any time, and from any location.

OSS provides three storage types: Standard, Infrequent Access, and Archive. The types vary in storage

price, read speed, and availability. All storage types have the same reliability and can be easily managed by using the OSS API. Standard is designed general storage, whereas Infrequent Access and Archive are designed for more long-term storage options. For more information, see Introduction to Storage Types.

1.1 Service models

The following table compares the basic functions and terminologies of AWS S3 and 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, Intelligent-Tiering, Standard-Infrequent Access, One Zone-Infrequent Access, Glacier, Glacier Deep Archive	Standard, Infrequent Access, Archive
Deployment location	Region	Region

1.1.1 Storage space (bucket)

Like AWS S3, Alibaba Cloud OSS uses buckets to store data. You can configure the region, access permissions, and lifecycle rules of each bucket. Both OSS buckets and S3 buckets must be named in accordance with the DNS standard. Bucket names must be globally unique, and they should not be nested.

By setting a bucket ACL, OSS authenticates a user to see whether they have access permission for a bucket, thereby implementing access control by using storage space levels.

OSS buckets do not currently support object version control, though it is supported by AWS S3. OSS will support this feature soon. You can check the OSS Release notes for the latest announcements.

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

Function Feature	Amazon S3	Alibaba Cloud OSS
Object storage	Simple Storage Service (S3)	Object Storage Service (OSS)
Deployment Unit	Bucket	Storage space (bucket)
Bucket ACL	Supported	Supported

Lifecycle Management	Supported	Supported
Max Bucket Quantity	100	30
Storage Type	Standard, Intelligent-Tiering, Standard-Infrequent Access, One Zone-Infrequent Access, Glacier, Glacier Deep Archive	Standard, Infrequent Access, and Archive
Version Control	Supported	Not Supported
Deployment Location	Region	Region

1.1.2 Object

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

Alibaba Cloud OSS buckets have no upper limit on total storage and number of objects. For large files, OSS supports segment-by-segment uploading. The maximum file size in OSS is 48.8 TB, whereas the maximum object size in AWS S3 is 5 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 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. To follow good data security practices, we do not recommend that you use the Public-Read-Write permission unless necessary.

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 while it is being transferred and when it is stored. Users can protect data during transfers 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, OSS decrypts the data and returns the 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 of events, Alibaba Cloud OSS allows users to create event notification rules. Based on these rules, a message is sent to a target if specific events occur.

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

1.4 Functional difference

1.4.1 Append write

With OSS, you can constantly append written data to the end of the object while reading the data at the front of the object. This function allows the newly generated content at the end of a file and the front content to be read simultaneously by an application. This is useful for live media streaming scenarios.

S3 does not support appending of tail data. Instead, the object data must be re-uploaded to a new file, and so S3 cannot effectively meet the requirements of live streaming applications.

1.4.2 Strong consistency for delete and update

Alibaba Cloud supports strong read-after-write consistency for object deletion and update. S3 does not support strong consistency for update and delete. Instead, S3 provides eventual consistency, meaning that after you delete or update an object, you may not see the change if you read the data shorty afterwards.

1.5 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 functions of AWS S3 and Alibaba Cloud OSS.

Function Feature	Amazon S3	Alibaba Cloud OSS
Storage object	Object	Object
Object ACL	Supported	Supported
Max object size	5 TB	48.8 TB
Data reliability	99.999999999% (11 nines)	99.999999999% (11 nines)
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

1.6 Service level agreement (SLA)

Both AWS S3 and Alibaba Cloud OSS provide service availability guarantees. If performance does not reach the guaranteed standard, the cloud providers will provide compensation according to the time the service is unavailable. For more information about the Alibaba Cloud OSS SLA, see Alibaba Cloud OSS Service Level Agreement.

1.7 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, amount of 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. For more information, see OSS Pricing.

2 Content Delivery Network

Alibaba Cloud Content Delivery Network (CDN) and Amazon CloudFront both deliver the content of the source site to the node nearest to the end user. This allows end users globally to receive their content with low latency and high efficiency. It resolves access delays caused by distribution, bandwidth, and server performance, and is applicable to scenarios such as website acceleration, video on demand, and live streaming.

Alibaba Cloud CDN has over 1500 nodes that cover 70 countries and regions in the world. Amazon CloudFront has 132 access points in 26 countries and regions.

CDN supports video AI, implements automatic content audit, and effectively identifies image and audio contents to avoid content violations.

Alibaba Cloud CDN includes five products: CDN, SCDN, PCDN, whole site acceleration, and edge node service. Their details are as follows:

- CDN: Delivers the content of the source site to the node located nearest to the end user, so the user can retrieve the desired content faster and with greater reliability. It resolves access delays caused by distribution, bandwidth, and server performance, and is applicable to scenarios such as website acceleration, video on demand, and live streaming.
- SCDN: Accelerates website access while protecting the website from threats such as DDoS, CC, Web app attacks, and malicious Web crawlers. It is suitable for websites that require content acceleration and security simultaneously.
- PCDN: Delivers content by using the mass fragmented idle resources in the edge networks based on P2P technology. It can offer distribution quality equal to or higher than CDN, and significantly reduce the distribution cost. It is suitable in scenarios where you must deliver content in real time, such as video on demand, live streaming, and large file downloads.
- Whole site acceleration: Improves the access experience of static resource hybrid websites. It supports static resource edge caches, dynamic content transmission back to the source through optimum routing, and provides improved access speeds and stability for whole websites. It is suitable for dynamic and static hybrid type websites, and pure dynamic type websites or applications.
- Edge node service: Reduces the response delay and the bandwidth cost, reduces the pressure on the central cluster, and is suitable for businesses under the “center + edge” structure. CDN-based edge flexible infrastructure is provided, so that you no longer need to maintain computing and forwarding infrastructure.

2.1 Service model

Similar to AWS CloudFront, Alibaba Cloud CDN transfers source content to an edge node within a vast network of globally deployed nodes. 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 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 Configuration	Supported	Supported
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 Standard protocol support

It supports HTTP-1.1 standard protocol, HTTP-2.0 protocol optimization transmission and end-to-end HTTPS secure transmission.

2.2.4 Cache refresh

In certain situations, such as source site update and static content modification, the user may need to manually refresh the CDN cache. Alibaba Cloud CDN allows the user to extract the latest contents from the source site to refresh the CDN contents. CDN supports URL refresh, directory refresh and URL push. AWS CloudFront does support the refresh of designated cache contents.

2.2.5 Cache invalidation

In certain situations, the end user may need to delete the CDN cache contents ahead of time. The user may set the cache object as disabled and extract the latest contents to access the object, or use the object version management function based on files containing the object version.

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 Site acceleration

The whole site acceleration supports dynamic/static content acceleration and websocket long connection protocol. For the websites with industry dynamic contents, dynamic and static hybrid contents, especially websites with many dynamic resource requests (for example, asp, jsp or php files), we recommended that you use Alibaba Cloud whole website acceleration, which can accelerate both dynamic content and static content.

2.2.8 Geographic location restriction

To specify the regions for content delivery, the end user is permitted to set the white list and black list of countries and regions. The data on distribution place can be identified based on the white list and black list.

2.3 Security

The following table compares the security functions and terminologies of 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

Like 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 [0.6 MB/s * capacity of file system (GB) + 600 MB/s, 20 GB/s]

Total throughput for each capacity-type file system (MB/s) = minimum [0.15 MB/s * capacity of file system (GB) + 150 MB/s, 10 GB/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 System	Several thousand	10,000+

- 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)

For more information, see 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.

For more information, see 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 five 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 one 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 has the TTL attribute which provides 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

When you create a table or index in Amazon DynamoDB, you must specify the throughput capacity in terms of read capacity units and enter the capacity units. 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 exceeds the reserved read/write throughput, Table Store will allocate additional throughput automatically to meet your requirements.

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, and access control and permission management. When it is used with Alibaba Cloud Resource Access Management (RAM) and Security Token Service (STS), Table Store allows users to access tables through subaccounts with different permissions. You can control permissions by granting 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 automates the backup and restore process. Table Store can manage multiple cloud data backups across different servers and racks. If any node of the backups fails, the other servers with backup copies will immediately restore the data to achieve zero data loss.

4.6 Pricing

Amazon DynamoDB offers a free tier limit. Users only need to pay for the resources they consume after 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 Internet downstream traffic. For more information, see Table Store Pricing.

Networking

Alibaba Cloud for AWS Professionals

By using cloud networking products, You can set up network isolation for 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	With the load balancing service that distributes traffic among several cloud servers, the external service capacity of the application system can be expanded via traffic distribution, and the availability and fault tolerance of the application system can be improved by eliminating single-point 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.
	Cloud Enterprise Network	Cloud Enterprise Network can build private communication channel between the VPCs and between the VPC and the local data center. It can improve the quick convergence of the network as well as the quality and security of the cross-network communication through automatic route distribution and learning, so as to realize the interworking of the resources in the whole network, thus helping you create an interconnected network with enterprise class scale and communication capacity.

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
ClassicLink	Supported	Supported
Elastic network interface	Supported	Supported
Private network	Supported	Supported
Dynamic Host Configuration Protocol (DHPC)	Supported	Supported

2.2 Costs

Amazon 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 Amazon NAT gateways differs from that of Alibaba Cloud NAT gateways. An Amazon 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 NAT gateway charge includes instance charge and public network charge. Because the NAT gateway does not have the ability to access the public network, it needs to use the flexible public network IP. The flexible public network IP can be purchased and managed as an independent resource. In loose coupling with the NAT network, it can facilitate the instance switching, expansion and IP address change, and support the real time modification of network bandwidth value.

Billing method	Amazon NAT Gateway	Alibaba Cloud NAT Gateway
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 Public network fee (Elastic IP address fee).

2.3 NAT Main advantages

	Alibaba Cloud	Applicable Scenarios / Alibaba cloud Advantages
Easy of use	Easy of Use: Support for multiple SNAT (source) and DNAT (destination) entries, easy to manage, simple billing. No need to configure routing separately after the instance is created.	ECS access to the Internet from VPC, or to serve internet facing external requests
	Flexible Rules：1),SNAT supports VPC, subnet, ECS, and SNAT for any CIDR segment within a VPC. 2),DNAT supports mapping of ECS NICs and elastic NICs, and it can support multiple public IP addresses for ECS.	ECS access to the Internet from VPC, or to serve internet facing external requests.

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.AWS ELB contains three types of service: Classic load balancer, network load balancer and application load balancer. Alibaba Cloud Load Balancing supports the same instance and provides Layer 4 and Layer 7 load balancing services, making management and billing easier.

Alibaba Cloud load balancer adopts full redundancy design and flexible expansion. It features super high stability, as proved by the Tmall 11.11 trial in these years.

3.1 Feature Comparison

Amazon Elastic Load Balancing vs. Alibaba CLoud Server Load Balancer

Feature	Amazon ELB	Alibaba Cloud SLB
Supported protocols	TCP, SSL, HTTP, and HTTPS.(UDP is not supported for the time being.)	TCP, UDP, HTTP, and HTTPS.
HTTP 2.0	Supported	Supported
Forwarding of domain names and URLs	Supported	Supported
Active/Standby server	N/A	Supported
IPv6	Supported	Supported
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.At the same time, it has access to Alibaba Cloud CloudMonitor and provides a rich set of alarm methods.
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(Free maximum 5G basic protection.) and Challenge Collapsar attacks.

3.2 Costs

Billing method	Amazon ELB	Alibaba Cloud SLB
Subscription(pay by Monthly/Annually)	Not Supported	Supported (Bandwidth)
Pay-As-You-Go	Supported(LCU* usage),$/LCU/hour	Supported(Bandwidth or traffic)
Instance	extra , $/instance/hour	extra , $/instance/hour

- LCU = Load Balancer Capacity Units

The billing of Amazon ELB is composed of outlet traffic + instance retention fee (charge for per hour) + LCU fee. where, the LCU fee is calculated by selecting the highest expense determined in four dimensions: new connections per second, active connections per second, bandwidth and rules processed per second. AWS focuses the ELB pricing on the cost of the load balancing, while the billing of public network bandwidth is unified (all the cloud products have consistent public network bandwidth price). The AliCloud SLB billing method is instance charge + traffic expense or bandwidth fee. The AliCloud SLB billing method is relatively simpler than AWS.

3.3 Main advantages

Distributes traffic among multiple instances to improve the service capabilities of your applications; removes single point of failure.

	Alibaba Cloud	Applicable Scenarios / AliCloud Advantages
Reliability	Designed for 99.95% reliability: Elastically scales and distributes workloads across multiples AZs; can use the DNS service in conjunction for cross-region load-balancing for disaster recovery.	Successfully supported 320K/sec peek hourly request rate in Tmall Singles' Day Shopping Events. Designed for workloads such as promotional events with very high and sudden traffic.
Ease of Use	IPv6 support: no need to update existing application.	Applications built for IPv6.

4. Dedicated Network Connections

The private network connection can realize high-speed, stable and secure private communication connection between the local data environment and the cloud environment, and is helpful to improve the flexibility of the network topology and the quality of cross-network communication. AWS is realized via Direct Connect service. The high-speed channel service of AliCloud includes private line access and VPC interworking. Private line access will be compared in this section.

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.	Physical private line can be used to connect the local data center to AliCloud physically, and then boundary router and router interface can be established to connect the local facilities and AliCloud VPC. In China, AliCloud cooperates with the frontline telecom operators to ensure the compliance of the cross-border line.
Dedicated network connection by using the Border Gateway Protocol (BGP)	Supported	Supported

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.

5. Cloud Enterprise Network (CEN)

The Cloud Enterprise Network provides a global network that can quickly build the hybrid cloud and distributed business system. With one product and four steps, end-to-end network between the

cloud and local data centers and between cross-regional VPCs can be established. Featuring simple configuration, full connected full-mesh, dynamic route, and multi-link sharing bandwidth, it can help enterprises quickly expand their businesses.As to the connection lines, AliCloud cooperates with the frontline telecom operator in China to provide strong cross-border VPC interconnection capacity and ensure compliance.

AWS does not provide such services for the moment. To realize the connection between the cloud and local data centers and between cross-region VPCs through one network, you need to use two services: AWS Direct Connect and VPC Peering Connection, and configure each connection separately. In addition, the traffic and bandwidth of the connections cannot be shared.

For more information on the products of Alibab Cloud CEN, please click here.

5.1 Main advantages

	Alibaba Cloud	Applicable Scenarios / Alibaba cloud Advantages
Cost Efficiency	Low cost：10% lower cost than Alibaba Cloud Express Connect.	1，More flexible and faster to setup than Express Connect, Early PoC before full migration to cloud 2，Detailed cost management 3，Predictable cost planning
Easy of use	Quick started：In 4 steps, you can build multiple cloud connections and cross-regional VPC networks. The features are simple configuration, full-mesh network, dynamic routing, and multi-link shared bandwidth.	Connect all on-premises data centers and cloud VPCs in all regions with an easy to set up mesh network.
	Compliance Support：Cooperation with tier-1 Chinese network operators. Cross-region VPC has strong interconnection capabilities.	User cross-region network connections, such as overseas business development, go China, etc.

DataBase

Alibaba Cloud for AWS Professionals

Contents

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	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	HiTSDB(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	PPAS, 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 GBSupports up to 40,000 of IOPS and 16 TB of storage	Supports up to 64-core, 512 GBSupports 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 Functional Differences

2.2.1 Read/write splitting:

AliCloud RDS MySQL supports the separation of read and write, that is, assigning the write operation to the key nodes, while assigning the read only operation to the read node chain. With automatic expansion, it can flexibly and efficiently support the scenario with varied peak value of read operations. In such application scenario as the e-business promotion activity (11.11, Black Friday), the customer may use the read and write separation to support the scenario with quick change and significant increase of peak value of inventory browsing operations (read operation) , without affecting the transaction sheet entry and inventory update operation on the key node (write operation) .

2.2.2 SQL audit:

AliCloud RDS MySQL supports the audit on all the database operations. When any problem is detected, it can trace back to the error or malicious processing precisely, and realize security audit management which can only be offered by commercial database on the open source database. The application scenario includes meeting the database audit compliance requirement for financial and regulated industries.

2.3 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.

2.4 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.

2.5 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 t they are used within the month.

2.6 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.

2.7 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 logon 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 Advantage

Three Database Engines for different application needs

- TerarkDB has a high compression ratio and is suitable for archiving historical data at a low cost.

- RocksDB is designed for high concurrent reads/writes, such as processing a large amount of historical documents, requiring high concurrent IO.
- WiredTiger is more balanced, and is suitable for most applications.

SQL Audit：

- Commercial-grade audit and recovery capability on open-source database. Monitors and records all database modifications, such as ADD, DELETE, and MODIFY operations. Accurately recover incremental data when needed.

Intelligent index recommendation:

- Provide users with real-time index optimization suggestions and comprehensive analysis reports in the console to improve database management efficiency.

3.6 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 Functional Differences

4.2.1 Read/write splitting:

AliCloud Redis supports the separation of read and write, that is, assigning the write operation to the key nodes, while assigning the read only operation to the read node chain. With automatic expansion, it can flexibly and efficiently support the scenario with varied peak value of read operations. In such application scenario as the e-business promotion activity (11.11, Black Friday), the customer may use the read and write separation to support the scenario with quick change and significant increase of peak value of inventory browsing operations (read operation) , without affecting the transaction sheet entry and inventory update operation on the key node (write operation) .

4.3 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.

4.4 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.

4.5 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.

4.6 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.

4.7 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

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

1.8 Key Selling Points

	Alibaba Cloud	AWS Cloud	Applicable Scenarios / Alibaba cloud Advantages
Easy of use	(1)Protect against large scale attacks：Supports up to 1 million QPS.(2)Flexible Encryption Algorithms and Supported Ports：Supports custom HTTPS encryption algorithms, provides HTTP and HTTPS protection for non-standard ports to meet relevant compliance requirements.(3)Customizable Protection Rules：customize the response page that matches your customer’s business to enhance the user experience, including protection	WAF	Protect customers and workloads of small or large from malicious traffic attacks

	policy interception, slider verification code, response timeout page, etc.		
Service	Customization and professional support services are available up on request to optimize the protection effect.	N/A	Help customers develop and deploy effective, customized solutions.

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

2.8 Key Selling Points

	Alibaba Cloud	AWS	Applicable Scenarios / Alibaba cloud Advantages
Features	(1)Can protect both Alibaba cloud resources and customer on-premise resources, and can be provisioned with any Internet IP address to which to return the clean traffic.(2)With automatic detection and attack policy	(1)To support custom origins outside of AWS, AWS Shild is integrated with Amazon CloudFront to fulfill that.(2)According to AWS documents, detection of some attacks is in minutes level.	

	matching, attacks can be identified within 1s, and then protection can be initiated immediately.(3)Comprehensive capabilities in protecting various attacks in network, transport and application layers and handling new attack methods.		
Service	For the paid customers(not anti-DDoS basic), Alibaba Cloud collaborates with partners, and provides 7*24 anti-DDoS consulting and technical support service in online tickets, phone, and VIP exclusive Dingtalk group.	According to the support tier subscribed, AWS DDoS Response Team provides corresponding support.	
Specific for China	Recommended Products: Anti-DDoS BGP (1)Superior Resources – 8 main scrubbing centers distributed in China(not CDN nodes), five-star IDC, with 1T anti-DDoS capacity each. 8-circuit BGP networking covers China Telecom, China Unicom, China Mobile, CERNET(China Education and Research Network) and other tier-2 carriers, with network latency less than 25ms. (2)Alibaba Cloud provides leased line in returning the clean traffic to the intended destination, with almost 0 network latency, to protect	AWS Shield services, including Standard and Advanced, are not available in China Beijing or Ningxia regions.	To protect servers deployed in Mainland China

	customers' resources on Alibaba Cloud (to leverage Internet in returning the clean traffic as to protecting customers' on-premise resources). (3)Compared with single-circuit anti-DDoS service, only 1 IP address is to be provisioned; Traffic can be automatically routed with BGP routing, and switch-over will be done in 3 minutes in case of failure. (4)Alibaba Cloud has rich anti-DDoS experience, with daily protection of peak DDoS attack over 1Tbps, and CC attack over 200 million. (5)Customized protection, such as blocking the attacks of overseas, cross-carriers, UDP and reflection, IDC originated.		
Specific for INTL	Recommended Products: Anti-DDoS Premium (1)Global Near Source Mitigation - integrates capacities of all Alibaba Cloud scrubbing centers distributed over the world as protection resources by using Anycast technology, and diverts DDoS attack traffic to the nearest scrubbing center to the attacking source for mitigation. The scrubbing centers also work as backups for each other to ensure service availability. (2)The overall	(1)Currently AWS Shield Advanced service is available in US, Ireland, Frankfurt, Tokyo and Sydney regions. (2)Though undisclosed yet, the overall scrubbing capacity should be lower than Alibaba Cloud.	To protect servers deployed internationally (outside of Mainland China)

	capacity of international scrubbing centers exceeds 2Tbps, and can provide anti-DDoS service to all the Alibaba Cloud regions around the world.		

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.

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 collection2. Data computing3. Data analysis4. Data visualization5. Data processing
The comparison covers the products as shown in the table below.

Feature	AWS	Alibaba Cloud
Data collection	AWS Kinesis	Alibaba Cloud Log ServiceAlibaba Cloud DataHub
Data computing	AWS Elastic MapReduceAWS Redshift	Alibaba Cloud E-MapReduceAlibaba Cloud MaxCompute
Data analysis	AWS QuickSight	Alibaba Cloud Quick BI
Data visualization	N/A	Alibaba Cloud DataV
Data processing	AWS GlueAWS Data Pipeline	Alibaba Cloud DataWorks

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/Table Store	OSS/MaxCompute/and 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.MaxCompute: 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/ParquetFunction computer	Connected to 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.

1.4 Cost

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 excessing 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 .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 DataVServer,

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

5. Data processing

Data processing carries out data transfer, data conversion, and other related operations, introducing data from different data sources to transform and process the data.Finally, the data was extracted to other data systems, with the entire data acquisition, conversion, development, analysis processes completed.

5.1 Service comparison

The following table compares the basic functions and terminologies of AWS Glue and AWS Data Pipeline vs Alibaba Cloud DataWorks：

Function	Property	AWS Glue	AWS Data Pipeline	Alibaba Cloud DataWorks
Data acquisition	Real-time acquisition	Not supported	Not supported	Supported
	Batch acquisition	Supported	Supported	Supported
	Client acquisition	Supported	Supported	Supported
	Local data	N/A	Not supported	Supported

	Cloud data	Supported	Supported	Supported
	Heterogeneous data sources	S3、DynamoDB、RDS、Redshift、JDBC	S3、DynamoDB、RDS、Redshift、JDBC	support over 20 + (RDBMS, NoSQL, MPP, Unstructured storage, Big data storage, etc)
Data management	Data discovery	Supported	N/A	Supported
	Capture metadata	Supported	N/A	Supported
	Version management	Supported	N/A	Not supported
	Capturing schema changes	Supported	N/A	Not supported
	Automatic Identification detection	Supported	N/A	Not supported
	Comment	Not supported	N/A	Not supported
	Collecting/structuring tags	Not supported	N/A	Not supported
	Data relationship	N/A	N/A	Supported
Data Conversion & Development	Automatic code generating	Supported	Supported	Not supported
	Online editing	Supported	N/A	Supported
	Version management	Supported by GIT	Supported by GIT	Supported
	Mode	Running in Spark container,auto scaling	Based on calculating engine（SQL，Shell scripts，EMR，Hive Pig）	Based on calculating engine(ODPS SQL, SHELL, PAI)
Orchestrating and Task Scheduling	Trigger mode	Cycle	Cycle,event trigger,lambda	Cycle,API trigger
	serveless	Supported	Supported	Supported
	Automatically re-run	Supported	Supported	Supported
Monitoring & Alarm	Monitor dashboard	Supported	Supported	Supported
	Alarm	Supported	Supported	Supported

Data quality	Offline monitoring	Not supported	Not supported	Supported
	Online monitoring	Not supported	Not supported	Supported
	Self-defined monitoring rules	Not supported	Not supported	Supported
Openness	API	N/A	Supported	Supported
	SDK	N/A	Supported	Not supported

5.2 Product comparison overview

AWS Glue

AWS Glue is a fully managed ETL(Extract, transform, and load) service for economic efficiently classify data, cleanup, and expansion, and reliably move data between a variety of data stores.AWS Glue consists of a central metadata repository called the AWS Glue Data Catalog, an autogenerated ETL engine for Python or Scala code, and a flexible scheduler that handles dependency resolution, job monitoring, and re-runs.AWS Glue is a serveless service, so you don’ t need to set up or manage your infrastructure.
You can use AWS Glue console to discover data, convert it, and makes it available for searching and querying.The console calls the underlying service to coordinate the work required to transform the data.You can also use AWS glue services by API operations to edit, debug, and test Python or Scala Apache spark ETL code in a familiar development environment.

AWS DataPipeline

Amazon DataPipeline s a web service which enables you to automate data movement and transformation.Using Amazon DataPipeline,you can define a data-targeted workflow, in which case, the task can then perform subsequent operations based on whether the previous task is completed successfully.

DataWorks

- Product location: one-stop big data platform, covering data integration, data management, data development, data operation, data service sharing, data security, data quality and other stages of the big data lifecycle
- Methodology: cloud data warehouse, streaming computing
- Target User: data developers (data integration, data development, data operation), data manager(data management, data security, data quality), data users (data management, data service, real-time analytic)
- How to use: Web-side
- Deployment approach: public cloud serverless, proprietary cloud
- Development language: SQL, Java (openmr), Python, R, etc
- Service level: public test (Data Integration is officially commercial)

- Underlying engine: MaxCompute, Blink.

5.3 Advantage and disadvantage comparison

Amazon Glue product advantages

- Compatible with different storage forms by metadata abstraction

AWS Glue supports unstructured files including CSV,JSON and database connections in the form of JDBC.By mapping different forms of storage to metadata such as database, table, schema, and so on, the differences are cleared.Therefore you can reduce the development difficulty of the data conversion process, while doing code reuse.

- Preprocessing unstructured text by Classifier

Using Classifier,you can automatically structure the obtained unstructured text with 12 different built in formats.You are also allowed to customize formats in ways such as Grok.Classifier provides very good compatibility.

- Support dynamic metadata acquisition

In addition to manually creating or getting metadata by Crawler, Glue also supports dynamic metadata acquisition.Crawler itself support wildcard characters and metadata acquisition for new tables.Glue also supports defining the run plan in cron format.Different Processing policies are also supported for tables that are added, changed, and deleted.These measures enable metadata to track data sources while maintaining change records.

- Closely integrated with Spark ecology,

Unlike AWS Data Pipeline, AWS Glue only supports Spark on YARN and its code submission interface is opened directly to usres.During the development of the ETL job, you can develop or upload PySpark or Scala files directly online.You only need to change several Data Frame classes to complete the migration of existing Spark scripts.
Meanwhile,Glue also integrates the Zeppline Notebook Server with Spark Shell as a debugging tool,which is convenient for users to manually run the written spark script.Glue is also able to use the computing capabilities of Spark cluster as OLAP tools, thanks to the integration of Zeppline Notebook.

Amazon Glue product disadvantages

- Only support Spark engine

Amazon glue only supports its own Spark engine and cannot use data in redshift and S3 directly,which may result in additional network transmission cost.

Amazon Data Pipeline product advantages

- Support different kinds of computing engines

Rich in Activity extensions,Data Pipeline support EMR,hive,Redshift,Pig and sql as its computing engine.

- Only implement core functions and seamlessly combinate with other products

Data Pipeline and DataWorks have certain coincident usage scenarios，but Data Pipeline’s functional model is much simpler.Most of the functions need to be achieved with other AWS products.

- Programmer-oriented, scripting definition, flexible

Data Pipeline graphical interface shows only a fraction of the functionality, and the experience is not ideal.
The main means of operation is JSON.JSON represents Data Pipeline’s programmer-oriented idea.By means of a well-defined grammar, with JSON, you can use many of Data Pipeline’s “hidden” features in a flexible manner.Many usage scenarios, such as parametric operation, complex scheduling settings, state inheritance, and so on, all can be easily defined using JSON.
Same functions require more complex interaction designs if shown by GUI,but the use of JSON avoids the problems.Programmer-oriented is the main design idea for many of AWS’s products.

Amazon Data Pipeline product disadvantages

- Simple scheduling model

Data Pipeline scheduling is time-based, and take the “day” as the basic scheduling unit (a task less than a day is called a high-frequency task, the shortest time is 15 minutes).
Meanwhile, unlike DataWorks, each Pipeline is atomized and stateless.Atomization means different Pipelines are independent of each other.Different Pipelines cannot trigger each other, and the activities inside are independent too.Statelessness means that Pipeline itself does not support parameter input and there is no variable passes between activities.

- Simple interface and single function

Data Pipeline interface interaction is extremely simple while some advanced features cannot be used by the GUI.The editing of the Activity script only provides a simple text box with no assisting development features such as syntax highlighting.
For functional design, Data Pipeline focuses on task scheduling.For most other features, you need to call other AWS products:

1. Data Pipeline supports very few types of data sources,while other types must be converted to supported types using Glue.
2. Data Pipeline does not support parameter input and variable transfer, however, this can be achieved through the support of a variety of Datanodes.
3. Data Pipeline also does not provide code management and SQL can only be saved in plain text.The upload of the jar package can only be implemented by S3.
   The premise of these combinations is that Data Pipeline is seamlessly integrated with other

products, the delay in data transmission is small enough, and the possibility of compatibility problems is low enough.

5.4 Conclusion

In summary, in data warehouse and data business process areas, the advantages of DataWorks are:

- Data Integration: supports for streaming control and real-time synchronization.
- Data Development: powerful online editing capabilities to experience a comparable offline IDE.
- Monitoring Operations: supports business baseline monitoring.
- Data Management: complete data management capabilities, also provides unique functions such as classification and data desensitization.
- Data Quality: unique features in competitors.

Monitoring & Management

Alibaba Cloud for AWS Professionals

contents

1. Monitor Service

Alibaba Cloud CloudMonitor is a service that monitors Alibaba Cloud resources and IoT (Internet of Things) applications. Alibaba Cloud CloudMonitor can be used to collect monitoring metrics for Alibaba Cloud resources or monitoring metrics customized by the user to detect service availability, and to set alerts for these metrics. It allows you to be fully aware of resource usage, service status, and service health on Alibaba Cloud, and enables you to promptly respond to error alerts and ensure smooth running of your application.

Amazon CloudWatch is a service that monitors AWS cloud resources applications running on AWS. You can use Amazon CloudWatch to collect and track various metrics, collect and monitor log files, and set alerts. You can use Amazon CloudWatch to always be aware of resource usage, application performance, and application running status. Based on these analysis results, you can make responses quickly to ensure that your applications run smoothly.

1.1 Main functions comparison

In general, Alibaba Cloud CloudMonitor supports more functions than AWS ClouWatch. The following table shows the details of the comparision.

Service Type	Alibaba CloudMonitor	AWS CloudWatch
Host monitoring	Supported	Supported
Alarm mode	Aliwangwang, Email, MNS, SMS + DingTalk (China site)	SNS, Email
Application group	Supported	Not supported
Digital operation	Dashboard，resource usage monthly report	Control Panel
Site monitoring	Supported	Not supported
Cloud service monitoring	Supported	Supported
Custom monitoring	Supported	Supported
Log monitoring	Supported (currently unsupported for the international site)	Supported

Overview	Overview of all cloud resource statistics, alerts, events, and resource count & level	Overview of alerts and service running status
AIP SDK	Supported	Supported

1.2 Host monitoring and cloud service monitoring

Alibaba CloudMonitor

- Hybrid cloud: Supports Alibaba Cloud host, one-click installation, authorized automatic installation, non-Alibaba Cloud hosts, and all mainstream operating systems.
- Metrics: Supports extensive metrics, for example cpu/mem, load/disk/net/device 30+f. More metrics will be supported, such as rdma gpu and virtual multiple NICs.
- Process: Top 5 process resource consumption information.
- Second-level monitoring: Collects data every second, aggregates data every 15s, averages resource consumption and business requirements.
- Monitoring: Supports monitoring of all cloud products that have been connected to CloudMonitor.

AWS CloudWatch

- Supports the basic monitoring metrics of Amazon EC2 instance, including CPU usage, data transmission, and disk usage activity.
- 7 pre-selection metrics every 5 minutes and 3 status-check metrics every 1 minute.
- Supports monitoring all other AWS products, including computing, network, storage, and database.

1.3 Alert service

Alibaba CloudMonitor

- One-click alert function: Supports one-click alert for mainstream products, covering all instances of these products.
- Alert module: Alert module and application grouping allows quick monitoring over big data IT infrastructures.
- Supports combining product alerts to improve the user’ s alert configuration efficiency.
- Alert methods: Supports multi-channel alerting, including MNS subscription, emails, and Aliwangwang.

AWS CloudWatch

- High quality alerting: Supports high precision alerting for a period of 10 or 30s, or scheduled alerting for a period that is an integer multiple of 60s.
- Assessment alert: Alert thresholds are set to be three values. The alert is configured to trigger when all three data points exceed the threshold value within the recent three

successive periods.
- Alert method: Amazon SNS themed notification alert.

1.4 Application group

Alibaba CloudMonitor

- Supports cross-product and cross-region resource grouping.
- Supports group-level aggregation computing and alert aggregation.
- Supports grouping custom speedup settings and time logs.
- Supports group-level authorization, subaccounts, primary/subaccounts, cross-accounts, and so on.

1.5 Digital operation

Alibaba CloudMonitor

- dashboard： Supports cross-product and cross-region metric display. Supports log monitoring, custom monitoring, and other metrics.
- O&M weekly reports, resource utilization monthly reports (supported by Enterprise Edition).

AWS CloudWatch

- Amazon CloudWatch control panel: You can use the control panel for centralized monitoring over various AWS resources at one location.
- Monitors resources in multiple regions.

1.6 Site monitoring

Alibaba CloudMonitor

- Provides IDC probes (charged) all over Alibaba Cloud with over 300,000 astmile user probes, and a 1-minute probing capacity.
- User access simulation to see the actual status of a website.
- Checks site status, including http, ping, tcp, udp, dns, pop, smtp, ftp, and response time.
- Network fault discovery.

1.7 Custom monitoring

Alibaba CloudMonitor

- Using customized monitoring, you can quickly integrate Redis, MySql, and other monitoring metrics to Alibaba Cloud CloudMonitor.
- Custom monitoring is a feature that allows you to customize monitoring metrics and alert rules. By using this feature, you can monitor service metrics that you care about, and report collected monitoring data to Alibaba Cloud CloudMonitor, so that Alibaba Cloud

CloudMonitor can process the data and generate alerts according to the results.

AWS CloudWatch

- Publishing custom metrics: You can use AWS CLI or API to send your own metrics to CloudWatch.
- You can submit custom metrics generated by your English application, and use AWS CloudWatch to align these monitoring metrics. You can submit these metrics to AWS CloudWatch by using a simple API. You can set the corresponding alert thresholds and metrics.

2 Comparison of Access Management

Alibaba Cloud Resource Access Management (RAM) is a management service designed for the centralized management of cloud identities and access permissions. You can use RAM to grant access and management permissions to Alibaba Cloud resources to your enterprise members or partners.

AWS Identity and Access Management (IAM) is a Web service that can help you safely control access to AWS resources. You can use IAM to decide which user needs to conduct ID authentication (upon login), and authorize users (grant permissions) to use resources.

2.1 Main functions comparison

Service Type	Alibaba RAM	AWS IAM
User Management	Supported	Supported
Policy management	Supported	Supported
Group Management	Supported	Supported
Role management	Supported	Supported
Centralized management	Supported	Supported
Flexibility	Supports integration with Alibaba Cloud service; supports external account management and multi-dimensional authorization	Supports seamless integration with AWS services, and cooperation with external web ID authentication service providers
Availability	Multi-node redundancy deployment	Supports eventual consistency
Security	Token, access key	Security certificate management, MFA
Operation audit	Supported	Supported
API/SDK/CLI	API/SDK/CLI	API/SDK/CLI
Expenses	Free	Free

2.2 Identity Management Comparison

2.2.1 User Management

User is an Alibaba Cloud RAM identity which corresponds to an operation entity, such as an operator or application. If you have a new user or application to access your cloud resources, you must create an Alibaba Cloud RAM user and grant it the access to the relevant resources.

AWS IAM allows you to create users in AWS IAM, and assign separate security certificates to them (such as the access key, password, and multi-factor authentication device), or provide temporary security certificates to grant users the access to AWS services and resources.

2.2.2 Group Management

If you have created multiple Alibaba Cloud RAM users under your Alibaba Cloud account, we recommend you use groups to better manage the users and their permissions. You can create a group for Alibaba Cloud RAM users who share the same responsibilities, and grant permissions by group.This provides the following advantages:

- When a user’ s responsibility changes, you only need to move this user to a group that has the corresponding responsibility, without affecting other users.
- When a group’ s responsibility changes, you only need to modify the group’ s authorization policy that applies to all users in the group.。

An AWS IAM group is a collection of AWS IAM users. You can manage group members as a simple list:

- You can grant permissions to a group by modifying the group’ s access control policy. This allows you to easily manage permissions of a group of users, without having to manage individual permissions one by one.
- A group does not have security certificates to directly access web services. The purpose of a group is to make user permission management easier.

2.2.3 Role Management

Alibaba Cloud RAM and user are both identities used in RAM. In comparison with a RAM user, a RAM role is a virtual user who does not have a long-term authentication key, and cannot be used without being played by an authorized entity.

- As a virtual user, a RAM role has a fixed identity and can be granted group authorization policies. However, it does not have a fixed identity authentication key (password or access key).
- A RAM role differs from a RAM user in the way it is used. A RAM role must be played by an authorized entity. After playing the role successfully, the entity receives a temporary STS security token for this RAM role. Then, this entity is able to use this security token to access the resources authorized for the role.

An AWS IAM role is an IAM entity that is associated with a group permission to submit an AWS service request. An IAM role is not uniquely associated with one user or group. Instead, a trusted entity (for example an IAM user, application, or EC2 and other AWS services) can assume any roles.

- An IAM role does not have any certificates and cannot directly raise AWS service requests. An IAM role must be assumed by an authorized entity, for example an IAM user, application, or EC2 and other AWS services.
- An IAM role allows you to assign access permissions to a trusted entity by using defined permissions, without having to share a long-term access key. You can use IAM roles to grant IAM users under you AWS account, IAM users under other AWS accounts, as well as EC2 and other AWS services the access permission.

2.3 Authorization Management Comparison

Alibaba Cloud RAM uses permission to describe an internal identity’ s ability (such as user, user group, and role) to access a specific resource. A permission is used to allow or deny the execution of certain operations on certain resources under certain conditions.

AWS IAM access management module helps define operations that a user or other entities can execute under an AWS account, which is usually called authorization. Permissions are granted by means of policies. A policy is an AWS entity. When associated with identities or resources, a policy defines their permissions. When a principal (such as a user) sends a request, AWS will evaluate these policies.

2.3.1 Permissions

Alibaba Cloud RAM permissions include:

- The primary account (resource owner) controls all permissions.
- By default, RAM users (operators) have no permissions.
- Resource creators (RAM users) are not automatically granted permissions for resources created by them.

AWS IAM attaches access management policies to users, groups, and roles for convenience in assigning permissions for AWS resources. By default, IAM users, groups, and users do not have permissions, and they must be granted the required permissions by a user that has the complete permissions by using policies.

2.3.2 Authorization policies

Alibaba Cloud RAM supports the following two types of authorization policies:

- System access policies: A group of commonly used permission sets created and managed by Alibaba Cloud, such as the read-only permission for ECS and the complete permission for ECS. You can use these policies, but cannot modify them.
- Custom access policies: A group of permission sets created and managed by the user. They

can be used to expand and supplement system authorization policies.

AWS IAM policies based on identities and resources:

- 1) Identity-based policies are permission policies that can be associated with a principal or an identity (such as an IAM user, role, and group). Identity-based policies control what actions that identity can perform, on which resources, and under what conditions.
- 2) Resource-based policies are JSON policy documents that you attached to a resource such as an Amazon S3 bucket. These policies control what actions a specified principal can perform on that resource and under what conditions.

2.3.3 Access control authorization

Granting permissions to an Alibaba Cloud RAM user refers to the process of binding one or more authorization policies to the user, user group, or role.

- You can bind both system authorization policies and custom authorization policies.
- If a bound authorization policy is updated, the updated policy automatically takes effect, and you do not have to rebind it.

Likewise, granting permissions to an AWS IAM user refers to the process of binding authorization policies to the user, user group, or role.

- Users and policies
- Combination policies
- Combination identities, users, and roles

2.4 Expenses

Alibaba Cloud RAM does not charge service fees. If you meet the activation criteria and have activated this service, you can use it immediately.

AWS IAM is a feature provided in an AWS account, and no additional cost is required.

3 Action Trail Comparision

Alibaba Cloud ActionTrail records your Alibaba Cloud account resource operations. It supports operation record query, and saves record files to your specified OSS bucket. With all the operation records saved by Alibaba Cloud ActionTrail, you can perform security analysis, resource change tracking and compliance audit.

AWS CloudTrail is a service that enables governance, compliance, operational auditing, and risk auditing of your AWS account. With AWS CloudTrail, you can log, continuously monitor, and retain account activity related to actions across your AWS infrastructure.

3.1 Main functions comparison

Service Type	Alibaba ActionTrail	AWS CloudTrail

API/SKD	API,SDK	API,SDK
Data Storage	OSS	S3
History event query	30 days by default, can be extended	90 days
Operation log	Supported	Supported
Filtering conditions	Operation period, user name, resource type, resource name,operation name, and so on	Event name, user name, resource name,event source, event ID, and resource type
Service support	Most cloud product services	Most AWS product services
Compliance audit	Supported	Supported
Security analysis	Supported	Supported
Troubleshooting	Supported	Supported

3.2 API & SDK Support

If you are an Alibaba Cloud user, you will be able to use the management console or API to create Alibaba Cloud ActionTrail for your account, and specify an OSS bucket to store ActionTrail event log. If you initiate an operation call by using SDK, Alibaba Cloud ActionTrail will automatically transmit the operation log to your specified OSS Bucket within ten minutes.

AWS CloudTrail can improve the visibility of user and resource activities by logging AWS management console operations and API calls. CloudTrail transmits events within 15 minutes after an API call.

3.3 Data Security

Alibaba Cloud ActionTrail saves event logs to your specified OSS bucket. You can use OSS data encryption and permission management functions to ensure data security of event logs.

By default, AWS CloudTrail encrypts CloudTrail log files by using S3 server encryption (SSE), and stores them in your S3 bucket. You can use the application AWS IAM or S3 storage policies to control the access to log files.

3.4 Log Query

Alibaba Cloud ActionTrail supports querying operation logs within 30 days by default. If you want to extend the time range for querying logs, you need to activate OSS and specify a bucket to save records to using the StartLogging command.

AWS CloudTrail only displays CloudTrail history event logs in the last 90 days for the region that you are currently viewing. You can view information from the last 90 days using the CloudTrail console or

CloudTrail API/CLI.

3.5 Security Analysis and Troubleshooting

When your Alibaba Cloud account or resource has security issues, logs recorded by Alibaba Cloud ActionTrail will help you analyze the issues and identify the causes. For example, Alibaba Cloud ActionTrail records all your account logon operations, including detailed records such as the logon time, which IP was used, and whether you used multi-factor authentication logon or not. With these records, you can determine whether your account has any security issues.

When your cloud resource undergoes any abnormal changes, Alibaba Cloud ActionTrail operation logs can help you identify the causes. It supports capturing changes and query operations occurred in your Alibaba Cloud account within a specific period, and helps you analyze and solve possible faults and problems.

With AWS CloudTrail, you can capture full history records for all changes in your AWS account for a specific period, to identify and solve security and operational problems. By importing AWS CloudTrail events to your log management and analysis solutions, you will be able to carry out security analysis and detect user behavior modes.

You can use AWS API calling history records generated by AWS CloudTrail to solve operational problems. For example, you can quickly identify changes to resources in your environment, including the creation, edit, and deletion of AWS resources.

3.6 Cost

You do not need to pay for using Alibaba Cloud ActionTrail, but you have to pay for OSS storage that you may use in Alibaba Cloud ActionTrail.

AWS CloudTrail allows you to view and download the last 90 days of your account activity for the create, modify, and delete operations of supported services free of charge. Once a CloudTrail trail is setup, Amazon S3 charges apply based on your usage.

Domains & Websites

Alibaba Cloud for AWS Professionals

contents

1. Domains

Aliyun Cloud (www.net.cn) domain name service brand provides a wide range of domain name registration and domain name trading services for entrepreneurs, small and medium-sized enterprises, and well-known brand enterprises.The user management experience is ensured by a convenient management platform, and the security of the user domain name assets is protected by a secure product strategy.

- Domain name registration: you can register various types of domain names at Alibaba Cloud Domain service.
- Domain name protection: your domain name registration information is fully protected from malicious harassment, based on the inbuilt security services such as privacy protection and security lock.
- Domain name resolution: you can use the Domain service together with Alibaba Cloud DNS. Alibaba Cloud DNS offers a free, effective, and secure DNS server to guarantee the immediate resolution of your domain name.

Enterprise Construction Station One-stop solution, service scope covers domain Name service, host service, Enterprise mailbox, website construction template, enterprise Building station personalization, cloud resolution DNS and other application services, as well as high-end enterprise e-commerce solutions and consulting services.To help enterprise customers to truly realize e-commerce applications, improve the competitiveness of enterprises.

> Market No.1: For the 20th consecutive year, the domestic domain name market NO.1 has been registered. More than 20 million domain names are registered in Wanwang. 4 million domain names are inquired in Wanwang every day. We use numbers to prove “domain names, starting from Wanwang(www.net.cn)”.

Easy to use security: Intelligent query, fast registration, you can easily manage through a powerful domain name self-service platform. Unique privacy protection, security locks, self-inspection services, and intimate reminders of expiration renewal, full protection of your domain name.

Fast and stable: one-click cloud resolution, zero cost, very fast real-time effect, 99.99% availability to ensure that the service runs reliably.

High performance-to-price ratio: Refined but inexpensive service is better service, we are committed to let you spend the least money, enjoy the best products and the most professional services.

Amazon Route 53 offers domain name registration services, where you can search for and register available domain names.AWS currently provides Domain Name Registration Services through Gandi SAS , Amazon Registrar, Inc., and other ICANN-accredited registrars (the “Registrar”), and your use of the Domain Name Registration Services is subject to their terms.

2. Introduction to DNS services

Alibaba Cloud Domain Name Service (DNS) is an authoritative, highly available, and scalable domain name resolution and management service. It aims to provide enterprises and developers with a stable, secure, and intelligent service that converts website domain names and app resources into IP addresses for computer interconnection. It routes access by end users to the designated websites or app resources, at the same time as providing a DNS scheduling management service. See Alibaba Cloud DNS for more information.

Amazon Route 53 is a highly available and scalable cloud DNS web service. It is designed to give developers and businesses an extremely reliable and cost effective way to route end users to Internet applications by translating domain names into IP addresses that computers use to connect to each other. See Amazon Route 53 for more information.

2.1 Comparison of Main Functions

The following table shows the main functions comparison between Alibaba Cloud DNS and Amazon Route 53

Main Function	Alibaba Cloud DNS	Amazon Route 53
API	Supported	Supported
Security protection	Supported	Supported
Monitoring services	Supported	Supported
Smart resolution	Supported	Supported
DNS load balancing	Supported	Supported

Import file template	Supported	Unknown
DNS record types	A、CNAME、MX、AAAA、SRV、TXT、NS...	A、CNAME、MX、AAAA、SRV、TXT、NS ...
Secondary DNS	Supported	Supported
Authorized resources-DNS	Supported	Supported
Custom TTL	Supported	Supported
URL forwarding	Supported	Supported
Chinese domain name resolution	Supported	Not Supported
Wildcard domain name resolution	Supported	Supported
Subdomain name resolution	Supported	Supported
Performance	Single unit performance of up to 40 million QPS, can store over 20 million domain names, can process more than 1 billion QPS.	Unknown
Billing mode	Free version + paid version	Hosted zone + query + run check

2.2 Comparison in API

Alibaba Cloud DNS supports APIs. You can use an API to control domain name resolution. Please ensure that you read the Alibaba Cloud DNS instructions and user agreement before using this interface. You must sign in to your Alibaba Cloud account in order to use the API.

AWS DNS services also support APIs. Amazon Route 53 provides a set of simple APIs to help you create and manage DNS records. You can use these for hosted zones, resource records, run checks, and cost allocation records and registration.

2.3 Comparison in Security

Alibaba Cloud DNS with domain name resolution DDoS protection can protect over 10 million domain names against high-volume DNS and DDoS attacks of up to 500,000 QPS.

Amazon Route 53 and AWS Shield (AWS service that provides DDoS protection) are highly integrated to protect web applications and prevent large-scale attacks. Amazon Route 53 can prevent DDoS attacks. It uses anycast striping, shuffle sharding, and a global network with 56 locations.

2.4 Comparison in Authorization

By default, when you enable DNS services with your cloud account, the cloud account has full

permission to manage its own resources. With Alibaba Cloud’ s Resource Access Management (RAM) service, you can grant permission to access and manage the DNS resources under your cloud account to RAM sub-users.

AWS DNS services can also manage access permission. You can use Amazon Route 53, AWS Identity and Access Management (IAM) to grant users in your AWS account unique certificates and manage their permissions, i.e., specify who has the right to use which Amazon Route 53 services.

2.5 Comparison in Performance

Alibaba Cloud DNS is an authoritative cloud-based DNS service. With support from customers, the service has reduced costs, allowing more businesses to enjoy low-cost, high-quality high-tech products that require no installation, no deployment, and no O&M.

Through software and hardware optimization, a single Alibaba Cloud DNS unit provides up to 40 million QPS and the capacity to store over 20 million domain names. The service can handle request volumes of over 1 billion QPS and provide more than 40 OpenAPIs to enterprises and developers.

However, Amazon Route 53 has not yet released detailed performance indicators. But it can automatically scale to handle large volumes of requests without your interference.

2.6 Comparison in Monitoring Services

Alibaba Cloud DNS features a nationwide monitoring network with over 300,000 monitoring stations. The monitoring stations monitor the security of web services and calculate network latency and DNS resolution times. It also issues alerts in the event of a fault.

Amazon Route 53 provides a run check function that monitors app performance, web servers, and other resources. An Amazon CloudWatch alert can be configured for each run check to inform you the run status and enable you to configure DNS failover.

2.7 Comparison in Price

Alibaba Cloud DNS supports two versions: free and premium. You can buy the premium version on monthly or annually basis. The pay-as-you-go version will be launched soon. You can also use Alibaba Cloud DNS API, which is free. But the API cannot be used more than five times. For more information on pricing, see Reference Price Information.

Amazon Route 53 offers pay-as-you-go pricing. There is no minimum charge. Charges is applied for using the hosting zone, submitting queries, and conducting run checks. For more information on pricing, see Amazon Route 53 Pricing Information.

3 Introduction to Virtual Private Servers

Alibaba Cloud Simple Application Server (SAS) is a new generation service for stand-alone application

scenarios. It provides one-click application deployment and supports all-in-one services such as domain name resolution, website publishing, security, O&M, and application management. This optimizes the user experience of setting up a simple application and makes it easier for entry-level users to use cloud computing products.

Amazon Lightsail is an AWS-based virtual private server. It provides the easiest way to get started with AWS for developers who just need virtual private servers. Lightsail has everything that you need to kickstart a project.

3.1 Comparison of Main Functions

The following table shows the main functions comparison between Alibaba Cloud SAS and Amazon Lightsail.

Main Functions	Alibaba Cloud SAS	Amazon Lightsail
Ease of Use	One-click activation, high level of integration, one-stop application management, and O&M.	Easy-host apps, click-to-activate, API scaling, and external app integration.
Application Images	WordPress，LAMP，Drupal，Joomla !,Node.js，GitLab，Ghost，Chyrp，Opencart，Magento，Jenkins...	WordPress，Magento，Drupal，Joomla!，Redmine，Plesk，Node.js，GitLab，LAMP，MEAN，Nginx...
Service monitoring	Supported	Supported
Backup recovery	Supported	Supported
Domain name and DNS management	Supported	Supported
Web SSH login	Supported	Supported
Configuration upgrade	Supported	Supported
HTTPS encrypted access	Supported	Supported
System reset	Supported	Not Supported
Static IP address	Supported	Supported
Key management	Supported	Supported
Scalability	Integrates with numerous Alibaba Cloud functions	Functions can be expanded using other AWS products

3.2 Comparison in Ease of Use

Alibaba Cloud Simple Application Server is easy to use. The server and applications can be launched with one click. It also provides one-stop application management and O&M services with a range of integrated apps.

Amazon Lightsail allows you to host apps with ease. You can launch a pre-configured development stack with just a few clicks, and users can use the simple Amazon Lightsail API to expand apps or integrate with external apps.

3.3 Comparison in Mirroring

Alibaba Cloud Simple Application Server mirroring includes application mirroring and system mirroring.

Application mirroring includes: (1) Applications and their initialization data. (2) Running environment required by the applications. (3) The underlying OS. Simple Application Server provides a large variety of applications via mirroring, such as WordPress, LAMP, Drupal, Joomla!, Node.js, GitLab, Ghost, Chyrp, Opencart, Magento, and Jenkins.

System mirroring only includes the initial OS. It does not contain any application or environment data. System mirroring is a pure initial environment. You can install required applications. It is suitable for users who know the system and application environment configurations well. OS mirroring currently supported by Simple Application Server includes CentOS, Debian, Ubuntu, Windows 2008, and Windows 2012.

Amazon Lightsail server mirroring also includes application mirroring and system mirroring.

Application mirroring: Amazon Lightsail servers use mirroring to provide a wide range of apps including WordPress, Magento, LAMP, Nginx, and Node.js.

Operating system mirroring: Amazon Lightsail currently supports five Linux/Unix versions (Amazon Linux, Debian, FreeBSD, OpenSUSE, and Ubuntu) and two Windows server versions (2012 R2 and 2016).

3.4 Backup Recovery & Instance Upgrades

Alibaba Cloud Simple Application Server supports creating snapshots for the server and rolling back previously created snapshots. As demand for services is growing, it supports using previously created snapshots to perform an update if purchased resources are insufficient.

Amazon Lightsail can use a console or API to create snapshots for instances. In the event of a fault or incorrect code deployment, you can create a new instance. Users can create snapshots for instances and use an API to start a larger instance.

3.5 Comparison in Scalability

Alibaba Cloud Simple Application Server is able to integrate with multiple Alibaba Cloud products to help you set up and manage applications.

- Domain name resolution. Specifying a domain name and directing it to the IP address of the current server.
- HTTPS encrypted access (CA certificate). Configuring HTTPS encrypted access for Web

services by specifying the purchased CA certificate.
- VPC Intranet. Multiple Simple Application Server instances in the same account are in the same VPC Intranet by default.

The features of Amazon Lightsail can be expanded by connecting to AWS products via the Lightsail server.

- These include Amazon EC2, VPC and AWS Identity and Access Management, hosted databases, and CDN.
- The user interface provides a web-based SSH console which is integrated into the key store.
- Lightsail provides signed certificates and works with a load balancer to protect the connection between the browser and the website.

3.6 Comparison in Cost

You can buy Alibaba Cloud Simple Application Server on a monthly or annual basis. If the traffic exceeds the upper limit of the package in the present month, the exceeding traffic will be charged on a pay-as-you-go basis. For details, see Simple Application Server Pricing.

Similar to Alibaba Cloud Simple Application Server, Amazon Lightsail can also be purchased on a monthly or annual basis. Additional fees apply for excess data transfers. For more information on pricing, see Amazon Lightsail Pricing Information.

Media Services

Alibaba Cloud for AWS Professionals

Media Services Contents

1. Media processing

ApsaraVideo for Media Processing (for media processing on Alibaba Cloud) is a transcoding computing service for multimedia data. The service provides cost-effective, flexible, and scalable transcoding of multimedia content into formats suitable for playback on PCs, televisions, and mobile devices. It can also provide smart moderation, content analysis, and smart editing through deep learning based on massive quantities of data. Media processing service features include a web-based console, service API, and SDKs. You can use these tools to implement and manage transcoding services or integrate transcoding functionality into your own applications and services.

Amazon Elastic Transcoder is media transcoding in the cloud. It is designed to be a highly scalable, easy to use and a cost effective way for developers and businesses to convert (or “transcode”) media files from their source format into versions that will playback on devices like smartphones, tablets and PCs.Users simply use the web-based console, service API, or SDKs to create a transcoding job, where they specify the input file, transcoding settings, and output file.

1.1 Comparison of Main Functions

Service Type	ApsaraVideo for Media Processing	Amazon Elastic Transcoder
API&SDK	API & SDK	API & SDK
Formats	Output formats; FLV、MP4、HLS（m3u8+ts）、MPEG-DASH（MPD+fMP4）MP3、PM4 and more	Output formats：MPEG-DASH、MP4、PM3、HLS、FLV and more
Video encoding	Supported	Supported
Video processing	Supported	Supported
Audio encoding	Supported	Supported
Import file template	Supported	Supported
Transcoding control	Supported	Supported
Video security	Supported	Supported
Transcoding presets	Presets + custom presets	Presets + custom presets
Watermarks	Static and dynamic watermarks	Static and dynamic watermarks

Cutting	Clip stitching and video editing	Video clip generation and editing/stitching
Screenshots	Supported	Supported
Media storage	Supports retrieval of audio and video file encoding and content stored in OSS	You can store the original versions of your media content in Amazon S3 for progressive download of video and audio files.
Subtitles	Supports import of external subtitle files and designated subtitle encoding formats	Subtitles can be added, removed, or retained
Video moderation	Supported	Unknown
Playback	Provides a web-based player; supports Flash, HTML5, and an adaptive mode.Provides a mobile device player SDK and supports iOS and Android	Commonly used to reach iOS and Android devices, set-top boxes, and browser-based players
Notifications	Supported	Supported

1.2 API & SDK

Multimedia processing service features include a web-based console, serviceAPI and SDK。You can use these tools to implement and manage transcoding services or integrate transcoding functionality into your own applications and services.The available SDK supports three languages: Java, Python, and PHP.

Developers using Amazon Elastic Transcoder simply use the web-based console, service API, or SDKs to create a transcoding job, where they specify the input file, transcoding settings, and output file. In addition, the SDKs support six languages: Python, Node.js, Java, .NET, PHP, and Ruby.

1.3 Transcoding presets

The media processing service provides two kinds of transcoding presets：

Preset template：

- Smart presets: These automatically adjust encoding parameters according to the specific details of the input file to meet output file video requirements. Since input files are all inherently different (resolution, bit rate, etc.), not all smart presets will necessarily be suitable. Therefore, we recommend that you use the preset analysis task to determine which presets are usable with your designated input file. Transcoding of multimedia files involves balancing the maximization of file size (i.e. bit rate) compression and the minimization of quality, of which the smart presets prioritize quality.

Static presets: These can be used immediately with no need to run preset analysis. There are three types of static presets: video transcoding presets, audio MP3 transcoding presets, and media container conversion presets. These include the most common playback devices and bandwidth conditions and prioritize controlling bit rate.

Narrowband high-definition TM presets: These can be used immediately with no need to run preset analysis. Video transcoding presets are included for three output file formats: FLV, MP4, and M3U8. Narrowband high-definition TM presets are unique to Alibaba Cloud multimedia processing. They provide a lower bit rate while maintaining the same level of clarity as other presets to help reduce your costs.

Custom presets:

These presets are created from user-defined transcoding parameters. These collections of transcoding parameters (such as for audio, video, and containers) can satisfy your individualized transcoding needs.

Amazon Elastic Transcoder also provides two types of transcoding templates:

- System transcoding presets:Amazon Elastic Transcoder provides a set of transcoding presets to eliminate the guesswork involved with figuring out which transcoding settings are appropriate for which different devices. You can choose from presets that create output files playable on any device or select a preset for compatible with a specific device. For maximum compatibility, select a “breadth preset” to create an output file that can be played back on most devices. For optimum quality and file size, select an “optimized preset” to create an output file suited to a particular device or category of devices.

- Custom transcoding presets:

Some customers may need to create certain presets for a specific output target. Custom presets can be used to define existing transcoding presets for use across all pipelines in your AWS account within a region.

1.4 Notifications

Notifications for media processing services have been integrated into the MNS service. Media processing fully supports the message queuing and notification features of the messaging service. It establishes a messaging attribute in the pipeline, and the return message from the asynchronous interface of the transcoding task within the pipeline can be automatically pushed to the user’s message receipt service through the message notification service.

Amazon Elastic Transcoder uses Amazon Simple Notification Service (SNS) to notify you of transcoding events. You will receive notifications when your transcoding task begins and completes and for any warnings or error conditions. Using notifications is an efficient way to monitor and manage your transcoding workload.

1.5 Video security

Video encryption is a method for protecting video content. Encryption can effectively prevent video leakage and theft and is widely used online in the education and finance fields.

Alibaba Cloud media processing services currently support two types of encryption methods:

> Private encryption：Video files are converted into an encrypted HLS format that can be decrypted and played back by the Alibaba Cloud player, ensuring video security on mobile devices and Flash. This provides a high level of security appropriate for scenarios such as online education and paid-for viewings.
>
> HLS standard encryption：Video content is encrypted according to the HLS AES-128 encryption standard and can be played back by any HLS standard player, ensuring video security on mobile devices. This provides a comparatively high level of security compatible with many client devices and software。An introduction to HLS encryption.。

Amazon Elastic Transcoder supports the following encryption methods：HLS with AES-128 Encryption: You can generate HLS streams protected with AES-128 encryption. Jobs created with this option will encrypt the media files and reference the decryption key in the playlist.

In addition to the job object, you can also choose to use SSE-S3 to have Elastic Transcoder write the encryption data keys directly into S3; data keys in S3 will be protected by the AWS-KMS master key.

1.6 Service region

Media processing services (MPS) are currently available in 11 regions: China North 2 (Beijing), China East 1 (Hangzhou), China East 2 (Shanghai), China South 1 (Shenzhen), Hong Kong, US West 1 (Silicon Valley), Asia-Pacific Southeast 1 (Singapore), Asia-Pacific Northeast 1 (Tokyo), Central Europe 1 (Frankfurt) and Asia-Pacific South 1 (Mumbai)， Middle East(Dubai).

Amazon Elastic Transcoder may be used in the following eight AWS regions: Eastern US (N. Virginia), Western US (Oregon), Western US (N. California), EU (Ireland), Asia Pacific (Singapore), Asia Pacific (Tokyo), Asia Pacific (Sydney), and Asia Pacific (Mumbai).

1.7 Cost

Pricing for the Alibaba Cloud media processing service is calculated as follows: transcoding fee = duration of output file x transcoding unit price：Duration of output file: Pricing is calculated per minute for each transcoding output file, to a precision of two digits after the decimal, with the second digit rounded. Durations under 1 minute are calculated as 0.02 minutes. The transcoding unit and output file format affect pricing, as different formats have different unit prices. For pricing specifics, please see Media Processing Pricing.。

Amazon Elastic Transcoder works on a pay-as-you-go basis. Pricing depends on the duration and resolution of the content that you output, with no minimum fee. Each output file is billed per minute, rounded to the nearest minute. If your Amazon S3 bucket is located in a region different from the one from which you submit your transcoding job, you will be assessed a data transfer fee. Additionally, pricing varies across regions.

2 Live Video

Alibaba Cloud ApsaraVideo Live is a live audio and video platform based on leading content access and distribution networks and large-scale distributed real-time transcoding technologies. It provides conveniently accessible and smooth high-definition live audio and video services with low latency even at high concurrency.

AWS Elemental MediaLive is a video-processing service that enables video providers to encode high-quality real-time video streams for delivery to a variety of broadcast televisions and multi-screen devices. The service works by encoding real-time video in real time by using larger real-time video sources and compressing them into smaller versions for distribution to viewers.

2.1 Comparison of Main Functions

Service Type	ApsaraVideo Live	AWS Elemental MediaLive
API & SDK	Supported	Supported
Protocols supported	RTMP, FLV , HLS,...	RTMP、RTP、HLS,...
Live stream broadcast	Supported	Supported
Console management	Supported	Supported
Security	Theft prevention, URL encryption, and HTTPS secure acceleration	Customer identity and access management (IAM) roles, security groups, and IP address whitelist
Authentication for live streaming	Supported	Not Supported
Screenshot management	Supported	Not Supported
Streaming notification callback URL,	Supported	Not Supported
Resource monitoring	Supported	Partially supported
Domain name management	Supported	Not Supported
Recording index management	Supported	Not Supported
instructor in broadcasting service	Supported (Chinese site)	Not Supported

2.2 Video standards supported

Alibaba Cloud ApsaraVideo Live supports iOS, Android, and Web stream push SDKs and Demo. It also supports common third-party stream push software such as OBS, XSplit, and FMLE and common third-party codecs and boxes based on the RTMP stream push protocol. It supports the RTMP, FLV, and HLS streaming delivery protocols as well as common third-party player software like VLC.

AWS Elemental MediaLive supports a broad range of video industry standards for the input, output, and archive of real-time video. It supports the latest codecs standards used for video compression, such as h.264/AVC and h.265/HEVC, and media communication protocols standards used to send video over the Internet, such as Real-Time Transport Protocol (RTP), HTTP Live Streaming (HLS), and Real-Time Messaging Protocol (RTMP).

2.3 Security

ApsaraVideo Live offers comprehensive security protections

- Anti-theft：Supports referrer blacklists and whitelists to protect your resources from being used by other sites.
- URL encryption：Collaboration between live stream accelerator nodes and your resource sites provides more secure and reliable protection for your live stream content resources against theft from illegitimate sites.
- HTTPS secure acceleration：Enjoy the reliable enterprise-grade HTTPS acceleration service that protects against hijacking, tampering, and leakage.

AWS Elemental MediaLive automatically protects video content as it moves between components by locally employing AWS security features.

AWS Elemental MediaLive automatically protects video content as it moves between components by natively employing AWS security capabilities. The service uses customer identity and access management (IAM) roles and security groups within their AWS environment. You can also add input security groups to whitelist IP addresses for input types used to push content to the service.

2.4 API & SDK

ApsaraVideo Live provides a web-based management console, API, and SDKs used to manage live video services and integrate them into your own applications and services.

API Management

- API stream management：Create, modify, delete, enable, or disable a live video domain; check the number of concurrent viewers; create or stop a recording; and create or stop a screenshot task.
- Live video screenshot：Use the API to take screenshots during a live stream and save them to the Alibaba Cloud OSS platform.
- Live video transcoding：Supports transcoding of multiple formats through the API.

SDK support

- Stream push SDK：Adjust stream pushing parameters and adaptive bit rate, frame rate, watermark, and beautification parameters in real time according to push-side network conditions.
- Player SDK：iOS, Android, and Web player SDKs and multiple playback formats.
- Live video SDK: Supports iOS and Android SDKs, packaging of pushed streams, and player SDKs.

AWS Elemental MediaLive can delete data using the management console, RESTful APIs, AWS CLI, or AWS SDKs. Of these, RESTful APIs provide URLs for each AWS Elemental MediaLive REST operation and information about content requests and responses. Any software application using a RESTful API or SDK must have the appropriate rights.

2.5 Resource monitoring

ApsaraVideo Live offers the following resource monitors:

- Traffic bandwidth：Supports peak traffic bandwidth values by namespace, cloud operator, region, and period of time; callback statistics; HTTP code traffic monitoring; and traffic bandwidth monitoring for user-specified time periods.
- Visitor data： Supports corresponding domain names, unique visitors (UV) per period of time, and statistical data on geographical distribution of users including region, total traffic, traffic proportions, visits to the current stream, visit proportions, and response time.
- Log management: Supports the download of logs for the most recent month.

AWS Elemental MediaLive does not support resource monitoring relating to traffic bandwidth or visitor statistical data.

AWS Elemental MediaLive can use the CloudWatch Logs standard feature to check and manage logs. Channel logs will be sent to Amazon CloudWatch Logs. These logs are extremely useful when the information in a warning message is insufficient to resolve a problem.

2.6 Availability

Alibaba Cloud’ s superior infrastructure delivers enhanced link quality and availability for live video. Over 1,300 live video nodes cover all major countries around the world so that your live video business can seamlessly go abroad.

ApsaraVideo Live can utilize the functionality of Alibaba Cloud accelerator products around the world to provide users with a high-speed pipeline between the area where video is captured and the area of the origin site from where it is broadcast. This creates the shortest and most optimal transmission link between the two locations to help your business resolve the problems of slow response times for users around the world and excessive delay.

Alibaba Cloud currently has two independent domestic live video centers in Beijing and Shanghai. Internationally, there are currently live video centers in Singapore and Japan (one in Germany is currently awaiting whitelisting). The 2018 World Cup stream link plan made full use of these multiple centers for disaster tolerance: two encoders pushed output streams simultaneously to Shanghai and Beijing to prevent any single center from becoming inoperable.

Each live video channel created with AWS Elemental MediaLive is operated on redundant infrastructure, which is physically distributed across multiple Availability Zones. When a channel is created in AWS Elemental MediaLive, the service deploys redundant infrastructure in two AWS Availability Zones (AZ). The service can monitor the status of encoding resources and automatically replaces any poorly performing component so it will not interrupt the channel. All resources flexibly expand with demand, ensuring consistent service for viewers.

2.7 Cost

ApsaraVideo Live product pricing comprises the following parts (for pricing specifics, refer to Live Video Broadcast Pricing。

- Live stream pricing according to traffic: Billed according to relevant tier of domestic traffic volume, with all traffic added up until the end of the calendar month and resetting on the next month.
- Live stream pricing according to peak bandwidth: Billed according to the total amount of download traffic used on a given day for the live video service
- Live video transcoding pricing: Billed according to the various bit rate formats used throughout the day and the respective totals of their durations on a given day
- Live video screenshot pricing: Billed according to the quantity of live video screenshots taken, according to the service area, with a corresponding charge for each one thousand screenshots taken.

AWS Elemental MediaLive offers pay-as-you-go pricing according to the following: inputs, outputs, added functionality, idle resources, and data transfer. AWS Elemental MediaLive provides two pricing models. You can choose to pay by the minute, which requires no pre-payment or long-term commitment.

Pricing is based on a simple per-minute model that simplifies the budgeting process and allows users to accurately predict how much they will spend for each of their channels. The price you pay will increase as you select more inputs and outputs, and you only need to pay for the encoders/decoders, resolutions, bit rates, and frame rates you actually use. There is no minimum usage requirement for the service, and you don’ t need to sign a long-term contract separate from the set prices. There is also a yearly plan with a set monthly price for 24/7 channels. For more information, please visit the AWS Elemental MediaTailor Pricingpage.