Speed Up Your Business

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Alibaba Cloud





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ABOUT US

Editor in Chief / Selina Yuan Editor / Stephanie Gao Review Editor / Huiping Guo, Yaw Yeo, Terry Lin, Zhenghui Wang, Lily Liang, Melvin Lim Website Planner / Melody Li , Sue Zhou Legal Advisor / Damon Ding PR Advisor / Crystal Liu Proofreading Editor / Olivia Kang Art Director / Diandian Wang Designer / Longze Ma

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When More Video Needs Are Coming

we help our internal businesses and external customers fulfill the full video production lifecycle requirements, from video production to end-user consumption. We offer a full range of advanced video processing capabilities to enable video editing, media management, automatic transcoding, intelligent analysis, adaptive streaming, seamless playback, and monetization. Some of our unique offerings include our proprietary Narrowband HDTM transcoding feature, which can save 20% to 40% bandwidth without compromising the image quality, and our integrated AI-assisted content moderation to make sure that the content is compliant with regulation.

It was reported in that by 2019, online content consists of 80 percent video marketing, and mobile consumption of video content continually rises by 100 percent annually. And the video games market could become a \$300 billion industry by 2025. Actually, we choose video meetings to work, video livestreaming to shop, video games to relax and so on. More video needs have been risen up.

Video has become the mainstream method for information transmission, and Internet users are increasingly demanding rich video engagement. New video formats such as live streaming, short video and Vlog are constantly emerging. Video applications have expanded from the entertainment field to vertical industries such as education, finance, and e-commerce. "Video+" has become a trend, and artificial intelligence, 5G, AR / VR and other technologies are accelerating the pace of innovation in the video domain to provide users with a smoother and higher-definition viewing experience.

I think when a person is listening, he or she can endure a little bit delays or interrupts, but when he or she is watching, a little delays or interrupts destroy the enjoy experience. In order to support the better end-users' experience, a better network and infrastructural technologies have been required.

In view of Alibaba Group's internal business, there are live streaming for the e-commerce that recent has been the trend. To guarantee the live streaming, and other video needs, we have to face the challenges of HD video, concurrent videos, interactive or return respond, etc. . We would like to share our technical experience and typical cases here.

Alibaba Cloud processes more than 60 million minutes of video playback and livestreaming per day in our media centers globally. Using our end-toend integrated VOD (Video-On-Demand) solution,

Selina Yuan

President of International Business Alibaba Cloud Intelligence



We have seen both Alibaba business units and Alibaba Cloud customers put these to great use. Merchants on Taobao and Tmall uses Taobao Live, Alibaba Group's livestreaming platform built on these underlying video technologies, to better engage potential buyers to promote their merchandise. Taobao/Tmall merchants uses Taobao Live in the most creative ways - chefs would broadcast cooking tutorials in restaurant kitchens, real-estate agents would give tours of apartments remotely over video, celebrities and singers would perform in online concerts from their homes, rural farmers would promote their fruits and vegetables through livestreaming, and even auto dealers are showcasing the interior of luxury cars through video.In Feb 2020 during the Covid-19 lockdown in China, DingTalk and Youku use the same Alibaba Cloud video technologies to support 50 million students from more than 300 Chinese cities in the Online Classroom program. More than 600,000 teachers in China tapped into the app's livestream feature to deliver their lessons.

When more video needs are coming, let's embrace the changing and challenges that might mean the big opportunities and great success is coming!

Speed Up Your Business in Gaming

The gaming industry is being with no geographical limits. Gaming companies, developers, and publishers from different countries come together to build games for a global audience. In this borderless gaming landscape, present day gamers demand amazing performance that traditional server backend infrastructures struggle to provide. The Cloud is a revolutionary force to foster competitive advantages.

These advantages include minimized operating cost, ease to scale, faster speed to market, and improved user experience. For example, given the increasing volume and dispersed location of gamers around the globe, it is no longer practical or cost effective to scale up manually with additional physical servers. Cloud resources relieve gaming companies from the cost of procuring and maintaining on-site servers, enabling them to automatically scale resources based on fluctuations in player demand.

Popular games witness an enormous surge in traffic during peak hours. Multiple players globally

access online games at the same time. Cloud can offer resource elasticity and ensure sufficient capacity to handle incoming access requests. SME gaming companies turn to Cloud-based gaming solutions when launching a new game title, yet the demand from gamers is not certain. They can have the flexibility to scale the resources up or down, according to real-time needs.

Faster Speed to Market is another benefit brought by the Cloud technology. Fierce global competition in the gaming industry puts immense pressure on developers to rapidly develop and deploy the latest gaming applications. Cloud facilitates continuous integration and deployment to ship the latest game features and upgrades faster.

For delivering a seamless user experience, game providers are faced with increasing challenges such as latency, bandwidth and packet loss. With a rapidly growing user base, gaming's biggest challenge remains in minimizing the delay between user input and execution on the screen. This delay, especially across geographic regions,



is a major concern for gamers and affects user experience as well as player retention. During peak hours, latency hinders the quality of the gaming experience. Low bandwidth and congested networks make it difficult for users to stay. A robust gaming solution powered by the Cloud can addresses these challenges and allow game publishers to gain greater control over content by offering more personalization and incorporating the latest updates in real-time.

Alibaba Cloud Gaming Solutions offer gaming companies a one-stop shop to quickly build, deploy, distribute, and monetize their gaming applications on the cloud. With a highly available global cloud network, Alibaba Cloud gives its users options to deploy from China, Japan, Singapore, Germany, Dubai, Australia and US. It provides a highly scalable and stable infrastructure through robust, high-memory server clusters to eliminate delay so that developers can cater to a vast number of games with the help of dedicated gaming clusters that support high concurrency and multi-scenario game deployment.

Alibaba Cloud also addresses a constant concern of most gaming providers: security. It provides a powerful Anti-DDoS service to effectively intercept and stop malicious attacks. With its stable connections with strong data security with layers of firewall protection, global data centers for seamless geographic distribution, gaming companies can quickly deploy new features and power their games on the cloud.

In this issue of our magazine, we will discuss these challenges in the gaming industry in more details and explain you specifically how we realize to enable the industry with our Gaming Solutions. We will introduce you the best practices of Alibaba Cloud's DCDN, a content delivery acceleration service based on Alibaba Cloud's CDN to accelerate content delivery for hybrid sites, dynamic sites, and applications, and show you how it is changing the game.

We will also share with you how to use our ultralow-latency livestreaming solution Real-Time Streaming (RTS) for achieving better real-time interaction in livestreaming. When conventional livestreaming technology can no longer meet the increasing requirements for video interaction, RTS supports the playback of tens of millions of concurrent streams with millisecond-level latency. You can use RTS to reduce the latency and freezing, and ensure instant loading and smooth playback for live streaming.

For supporting gaming with more and more urging requirements, Alibaba Cloud CDN needs to satisfy the varying needs of a huge user base operating a wide range of services, including usage scenarios, downloading, live streaming, video-ondemand, and dynamic acceleration. Making CDN programmable will allow customers to customize their business systems beyond standard functions. For responding to the demands, Alibaba Cloud has launched EdgeScript to serve as the dedicated script tool for CDN programmable configurations. In this issue, we will introduce you how EdgeScript can help you easily build custom business systems based on Alibaba Cloud CDN and reap agile business development benefits.

In the era of 5G, 5G messages provide a powerful channel for game providers to connect with users. By integrating functions such as more abundant media types, chatbot dialogs, and closed-loop effect analysis, 5G messages significantly improve the connection efficiency between enterprises and users. To help gaming providers make better use of 5G messages, Alibaba Cloud launched the 5G Message Enabler Platform (MEP). Among many advantages, users can quickly employ "message as a service" without knowing the complex underlying technology of 5G messages. They can connect with their self-trained robots on MEP, improving the efficiency in delivering customer service.

Finally, you can understand the benefits of our Gaming Solutions better by reading the case study of Lilith Game, a Shanghai-based mobile game provider that creates fun games for worldwide players. Through Alibaba Cloud's Dynamic Route for Content Delivery Network (DCDN), Lilith Games improved players' interactive experience in the games, saving the cost of origin server bandwidth by more than 50% and eliminating attacks from distributed denial-of-service (DDoS) and Web applications.

Are you eager to be the next game winner? Explore our flexible, secure, and on-demand gaming solutions in this issue!

Why Our CDN is Ideal for Asia Pacific

5G will unleash high-speed uploads and downloads the world over, while 4K and 8K livestreaming will create both benefits and challenges for content delivery networks. As demand for intelligent computing increases, more computing and storage resources will move towards "the edge". You can overcome these challenges using a CDN, which allows you to grant access and easily configure your edge resources .

Many cloud service providers offer now CDNs, helping enterprises handle traffic peaks driven by their e-commerce sites, mobile apps, videos, and live streams. As these applications continue to grow in scale and complexity, the development of cloud-based CDNs has taken off in recent years. This has released many benefits into the market, including flexible resource configurations, robust large-scale data processing capabilities, pricing transparency and affordability, and improved utilization of holistic cloud computing platforms. For example, using the advanced and easy-to-use features of the cloud, a user can easily solve the high latency and lag problems typical in live streaming. Additionally, cloud computing platforms provide a wide range of supporting services, such as data mining and elastic scaling, opening up further opportunities for savvy organizations. The CDN landscape has changed a great deal, benefiting both the end user and the business.

The Alibaba Cloud CDN

Alibaba Cloud has realized many CDN successes in recent times. In Gartner's 2019 "Market Guide for CDN Services", for example, Alibaba Cloud was identified as a global service provider thanks to our strong global service capabilities and recent product technology advantages, while providing a broad



range of access services across five continents.

Our CDN is built on a strong technical foundation, providing more than 2,800 edge nodes and serving over 30,000 customers worldwide, with a bandwidth reserve of 150 Tbit/s. It accelerates millions of domain names and processes billions of refresh operations every day. It continues to support our Double 11 Shopping Festival and was also instrumental for livestreaming the 2018 Russia World Cup. These experiences have helped us develop a sophisticated set of solutions and a comprehensive emergency response plans tailored to a range of high video concurrency scenarios.

Value of Our CDN Solutions

Alibaba Cloud CDN provides a suite of targeted CDN solutions to maximize your profits across applications including video-on-demand, livestreaming, image transmission, HTTPS transmission, large file transfer, player SDK, and content moderation.

Here are four key ways Alibaba Cloud CDN can help your business:

1. Access all-in-one, cost-effective services: Alibaba Cloud provides a range of all-in-one services, including a Domain Name Service, storage services, and cloud-based CDN services.

Our Domain Name Service and Object Storage Service (OSS) can help you quickly launch your services, while reducing your O&M costs. We provide a range of user-friendly, secure, fast, stable, and affordable services, such as domain name registration, management, analysis, protection, Domain Name System (DNS), and ICP filing, if you want to operate in China. We can provide your business with technical support across more than 40 million domain names worldwide.

Our customers operate on a global basis. So does Alibaba Cloud, our CDN and OSS services now connecting to 13 global regions. We also provide fee exemptions on a per-user basis in scenarios including: (a) Back-to-origin data traffic from an Alibaba Cloud CDN node outside mainland China to Alibaba Cloud OSS; (b) 100 million read and write requests to OSS per month in each region



outside mainland China; and (c) Processing of 10 TB of image data in OSS per month in each region outside mainland China.

2. Enabling your global reach, across any border: Alibaba Cloud provides a range of optimization solutions designed for your cross-border scenarios.

These solutions avoid poor user experiences due to poor and high-latency cross-border transmission. Instead, the Alibaba Cloud CDN infrastructure provides superior link quality and availability. DCDN also provides IP application acceleration to accelerate your TCP and UDP transmission. What's more DCDN integrates closest access, intelligent routing, transport protocol optimization, and multiple load balancing technologies to ensure optimal transmission. To help your enterprise solve the problem of slow or delayed access for your users worldwide, our technologies are also capable of identifying the shortest, optimal path between the content acquisition region and the consumption region. We achieve this using the following three techniques:

• A suite of acceleration scenarios.

The full-protocol-stack acceleration tunnel supports acceleration through the Layer-7, Layer-4, and Layer-3 network protocols. This allows it to satisfy a broader range of user needs and scenario requirements.

• Improved reliability and reduced latency.

Similar to a navigation system, a real-time intelligent routing detection system selects the optimal transmission path in real time. It can solve transmission failures due to single-line origin sites, traffic spikes, and network congestion. It can also quickly determine and adjust the appropriate transmission route to find a shorter path to the destination. The system provides endto-end available network connections around the clock, even in remote areas. This reduces error rates and provides a high reliability and low latency acceleration experience.

• A high-performance proprietary transport protocol.

Multi-path data transmissions often encounter problems including data redundancy, data comparison, and lost packet retransmission. Alibaba Cloud transforms the TCP protocol stack to improve the reliability of your realtime data transmissions. It also implements intelligent route switching, in seconds to avoid packet loss during data transmission.

3. Secure acceleration and distribution services.

We have developed a series of sophisticated security solutions to protect your business in Asia Pacific. Alibaba Cloud was the only Asia Pacific cloud service provider included in recent a Forrester Wave evaluation of native security capabilities in the public cloud field, where we ranked as a Strong Performer. Alibaba Cloud Web Application Firewall is also the only WAF product in Asia Pacific to be included in the Gartner Magic Quadrant.

In light of the technical context and current industry trends, we have continued to optimize our CDN plus security solution. Some key highlights include:

(1) Multi-level protection at the edge

Our CDN nodes provide rich edge protection features. You can implement precise access control using features including blacklist and whitelist settings, HTTP request analysis, region blocking, and IP reputation scoring. Our frequency analysis engine can also intercept IP addresses that initiate abnormal access requests. Plus, our WAF is deployed on each CDN node, effectively defending against web attacks, preventing data breaches, and ensuring origin site security.

(2) DDoS protection through CDN and Anti-DDoS

Our CDN provides certain anti-DDoS capabilities

and traffic acceleration. Once the intelligent scheduling system detects a cyberattack, it directs traffic from the attacked area to a high-capacity distributed scrubbing center automatically. Our CDN works with the scrubbing center to ensure your business continuity and stability whether your business is operating normally or under attack.

(3) Invalid website access requests filtered by Anti-Bot Service

Our Anti-Bot Service extracts the valid features from incoming requests and compares them with internal data to distinguish normal access requests from crawler access requests. This allows you to improve your end user experience, intercepting



invalid access requests, while reducing your CDN bandwidth expenditures.

4. Full cost transparency and easy-of-use.

The Alibaba Cloud self-service platform provides you with a flexible and transparently priced selfservice model, including subscription and pay-asyou-go billing options. This out-of-the-box solution is easy to configure, without any in-depth technical knowledge. In fact, you can be up and running in less than one minute and with just one click. This reduces your O&M costs and responsibilities, accelerates your time to market and provides a smooth user experience.

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tch of enterprises that obtained CDN	licenses •	
service provider accredited by Garti	ner	
ed the first authoritative IPv6 ogo certification in the world		
Cloud Initiative: AAA for n CDN service providers		
or CDN classified protection •	Global Recognition	
apacity: up to 40 TB to 1.5 PB		
ts for the same URL into one request		
Precise intelligent routing		
Quality check within only a few sec	conds	
	 Content consistency verification 	
n management Content Tamper-	End-to-end HTTPS transmission encryption	
g delivery proofing	Refreshes data within only a few	
nce	seconds	
• End-to-e	nd latency: within 1 second	
Real-time streaming	s of millions of concurrent requests	
	 E-commerce live-streaming: UV conversion rate increased by 4% and GMV by 5% 	
One-stop self-service	configuration and API management	
Content oderation nagement Pornography dete	ection accuracy: 99%+	
Application-layer pr	rotection on edge nodes	
APP Mobile app up	odates	
bs Low-latency liv	ve-streaming for online education	
Dynamic con for social int	ntent delivery acceleration eraction	
Acceleratio	on of secure access to financial data	
Popular ga	ame updates	
Live-streaming for large events		
 Intelligent web page acceleration 		
• E-commerce flash sale		
Massive traffic distribution for Internet entertainment		

PCI-DSS certification



How Dynamic Route for CDN (DCDN) **Supercharges Today's Gaming** Industry

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As the gaming industry goes from strength to strength, this article introduces the challenges today's gamers and game providers face and the benefits of using the Dynamic Route for **Content Delivery Network to overcome them.**

Gaming is a burgeoning business. New products and technologies, not to mention rising levels of investment, have driven the recent development of high-quality gaming platforms. While these games continue to attract established gamers, ubiquitous smartphones and the advent of 5G are introducing new players, causing the market to grow at an exponential rate.

Pain Points in the Gaming Industry

From low latency to poor in-game interactions, game providers must address a range of challenges to meet the high demands of today's gamers. These issues may include:

• Peaks in demand: You are launching a new game and expect two million users to access your online platform within a few hours. Your existing IT infrastructure cannot handle this surge in demand.

• Expanding geographically: You are introducing an existing game into a new country but your organization has no IT resources in this region, causing unacceptable delays for your new, overseas gamers.

• Slow user interactions: You use WebSocket and private protocols, including non-HTTP/ HTTPS, to enable interactions between gamers. This is a slow and painful process for the end user. You also use both static files and dynamic request resources. Again, latency issues are resulting in a poor end user experience.

• Poor online security: Your existing network and resources were recently attacked, resulting



in the loss of important customer and corporate data

A traditional CDN cannot address these issues. That's why Alibaba Cloud is making the best use of its powerful and global infrastructure, empowering established providers, game developers and startups to unlock seamless, worldwide gaming.

By removing many of the network issues hampering the games industry, game providers can focus on game design and the user experience, allowing you to promote and improve your end-product, without worrying about other technical issues.

Based on our industry expertise, Alibaba Cloud's DCDN was developed to meet this need. It seamlessly meets the acceleration demands of the game industry, providing companies with low latency on a global scale, robust security, and seamless user interactions

DCDN also addresses the unique set of challenges faced by game developers and start-ups. These include:

• The Start-Up Stage: Here, cost and scalability are critical factors. The cloud is available ondemand, providing the elasticity for start-ups and developers to start work with limited assets, increasing your computational capacity when required. In short, you pay for what you use with no high initial investment costs or future capacity issues.

• **High Security**: The gaming industry is frequently targeted by cyber criminals. Developers and start-ups must implement robust security measures. The edge protection capabilities of the CDN across your platform, data, and business levels provides robust protection against a broad range of online attacks.

• Elastic Scalability: High peaks in demand are common in the gaming industry, especially when a new game hits the market. These surges in demand can put tremendous pressure of your network. However, start-ups and developers gain elastic scalability using the cloud, giving gamers easy access to their services and a seamless user experience, even during peaks in demand.

• Game Experience: The quality of the gaming experience ultimately determines the success of a game. Game developers and start-ups must focus on areas including ease of access, login, downloads, transactions, and interactions to provide a seamless end user experience. To achieve this, Alibaba Cloud's DCDN provides an all-in-one accelerated distribution for dynamic and static data. This provides superior interactions between gamers and delivers players' instructions under non-standard protocols, improving the overall gaming experience.



Value of Our CDN Solutions

Dynamic Route for CDN (DCDN) is a CDN service developed by Alibaba Cloud to accelerate static and dynamic content delivery. DCDN solves issues like slow response times, packet loss, and service instability caused by factors including mixed static and dynamic resources, multiple operators, network instability, single-line source servers, burst traffic, and network congestion. It improves the performance across every server and massively streamlines the end user experience.

When adapting source servers, DCDN doesn't need any server resource adjustment. It can intelligently distinguish dynamic and static content and accelerate them separately, making it an ideal acceleration solution for game providers.

DCDN is built on the CDN infrastructure with more than 2,800 worldwide nodes and is compliant with the Service Level Agreement (SLA.) It builds a rapid, reliable, intelligent, and secure "highspeed railway" between users and source servers.

To summarize, DCDN provides five key benefits to the gaming industry: transmission acceleration, stability and balancing, HTTPS, basic defense, and flexible management.

Applying DCDN in the Gaming Industry

Let's look at how DCDN can resolve some of the common issues faced by today's gaming industry, across three broad areas.

Intelligent Routing

Servers must guarantee performance, provide a seamless end-user experience, and handle high traffic loads stably and efficiently to ensure the 24/7 network availability, even during peaks in demand. In the gaming industry, this is no easy task.

Compared to a traditional CDN, DCDN uses intelligent routing to resolve the page latency and content interaction failures caused by singleline source servers, burst traffic, and network congestion. As a result, game providers avoid the situation where online users may directly give up access to the server.

DCDN can accurately calculate the effect of each hop to optimize everything from their intelligent routing capabilities to real-time network detection, and smooth cross-network interactions. This ensures that each piece of information is seamlessly transmitted to the source servers or other users without any network congestion issues.

IP Application Acceleration

Many gaming industry scenarios require nonstandard HTTP protocols. For example, the transmission of interactive information is implemented through non-standard HTTP protocols, especially when using four-layer private protocols. Traditional CDN solutions cannot address this issue.

DCDN accelerates network transmission, reduces service latency, and improves access availability. It uses four-layer protocol acceleration to complete access and transmission. DCDN also resolves the transmission problems of some private protocols, enabling transparent transmission without any intrusion.

WebSocket

WebSocket is a new network protocol based on TCP, supporting full-duplex communication between clients and servers. In other words, WebSocket allows a server to send requests to a client. Therefore, with WebSocket, once a client connects to a server, the connection persists. This simplifies the data exchange between clients and servers and also improves its efficiency. The gaming industry uses this protocol regularly for information interactions.

However, traditional CDN products cannot provide acceleration for customers using this protocol. So, DCDN supports comprehensive procedure transmission. This provides several advantages. First, DCDN supports small Header transmission, roughly two bytes. Second, the server no longer passively returns data after receiving a browser request. Instead, when new data is available, the server actively sends this data to the browser. Third, the WebSocket protocol helps to reduce server resources and bandwidth issues, facilitating real-time communication.

Transforming Livestreaming **Using RTS for Better Real-Time** Interactions

The Alibaba Cloud ApsaraVideo Team explains how Real-Time Streaming (RTS) helped connect businesses during the recent pandemic, and why it's still going strong.

During the pandemic, livestreaming helped people enjoy their leisure and recreational activities, stay informed, and attend class, according to QuestMobile's "2020 Special Report on the Fight Against COVID-19 in China's Mobile Livestreaming Industry".

For those industries previously reliant on offline interactions, livestreaming provided a muchneeded lifeline, changing the way the world worked and played. Retailers started to livestream online to promote sales, for example.

We've also seen e-commerce businesses investing more in their livestreaming capabilities during the pandemic. Now, they are continuing to offer these livestreaming platforms and services to boost sales. They are also fitting out their brickand-mortar stores with livestreaming services to further promote their wares and streamline their online and offline sales capabilities.

In addition to the online celebrities who dominate today's livestreaming platforms, a wide range of organizations and traditionally offline businesses have started to offer a variety of livestream offerings, including virtual museum services, cloud dancing sessions, and cloud tours, to name a few. These services and solutions have attracted a large number of young Internet users.

To summarize, livestreaming not only creates online, recreational content. It has also evolved into a basic tool, which is now closely integrated with many of today's business scenarios across multiple industries and geographies.



Rewards, advertising, content distribution, game distribution, membership, subscription, and more

Leisure and recreation, social networking, following broadcaster updates, and more

User Needs

Various livestreaming platforms and short video platforms



Future Challenges and How to Stay Ahead

Livestreaming is a real-time and interactive entity but are today's livestreams real-time and interactive enough?

Some livestreams are hampered by extremely long latency, for example. When a viewer posts a comment, it may take anywhere from five to 10 seconds before the broadcaster sees the comments on the screen and responds. This could lead to a range of second-rate user experiences, including:

1.In a livestreamed class, a student may ask a question, but the teacher has moved on to the next topic before seeing the question.

2.In a livestreamed e-commerce session, the merchant appear to ignore a viewer's product questions when they actually have not seen them.

3.A livestreaming broadcaster may not thank a fan who gives them a reward, because it is delayed.

4.During a livestreaming sports game, the fan already knows when their team scores from the cheers, before they see the goal on the screen.



SOLD **Business** Model

> Obtain product instruction and promotional information, acquire professional knowledage, and learn skills.

As a means to acquire customers and drive

order creation, livestreaming has become an

important sales channel in various industries.

Vertical industry apps and mass entertainment apps are competing for related scenarios.

High latency adversely impacts the interactive experience across multiple livestreaming scenarios, hindering the commercial application of this technology. This is particularly damaging within the world of e-commerce. Posting and replying to comments are essential to maintain the interaction between the audience and the merchant, during a livestream. The merchant's real-time interaction or feedback can determine the level of activity and transaction rates during the session.

Conventional livestreaming solutions, such as RTMP push streams and FLV, RTMP, or HLS playback, usually have a latency of between five to 10 seconds. This could be caused by encoding latency, where the performance may vary between operating platforms, even when the same settings are used. On MacOS, this latency is around several hundreds of milliseconds, for example, but it can be as low as 50 ms on Windows.

CDN link latency is partly caused by network transmission latency. The playback buffer is another source of latency. Public network environments can also vary in quality. If network jitter occurs in any stage, whether during the stream push, CDN transmission, or playback and reception of streaming media, the performance of the streaming client is adversely impacted. To cope with this jitter, client media players usually implement a media buffer of about six seconds.

Introducing Alibaba Cloud RTS

The ultra-low latency livestreaming Real-Time Streaming (RTS) solution from Alibaba Cloud addresses these challenges. It is built on WebRTC technology and the UDP transmission protocol, supporting large-scale concurrent livestreaming with an end-to-end latency of less than one second. Deployed on Alibaba Cloud CDN nodes, the RTS service reuses CDN nodes and network resources to strike the right balance between access costs, node coverage, and carrying capacity.

Based on core metrics, Alibaba Cloud's RTS service delivers outstanding livestreaming performance. Given the same frame lag rate, the RTS service can reduce the livestreaming latency by 75%.

Without requiring any improvement in the network latency or packet loss rate, RTS also significantly improves the livestreaming experience by improving the livestream success rate, the frame lag rate, the quick launch rate, and other indicators.

The RTS service is extensively used in Taobao Live to reduce latency and improve user interaction. Real-world online applications show that RTS significantly improves transaction rates during e-commerce livestreaming sessions, with the UV conversion rate increasing by 4% and the GMV increasing by 5%. Currently, many of our well-known clients in sectors including education, e-commerce, and game casting have used RTS to launch their livestreaming businesses.



EdgeScript Explained: the Simple Way to Program an Out-ofthe-box CDN

This article outlines the challenges of out-of-the-box CDN implementations and explores how EdgeScript can personalize many CDN-based business systems.

Challenges of CDN

An out-of-the-box CDN has certain drawbacks. Many CDNs have a limited amount of functionality. Others may fail to meet customer requirements where developers want to customize existing CDN capabilities or business experts want an intuitive coding platform to implement their organizational plans. O&M support personnel may also want to isolate their staging and production environments to achieve stability and quick transitions. The list is endless. But the capabilities of a traditional outof-the-box CDN is not.

To overcome this black-box paradigm, we need programmable CDNs, providing organizations with a way to customize their business systems beyond today's standard functions.

Introducing EdgeScript for Your CDN-based Business Systems

EdgeScript is a dedicated script tool for CDN programmable configurations. Launched by

Alibaba Cloud, EdgeScript helps you easily build custom business systems based on our CDN solution, while helping you reap the rewards of agile and iterative business development and can shorten your delivery cycles from two to four weeks to less than one week.

Available since September 2019, EdgeScript is widely used both inside and outside Alibaba Group. We believe that the most beneficial features of EdgeScript are its customization capabilities and agility, allowing it to be used across a wide range of business scenarios, while shortening release cycles from two to four weeks to just one week.

Introducing EdgeScript

A CDN is essentially a tunnel connecting an organization to its end-users. It is used to accelerate distribution of content before the end-users access that content in the origin server. There are two ends to a CDN. One is the access end, and the other is the origin server. EdgeScript enables script-based programmable configurations at both the access and origin ends.



Let's look at some examples of EdgeScript and how it can make the access-side configurations programmable:

1) Scenario Authentication: This is commonly seen in hotlink protection for live and on-demand video streaming. EdgeScript secures your resources by quickly customizing the logic for request parameter-based and cookie-based authentication, as well as authentication involving complex algorithms.

2) Remote Authentication: CDNs are mainly used for distributed storage and internal content distribution. So, they only offer limited authentication support for client-related operations, such as the playing of video/audio files and user retention. The data processing of such operations generally requires self-built client-side authentication centers. This is where EdgeScript comes in. It can remotely access apps and, therefore, interact with clientside authentication centers. This is particularly useful when adding hotlink protection to basic authentication support.

3) Request and Response Controls: EdgeScript provides total control over the requests and responses received by the CDN.

4)Redirects and Rewrites: Redirection for multilingual sites is another common application. For example, users visiting the Chinese site are redirected via 302 to one site, whereas users visiting the English or German site are redirected to another site.



5) Blocking and Interception: EdgeScript can implement programmable and custom policies to block traffic associated with specific regions, logic, or client IP addresses. At the same time, it can also implement anti-scraping policies to protect websites against crawlers.

6) A/B Testing: Generally, if a new feature is deployed on the origin server in an external system, it may need to go through A/B testing. CDN is useful in this area, forwarding the origin request header to different URLs to trigger different functions on the origin server and complete the A/B test.

7) Cache Policies: You can use EdgeScript to design a tailored solution when the validity period of cache entries or the current cache policy no longer suffice for your needs.

8) Throttling Control: You can customize your throttling policies, applying different speed limits to VIP users and non-VIP users.

9) Rewriting M3U8 Files: You can rewrite your M3U8 files with ease, which is usually required in live streaming and other video-related businesses.

10) Dynamic Tagging: EdgeScript can also be

used to tag CDN logs, helping you manage your CDN logs.

EdgeScript also enables programmable support for origin-pulls, origin-pull authentication, and also origin-pull policies and traffic redistribution. In short, you can use EdgeScript to switch between different origin servers with ease.



Conclusion

Alibaba Cloud CDN is evolving from providing standard services into a highly programmable network, bringing many benefits to organizations. A programmable CDN allows you to quickly build a personalized business system on the cloud and swiftly implement configuration changes and iterations. Going forward, we hope to see more people using EdgeScript to customize their CDN services.





Programmable CDN for Agile Development

Peter Gets New CDN Skill

(1)



After Peter adopts the Alibaba Cloud CDN solution he receives fewer complaints and more positive feedback.



2

However, at today's weekly meeting...



Peter gets upset and the meeting is at a standstill.



25

Alibaba Cloud





Peter gets upset and the meeting is at a standstill.



4





27

28









Game Smart Hardware Alibaba Cloud, of course. In addition to e-commerce applications in the Alibaba ecosystem,hundreds of cloud users are also using EdgeScript.

Live-

6



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How Lilith Games Packed a Powerful **UX Punch with DCDN**

We explain the benefits of using the Alibaba Cloud Dynamic Route for Content Delivery Network (DCDN) through the lens of mobile games provider, Lilith Games.

Lilith Games is a Shanghai-based mobile game provider, which has launched a range of highly successful mobile games, including Allstar Heroes, Rise of Kingdoms, and AFK Arena, to its global gaming audience.

Lilith Games was listed on LinkedIn's Top Companies and KPMG's Top 50 Leading Chinese Cross-Border Brands in 2019. From January to April 2020, Lilith Games topped the list of Chinaheadquartered apps by worldwide consumer spending from overseas.

Business Difficulties

1. Poor Dynamic Command in the Game: Players are spread across different cities and provinces in China. The game carriers also vary in size and quality. This complicated network environment leads to serious latency and network fluctuations, especially when the transmission is operated in cross-network and cross-region scenarios. These issues prevent users from sending their dynamic command in time, adversely affecting their operation in the game.

2. Decreased Game Performance: A rapid increase in players logging on within a short time may cause network congestion and network quality fluctuations. This often results in packet loss and affects the content delivery of the game, lessening the players' gaming experience.

3.Complex and Insecure Self-Built Acceleration Procedures: To improve player interaction, the node and infrastructure quality in the transmission acceleration network is vital. In addition, route selection and protocol optimization must be customized. All of these factors are complex for self-built acceleration procedures. To provide this functionality, a certain level of detection capability at the gaming device level is required, as well as intelligent routing strategies. Furthermore, the link between self-built procedures is often vulnerable to network attacks, leading to further link instability and interruption.



An Architecture Diagram of Solutions

Solutions

To reduce the latency of in-game dynamic commands, Alibaba Cloud completed the following:

•The Deployment of High-Quality Asset Nodes: Alibaba Cloud's Dynamic Route for CDN (DCDN) provided a large number of asset nodes, covering internet service providers (ISPs) from different cities, provinces, and regions in China so players can access the closest nodes. Moreover, the DCDN also ensured stable connections with low latency and solved the issues caused by transmission between different regions and different ISPs.

•Intelligent Routing for Latency Minimization: Alibaba Cloud's DCDN uses global detection to collect transmission latency data from nodes in real-time. By adjusting the router based on the dynamic information of asset nodes, Alibaba Cloud's DCDN minimized the latency of dynamic game instructions and online interactions.

•Protocol Optimization: Alibaba Cloud's DCDN uses its proprietary transfer protocol. Compared with the traditional Transmission Control

Protocol (TCP), the protocol is optimized to resolve issues caused by the slow start mechanisms, poor congestion control, and data retransmission. Also, our protocol makes full use of the available bandwidth resources. As a result, the efficiency of data transmission was further improved.

Alibaba Cloud improved the stability of game operations for Lilith Games in the following ways:

•Intelligent Routing for Minimizing the Packet Loss Rate: Alibaba Cloud's DCDN uses global detection to obtain transmission packet loss



data between nodes in real-time. By adjusting the router based on the dynamic information of asset nodes, Alibaba Cloud's DCDN ensured the stable transmission of dynamic game instructions and online interactions.

•Multi-Channel Transmission: With multichannel transmission, Alibaba Cloud's DCDN replicates the data of dynamic game instructions and online interactions, transmitting data through multiple channels. Compared with the single-channel transmission, this technology minimizes network fluctuations.

•Zero-Latency Switchover: Alibaba Cloud's DCDN quickly switches over services with zero latency to ensure players can still play the game normally when a node failure occurs on the platform. Through the zero-latency switchover, the stability of the platform was guaranteed.

Based on the Alibaba Cloud's Content Delivery Network (CDN) infrastructure, internal protocol optimization, and intelligent routing system, Alibaba Cloud's DCDN greatly improved its transmission rate and usability, especially in a poor network environment.

DCDN supports the transparent retransmission of customers' business to protect their privacy without attacks. More specifically, with some simple changes to the origin server, Alibaba Cloud's DCDN can obtain the IP addresses of customers. The distributed deployment of nodes can protect the service against attacks as well. Using these DCDN features, Alibaba Cloud also enhanced the compatibility and security of Lilith Games' platform.

Customers Benefits

•Enhanced User Experience: Alibaba Cloud's DCDN minimizes network latency and improves the end-user experience.

•Cost Reduction: Alibaba Cloud's DCDN allows users to replace all Border Gateway Protocol (BGP) network resources of their origin servers with a single operation network. This reduces the bandwidth costs of the origin servers by more than 50%.

•Flexibility and Security: Characterized by easy access and privacy protection, Alibaba Cloud's DCDN supports transparent retransmission and has four to seven protection layers, mitigating the risk of attacks from DDoS and web applications.

Conclusion

Using Alibaba Cloud's Dynamic Route for Content Delivery Network (DCDN), Lilith Games improved players' interactive experience, saving the cost of origin server bandwidth by more than 50% and eliminating attacks from distributed denial-of-service (DDoS) across its Web applications.

Using DCDN's static and dynamic separation,



edge caching, intelligent routing and compression transmission features, many issues were resolved including slow response rates, packet loss, and unstable services caused by multiple carriers, network instability, single-line origin server, burst traffic, and network congestion.

As a result, Lilith Games improved its acceleration performance and the end-user experience, where dynamic and static mixing features helping the organization reduce costs, improve security and gain business flexibility.

Creating Enterprise-Level Acceleration Experience in Content Delivery

This article presents insights from a recent interview with Yaw Yeo Chief Architect of CDN, Alibaba Cloud Intelligence. Yaw Yeo discusses the next generation of CDN's features and its future applications.

Q: What is the driving force behind the recent CDN advances?

Yaw Yeo: With the rapid development of the Internet and advancing digitization, "online" can make it easier for enterprises to realize regional expansion. More and more enterprises are moving their services to the cloud to meet users' changing needs and provide more convenient and efficient online services. Presently, everyone believes it is necessary to move enterprises online, but the question is how to do it well."

In this context, it's easy to see how the response speed of an enterprise application is now one of the key indicators for success.

Q: What direction will next generation CDN solutions take?

Yaw Yeo: I want to highlight four areas.

1.**Full Acceleration**. With its self-developed protocol stack, new dynamic path optimization, and powerful network infrastructure, Alibaba

Cloud CDN provides comprehensive protocolindependent acceleration capabilities. For the latest protocols, such as QUIC and HTTP3, layer-4 and layer-3 connections support the acceleration of your WebSocket and IP applications.

2.**Programmable**. With the popularization of cloud-native technologies, Alibaba Cloud CDN's programming capabilities are increasing and can now be implemented near users, enabling users to offload stateless business logic at the edge by using functions or containers to provide interactive responses with the shortest latency. Based on the powerful basic resource capabilities and high-performance architecture of the Alibaba Cloud CDN platform, we can easily meet your demand for mass flexibility.





3.Security. Alibaba Cloud CDN provides your business with multi-dimensional protection capabilities, including at the network layer and application layer. To achieve this, our worldleading security capabilities, such as WAF and anti-DDoS, are fully integrated with our global CDN nodes, while accumulating attack and defense data. At the same time, to meet the government and enterprise industry's requirements for acceleration and security, Alibaba Cloud has launched a security acceleration solution to help customers from finance, TV broadcasting and media, and traditional fields obtain stable and smooth online business and security compliance.

4.Data-Based Decision-Making. Online enterprises need a precise and efficient data system to support their business operations. Alibaba Cloud CDN provides a world-leading data delivery system to help enterprises develop accurate decision-making capabilities. Based on CDN's detection and routing capabilities and the distributed log channel, delivery can be completed in seconds. Alibaba Cloud CDN also combines SLS, HTTP-POST, Kafka, and other common methods, allowing enterprises to access their data content and directly deliver this data to their cloud products with ease. Enterprises can customize their processing and storage requirements using different products, such as ODPS, OSS, and DTplus. In terms of data comprehensiveness, CDN provides data from different dimensions, such as access, backto-origin, exceptions, and orchestration and processing results. With this data capability, enterprises can make the right decisions, at the right time.

Q: How can organizations deploy CDN to address today's business challenges?

Yaw Yeo: Every internet-based application builder is continuously pursuing faster service speeds, increasingly diversified service forms, and broader service areas. In a globalized era, CDN is an indispensable capability for enterprises because their users are distributed widely and distant from their original sites.

To achieve this, Alibaba Cloud CDN has built data centers and media centers in many regions and set up a global acceleration network and scheduling system to help localize content from overseas live streaming and VOD. Alibaba Cloud CDN has covered more than 80 countries and over 100 operators around the world. This is an important point, demonstrating how Alibaba Cloud can help enterprises extend and develop their businesses in overseas markets. Alibaba Cloud CDN has also achieved data compliance in many regions, helping enterprises accelerate global content distribution on one platform.

For example, to support the overseas expansion of Chinese enterprises, Alibaba Cloud has completed the network optimization of CDN and cloud storage (OSS) in 13 data centers around the world and recently launched overseas CDN + OSS, which is a free back-to-origin solution, enabling enterprises to obtain high-quality services and reduce costs on one platform with ease.



That's not all. Focusing on the acceleration scenarios of online content, Alibaba Cloud CDN has also developed a complete set of products and solutions, including video acceleration, Dynamic Route for CDN (DCDN), and security acceleration for a range of industries. By integrating these products and solutions with video PaaS products, Alibaba Cloud CDN can provide end-to-end technical support for seamless enterprise application innovation.

This work was invaluable during the recent pandemic when the online education industry experienced explosive growth. When the traffic surged, the user request volume and the downstream traffic bandwidth also increased. This put servers under tremendous pressure, slowing site responses, especially for video services.

Di Jie, a Senior Technical Expert from VIPKID, an online education company, said, "Based on Alibaba Cloud CDN and RTS ultra-low latency live broadcasting services, VIPKID supports over 2800 CDN nodes and 130 Tbit/s bandwidth reserve for flexible scaling."

Combining RTS to optimize the original Live Broadcast Architecture, VIPKID achieved high concurrency scenarios with millisecond-level delay live broadcast, ensuring low stalling, smooth application opening in seconds, and real-time interactions.

I am sure with the development of 5G, IoT, and digital transformation, CDN will continue to evolve from content delivery to value delivery, making it a powerful driving force for enterprises to improve their efficiency, optimize their operations, and implement intelligent applications.