Alibaba Cloud CDN

## Product Introduction

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What is CDN

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Alibaba Cloud Content Delivery Network (CDN), clustered by edge node servers across regions, is a distributed network built on and overlaying the bearer network. It renovates the data transmission mode traditionally centered on web servers.

As a precise dispatching system, Alibaba Cloud CDN caches the source content to edge nodes, and distributes the user requests to the ideal nodes. It allows the users to efficiently acquire the resource they need, avoiding the possible network congestion, accelerating the user resource acquisition, and ensuring the user experience.

To quickly get access to CDN service, go to Quick Satrt.

The process for http request processing after using CDN is as follows:
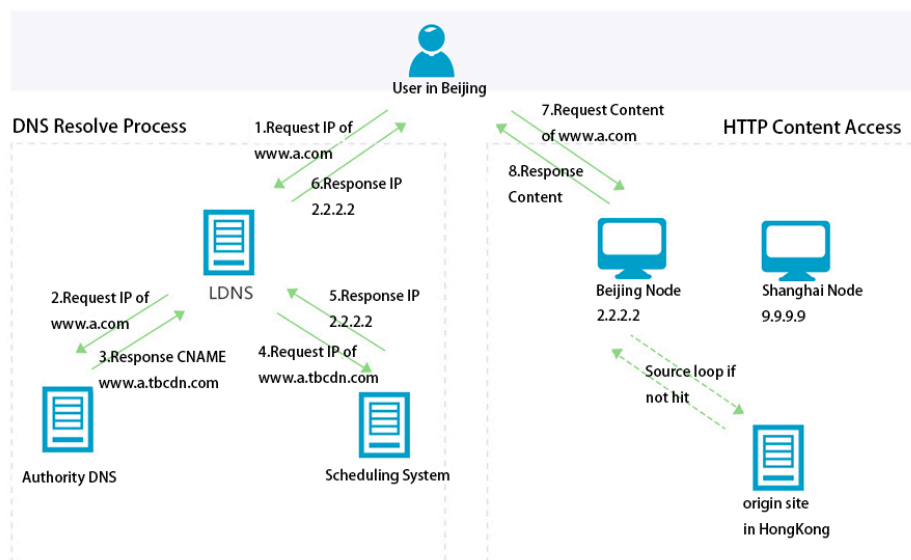
Features

Intelligent node cache

Precise cache , delivering layer-based hot resource caching and more efficient resource acquisition.

High-speed cache, with multi-core CPU processing ability, efficiently using and controlling the RAM and maximizing SSD IOPS and throughput.

High-speed SSD processing with SSD acceleration for each node, greatly saving time for users and improving the availability.

Intelligent compression, effectively shrinking the transmitting content and accelerating the distribution.

UI optimization, minimizing the page sizes by removing the redundant on-page contents , and combining multiple JavaScript/CSS files into a single request.

Precise dispatching

Full-covered: It is applicable for wide arrays of websites and apps with targeted service support and all-round acceleration.

Million-level: It allows dispatching million-level domain names using a single server.

Controllable and scalable: It reduces the real cost.

Multi-system collaborated: It allows collaboration with security defense system, refresh system, and content management system.

Real-time: It supports node-level data-based estimation, improving the dispatching quality and accuracy.

Multi-scenario application

Seamlessly collaborated with various Alibaba Cloud services, CDN speeds up cloud resource accessing and downloading, including:

Object Storage Service (OSS), effectively improving website access speed and reducing the data charges that may incur on the external network.

Elastic Compute Service (ECS), enhancing the website availability, protecting the information on server's source station, and lowering the use cost of bandwidth.

Server Load Balancer , set whose IP address as the source site, relieving the bandwidth pressure.

ApsaraVideo Live service, delivering an integrated solution including media asset, slice transcoding, visiting authentication, content delivery acceleration.

Resource link authentication, enabling you to customize authentication keys, which ensures the security of your media asset.

CDN also allows non-Alibaba Cloud source stations to rapidly deploy the acceleration services just after resource verification.

Self management

Self-service console, allowing customized, intelligent, and minute-level deployment on all CDN nodes.

CDN Quick Start, enabling you to add, delete, modify, and query the domain names, set information such as accelerated node caching strategy, anti-leech, and optionally open acceleration service based on your individual demands via the console. Learn more.

Opened and scalable APIs, enabling flexible deployment, fast operations, precision usage, and timely monitoring of CDN domains, distribution resources, and monitoring data. It can also works with the APIs of other Alibaba Cloud products for a custom, multi-platform portal. Learn more.

Real-time monitoring

All-round monitoring, including bandwidth, visiting quality, visitor data, hot analysis, * security guarding.

Multi-dimensional data analysis

Convenient resource report downloading

CDN Node Distribution

Feature

Full coverage

- 1000+ nodes in mainland China, covering 34 provinces.
- Most nodes distributed in major cities.
- 300+ nodes outside China, covering over 60 countries and regions.

High performance

- Connected with backbone network, with 10G optical network card.
- 90t bandwidth capability reserve
- 40TB to 1.5PB storage space for each node.
- 40Gbps-200Gbps bandwidth loading capability

Details

CDN Node Distribution Rules:

After a domain name is added, the following domestic nodes will become available by default. The system will automatically add corresponding nodes according to the domain's actual volume of traffic. Note that overseas nodes are not included.

China Telecom	China Unicom	China Mobile	China Tietong	CERNET	Dr. Peng	Overseas Nodes
Shangrao	Hangzhou	Jinan	Hangzhou	Beijing	Beijing	Singapore
Fuzhou	Jiaozuo	Nanchang				Japan
Jiaxing	Shenyang					Hong Kong
Xiamen	Taiyuan					Germany
Dongguan	Changchun					U.S.

Yangzhou	Shijiazhuang					
Kunming	Tianjin					
Xuzhou	Shantou					
Nanning	Harbin					
Huangshi	Jinan					
Changsha	Qingdao					
Beijing	Hohhot					
Chengdu	Luoyang					
Xi' an	Tangshan					
Lanzhou	Hangzhou					
Shanghai	Qingdao					
Shanghai						
Zhuhai						
Hainan						
Urumqi						
Hefei						
Chengdu						
Chongqing						
Jinhua						

Benefits

The advantages of applying CDN are described in the following section.

Stable and fast

Advanced distributed system architecture: almost 1000+ nodes in China and over 200+ abroad.

Adequate bandwidth and storage resources: a single node provides a bandwidth of more than 40 Gbps and a storage capacity of 40 TB to 1.5 PB.

Stable and efficient performance indicators: greater than 95% hit rate and video fluency rate, as well as millisecond-level response time.

Mature monitoring and service systems: 24/7 network-wide monitoring, smart monitoring and scheduling based on service quality.

Cost-effective

With scalable resources, you are charged only for resources you use, and can achieve cross-carrier, cross-region network-wide coverage.

Two billing methods are provided, PayByTraffic and PayByBandwidth, to satisfy different business needs.

The service automatically responds to site traffic spikes and makes adjustments without user intervention, reducing pressure on the origin site.

Easy to use

You can add, delete, modify, and query domain names on your own by using a wide range of simple custom configuration options. CDN supports customizing anti-leech measures, cache policies, HTTP request headers, and other functions.

The open API interfaces provide functions such as service activation, content refreshing, monitoring data retrieval, and distribution log downloads.

Scenarios

This section describes different CDN application scenarios.

Website/application acceleration

To accelerate the distribution of resources for websites, or applications, with a large volume of static resources, you can separate the dynamic and static contents. The dynamic files can be stored on ECS. For large volumes of static resources such as image, HTML, CSS, and JS files, we recommend that you store them on OSS. This can accelerate content download speeds and make it easy to perform distribution for images, videos, and other media content.

Acceleration of on-demand audio and video/large file downloads and distribution

Alibaba Cloud CDN supports the downloading and distributing of various types of files. It also supports the acceleration of online on-demand streaming services, for example, MP4 and FLV videos, or scenarios where the average size of a single file is greater than 20 MB. The primary service scenarios are on-demand video/audio and large file downloads (for example, installation packages). You can combine CDN with OSS to increase origin retrieval speeds to reduce origin retrieval bandwidth cost by nearly 60%.

Acceleration of live streaming media

The live streaming media service provides an integrated solution for media asset storage, slicing and transcoding, access authentication, and content delivery acceleration. Combined with Alibaba Cloud Auto Scaling, CDN can promptly adjust server bandwidth and respond to sudden access traffic bursts. When combined with the media transcoding service, CDN can provide high-speed and stable concurrent transcoding and seamless task scaling.

Mobile application acceleration

For the distribution of mobile app update files (APK files), CDN delivers optimized and accelerated distribution of in-app images, pages, short videos, UGC, and other media content. The http DNS service prevents DNS hijacking and retrieves precise DNS resolution results in real time, effectively reducing user access time and improving user experience.

Architecture

Architecture

The following section details key components featured in the CDN architecture.

Key components

LVS performs Layer-4 server load balancing

DR mode

Dual-LVS performs active-active mutual backup

WRR is the algorithm used for server load balancing

Tengine performs Layer-7 server load balancing

The Alibaba Cloud high-performance HTTP servers developed on Nginx are open-source. For more details, refer to the official website.
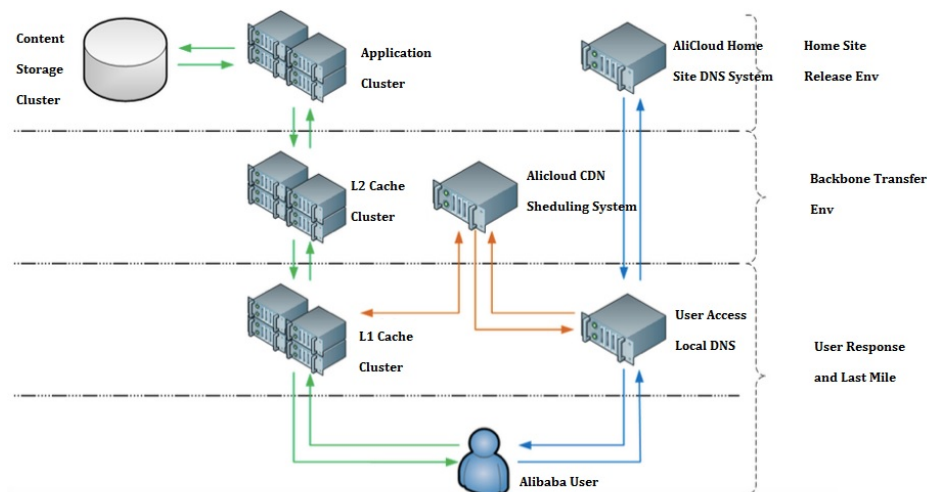
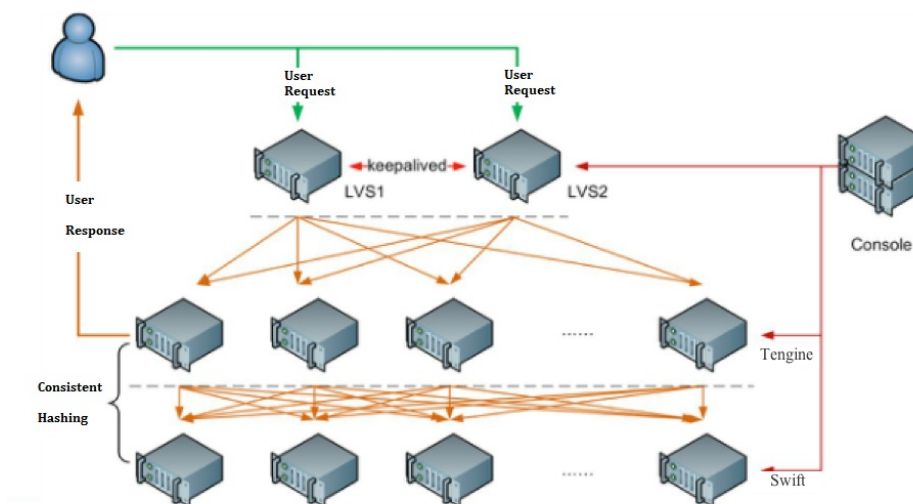Proactive health checks

SPDY v3 support

Swift performs HTTP caching

High-performance cache

Disk (SSD/SATA)

Architecture diagram

Deployment architecture diagram

Terms

Domain name

A domain name is a server or network system name that identifies IP resources connected to the Internet. All domain names are unique worldwide.

CNAME record

A Canonical Name (CNAME) record is a type of resource record in the Domain Name System (DNS) used to specify that a domain name is an alias for another domain, which is the "canonical" domain.

CNAME domain name

CDN domain acceleration needs to use the CNAME records.

You will receive an accelerated domain name which is the CNAME domain name (this domain name should be *.*kunlun.com) after CDN acceleration on the Alibaba Cloud console is configured. The domain name resolution is then formally transferred to Alibaba Cloud after you reference the domain name *.*kunlun.com following the CNAME operation.

All requests for this domain name will be transferred to the Alibaba Cloud CDN nodes.

DNS

DNS stands for Domain Name System. It refers to the domain name resolution service. Its function on the Internet is to convert a domain name to an IP address that can be recognized by the network.

The domain name and IP address are synonymous to each other and the task of converting between the two is called domain name resolution. Domain name resolution requires a dedicated domain name resolution server to complete the task, and the entire process runs automatically.

For example, the domain name www.baidu.com is automatically converted to 220.181.112.143.

Edge node

Edge node is also referred to as CDN node or cache node.

Edge node is a concept proposed in contrast to the complex structure of the network. It refers to network nodes with a smaller number of accessible links. This improves the response capability and connection speed for the end user.

Edge nodes are used to store webpage contents and objects with a higher traffic volume in specialized cache machine on the front-end of the server. This improves the speed and quality of website access.

origin retrieva host

origin retrieval host: The origin retrieval host determines the site to which a origin retrieval request is sent.

Example 1: The origin site is a domain name.If the origin site is www.a.com and the origin

retrieval host is www.b.com,the actual origin retrieval request is sent to the IP address resolved from www.a.com corresponding to the site www.b.com on the host.

Example 2: The origin site is an IP address.If the origin site is 1.1.1.1 and the origin retrieval host is www.b.com,then, the actual origin retrieval request is sent to the site www.b.com on the host corresponding to 1.1.1.1.

Protocol-based origin retrieval request

The same protocol is used for sending origin retrieval requests and accessing resources from the client. That is, if the client initiates an HTTPS request for resources but the resources are not cached on the CDN node, the node initiates a origin retrieval HTTPS request for the resources. The same is true for HTTP requests.

Filter parameters

When a URL request includes a question mark (?) and request parameters are sent to a CDN node, the CDN node determines whether to send the request to the origin site. If the "Filter Parameter" function is enabled, after the request arrives at the CDN node, the URL without parameters will be intercepted and requested against the origin site. In addition, the CDN node keeps only one copy. If the "Filter Parameter" function is disabled, different copies are cached on the CDN node for different URLs.

Example of use

The http://www.abc.com/a.jpg?x=1 URL request is sent to a CDN node.After the "Filter Parameter" function is enabled, the CDN node initiates the http://www.abc.com/a.jpg request (ignore the parameter x=1) to the origin site. After the origin site returns a response, the CDN node keeps a copy. Then, the origin site sends a response on http://www.abc.com/a.jpg to the terminal. For all requests similar to http://www.abc.com/a.jpg? parameters, the origin site responds to the content of CDN copy http://www.abc.com/a.jpg.When the "Filter Parameter" function is disabled, different copies are cached on the CDN node for different URLs. For example, different contents are returned by the origin site in response to http://www.abc.com/a.jpg?x=1 and http://www.abc.com/a.jpg?x=2.

Change History

Date	Event Description
2008~2011	Taobao CDN was launched in order to serve the Taobao site.
2011~2014-02	Taobao CDN evolved into Alibaba Cloud CDN, which was to provide services for all subsidiaries of the Alibaba Group.
2014-03-21	The Alibaba Cloud CDN service was officially launched and provided for external sales
2015-05-22	Responding to the call of the premier, Alibaba Cloud reduced the full price of CDN by 21%.
2015-06-04	Customization of the 404 Page function was deployed.
2015-06-18	Alibaba Cloud released the new OpenAPI to support the addition, deletion, modification, and query of CDN domains.
2015-07-31	The on-demand streaming media acceleration solution was deployed, along with the on-demand authentication function.
2015-08-27	The Set HTTP Request Header function was deployed.
2015-09-24	Support for resource monitoring traffic report export was added to provide multi-dimensional support for resource distribution.
2015-10-13	The priority function for custom cache configurations was deployed.
2015-12-29	The domain name configuration and resource monitoring APIs were deployed.
2016-02-02	The prepay CDN resource package was deployed.

Customer Cases

CDN Customer Cases

Typical Alibaba Cloud CDN Customer	Description
Tmall	Tmall's use of our distributed system architecture has contributed to a significant

	reduction in their bandwidth usage and overhead. Users around the world can now access to the website more quickly, and the website is able to successfully cope with traffic spikes such as that of China's Singles' Day.
Taobao	We support Taobao's content distribution to PCs and mobile terminals, allowing Taobao to respond in milliseconds and load images in seconds while facing masses of image processing requests, providing users with superior experience.
Alipay	We provide across-the-board support for Alipay's financial services. The encrypted HTTPS access not only improves user experience but also keeps users' personal and banking information secure from theft and tampering.
Sina Weibo	Sina Weibo uses our service to enhance imagesdownloading experience for their users. It optimizes underlying TCP protocol to accelerate image download speed by 20%. Alibaba Cloud CDN is currently the main CDN provider for Sina Weibo.
Xiami.com	Alibaba Cloud CDN's innovative approach and 99.9%+ availability play a significant role in improving the business stability of Xiami.com. Alibaba Cloud's after-sales team guarantees customers quick online response and solution to any problem.
Zhihu	Zhihu uses Alibaba Cloud as its multi-media solution. Response time has been reduced by one-third. Users' access experience is greatly improved.
Momo	With massive processing requests for images and short videos, Momo turned to Alibaba Cloud CDN. We helped them increase speed of both in image display styling and photo loading speed, providing their users with a superior experience.
UC	CDN helped UCWEB reduce its bandwidth consumption significantly across the whole business. Using the OSS storage service, UC has significantly reduced required IT hardware investment and reduced the difficulty and workload of development and O&M.