

# Alibaba Cloud CDN

## Product Introduction

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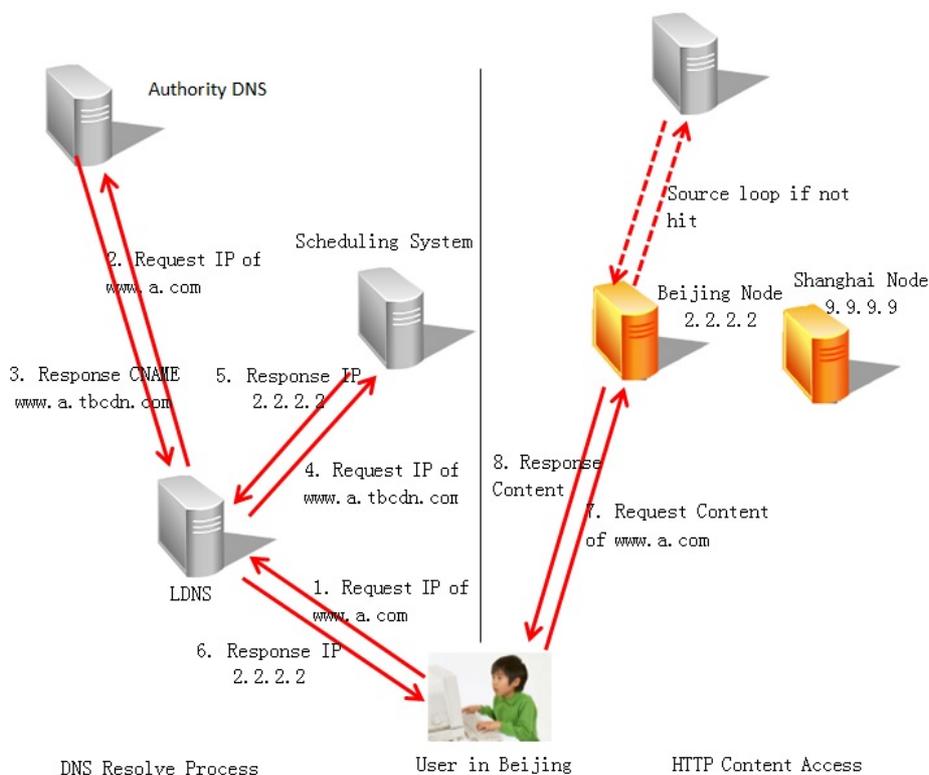
## Product Overview

### Introduction

Alibaba Cloud CDN stands for Content Delivery Network. As a distributed network that is built on and overlays the bearer network, it is composed of edge node server clusters distributed across different regions. The network replaces the traditional data transmission mode centered on Web servers.

It delivers the source content to edge nodes, and works with a precise scheduling system. It distributes user requests to the most suitable nodes, allowing the user to retrieve the content they need as quickly as possible, effectively solving the Internet congestion problem, and increasing the response speed of users visiting the website.

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



# Function Introduction

## Node Cache

- The intelligent object heat algorithm and hierarchical HOT cache resources allow for precise resource acceleration
- The high-performance cache system design, balanced use of processing capacity of multiple CPU cores, and efficient and reasonable use and control of memory maximizes SSD IOPS and throughput
- Each node provides high-speed read/write SSD storage. Used with the SSD acceleration capabilities, this greatly reduces user access waiting time and improves availability
- Smart compression effectively reduces the size of the content transmitted by users, thus accelerating distribution
- Page optimization removes spaces, line breaks, TABs, annotations, and other redundant page content, reducing page sizes
- Multiple JavaScript/CSS files are combined into a single request, reducing the number of requests

## Precise Scheduling

No matter whether your website is a portal information site, multimedia audio and video site, game site, mobile app, or any other type, the CDN service intelligently allocates scheduling domains to provide the required support, improving the overall speed of your site

- Self-developed scheduling system, supporting scheduling for millions of domain names with one single machine
- Higher controllability and protocol scalability further reduce costs
- Supports multi-level scheduling policies, so node failure will not cause unavailability to users
- Multi-system interaction coordinates with security defense systems, refresh systems, and content management systems
- Real-time data scheduling and support for node-level traffic prediction improve the quality and accuracy of scheduling

## Business Support for Multiple Scenarios, Works With Other Services

- The live streaming media service provides an integrated solution for media asset storage, slicing and transcoding, access authentication, and content delivery acceleration (available soon)
- The audio and video incremental on-demand service provides low buffering times, a smooth playback experience, and supports MP4 and FLV video formats
- Resource link authentication and custom authentication KEYS are supported to ensure the security of your media resources and free you from worries about leeching
- By freely integrating multiple Alibaba Cloud services, the system works seamlessly with

- different services to increase cloud resource access and download speeds
- It can work seamlessly with Object Storage Service (OSS) to accelerate website access and effectively reduce OSS Internet traffic fees
- It can work with Elastic Compute Service (ECS) to increase site availability, protect the origin site information on the server, and reduce bandwidth usage cost
- It can also use Server Load Balancer (SLB) for the origin site address to go back to the source for data, reducing the back-to-source bandwidth pressure
- In addition, it supports non-Alibaba Cloud origin sites and provides unobstructed access and rapid deployment of acceleration services following resource reviews

## Self-management

- The self-help console allows for the smart deployment of all nodes in minutes using custom configurations
- Through a simple operation, you can quickly activate the CDN service. You can use the console to add, delete, modify, and query self-configured domain names, as well as set node cache acceleration policies, anti-leeching measures, http header information, etc. As needed, you may also choose to enable different types of acceleration and optimization functions.  
[Learn More](#)
- The open and atomically scalable CDN APIs enable flexible deployment, fast operation, precise use, and timely monitoring of CDN domains, distribution resources, and monitoring data. It can also be used with the APIs of other Alibaba Cloud products for a custom, multi-platform portal [Learn More](#)

## Real-time Monitoring

- The all-round information monitoring feature provides multi-dimensional support for resource distribution
- Full network monitoring, rich data analysis, and convenient resource report downloads provide a wide range of monitoring information, including information on bandwidth traffic, access quality, visitor data, popularity analysis, and security protection

## CDN Node Distribution

*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 (does not include Overseas nodes) according to the domain's actual volume of traffic. No manual operations are required.*

China Telecom	China Unicom	China Mobile	China Tietong	CERNET	Dr. Peng	Overseas Nodes
Shangrao	Hangzhou	Jinan	Hangzhou	Beijing	Beijing	Singapore
Fuzhou	Jiaozuo	Nanchan				Japan

		g				
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						

## Glossary

### Domain name

A domain name is a server or network system name connected to the Internet. All domain names are

unique worldwide.

## CNAME record

It is a Canonical Name (CNAME) record. When the DNS system is querying the name on the left of CNAME, it instead queries the name on the right of CNAME. It continues until it traces the PTR or A name. It only responds after a successful query; otherwise, it fails.

## CNAME domain name

CDN domain acceleration needs to use the CNAME records. After configuring the CDN acceleration on the Alibaba Cloud console, you receive an accelerated domain name called the CNAME domain name (this domain name should be `*.kunlun.com`). After you direct your domain to the domain name `*.kunlun.com` following the CNAME operation, the domain name resolution is formally transferred to Alibaba Cloud. 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. People are used to memorizing domain names, but machines only recognize IP addresses. The domain name and IP address correspond 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 entered domain name `www.baidu.com` is automatically converted to `220.181.112.143`.

## Edge node

It is also called CDN node, cache node, etc. It is a concept proposed in contrast to the complex structure of the network. It refers to network node with a comparatively small number of links for you to access. This improves the response capability and connection speed for the end user. It is used to store the webpage contents and objects with a higher traffic volume in the specialized cache machine on the front-end of the server, so as to improve the speed and quality for website access.

## Strengths Stable and fast

- Advanced distributed system architecture: Around 500 nodes in China and over 30 abroad.
- Adequate bandwidth and storage resources: A single node provides a bandwidth of more than 40 Gbps and a storage capacity of 40 TB~1.5 PB.
- Stable and efficient performance indicators: 95% and higher hit rate, response time in milliseconds, 95% and higher video fluency rate.
- 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 actually use, and can achieve cross-carrier, cross-region network-wide coverage.
- Use first, pay later; provides two billing types, "PayByTraffic" and "PayByBandwidth", to satisfy different business needs.
- The service automatically responds to site traffic spikes and makes proper adjustments without user intervention, reducing the pressure on the origin site.

## Easy to use

- You are allowed to add, delete, modify and query domain names on your own, by using a wide range of simple custom configuration options. It 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.

# Application scenarios

## Website/Application acceleration

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

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

This service supports downloading and distributing various types of files. It also supports the acceleration of online on-demand streaming services, for example, MP4 and FLV videos or 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). It is suggested that you use this service with OSS to increase back-to-source speeds to reduce back-to-source bandwidth cost by nearly 2/3.

## Acceleration of live streaming media (in beta testing)

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, it can promptly adjust server bandwidth and respond to sudden access traffic bursts. Combined with the media transcoding service, it can provide high-speed and stable concurrent transcoding and seamless task scaling. Currently, the live streaming media service of CDN has been tested by internal users and optimized. It will be available soon.

## Mobile application acceleration

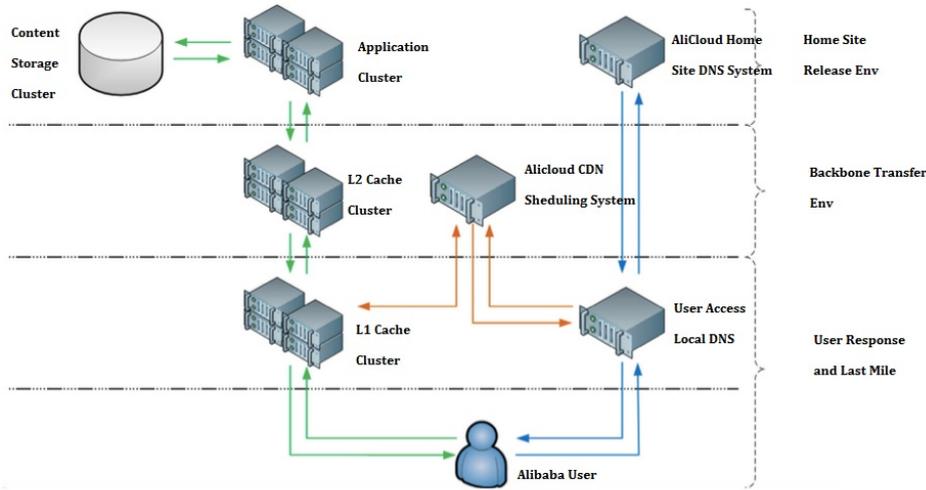
For the distribution of mobile app update files (APK files), the service delivers optimized and accelerated distribution of in-app images, pages, short videos, UGC, and other contents. The httpDNS service prevents DNS hijacking and retrieves precise DNS resolution results in real time. This effectively reduces user access time and improves user experience.

# Architecture

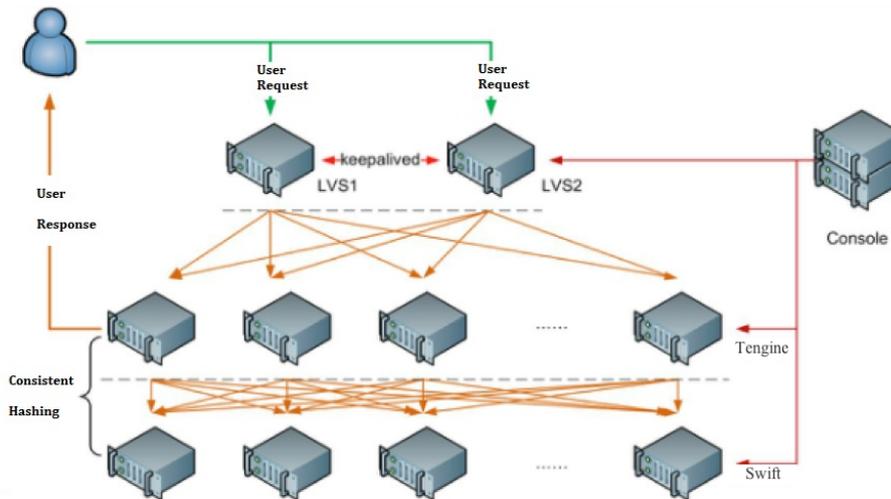
## Key components

- LVS performs Layer-4 server load balancing
  - DR mode
  - Dual-LVS performs Active-Active mutual backup
  - WRR is used as the server load balancing algorithm
- Tengine performs Layer-7 server load balancing
  - The Alibaba Cloud high-performance HTTP servers developed on Nginx are already open-source. For more details, refer to <http://tengine.taobao.org>.
  - Proactive health checks
  - SPDY v3 support
- Swift performs HTTP caching
  - High-performance cache
  - Disk (SSD/SATA)

# Architecture diagram



# Deployment architecture diagram



# History

Date	Event Description
2008~2011	Taobao CDN was launched by Taobao technology department 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	The Customizing 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 officially 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 your 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.