

ALIBABA CLOUD

# Alibaba Cloud

CDN

Product Introduction

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 Alibaba Cloud

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# Document conventions

Style	Description	Example
 <b>Danger</b>	A danger notice indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results.	 <b>Danger:</b> Resetting will result in the loss of user configuration data.
 <b>Warning</b>	A warning notice indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results.	 <b>Warning:</b> Restarting will cause business interruption. About 10 minutes are required to restart an instance.
 <b>Notice</b>	A caution notice indicates warning information, supplementary instructions, and other content that the user must understand.	 <b>Notice:</b> If the weight is set to 0, the server no longer receives new requests.
 <b>Note</b>	A note indicates supplemental instructions, best practices, tips, and other content.	 <b>Note:</b> You can use Ctrl + A to select all files.
>	Closing angle brackets are used to indicate a multi-level menu cascade.	Click <b>Settings &gt; Network &gt; Set network type</b> .
<b>Bold</b>	Bold formatting is used for buttons, menus, page names, and other UI elements.	Click <b>OK</b> .
Courier font	Courier font is used for commands	Run the <code>cd /d C:/window</code> command to enter the Windows system folder.
<i>Italic</i>	Italic formatting is used for parameters and variables.	<code>bae log list --instanceid</code> <i>Instance_ID</i>
[] or [a b]	This format is used for an optional value, where only one item can be selected.	<code>ipconfig [-all -t]</code>
{ } or {a b}	This format is used for a required value, where only one item can be selected.	<code>switch {active stand}</code>

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# 1. Competitive advantages of Alibaba Cloud CDN

This topic describes the competitive advantages of Alibaba Cloud CDN in terms of service performance, technologies, pricing, service bundling, and service support.

Alibaba Cloud CDN holds the following advantages:

- Excellent performance with user-friendly features
- Technical advantages
- Cost-effective pricing strategies
- Flexible service bundling
- Service support

## Excellent performance with user-friendly features

### Globally distributed nodes

Alibaba Cloud CDN provides more than 2,800 globally distributed edge nodes. Among these nodes, more than 2,300 are distributed across 31 provincial regions and first-tier cities in mainland China and more than 500 are distributed across over 70 countries and regions, including Hong Kong (China), Macao (China), and Taiwan (China). The total bandwidth capacity of Alibaba Cloud CDN can reach up to 150 Tbit/s. Alibaba Cloud CDN uses globally distributed nodes and high-capacity bandwidth to provide secure, stable, and reliable content delivery services.

### Industry-certified capabilities

- Alibaba Cloud CDN is graded Level 3 by the Ministry of Public Security based on the multi-level protection scheme.
- Alibaba Cloud CDN is certified by the Payment Card Industry Data Security Standard (PCI DSS).
- Alibaba Cloud is recognized as a global-scale CDN service provider by Gartner.
- Alibaba Cloud CDN is the first IPv6 Enabled CDN Logo certified CDN service in the world.

### Diverse features

Alibaba Cloud CDN is an all-in-one content delivery service. It allows you to use and manage its features in the console or by calling API operations. The following table describes the major features provided by Alibaba Cloud CDN.

Category	Feature
Domain name management	Supports the following features: accelerated domain name settings, basic settings, back-to-origin settings, caching settings, HTTPS settings, access control settings, performance optimization, video-related settings, security settings, advanced settings, EdgeScript (ES) settings, IPv6 settings, and secure acceleration for public service sectors and enterprises.

Category	Feature
Monitoring and usage analytics	Supports the following features: resource monitoring, real-time monitoring, aggregation and analytics, resource usage query, ES monitoring, and security monitoring.
Log management	Supports the following features: log export, log storage, and real-time log delivery.
Refresh and prefetch	Supports the following features: URL refresh, directory refresh, and URL prefetch.

### Programmable configurations

Alibaba Cloud CDN is an all-in-one service that provides out-of-the-box features for you to accelerate content delivery. In addition, Alibaba Cloud CDN is programmable. You can use [ES](#) to customize configurations. If the standard configurations in the Alibaba Cloud CDN console cannot meet your requirements, you can use ES to customize configurations and tailor your services for long-term commitment and various requirements.

### Custom routines on edge nodes

EdgeRoutine (ER) is a serverless computing environment provided by Alibaba Cloud CDN. ER allows you to run custom JavaScript code on CDN edge nodes. After you use the EdgeRoutine command-line interface (CLI) to deploy code to the production environment, the system automatically runs the code on all CDN edge nodes. The CDN edge nodes process requests in different regions worldwide by following the code logic. For more information, see [ER overview](#).

### Various API operations

You can call API operations to use and manage features of Alibaba Cloud CDN. For more information, see [List of operations by function](#).

## Technical advantages

### High-accuracy scheduling system

- To improve the accuracy of the scheduling system, Alibaba Cloud CDN is optimized based on the following techniques:
  - A dynamically updated IP library: Alibaba Cloud CDN maintains a dynamically updated IP library that provides information such as regions and Internet service providers (ISPs) to the scheduling system when the scheduling system receives DNS resolution requests from clients. Based on the information, the scheduling system schedules user requests to their nearest CDN edge nodes that belong to the same ISP. The IP library is dynamically updated to ensure that the data is up-to-date.
  - HTTPDNS (requires compatibility with clients): HTTPDNS allows clients to bypass the local DNS servers of ISPs and directly access the scheduling system over HTTP. The scheduling system then redirects the requests to optimal nodes for the destination domain names. This prevents security issues such as DNS hijacking.
  - Node analytics: The scheduling system of Alibaba Cloud CDN analyzes the health status of all nodes and links in the caching system in real time based on the statistics provided by the link quality system. This improves user experience by increasing the link quality of CDN edge nodes.

- Content-oriented scheduling: Content-oriented scheduling increases the cache hit ratio of Alibaba Cloud CDN. 302 redirection, one of the content-oriented scheduling schemes, is used in scenarios such as large file distribution and on-demand video streaming. After a client sends a request, the request is resolved by the DNS server, redirected to the scheduling system, and then parsed by the scheduling system to locate the content that the request wants to access. Then, a 302 redirect is performed to redirect the request to an optimal node selected by the scheduling system.
- Benefits: The scheduling system can schedule requests based on the trend of data transfer, or schedule requests in real time to handle traffic spikes.
- Expected results: Based on the scheduling system, Alibaba Cloud CDN can monitor the health status of each node in real time and select an optimal node for each request.

### Intelligent caching system

- Accurate caching: Alibaba Cloud CDN uses intelligent object algorithms to cache content based on object popularity in a multi-level cache hierarchy. This increases the accuracy when Alibaba Cloud CDN caches content.
- High-speed caching: Alibaba Cloud CDN provides a high-performance caching system. This system balances the use of multi-core processing capabilities, implements efficient memory utilization and control, and maximizes IOPS and throughput of SSDs.
- High read and write speeds: All nodes are configured with SSDs to support high data read and write speeds. Based on the acceleration capabilities, these SSDs can reduce the response time and improve the availability of CDN edge nodes.
- Efficient back-to-origin routing: Alibaba Cloud CDN provides failover and retransmission mechanisms to ensure efficient back-to-origin routing and information synchronization.

### Efficient transport layer protocol

- Quick UDP Internet Connection (QUIC): QUIC is a new transport layer network protocol that has inherited qualities from TCP, TLS, and HTTP/2. QUIC supports encrypted, low-latency, and multiplexed connections. These qualities can meet the requirements for the transport and application layers.
- Independently developed algorithms for the TCP protocol suite: Alibaba Cloud has developed algorithms such as congestion detection and packet loss probing algorithms to improve the performance of TCP. The transmission performance has been significantly improved.

### Reliable protection capabilities

Alibaba Cloud CDN integrates with various security features and services to minimize security risks for your services.

- Hotlink protection: Alibaba Cloud CDN supports multiple types of whitelists and blacklists to filter packets based on the referer header, user-agent header, URLs, and IP addresses. You can also use ES to customize security features and then protect your origin servers from unauthorized access. Alibaba Cloud CDN also supports remote authentication, which is a two-factor authentication method used to reinforce the security of your origin servers.
- DNS hijacking protection: HTTPDNS allows clients to bypass the local DNS servers of ISPs and access Alibaba Cloud servers over HTTP to acquire DNS resolution results. This prevents DNS hijacking.
- HTTPS-based transmission: The security of data may be compromised if it is transmitted as plaintext over the Internet. Alibaba Cloud CDN uses TLS to encrypt HTTP messages. You can also configure advanced settings such as TLS1.3, HSTS, and keyless.
- Protection for origin servers: Alibaba Cloud CDN provides basic security features. If your origin servers require reinforced protection, you can use Secure CDN (SCDN).

- High availability of origin servers: Alibaba Cloud CDN supports primary and secondary origin servers, and monitors the health status of the origin servers. If the primary origin server fails, requests are redirected to a secondary origin server.

## Cost-effective pricing strategies

Alibaba Cloud CDN provides cost-effective pricing strategies.

- Flexible metering methods. For more information, see [Billing overview](#).
- Discounts for subscription resource plans. For more information, see [CDN resource plans](#).

### Recommended metering methods and resource plans

Alibaba Cloud CDN supports multiple metering methods and resource plans that are applicable to different scenarios. Select a metering method based on your business requirements.

Scenario	Recommended metering method or resource plan
The number of visits to origin servers is small or the bandwidth usage spikes only during specific periods of time.	Pay-by-data-transfer. <div style="border: 1px solid #ccc; background-color: #e6f2ff; padding: 10px; margin-top: 10px;"> <p> <b>Note</b> We recommend that you purchase <a href="#">resource plans</a> to reduce costs. Alibaba Cloud CDN provides multiple types of resource plans for different accelerated regions. The capacity of these resource plans ranges from 100 GB to 50 PB. Choose resource plans based on your business requirements.</p> </div>

For more information about the metering methods of Alibaba Cloud CDN, see [CDN pricing](#).

## Flexible service bundling

Alibaba Cloud provides an ecosystem of diversified services and products. The following tables describe the services and products that can be used together with Alibaba Cloud CDN in different scenarios.

- You can integrate Alibaba Cloud CDN with other Alibaba Cloud services to optimize service performance and improve management efficiency.

Existing service	Recommended service	Benefit
<a href="#">Elastic Compute Service (ECS)</a>	Alibaba Cloud	If you use an ECS instance as an origin server, you can use Alibaba Cloud CDN to accelerate content delivery for the website that is hosted on the ECS instance.
<a href="#">Object Storage Service (OSS)</a>		If you use an OSS bucket as an origin server, you can use Alibaba Cloud CDN to accelerate content delivery and reduce the costs of Internet data transfer.

Existing service	CDN Recommended service	Benefit
Function Compute		Alibaba Cloud Function Compute is a fully-managed, event-driven computing service. Function Compute allows you to focus on coding without the need to procure and manage infrastructure resources such as servers. You need only to upload your code. Function Compute allocates computing resources, runs tasks in an elastic and reliable way, and provides features such as log query, performance monitoring, and alerting.

- Alibaba Cloud CDN is best suitable for accelerating the delivery of static content. If you want to accelerate the delivery of both static and dynamic content, or require reinforced protection, you can use the following services.

Scenario	Recommended service	Benefit
Accelerate the delivery of both dynamic and static content	Dynamic Route for CDN (DCDN)	DCDN is a branch of Alibaba Cloud CDN that can accelerate the delivery of both dynamic and static content. DCDN automatically separates dynamic content from static content and accelerates the delivery of both types of content in parallel.

- If you have already activated Alibaba Cloud CDN, you can integrate Alibaba Cloud CDN with other services to meet your business requirements. The following table describes the services that can be used together with Alibaba Cloud CDN in different scenarios.

Scenario	Recommended service	Benefit
Accelerate on-demand audio and video streaming	ApsaraVideo VOD (VOD)	VOD is an all-in-one solution for on-demand audio and video streaming. VOD supports audio and video uploading, automatic transcoding, media resource management, and content delivery acceleration.
Accelerate live streaming	ApsaraVideo Live	ApsaraVideo Live is an audio and video streaming platform that is based on the next-generation content access and distribution network and supports large-scale and distributed real-time transcoding. ApsaraVideo Live is a live video broadcast service that supports low latency, processes concurrent requests, and delivers smooth and high-resolution video content.

Scenario	Recommended service	Benefit
Register a domain name to be accelerated by Alibaba Cloud CDN	<a href="#">Domains</a>	Domains is a domain name management platform that provides domain name registration, transaction, monitoring, and protection services. This platform is also integrated with the Alibaba Cloud ICP Filing and Alibaba Cloud DNS services.
Apply for an Internet Content Provider (ICP) number for the domain name to be accelerated by Alibaba Cloud CDN	<a href="#">Alibaba Cloud ICP Filing</a>	China mandates an ICP filing system for non-commercial Internet information services and an ICP licensing system for commercial Internet information services. You must apply for an ICP number for your domain name to comply with Measures for the Administration of Internet Information Services and Registration Administration Measures for Non-Commercial Internet Information Services. Websites that do not have an ICP number or license are prohibited from providing Internet information services. Therefore, all websites must obtain an ICP number before they are permitted to operate in mainland China. You can use the Alibaba Cloud ICP Filing system to apply for ICP numbers, modify ICP filing information, cancel ICP filing applications, and claim ICP numbers.
Enable and configure HTTPS for a website	<a href="#">SSL Certificates Service</a>	SSL Certificates Service is a digital server certificate service provided by Alibaba Cloud. This service provides digital server certificates issued by certification authorities (CAs) inside or outside China. You can obtain free digital certificates or purchase other types of certificates from Alibaba Cloud. You can deploy these certificates in Alibaba Cloud services to enable HTTPS for HTTP-based services at minimum costs. This enables your websites to implement identity verification and data transmission encryption.
Improve the O&M efficiency, and process large volumes of log data	<a href="#">Log Service</a>	Log Service is an all-in-one logging service developed by Alibaba Cloud. It has shown superior performance in big data computing scenarios. Log Service helps you quickly collect, consume, ship, query, and analyze log data without development work. It improves the O&M efficiency and provides the capability to process large volumes of data.

Scenario	Recommended service	Benefit
Monitor Alibaba Cloud resources and Internet applications	CloudMonitor	CloudMonitor is a service that focuses on the monitoring of Alibaba Cloud resources and Internet applications. CloudMonitor collects monitoring metrics of Alibaba Cloud resources. You can use CloudMonitor to detect the availability of your network and set alerts for specific metrics.

## Service support

Alibaba Cloud CDN provides comprehensive service support, including:

- End-to-end and 24/7 monitoring and support systems.
- Well-maintained documentation. For more information, see [什么是阿里云CDN](#)
- Quick-response troubleshooting systems:
  - Online support: To consult about pre-sales and after-sales issues or give feedback on Alibaba Cloud CDN, you can click the **Phone** icon on the right side of the Alibaba Cloud International site.
  - Ticket system: To request technical support, you can .

## 2.Scenarios

Alibaba Cloud CDN is applicable to a wide array of scenarios. You can use Alibaba Cloud CDN to accelerate the delivery of images, small files, large files, and on-demand video and audio content. This topic describes the scenarios supported by Alibaba Cloud CDN.

### Scenarios

The following table describes the scenarios supported by Alibaba Cloud CDN.

Scenario	Description
<a href="#">Image and small file distribution</a>	Accelerates the delivery of small files on websites and applications. Examples of the websites and applications include web portals, e-commerce websites, news websites and applications, and gaming and other entertainment websites.
<a href="#">Large file distribution</a>	Accelerates the delivery of files that are larger than 20 MB, such as game installation packages, application updates, ROM updates, and application packages.
<a href="#">On-demand audio and video streaming</a>	Accelerates the delivery of audio and video content on websites and applications, such as film and television websites, online education websites, news websites, and short video websites. Mainstream video formats, including MP4 and FLV, are supported.

### Image and small file distribution

Alibaba Cloud CDN accelerates the delivery of small files on websites and applications. Examples of the websites and applications include web portals, e-commerce websites, news websites and applications, and gaming and other entertainment websites. You must separate static content from dynamic content on your origin server. The delivery of static content, such as images, CSS files, and small JavaScript files, is accelerated by Alibaba Cloud CDN. The delivery of dynamic content is accelerated by [Dynamic Route for CDN \(DCDN\)](#). For more information about static and dynamic content, see [What are static content and dynamic content?](#)

This feature addresses the following issues:

- Websites respond slowly because they contain a large number of small files.
- The web page loading speed and the quality of web services differ across regions.
- During promotions, the origin servers may become unavailable due to traffic spikes. In this case, services are interrupted.
- Images cannot be compressed or optimized to meet client requirements due to complex processing of image formats and resolution.

### Large file distribution

Alibaba Cloud CDN accelerates the delivery of files that are larger than 20 MB, such as game installation packages, application updates, ROM updates, and application packages.

This feature addresses the following issues:

- Users cannot download files, or the download speed is low.
- Downloads may be interrupted due to unstable network connections. If users download the data again, additional data transfer is required.

- A website is vulnerable to hijacking or hotlinking, which can cause business loss.
- The origin server requires higher performance to withstand high-concurrent downloads or download spikes. The bandwidth cost of the origin server is high.

## On-demand audio and video streaming

Alibaba Cloud CDN distributes and accelerates the delivery of audio and video content on websites and applications, such as film and television websites, online education websites, news websites, and short video websites.

This feature addresses the following issues:

- Errors or stalling issues that occur when users request video content.
- Your website or application is vulnerable to hijacking or unauthorized downloads of video content. The copyright of the video content requires protection.
- The origin server requires higher performance to withstand high-concurrent accesses or access spikes. The bandwidth cost of the origin server is high.

Apart from the preceding features, if you want an all-in-one service that can upload, transcode, store, and distribute audio or video content at the same time, you can use ApsaraVideo VOD. For more information, see [What is ApsaraVideo VOD?](#)

# 3. Glossary

This topic describes the terms of Alibaba Cloud CDN. These terms help you better understand and use Alibaba Cloud CDN.

## Origin server

An origin server refers to the server where your workloads are running. Content distributed by Alibaba Cloud CDN is provided by the origin server.

An origin server can process and respond to user requests. If the requested content is not cached on edge nodes, the request is redirected to the origin server to retrieve the content. Alibaba Cloud CDN supports the following types of origin server: Object Storage Service (OSS) buckets, Function Compute, and custom servers (IP addresses and domain names).

## Edge node

An edge node is where resources from origin servers are cached. Edge nodes are deployed in different regions to accelerate content delivery.

In the documents of Alibaba Cloud CDN, an edge node is also called a CDN node, a cache node, an acceleration node, or an Alibaba Cloud node.

## Accelerated domain name

An accelerated domain name refers to a domain name that is accelerated by Alibaba Cloud CDN and accessed by users. For example, if you add `aliyundoc.com` to Alibaba Cloud CDN, `aliyundoc.com` is an accelerated domain name.

Alibaba Cloud CDN retrieves resources from origin servers and caches them on edge nodes to accelerate content delivery. In the documents of Alibaba Cloud CDN, an accelerated domain name is also called a domain name.

 **Note** A domain name, also known as a network domain, is an identification string that defines one or more Internet resources, such as computers. A domain name is a numerical address and sometimes also represents a physical location.

## CNAME record

A CNAME record, also called an alias record, maps a domain name to another domain name, which is then resolved to the IP address of the destination server.

After you add a domain name to Alibaba Cloud CDN, Alibaba Cloud CDN generates and assigns a CNAME to the domain name.

Alibaba Cloud CDN uses its globally distributed edge nodes to accelerate content delivery. The IP addresses of edge nodes that are in different regions or used by different Internet service providers (ISPs) are different. Therefore, an accelerated domain name cannot be resolved to a specific IP address by using an A record. To address this issue, CNAME records are used. You must add a CNAME record in the system of your DNS service provider to map your accelerated domain name to a unique CNAME. The CNAME record can point user requests that are sent to the accelerated domain name to CDN edge nodes.

 **Note** The CNAME is resolved to the IP address of a specific edge node. The node is selected by the scheduling system based on the region, ISP, and node resource usage.

## CNAME

After you add a domain name to Alibaba Cloud CDN, the domain name is assigned a CNAME. The CNAME is in the format of `*.*kunlun*.com`.

You must add a CNAME record in the system of your service provider to map the domain name to its CNAME. After the CNAME record takes effect, all requests sent to the domain name are redirected to edge nodes. This accelerates content delivery.

## Static content (static resources)

Static content refers to content that remains unchanged no matter how many times it is requested by users. Static content includes images, videos, web files such as HTML, CSS, and JavaScript files, software installation packages, APK files, and compressed files.

Alibaba Cloud CDN caches static content from origin servers to the globally distributed edge nodes. Users can retrieve static content from the nearest edge nodes. This accelerates content delivery.

## Dynamic content (dynamic resources)

Dynamic content refers to content that may change for different requests. Dynamic content includes web files such as ASP, JSP, PHP, PERL, and CGI files, API operations, and interactive requests to databases.

If you want to improve the acceleration performance for dynamic content delivery, we recommend that you use Dynamic Route for CDN (DCDN). For more information, see [What is DCDN?](#).

## DNS/domain name resolution

Domain Name System (DNS) is a service used to resolve domain names to the corresponding IP addresses that can be recognized by machines. Domain names are easy-to-identify to humans but machines identify only IP addresses.

Domain name resolution is automatically performed by DNS servers. For example, if you enter `aliyundoc.com` into the address bar of your browser, the domain name is automatically resolved to an IP address, for example, 10.10.10.10.

Alibaba Cloud also provides a DNS resolution service called Alibaba Cloud DNS. For more information, see [Alibaba Cloud DNS](#).

## SSL/TLS

Secure Sockets Layer (SSL) is a secure communication protocol that improves the integrity and security of data transmitted over the Internet. SSL encryption is implemented between the TCP/IP protocol stack and application layer protocols. After SSL is standardized, its name is changed to Transport Layer Security (TLS), which is a cryptographic protocol on the transport layer. Therefore, SSL and TLS are collectively known as SSL/TLS.

## Back-to-origin routing

If the resources requested by a request are not cached on edge nodes or have expired on edge nodes, the request is redirected to the origin server to retrieve the resources. This process is called back-to-origin routing.

## Origin host

An origin host refers to the domain name to which edge nodes redirect requests during back-to-origin routing. If multiple domain names are hosted on the same origin server, you must specify the domain name to which edge nodes redirect requests during back-to-origin routing. For more information about how to set an origin host, see [Configure an origin host](#).

For example, the domain name to which edge nodes redirect requests is `aliyundoc.com`, which is different from the accelerated domain name `www.aliyundoc.com`. In this case, you specify `aliyundoc.com` as the origin host.

## Origin protocol policy

An origin protocol policy specifies the protocol that is used to redirect requests to origin servers. An origin protocol policy can specify whether requests are redirected to origin servers over the protocol used by the clients. For example, if clients send HTTPS requests to edge nodes, you can set the origin protocol policy to HTTPS. If the origin server does not support HTTPS, you can set the origin protocol policy to HTTP. For more information about how to configure the origin protocol policy, see [Configure the origin protocol policy](#).

## SNI

Server Name Indication (SNI) is an extension of SSL/TLS. If multiple domain names are hosted on the same HTTPS server (IP address), you can use SNI to specify the domain name to which requests are redirected.

If the IP address of an origin server is associated with multiple domain names, and the origin protocol policy is set to HTTPS, you can configure SNI to specify the domain name to which requests are redirected. When requests are redirected to the origin server, the origin server returns the certificate of the requested domain name. For more information, see [Configure SNI](#).

## Object chunking

If a request redirected from edge nodes to the origin server carries the Range header, the origin server returns the content specified by the Range header to the edge nodes. This process is called object chunking. For example, the Range header can specify that the origin server returns only the first 0 to 100 bytes of data from a specified file.

In large file distribution scenarios such as on-demand video streaming and software package distribution, object chunking accelerates file distribution, increases cache hit ratios, reduces back-to-origin network traffic and loads on origin servers, and reduces the response time of origin servers. For more information, see [Object chunking](#).

 **Note** Range is an HTTP header that specifies the part of content to be retrieved.

## 302 redirection

302 redirect allows edge nodes to process the HTTP 302 status code returned from the origin server instead of directly returning the HTTP 302 status code to clients. 302 redirection simplifies the request processing pipeline and accelerates content delivery.

## Referer-based hotlink protection

Referer-based hot link protection refers to access control based on the Referer header. For example, you can configure a Referer whitelist to allow only specified requests to access your resources or a blacklist to block specified requests. Referer-based hot link protection identifies and filters user identities and protects your resources from unauthorized access. After you configure a Referer whitelist or blacklist, Alibaba Cloud CDN allows or blocks requests based on user identities. For more information, see [Configure a Referer whitelist or blacklist to enable hot link protection](#).

 **Note** The Referer header is a component of the header section in HTTP requests and carries information about the source address, including the protocol, domain name, and query string. Referer is used to identify the source of a request.

## Bandwidth cap

A bandwidth cap specifies the maximum amount of bandwidth resources that can be consumed to prevent bandwidth usage spikes.

During a statistical period (1 minute), if the average bandwidth value of an accelerated domain name reaches the specified bandwidth cap, Alibaba Cloud CDN suspends services and disables the domain name. The domain name is mapped to the invalid domain name `offline.***.com`. In this case, the domain name becomes inaccessible. For more information, see [Set a bandwidth cap](#).

## TTL value

Time-to-live (TTL) refers to the amount of time that a resource is cached on Alibaba Cloud CDN edge nodes. Expired resources are automatically removed from edge nodes. Requests for expired resources are considered cache misses and redirected to the origin server. The retrieved resources are returned to the clients and cached on edge nodes. For more information, see [Add a cache rule](#).

## CORS

Cross-origin resource sharing is an access control mechanism based on HTTP headers. CORS allows web servers to define the origin servers by specifying the domain name, protocol, and port from which a browser is allowed to retrieve specified resources. For more information, see [Configure CORS](#).

## EdgeScript

EdgeScript (ES) allows you to customize Alibaba Cloud CDN and DCDN configurations by running scripts if the standard configurations in the Alibaba Cloud CDN or DCDN console cannot meet your business requirements.

## EdgeRoutine

EdgeRoutine (ER) is a JavaScript code runtime environment that runs on Alibaba Cloud edge nodes around the world. It supports the ES6 syntax and standard Web Service Worker APIs. You can deploy your JavaScript code to ER to take advantage of ER's global network. This allows you to process requests at the edge nodes closest to the client.

## HSTS

HTTP Strict Transport Security (HSTS) is a policy mechanism that allows websites to accept only HTTPS connections. Websites can use HSTS to demand that clients such as browsers must use HTTPS. All HTTP requests and untrusted SSL certificates are rejected. HSTS prevents man-in-the-middle (MITM) attacks during the first visits from clients. For more information, see [Configure HSTS](#).

If HSTS is disabled and the origin server supports only HTTPS, HTTP user requests are redirected to HTTPS through 301 redirection or 302 redirection. When users access the origin server over HTTP, HTTP requests may be hijacked or tampered with. This raises security issues. If HSTS is enabled, clients can access the origin server only over HTTPS. This prevents requests from hijacking and tampering.

## QUIC

Quick UDP Internet Connections (QUIC) is a general-purpose transport layer network protocol built on top of UDP. QUIC provides the same level of security as TLS/SSL and reduces the connection and transmission time. QUIC reduces network congestion and ensures service availability when the packet loss rate and network latency increase.

QUIC can implement different congestion control algorithms at the application layer regardless of the operating system or kernel that is used. Compared with TCP, QUIC supports flexible adjustments based on service requirements. QUIC is a suitable alternative when TCP optimization encounters bottlenecks.

## HTTP status code

An HTTP status code is a numeric code that indicates a server response. You can determine and analyze server status based on HTTP status codes. After a client such as a browser sends a request to a server, the server returns a response header that includes an HTTP status code. The HTTP status code indicates the response status.

HTTP status codes are classified into the following types:

- 1xx: indicate messages.
- 2xx: indicate successful requests.
- 3xx: indicate request redirection.
- 4xx: indicates client errors.
- 5xx: indicate server errors.

# 4.Limits

This topic describes the limits that Alibaba Cloud CDN imposes on domain names. Before you add a domain name to Alibaba Cloud CDN, make sure that the domain name meets the requirements. This helps you prevent losses that can be caused by violations.

Item	Description
Accelerated domain name	<ul style="list-style-type: none"> <li>• <b>Address length:</b> The address of an origin server cannot exceed 67 characters in length.</li> <li>• <b>Maximum number of origin servers:</b> You can set a maximum of 20 origin server addresses for each accelerated domain name.</li> <li>• <b>OSS Domain Name</b> <ul style="list-style-type: none"> <li>◦ If you use an Object Storage Service (OSS) bucket as the origin server, you can enter the public endpoint of the OSS bucket, for example, <code>***.oss-cn-hangzhou.aliyuncs.com</code>. Internal endpoints of OSS buckets are not supported.</li> <li>◦ To view the public endpoint of an OSS bucket, log on to the <a href="#">OSS console</a>. You can also select the endpoint of an OSS bucket that belongs to the current Alibaba Cloud account from the Domain Name drop-down list.</li> </ul> </li> </ul> <div style="background-color: #e6f2ff; padding: 10px; margin: 10px 0;"> <p> <b>Note</b> Discounts for data transfer between Alibaba Cloud CDN and OSS:</p> <ul style="list-style-type: none"> <li>◦ If you want OSS to identify network traffic sent from Alibaba Cloud CDN and apply for a discount on the data transfer, you must set the origin server type to OSS Domain in the Alibaba Cloud CDN console.</li> <li>◦ If you set the origin server type to Site Domain in the Alibaba Cloud CDN console, OSS identifies network traffic sent from Alibaba Cloud CDN as outbound data transfer over the Internet. In this case, the discounts do not apply.</li> </ul> <p>For more information, see <a href="#">Billing of OSS content acceleration</a>.</p> </div> <ul style="list-style-type: none"> <li>• <b>IP:</b> Enter the public IP addresses of one or more servers. Public IP addresses of Alibaba Cloud Elastic Compute Service (ECS) instances do not need to be reviewed.</li> <li>• <b>Site Domain:</b> Enter the domain names of one or more origin servers.</li> </ul>
Origin server	

Item	Description
	<p><b>Note</b></p> <ul style="list-style-type: none"> <li>◦ The origin domain name must be different from the accelerated domain name. Otherwise, a DNS resolution loop occurs, and requests cannot be redirected to the origin server.</li> <li>◦ The format of the origin domain name:               <ul style="list-style-type: none"> <li>▪ The domain name must be 1 to 67 characters in length,</li> <li>▪ and can contain lowercase letters, digits, and hyphens (-). Example: example.com.</li> <li>▪ The domain name cannot contain Chinese characters, uppercase letters, or characters other than hyphens (-). The domain name cannot be a hyphen (-). A hyphen (-) in a domain name cannot be followed by another hyphen (-). The domain name cannot start or end with a hyphen (-). If the domain name contains Chinese characters such as 阿里云.网址, you must apply for an ICP number for the domain name in Chinese characters, and use the tool Punycode to convert the domain name from Chinese characters to English letters, such as xn--fiq****.xn--eq****. Then, you can specify it as the domain name to be accelerated.</li> </ul> </li> <li>◦ You cannot add the IP address of an Alibaba Cloud Application Load Balancer (ALB) instance, for example, <code>example.hangzhou.alb.aliyuncs.com</code>, as the IP address of an origin server. However, you can configure a CNAME record for an ALB instance to resolve a service domain name, for example, <code>origin.example.com</code>, to the address of an ALB instance. For more information, see <a href="#">Configure a CNAME record</a>. Then, set the service domain name</li> </ul>
CNAME	<p>CNAMEs that are assigned by Alibaba Cloud CDN, Dynamic Route for CDN (DCDN), ApsaraVideo Live, ApsaraVideo VOD, or Secure CDN (SCDN) are used only for domain name resolution. If Alibaba Cloud discovers that your CNAME is used for malicious activities, Alibaba Cloud reserves the right to close your Alibaba Cloud account and remove the domain names.</p> <ul style="list-style-type: none"> <li>• <b>Function Compute Domain:</b> Enter a Function Compute domain name that belongs to the current Alibaba Cloud account. You must set the <b>Region</b> and <b>Domain Name</b> parameters for the Function Compute domain name. For more information, see <a href="#">Configure a custom domain name</a>.</li> </ul>

Item	Description
Service quota	<ul style="list-style-type: none"><li data-bbox="512 309 823 333">• Accelerated domain name Each Alibaba Cloud account can add a maximum of 50 domain names to Alibaba Cloud CDN. If the average daily peak bandwidth value exceeds 50 Mbit/s and your workloads are protected, you can <a href="#">submit a ticket</a> to add more domain names to Alibaba Cloud CDN.</li><li data-bbox="512 501 1358 611">• Cache refresh<ul style="list-style-type: none"><li data-bbox="539 539 1270 564">◦ URL refresh: 10,000 URLs per day for each Alibaba Cloud account.</li><li data-bbox="539 582 1358 607">◦ Directory refresh: 100 directories per day for each Alibaba Cloud account.</li></ul></li></ul> <p data-bbox="539 640 1370 728">If the daily peak bandwidth value of your workloads exceeds 200 Mbit/s, you can <a href="#">submit a ticket</a> to increase the upper limit. Alibaba Cloud will review your application and then increase the quota accordingly.</p> <ul style="list-style-type: none"><li data-bbox="512 752 1334 862">• File prefetch You can prefetch files only by using URLs. Each Alibaba Cloud account can submit a maximum of 1,000 URLs per day.  If the daily peak bandwidth value of your workloads exceeds 200 Mbit/s, you can <a href="#">submit a ticket</a> to increase the upper limit. Alibaba Cloud will review your application and then increase the quota accordingly.</li></ul>

Item	Description
Content moderation	<p>Alibaba Cloud reviews the content of all accelerated domain names. Domain names that cannot be accelerated by Alibaba Cloud CDN include but are not limited to:</p> <ul style="list-style-type: none"> <li>• Websites whose content is inaccessible or does not provide valid information</li> <li>• Servers that host pirated games</li> <li>• Websites that provide multiplayer role-playing games and card games</li> <li>• Websites that provide downloads of pirated content, including pirated software, books, videos, and comics</li> <li>• Websites that run peer-to-peer (P2P) lending</li> <li>• Lottery websites</li> <li>• Websites of unlicensed hospitals and pharmaceuticals</li> <li>• Websites that contain pornography, drugs, and gambling content</li> </ul> <div style="background-color: #e6f2ff; padding: 10px; margin-top: 10px;"> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• You are legally responsible for the content hosted on your accelerated domain name. Alibaba Cloud CDN regularly reviews the content of accelerated domain names. If illicit content is detected from a domain name, Alibaba Cloud CDN immediately disables or blocks the domain name. If the violation is severe, Alibaba Cloud CDN may even permanently block all domain names that belong to the Alibaba Cloud account.</li> <li>• If you add a wildcard domain name, for example, <code>*.example.com</code>, to Alibaba Cloud CDN and a specific domain name, for example, <code>a.example.com</code>, that matches the wildcard domain name contains illicit content, Alibaba Cloud CDN disables the wildcard domain name <code>*.example.com</code>.</li> <li>• If a domain name fails the review, you can check the reason for rejection on the Domain Names page in the Alibaba Cloud CDN console. Then, you can modify the content based on the rejection details and submit the domain name for review again.</li> </ul> </div>

Item	Description						
Back-to-origin routing	<ul style="list-style-type: none"> <li>An HTTP request header cannot exceed 300 bytes.</li> <li>Timeout period By default, the timeout period for back-to-origin requests that are transmitted over TCP is 10 seconds. The timeout period for back-to-origin requests that are transmitted over HTTP is 30 seconds.</li> <li>Response header If an origin server does not respond to <code>Content-Type</code>, Alibaba Cloud CDN automatically adds <code>Content-Type:application/octet-stream</code>.</li> <li>Automatic conversion from HEAD to GET for back-to-origin requests By default, HEAD requests are sent to CDN edge nodes before the requests are redirected to origin servers. In this case, HEAD requests are converted to GET requests. If you do not want to convert HEAD requests to GET requests, you can navigate to the Custom Request Header tab in the Alibaba Cloud CDN console, and configure custom HTTP headers for back-to-origin requests. The following table describes the parameters of custom HTTP headers. For more information, see <a href="#">Configure an HTTP header for back-to-origin requests</a>.</li> </ul> <table border="1" data-bbox="544 927 1382 1122"> <thead> <tr> <th>Parameter</th> <th>Custom header</th> </tr> </thead> <tbody> <tr> <td>Custom Parameters</td> <td>Ali-Swift-Fwd-Head</td> </tr> <tr> <td>Value</td> <td>on</td> </tr> </tbody> </table> <div style="background-color: #e6f2ff; padding: 10px; margin-top: 10px;"> <p> <b>Notice</b> After you set the <b>Customize Back-to-origin Request</b> parameter, the strings are converted to camel case during back-to-origin routing, as shown in the following examples:</p> <ul style="list-style-type: none"> <li>Example 1: ALI-CDN is converted to Ali-Cdn.</li> <li>Example 2: ALICDN is converted to Alicdn.</li> </ul> <p>If you want to disable automatic letter case conversion, add the following header to <b>Customize Back-to-origin Request</b>:</p> <ul style="list-style-type: none"> <li>Parameter: Ali-Swift-Header-Capitalize</li> <li>Value: off</li> </ul> </div>	Parameter	Custom header	Custom Parameters	Ali-Swift-Fwd-Head	Value	on
Parameter	Custom header						
Custom Parameters	Ali-Swift-Fwd-Head						
Value	on						
Bandwidth throttling	<p>Based on the <a href="#">Alibaba Cloud International Website Product Terms of Service</a>, if the metering method of your domain name is pay-by-data-transfer or pay-by-bandwidth and the peak bandwidth value reaches 10 Gbit/s within 1 minute, Alibaba Cloud enables bandwidth throttling for the domain name. Bandwidth throttling protects your domain name from attacks and prevents unexpected high bills. If you want to disable bandwidth throttling, you can contact Alibaba Cloud customer service or .</p>						

Item	Description
File	<ul style="list-style-type: none"> <li>• File cache                             <ul style="list-style-type: none"> <li>◦ If the request to a file that is larger than 100 MB is a cache miss, and the origin server returns a no-cache response header, Alibaba Cloud CDN closes the connection after the amount of data transmitted from the origin server reaches 100 MB.</li> <li>◦ If the origin server returns a response header whose Cache-Control directive allows the response to be cached, the edge nodes can cache files that are up to 500 GB in size.</li> </ul> </li> <li>• File upload                             <p>You can upload files to origin servers by using Alibaba Cloud CDN. Each file can be up to 300 MB in size.</p> </li> </ul>
EdgeScript	<p>By default, you can configure only one script for each domain name. If you want to configure more scripts, .</p>
Stress testing	<p>If you want to run stress tests on a domain name that is accelerated by Alibaba Cloud CDN, you must at least three days in advance. Otherwise, you may experience the following issues:</p> <ul style="list-style-type: none"> <li>• Stress tests on bandwidth may cause bandwidth usage spikes and increase bandwidth costs.</li> <li>• Stress tests on the number of queries per second (QPS) may trigger HTTP flood protection rules of Alibaba Cloud CDN and sandbox the domain name.</li> </ul>
Length of URLs and HTTP request headers, and total length of URLs and HTTP request headers	<p>HTTP/2:</p> <ul style="list-style-type: none"> <li>• If the default setting of the NGINX directive is <code>http2_max_field_size=32KB</code>, the length of an individual HTTP request header or an individual URL cannot exceed 32 KB. Otherwise, the HTTP 414 status code is returned.</li> <li>• If the default setting of the NGINX directive is <code>http2_max_header_size=128KB</code>, the total length of all HTTP request headers and URLs cannot exceed 128 KB. Otherwise, the HTTP 400 status code is returned.</li> </ul> <p>HTTP/1.1: For the <code>large_client_header_buffers</code> directive, number is set to 4 and size is set to 64 KB. In this case, the length of an individual HTTP request header or an individual URL cannot exceed 64 KB. Otherwise, the HTTP 414 status code is returned. The total length of all HTTP request headers and URLs cannot exceed 256 KB. Otherwise, the HTTP 400 status code is returned.</p>

Item	Description						
Request method	<p>Alibaba Cloud CDN supports the <code>GET</code>, <code>PUT</code>, <code>POST</code>, and <code>HEAD</code> request methods.</p> <div style="background-color: #e6f2ff; padding: 10px; border: 1px solid #d9e1f2;"> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>If you want your website to support <code>DELETE</code> and <code>PATCH</code> requests, use DCDN to enable acceleration for dynamic content delivery.</li> <li>Only <code>POST</code> and <code>PUT</code> requests can carry a request body.</li> <li>By default, Alibaba Cloud CDN converts HEAD requests to GET requests before they are redirected to the origin server. If you want to redirect HEAD requests to the origin server, you can add a custom request header on the <b>Custom Request Header</b> tab in the Alibaba Cloud CDN console. The following table describes how to add a custom request header. For more information, see <a href="#">Configure an HTTP header for back-to-origin requests</a>.</li> </ul> <table border="1" data-bbox="539 842 1358 1039" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Parameter</th> <th style="width: 50%;">Custom header</th> </tr> </thead> <tbody> <tr> <td>Custom Parameters</td> <td>Ali-Swift-Fwd-Head</td> </tr> <tr> <td>Value</td> <td>on</td> </tr> </tbody> </table> </div>	Parameter	Custom header	Custom Parameters	Ali-Swift-Fwd-Head	Value	on
Parameter	Custom header						
Custom Parameters	Ali-Swift-Fwd-Head						
Value	on						
Feature configuration	<p>You can add a maximum of 50 configuration records, including the following features: <b>Custom Request Header</b>, <b>Custom Response Headers</b>, <b>URI Rewrite</b>, <b>Parameter Rewrite</b>, and <b>Cache Expiration</b>.</p>						
Intelligent and Brotli compression	<p>Only files that are not smaller than 1 KB are compressed.</p>						

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Item	Description
API calls for each account	<p>You can call this API operation up to 1,000 times per second per account. If this upper limit is reached, the following message is returned:</p> <pre data-bbox="517 360 1385 450">ErrorCode:Throttling ErrorMessage:Request was denied due to flow control.</pre>

## 5. Case studies

Alibaba Cloud CDN can reduce network latency caused by geographic location, bandwidth limits, and server performance. These are core factors in the improvement of user experience.

Customer	Case
Tmall	Tmall has greatly reduced costs on bandwidth resources and business operations by using Alibaba Cloud CDN, which is built on a distributed architecture. Alibaba Cloud CDN accelerates user requests destined for Tmall and handles traffic spikes during the Double 11 sales event.
Taobao	Alibaba Cloud CDN delivers content to web clients and mobile clients for Taobao. A large number of images can be delivered to users within milliseconds. This greatly reduces the time to load images and improves user experience.
Alipay	Alibaba Cloud CDN provides support for financial services of Alipay. HTTPS connections are used to prevent DNS servers and resources from hijacking and tampering. This protects user information and ensures the security of transactions.
UC	Alibaba Cloud CDN helps UCWeb reduce bandwidth costs on delivering content to web clients. After UCWeb uses Alibaba Cloud CDN together with Object Storage Service (OSS), the costs on storage hardware are also reduced and the pipeline of development and O&M is simplified.
Youku	Alibaba Cloud CDN accelerates the delivery of multi-media content such as long videos, short videos, audio content, and images for Youku. Alibaba Cloud CDN ensures that web clients and mobile clients can access content on Youku through quick and stable connections. This greatly improves user experience.

# 6. Node distribution

Alibaba Cloud CDN provides more than 2,800 edge nodes distributed around the world. Among these nodes, more than 2,300 are distributed across 31 provincial regions and first-tier cities in the Chinese mainland and more than 500 are distributed across over 70 countries and regions, including Hong Kong (China), Macao (China), and Taiwan (China). The total bandwidth capacity of Alibaba Cloud CDN can reach up to 150 Tbit/s.

## Global distribution of high-performance nodes

Alibaba Cloud CDN supports a total bandwidth capacity of up to 150 Tbit/s and 10GE network interface controllers (NICs). Each node provides 40 TB to 1.5 PB of data storage, and a bandwidth capacity of 40 Gbit/s to 200 Gbit/s.

The widely distributed high-performance nodes can accelerate content delivery and withstand traffic spikes.

## Node distribution

Billable region	Node distribution
Chinese mainland	<ul style="list-style-type: none"> <li>• North China: Beijing, Tianjin, Hebei, Shanxi, and Inner Mongolia</li> <li>• East China: Shandong, Jiangsu, Anhui, Zhejiang, Fujian, Shanghai, and Jiangxi</li> <li>• Central China: Hubei, Hunan, and Henan</li> <li>• South China: Guangdong, Guangxi, and Hainan</li> <li>• Southeast China: Sichuan, Yunnan, Guizhou, Tibet, and Chongqing</li> <li>• Northwest China: Ningxia, Xinjiang, Qinghai, Shaanxi, and Gansu</li> <li>• Northeast China: Liaoning, Jilin, and Heilongjiang</li> </ul>
North America	US (Los Angeles, California, Miami, New York, Seattle, San Jose, Denver, Dallas, Chicago, and Santa Clara)
Europe	Russia (Moscow and St. Petersburg), Ukraine, UK, France, Netherlands, Spain, Italy, Sweden, and Germany
Asia Pacific 1	Hong Kong (China), Macau (China), Taiwan (China), Japan (Tokyo and Osaka), Singapore, Thailand (Bangkok), Philippines (Manila), Malaysia (Kuala Lumpur), Myanmar, Cambodia, and Laos
Asia Pacific 2	Indonesia (Jakarta, Surabaya, and Batam), India (Kolkata, New Delhi, Mumbai, Hyderabad, Bangalore, Chennai, Nagpur, and Patna), South Korea (Seoul), and Vietnam (Ho Chi Minh and Hanoi)
Asia Pacific 3	Australia (Sydney and Melbourne)
Middle East and Africa	Kuwait, Qatar (Doha), Oman, South Africa (Johannesburg)
South America	Brazil (São Paulo and Rio de Janeiro)

# 7. Performance indicators

This topic describes the major performance indicators that are used to evaluate the performance of content delivery before and after a website is accelerated by Alibaba Cloud CDN.

You can make informed business decisions based on the performance indicators. Performance indicators include:

- [Common performance indicators](#)
- [Performance indicators for small file distribution](#)
- [Performance indicators for large file distribution](#)
- [Performance indicators for on-demand video and audio streaming](#)

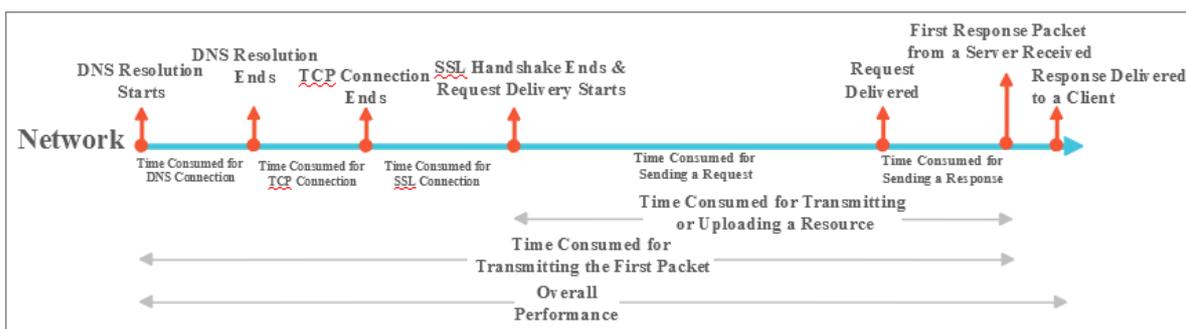
## Common performance indicators

You can monitor the following performance indicators to evaluate the performance of content delivery before and after your website is accelerated by Alibaba Cloud CDN. Common performance indicators include but are not limited to the ones described in this topic.

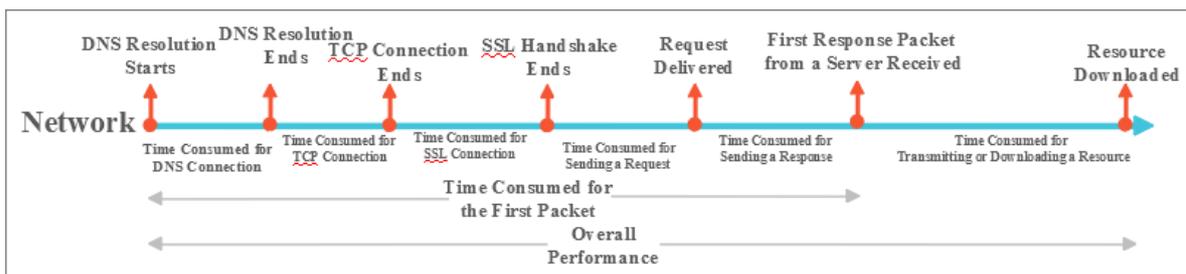
**Note**

- After a website is accelerated by Alibaba Cloud CDN, the network latency, packet loss rate, and back-to-origin rate are typically reduced, and the cache hit ratio is increased. However, the actual performance may vary based on the business scenario and workload type. The performance indicators described in this topic are based on pure statistics.
- The back-to-origin rate and cache hit ratio described in the following table are used to evaluate the performance of content delivery for a website after it is accelerated by Alibaba Cloud CDN. If your website is not accelerated by Alibaba Cloud CDN, the back-to-origin rate is 100%, and the cache hit ratio is 0.

- How content is delivered to a client



- How content is downloaded by a client



Performance indicator	Description
DNS time	The time it takes for a client to initiate a request and to receive the IP address of the destination host.
TCP time	The time it takes for a client to establish a TCP connection to the destination server.
SSL time	The time it takes for a client to establish an SSL connection to a web server.
Delivery time	The time it takes to complete sending a request after SSL handshakes are completed.
Connection time	If a CDN edge node uses HTTP to accelerate content delivery, the connection time consists of the DNS time and TCP time. If a CDN edge node uses HTTPS to accelerate content delivery, the connection time consists of the DNS time, TCP time, and SSL time. The connection time shows the number of available CDN edge nodes and their capabilities for content delivery.
Response time	The time it takes for a web server to process an HTTP request and return a response to a client.
Download time	The time it takes for a client to receive and download the first packet returned from a web server.
Time to first packet	<p>The time it takes for a client to send a request and receive the first HTTP packet from a server. The time to first packet shows the overall performance of CDN nodes.</p> <ul style="list-style-type: none"> <li>• For content uploading, the time to first packet consists of the DNS time, TCP time, SSL time, request delivery time, and response time.</li> <li>• For content downloading, the time to first packet consists of the DNS time, TCP time, SSL time, request delivery time, and response time.</li> </ul> <div style="background-color: #e1f5fe; padding: 10px; margin-top: 10px;"> <p> <b>Note</b> A newly purchased domain name may require a longer period of DNS resolution time than other domain names. This is irrelevant to the cache retrieval time.</p> </div>
Overall performance	The time it takes to upload or download an entire file.
Packet loss rate	The ratio of lost packets to total packets during transmission.

Performance indicator	Description
Back-to-origin rate	<p>The back-to-origin rate is classified into the back-to-origin request ratio and back-to-origin data transfer ratio.</p> <ul style="list-style-type: none"> <li>The back-to-origin request ratio refers to the ratio of requests to resources that are not cached, have expired, or cannot be cached on CDN edge nodes to total requests. <math>\text{Back-to-origin request ratio} = \frac{\text{Number of back-to-origin requests from CDN edge nodes}}{\text{Total number of requests sent to CDN edge nodes}}</math>. A lower back-to-origin request ratio indicates a higher performance. However, if the original user requests are fragmented after CDN edge nodes redirect them to the origin servers, the number of back-to-origin requests becomes greater than the total number of requests sent to CDN edge nodes.</li> <li>The back-to-origin data transfer ratio refers to the ratio of data transfer returned by the origin servers to data transfer returned by CDN edge nodes to clients. <math>\text{Back-to-origin data transfer ratio} = \frac{\text{Number of bytes returned from the origin servers to CDN edge nodes}}{\text{Number of bytes returned from CDN edge nodes to clients}}</math>. A lower data transfer ratio indicates a higher performance.</li> </ul>
Cache hit ratio	<p>The cache hit ratio of Alibaba Cloud CDN is classified into the byte cache hit ratio and request cache hit ratio. The cache hit ratio of Alibaba Cloud CDN is represented by the byte cache hit ratio. A higher cache hit ratio indicates a higher performance.</p> <ul style="list-style-type: none"> <li>Byte cache hit ratio = <math>\frac{\text{Total number of bytes returned from CDN edge nodes to clients} - \text{Total number of bytes returned from the origin servers to CDN edge nodes}}{\text{Total number of bytes returned from CDN edge nodes to clients}}</math>.</li> </ul> <div style="background-color: #e6f2ff; padding: 10px; margin: 10px 0;"> <p> <b>Note</b> A lower byte cache hit ratio indicates a higher amount of back-to-origin traffic. A higher amount of outbound traffic from the origin server indicates a larger bandwidth value and heavier workloads of the origin server. Therefore, back-to-origin traffic represents the amount of workloads on the origin server, and the byte cache hit ratio is the major concern in actual business scenarios.</p> </div> <ul style="list-style-type: none"> <li>Request cache hit ratio = <math>\frac{\text{Total number of requests to CDN edge nodes} - \text{Total number of back-to-origin requests}}{\text{Total number of requests to CDN edge nodes}}</math>.</li> </ul>

## Performance indicators for small file distribution

Small files refer to `HTML`, `JavaScript`, `JPG`, and `CSS` files. The delivery of these types of files is latency-sensitive. A lower latency indicates a higher performance. The latency is determined by the following factors:

- Time to first packet (most critical factor)
- Connection time
- Download time

Alibaba Cloud CDN provides a configuration guide for accelerating the delivery of small files. For more information, see [Image and small file distribution](#).

## Performance indicators for large file distribution

Large files refer to files that are larger than 20 MB. The key indicators for large file distribution include:

- Download rate
- Download time

Alibaba Cloud CDN provides a configuration guide for accelerating the delivery of large files. For more information, see [Large file distribution](#).

## Performance indicators for on-demand video and audio streaming

On-demand audio and video streaming mainly uses `FLV` , `MP4` , `WMV` , and `MKV` files. The key indicators for on-demand video and audio streaming include:

- Initial load time

The initial load time refers to the total amount of time that it takes to complete loading the first frame of a stream. The initial load time is determined by the DNS time, connection time, and time to first packet. A shorter initial load time indicates a higher performance.

- Stalling rate

Stalling events may occur when a video or audio stream is played or a resource is loaded. The stalling rate refers to the rate of viewers that have stalling events among every 100 viewers. A lower stalling rate indicates a higher performance.

Alibaba Cloud CDN provides a configuration guide for accelerating on-demand video and audio streaming. For more information, see [On-demand audio and video streaming](#).