



Download Acceleration

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CDNetworks download acceleration product is independently researched and developed by CDNetworks and it is based on the CDN2.0 acceleration platform constituted by 1500+ nodes globally, providing fast, stable and secure download acceleration service for customers.

The product is one of the CDNetworks CDN star products. It has addressed issues including low download speed, hijacking in download and severe bandwidth bursts, and assist content providers in promoting download speed, availability and user experience. The content delivery scheduling method and system of download product have gained multiple technological patents.

Product & Current Status of Industry & Challenges

The network bottleneck sticks out with the development of website service. The connectivity, network congestion and network bottleneck issues that network operators faced have given rise to the slow download of software and application. Users have unstable download experience, and often file complaints, bothering website operators a lot.

Besides, illegal hijacking and hotlinking issues occur now and then. Users face with hijacking including advertisement pushing and downloaded software tampering in access, thus their access effect and experience are compromised. So how to find an edge tool to defend against hotlinking action of illegal website download and malicious referencing is the top priority for website.

With the continual evolution of mobile telecommunication and diversity development of mobile internet, mobile APP saw more frequent download. Websites need to handle the frequent bandwidth bursts in popular APP update and delivery. The adoption of the high bandwidth mode will solve this pain spot, but cost website high expenditures, which is not a smart move.

Compared with traditional network, mobile-end network is more sensitive to mobility as it is portable and it may face worse network stability and higher packet loss ratio in transmission, so the speed bottleneck sticks out. To solve the dilemma that the better user experience is achieved without incurring more costs, CDNetworks independently researches and develops download acceleration product to break the bottleneck that besets website content providers in development. The product owns multiple anti-hijacking strategies and anti-hotlinking methods, possesses huge redundant bandwidth resources to cope with hotlinking and frequent access bursts, providing high-quality user experience with low investment from customer.

Product Introduction

Product Brief

The Download Acceleration product redirects the users download request through CDNetworks intelligent load balancing system to the optimum edge pops where users can download the content; it prefetches file to CDNetworks nodes by using content management system, avoiding the latency in the first file retrieving,



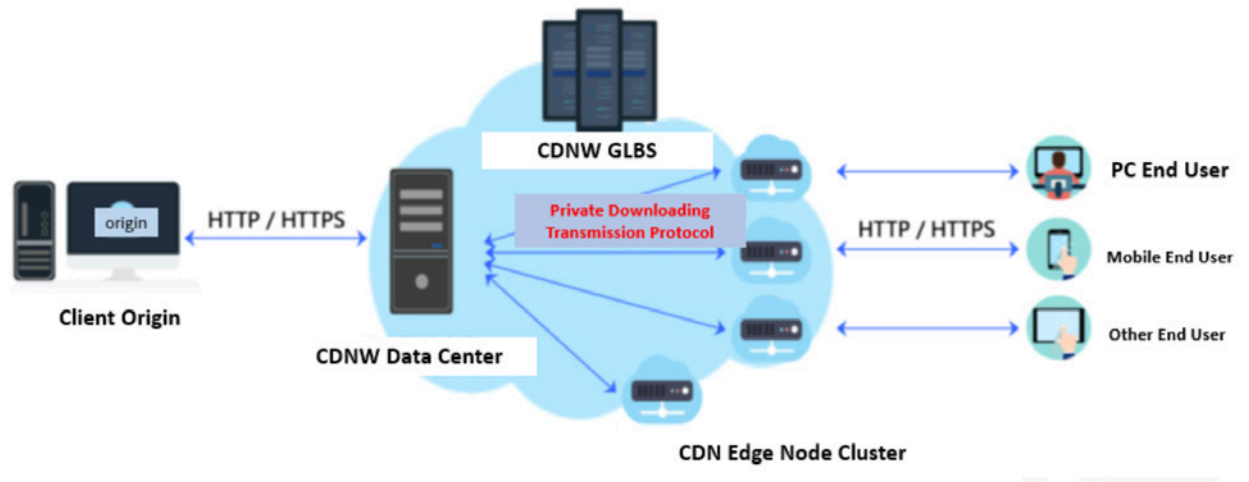
meeting the need of high concurrency and bypassing the congested route in network. Thus, end users will realize fast access, high-speed download, and enjoy better website service, and the origin pressure is eased in the meantime.

CDNetworks DA product, closely integrating with cloud storage product, provides customers one-step service, and supports HTTPS or CDNetworks private protocol transmission in the first mile, where the safe and swift file transmission is ensured. With such integration, the product realizes anti-hijacking in the first mile without incurring high expenditures for customers, who only need to upload the distributed file to cloud storage and whose time and money investment is spared. Tailored to the customers' practical needs, it offers multiple add-on supporting service and value-added products, ensuring the high-efficient and satisfactory usage for customer.

Product Positioning and Application Scopes

CDNetworks Download Acceleration product strives to solve the issues of slow download speed, connection resuming failure on break-point, severe bursts, and hijacking and tampering from operators. It will upgrade the download quality and data security, and with it the end users will enjoy fast, stable and secure download experience. Thus, the user loyalty to the customer website is enhanced and customer brand value is promoted.

The product is applied in: websites download service providers including gaming operator, APP shop operator, software developer, video/audio content providers and cloud storage service provider, and etc. It is applied for customers from the emerging industries such as VR/AR gaming, intelligent television OTT.



Picture 1-1 Download Acceleration Product Topological Graph

Product Technology Architecture

CDNetworks DA product architecture is shown as picture 1-1, and the detailed description is as below:

1. Website operators maintain original content for delivery, and CDN service providers ensure the good network operation;
2. CDNetworks utilizes the devices in the vicinity of customer origin or the devices of the same operators as CDNetworks data center to efficiently retrieve files from customer origin;



3. CDNetworks GLBS is in charge of redirecting the request of end users to the optimum download nodes;
4. Under the CDNetworks private transmission protocol, edge node cluster will retrieve files from CDNetworks data center;
5. CDN edge nodes across the whole network are in charge of responding the request of terminal user promptly.

Product service workflow:

1. Customer uploads file to customer origin, and make sure the file has uploaded successfully;
2. End user sends requests to local DNS before downloading from HTTP/HTTPS;
3. CNAME customer domain name into CDNetworks acceleration domain name, and the local DNS will raise the request to CDNetworks GLBS, which will respond local DNS with optimum node IP based on its intelligent judgement;
4. End user sends requests to optimum CDNetworks edge nodes to fetch the downloaded file based on the domain resolution results by local DNS; in the end user's first file fetching from edge pop, the edge pop will retrieve the file from CDNetworks data center, cache it and forward to end user. If the data center does not have this file, it will retrieve from customer origin, cache it and return to edge nodes.

Product Feature

Convenient File Download

CDNetworks DA product upgrades download speed for customers by making multi-layer acceleration optimization:

NGB (New Global Balancer, new global load balancing system)

NGB is a new multi-layered scheduling system for load balancing, and it is researched and developed independently by CDNetworks. The system is capable of collecting node loading status and network quality in real time, making judgement by integrating information and accurately redirecting users to the optimum node based on user IP (non-local DNS IP), thus promoting download speed.

As HTTPS gains popularity in Internet, CDNetworks innovates HTTPS acceleration technology based on IP scheduling method and integrates with NGB scheduling system characteristics. For now, NGB scheduling system has been applied in supporting HTTPS acceleration, and CDNetworks has successfully applied technological patent for it.

Private Transfer Protocol for Download

Focusing on the download industry features, CDNetworks independently researches and develops file download transfer protocol, which outperforms traditional transfer protocol. With this protocol, transfer efficiency is 30~40 times of the traditional one, and the data transmission is very stable.

Mobile Network Transfer Protocol for Two-Sided Acceleration

Focusing on mobile networking features, CDNetworks independently researches and develops Mobile Network Transfer Protocol for Two-Sided Acceleration, which works for customized optimization and facilitates



information interaction through the two-sided protocol of server and client. With it, congestion is avoided, data transmission performs better, and mobile App's download performance upgrades by 10-40%.

Ultra Large File Delivery

Online gaming, especially PC-end games or console games, is featured with large game packet size, sometimes reaching over 100 Gigabyte. Limited by server storage space and distribution mechanism, traditional CDN providers may come across with many issues when caching the file of such large size, affecting user experience. At present, CDNetworks edge node clusters have realized the cache and distribution of ultra large files (of volume over 100 G), and nodes will directly respond to the mega large file request from end user. Customer is free from pre-splitting and post-splicing for such large file, thus the origin pressure is relieved and content delivery speed is accelerated.

Data Security Guaranteed

These years witnessed the development of internet, along with networking security issues of hijacking and tampering in all kinds. How to guarantee data security has always been a headache to customer and it is of great significance. CDNetworks download acceleration provides multiple methods to secure customer data and HTTPS protocol for download, meeting the current internet HTTPS development requirements:

HTTPS Protocol Download

CDNetworks download acceleration product offers HTTP download and HTTPS download, meeting the current internet HTTPS development requirements of customers, especially those who are sensitive to web security (such as data security). As HTTPS is featured with certificate authentication, encrypted data transmission and by-block authentication, so data will be delivered to the actual information receivers in an encrypted manner, efficiently avoiding hijacking, tampering and ad inserting from operators. In addition, CDNetworks HTTPS download acceleration fully supports TLS SNI (Server Name Indication) and realizes one IP with multiple certificates binding, which effectively mitigates IPv4 resource shortage, shortens deployment duration for customers with SNI, and implements prompt scaling out in customers 'business surges. Traditional binding mode is still supported to satisfy various business needs.

Multiple Anti-Hijacking Methods

CDNetworks DA product provides multiple anti-hijacking methods to reduce the impact of hijacking on user access effect and user experience. It provides HTTP DNS anti-hijacking scheme, where node IP will be obtained through HTTP request and DNS hijacking is avoided by circumventing operators DNS servers; or the URI encryption and HTTPS anti-hijacking scheme. The URI scheme is to rewrite dynamic URL with its file name or postfix cloaked, avoiding the hijacking targeting at a specific file name or type.

In addition, HTTPS anti-hijacking scheme will make judgement based on the conventional rule if the file has been hijacked at the beginning of download: if it has, abandon the file and issue an HTTPS request again to download a new one in an encrypted manner.

Lightweight Characteristics Value Authentication for Anti-Hijacking

CDNetworks DA product ensures global platform file accuracy with its intelligent anti-hijacking authentication feature. When CDN nodes retrieve content from origin, all the content that origin responds will go through



dynamic characteristics authentication with the method following the customer origin. Only when it passes the authentication, will the file be cached and responded to end user; otherwise, the file will be retrieved from origin again with HTTPS method. Such authentication effectively reduces hijacking, ensuring the consistency of the file from CDN nodes and from customer origin.

Convenient Content Control

With the booming mobile internet development, mobile delivery business thrives. Customers have come across with greater difficulties and challenges in file purging and upgrading with the scaling up of file content. CDNetworks content management platform facilitates file management for customers by providing multiple options, ensuring the smooth conduction of file purging and updating:

Easy to Update

Focusing on the business scenario that original file, such as the game file to be updated, CDNetworks will provide flexible file updating methods (such as the update on port or interface) for customers to achieve fast file update.

Dedicated Caching

It provides a differential caching strategy catering to customer need, and it creates a caching space in the node specific for customers, whose important or cold file can be ensured to be obtained by end users. The service is fast and optimal.

Advanced File Prefetch

It provides API to prefetch the file to node and cache it. Compared with basic file prefetch, it is more flexible; the prefetching by API is by demand, so the back-to-origin amount is effectively controlled; its timeliness is ensured as the time of content prefetch can be set according to different regions.

Easy Cost Control

With the increasing user access and the frequent mobile download, website needs to cope with the bandwidth bursts and hotlinking in all types when delivering popular APP. CDNetworks DA product addresses the issues including frequent bursts and anti-hotlinking by providing multiple anti-hotlinking methods and varieties of bandwidth controls, and effectively reduce customers' bandwidth investment as we have rich redundant bandwidth resources, thus increasing the economic efficiency for customers.

Multiple Anti-Hotlinking Methods

CDNetworks offers multiple anti-hotlinking methods to block illegal requests and thus reduce the bandwidth waste entailed, saving customer bandwidth cost from hotlinking. In the meanwhile, CDNetworks advanced access control technology will effectively prevent the website content resources theft by other websites or end users. It will judge the request legality by vetting the information in encrypted URL, respond normally to legal request and reject the illegal request, effectively protecting customer website resources.

Single Link Rate Limiting

Single link rate limiting will set the download speed of single connection, restricting the speed upper limit with



the preset value. It well allocates bandwidth resources while ensuring user access experience, saving customer bandwidth cost in a reasonable manner.

Diversity Bandwidth Control

CDNetworks provides total bandwidth restriction strategy, where customers will dynamically restrict the total bandwidth amount upon a specific domain or multiple domain, thus the bandwidth cost is effectively controlled without sacrificing user experience.

Product Value

Better User Experience

Boasting years of CDN service experience and rich bandwidth resources, CDNetworks is capable of delivering the download resources to users swiftly. Besides that, CDNetworks DA product supports multiple download ways and connection resuming on break-point feature, satisfying the high expectation of customers.

More Secure Service Platform

CDNetworks DA product secures customer data in multiple methods with the integration of HTTPS acceleration service. In addition, the multiple anti-hijacking schemes effectively mitigates network hijacking's impact on access security and user experience.

More Stable Download Service

Full featured monitoring system of CDNetworks download acceleration product will conduct monitor on device loading, network climate, download business features, and etc., in the real time. It secures over 99.9% service availability by intelligently detecting and addressing issues, and making download resources available all the time to end users.

Cheaper Operating Cost

CDNetworks download acceleration product will deploy resources on demand, ingest millions of concurrent requests, support T-level bandwidth burst, and help customers to focus on download business. It spares customers lots of server investment for origin building, redundant bandwidth cost to cope with bursts, labor and money investment for maintenance, and prevents hotlinking action and assists customers in cost control, saving them lots of time and energy.

More Comprehensive Value-Added Service

CDNetworks provides multi-dimensional and all-round value-added services that target at customer business:



1. **Advanced logging**, defines log field by customer needs, merge logs of different times lots, and filter logs of the designated URL types and supports FTP automatic upload function.
2. **Status code monitoring**, provides customers the status code ratio that appears in CDN acceleration websites, and set the upper limit on status code ratio and the customer service staff will be notified for troubleshooting when the limit is exceeded.
3. **Origin monitoring**, apprehend the operating status of the websites that require unremitting service in the real time and sent an alert if the malfunction is detected. The origin monitoring is for the customer's PAD, and customer origin monitor is conducted in 4 layers, including checking if the origin device crashes, if networking works normal, if origin HTTP service works normal, if DNS resolution processing works normal. And the alarm can be sent by email or by SMS.
4. **Quality assessment report**, is to analyze customer website service quality with the reference of third-party's assessment, and provide professional reports, including URL response time to request, access availability ratio, error times, backbone network and performance by-region statistics, and etc.

About CDNetworks

CDNetworks is a global content delivery network (CDN) with a fully integrated cloud solution, offering unparalleled speed, security and reliability for the almost instant delivery of web content. Optimized for any device, browser and network, we ensure all users have a fast and safe web experience - whether you're serving B2B or B2C customers, mobile employees or remote offices.

CDNetworks accelerates and secures websites and web applications over our strategically built network of global PoPs in both established and emerging markets. We specialize in those parts of the world where keeping a website accessible is most difficult: Mainland China, Russia, South East Asia and the Middle East.

No matter where you are and which device is being used, our in-country experts can advise you on licensing requirements and regulations to deliver the best web experience to your users.

Since 2000, we have been providing our customers with exceptional customer services and support, thanks to our team of dedicated tech engineers located across the globe. Businesses with an international web presence trust CDNetworks to protect their websites, web applications and cloud services.

CDNetworks has offices located in the UK, France, Germany, US, South Korea, China, Japan, and Singapore.









