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Content Delivery Network

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ABSTRACT

In order to solve the inherent limitations of the Internet regarding how consumers experience the Quality of Service (QoS) while accessing Web content, CDNs have been established. Content Delivery System is based on the web application. Content Delivery System (CDS) is a Process of Delivering digital content and technologies that enable the efficient distribution of digital content, such as web pages, videos, and images, to end-users. CDS is to ensure that content is delivered quickly. All contents will be in dynamic nature and editable for any user. If user want to modify existing content, they can propose their ideas if the idea is unique for this content, then it will be updated along with contributor name and will be rewarded. Website will available with every language support and security.

Our goal is to classify and scrutinize the present CDNs and delve into their distinctiveness, drawbacks, possibilities, and upcoming pathways in this domain.

Keywords

Content Delivery, Web application , Distribution , Dynamic nature, Editable , Contributor name , Rewarded , language support , security.

Introduction

Content Delivery system (CDS)is mainly based on web application is to provide seamless and consistent article on any topics. Peering among Content Delivery Networks (CDNs) can enhance the efficacy of CDNs used for commercial purposes. Content Delivery System (CDS) is a Process of Delivering digital content and technologies that enable the efficient distribution of digital content, such as web pages, videos, and images, to end-users. CDS is Available every user Publicly and free of cost. In CDS some tools for students to make their work easy and free of cost. CDS will available with every language support and security. User can select any language by choice. User can login and create a password or signup by other account. User can be writing a post or create a page. If any user want create a group, then they can do. They can see the others post and like, dislike, share the posts and can bookmark.

Overview

CDNs came into existence in 1998 as a solution to overcome the limitations of the Web's inadequate infrastructure in transmitting large content over long distances. A group of network components that are organized to enhance the distribution of material to final consumers is known as a CDN. In order to enhance performance by duplicating documents, a CDN ought to focus on situating the replicas in close proximity to the clients' locations. The efficacy of a CCDN is heavily contingent on the quantity of users who actively engage with it. At present, there are numerous CDNs that offer services to expedite acceleration.

For corporations deciding on their infrastructure investment priorities and customers in search of a CDN provider, our study has the potential to provide significant value. At present, there are three predominant content delivery systems in existence: the worldwide web that operates on a client/server model, content delivery networks, and peer-to-peer file sharing systems. Collections of servers that are strategically located to distribute content over the wide-area Internet constitute content delivery networks. Content providers find CDNs an attractive option as they can transfer the responsibility of content hosting to the CDN infrastructure.

Existing Approaches

Many strategies for scalable and dependable content delivery have been investigated by researchers. It is possible to increase fault tolerance and scalability. However, the entire cluster is unavailable to consumers if the data centre or the ISP that provides connectivity goes down. Sites can provide mirroring (deploying clusters in a few locations) and multihoming (connecting to the Internet through various ISPs) to address this issue. For locations with strict reliability and scalability requirements, clustering, mirroring, and multihoming are typical options.

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However, these approaches both create new connectivity issues and do not completely fix existing ones:

- Scaling clusters to thousands of servers is challenging.
- while connections fail while multihoming is used, the underlying network protocols, particularly the border gateway protocol (BGP)2, do not quickly converge to new routes.
- Synchronising the site across the mirrors is necessary for mirroring and might be challenging.

All three situations call for additional capacity: For multihoming, each link must be able to carry all the traffic; for clustering, there must be enough servers at each site to manage peak loads, which can be an order of magnitude above average loads; and for mirroring, each mirror must be able to bear the full load. Thus, the price of each of these options is high and might more than quadruple the original infrastructure cost and continuing operating expenditures of a site.

Static Content

HTML pages, executables, embedded pictures, PDF files, and other static web content so forth. The content servers of Akamai employ content type to apply lifetime and other attributes to static documents, which can have different levels of service needs and varied levels of cacheability.

For instance, lifetimes can range from 0 seconds, where the edge server checks the object's coherence with the origin server on each request, to infinite, where the content server never does so. Additionally, end users, downstream proxy servers, and Akamai edge servers may have different lifetime values.

The ability to deliver secure information over the HTTPS protocol, allow alternative content and transport encodings, handle cookies, and other features are examples of special features. Using a metadata facility that specifies which features to apply by customer, content type, and other criteria, Akamai controls features on behalf of each customer.

Dynamic Content

Today's websites mainly rely on dynamic content generation to provide consumers with informative and engrossing content. However, as we just mentioned, proxy caches often are unable to cache dynamic content. For instance, if a Web page featured an advertisement that changed based on each user's profile, proxy cache could not handle the page.

Edge Side Includes technology (www.esi.org), which assembles dynamic content on edge servers, is used to address this. Similar to server-side inclusion languages, ESI also incorporates an XSLT (Extensible Stylesheet Language Transformation) engine to process XML data along with fault-tolerance features (for when the origin server is down). A content provider can divide a dynamic page into pieces with distinct cache ability characteristics by using ESI. In the edge server's cache, these pieces are kept as independent objects and are dynamically put together into Web pages in response to user requests. Because the server may put together dynamic pages from separate page fragments, only noncacheable or expired pieces from the origin Web site; this lessens the amount of data that the edge server must retrieve from the central origin server as well as the stress on the site's content generating infrastructure.

ESI decreased bandwidth needs for dynamic information across a variety of dynamic sites we looked at, including portals and financial websites, by 95 to 99 percent. The ensuing decrease in centralised infrastructure allows content providers to save a lot of money.

Technical Challenges

Many non-technical issues must be resolved in order to build a worldwide network, including the deployment of network and server gear, building strong working relationships with network providers, managing operational costs, and attracting and maintaining clients. Despite their importance, we are concentrating on problems with the system's actual design, construction, and operation.

System Reliability

While a distributed system presents numerous chances for fault tolerance, it also introduces numerous potential failure points. Scale issues play a role in this issue since several software platforms must all work together to identify and fix system faults. Computer hardware will also inevitably deteriorate over time, especially discs and other moving elements. A small number of the devices in a large network will malfunction each month as it becomes older. The team in charge of network operations must immediately identify failing components and remove them from service so they may be transported to a warehouse, possibly repaired, and then put back into operation.

Finally, we need to find and fix software bugs. A major issue in the delivery of web material is that client requests and server responses are dynamic; edge servers must accurately and quickly read new request and response headers that frequently occur when vendors update their servers and browsers. Testing new versions on all relevant browser and content-server versions would be impossible because such improvements could occur at any time. Additionally, testing content server features with the best browser and content server settings would result in an extremely complicated testing matrix. To overcome this difficulty, we developed a test tool that routes a replica of traffic from a live server to a test version of our programme without interfering with content delivery. We are able to identify issues before software is introduced to the live network thanks to this real-world traffic.

Network Monitoring

Our DNS-based load balancing system constantly checks the health of the services, as well as the servers and networks that support them. For the HTTP, HTTPS, and streaming protocols, each content server frequently transmits its load to a monitoring tool, which compiles and distributes load reports to the neighbourhood DNS server. Then, while resolving DNS names, that DNS server chooses which IP addresses (two or more) to return. The DNS server simultaneously distributes some of the server's allocated content to multiple servers if a server's load rises over a predetermined level. Clients can no longer access the server's IP address if the load reaches a certain level. Thus, when the server is under moderate to heavy pressure, it can reduce some of that stress. The monitoring system also sends the top-level DNS resolver data centre load in order to reroute traffic away from overburdened data centres.

Management of Platforms and Software Deployment

Software must advance with new consumer features, better performance, and better operational and monitoring capabilities in addition to growing in size and scope. To overcome this obstacle, we must frequently swiftly deploy high-quality software to servers across numerous networks in order to support a business model that requires a speedy time to market.

We are unable to atomically update software across the entire network. At the very least, caution requires that we roll out new network software gradually so that we can spot issues before they have a major impact. Additionally, it's doubtful that all edge servers (or perhaps all networks) will be accessible at once. Unavoidably, we'll overlook certain servers and need to update them later. Therefore, having two active versions of a software component on the network at once is more common than not. Given this, we must carefully manage modifications to component interfaces while writing components so that various versions can coexist. The network must be constantly monitored by network operations, and any servers with improper configurations must be suspended.

The Windows and Linux operating systems are used on the servers in the Akamai network. A monitoring platform and tools that run across those platforms and have access to the service delivery parameters of servers are necessary for managing multiple OS platforms and services. Both local and global load balancing as well as problem detection for operations and customer care require this information. Finally, maintaining numerous platforms and applications requires knowledge of all servers and supporting systems.

Visibility and control of the content

The network of Akamai distributes and serves content for the benefit of providers, who must maintain control over their content as it is served at the edge and who need to see real-time information on who is receiving what content when. Offering this visibility and content control poses difficulties in a number of areas, including cache consistency, lifetime management, and integrity control.

Literature review

According to George Pallis and Athena Vakali , This study examines the CDN's requirements, significance for web and desktop applications, and potential expansion into mobile applications. Customer satisfaction is their top priority. One of the highlights of this study was the mention of the CDN manager's ability to meet each individual's needs, which necessitates investigation of this flaw.

According to Erik Nygren, Ramesh K. Sitaraman, Jennifer Sun, In this paper, the authors provide a brief overview of the Akamai Content Delivery system as a whole, which delivers Internet services to billions of users daily and manages hundreds of interactions, assisting businesses and enterprises to improve the quality

and dependability of their services and online applications. There is a discussion of the system's architecture, design principles, and various components in general. They concentrate mostly on the problems with Internet delivery and attempt to solve them with the suggested approach. But there is no mention of CDN for mobile networks and the system architecture is for desktop services rather than mobile applications.

Features

several important aspects of the innovative learning pedagogy that involve new methods of interaction between 'instructor-student-resource' in the learning and teaching practice are often ignored in the discussion related to the immersive blended learning environment These Content or blogs writing and delivery have the capability of supporting the learning community to complete a task, solve a problem, create a product, and share their thoughts .This mapping is suitable for classroom teaching and learning if the following criteria/standards are met:

any teaching and learning environment that involve the use of online/virtual/remote/distance learning that requires the assistance of technological learning tools. Immersive learning characteristics are (1) real-life like environment, (2) learning process focuses more on learning experience, and (3) supported by appropriate Web 2.0 technological tools like compressor, palagrism checker that are free of cost.

Higher education educators may also utilise the techno-pedagogy mapping framework that is as a discourse opportunity to innovate their mainstream online curricular delivery by integrating innovative pedagogies with technological capabilities to prepare learners with twenty-first century skills/values in novel situations, such as creativity, independence, communication, self-determination, ability to work with others, critical thinking, capacity to learn and so on blended learning requires like Website will available with every language support and security will help students to equip themselves with self-regulation skills and technological competence in order to manage their learning at their own pace with less instructor facilitation. Instructors, meanwhile, are also required to be competent in utilising and merging both online resources and various pedagogies effectively into course design, and thereby can increase student engagement and performance .Students in the twenty-first century desire immersive learning that Avail for every user publicly and free of cost because it can give them the opportunity to immerse and interact actively in teams with fellow students by building a sense of identity and belonging in a low-risk environment Another form of collaborative learning, which is known as pedagogy, has gained attention in higher education because of its unique concept. This peer-learning pedagogy focuses on co-creating and co-learning with peers, who share their learning situations and experiences in a social, active, and continuous process Learning through communities is also supported by the cybergogical approach by activating students to engage in discussions, negotiate ideas, and devise solutions with the community.

Conclusion

The CDN'S era requires both instructors and students to change the learning and teaching paradigm by implementing and experiencing innovative pedagogies. The techno-pedagogy mapping developed through this systematic review could offer search function modified, customized search and a website which is user friendly and easy to navigate helpful guidance for providing an immersive blended learning environment to fit the mission of twenty-first century learning where All contents will be dynamic and changeable as per user recommendation if it's found new and modified than previous one. Furthermore, the techno-pedagogy mapping which have been identified and aligned in detail including some suggestions in order to make it more practical could provide an input to other significant parties in education, such as curriculum designers and faculty administrators and complement the transformation of learning and teaching course design, curriculum

and delivery as the framework of a future-ready curriculum for is yet to provide any guidelines on how to use this pedagogy and technology effectively or it could provide clean website.

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