

LOAD AWARE CONTENT DISTRIBUTION IN CLOUD

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Abstract: A content delivery network or content distribution network (CDN) is a large distributed system of servers deployed in multiple data centers across the Internet. The goal of a CDN is to serve content to end-users with high availability and high performance. CDNs serve a large fraction of the Internet content today, including web objects (text, graphics and scripts), downloadable objects (media files, software, and documents), applications (e-commerce, portals), live streaming media, on-demand streaming media, and social networks. We will propose a scalable and consistent model for CDN which will be based on some heuristics approach in which caching of data will be based on their usage i.e. we will do usage mining which will increase the overall performance of CDN in terms of service time.

I. INTRODUCTION

With the growth in internet, accessing web content make very difficult due to highest demand of services. In this case manage no. of request and flow of traffic is very difficult. Make different copy of web content over many servers to improve the performance and scalability. When user request for particular data at that time user is redirected to the nearest web server. By doing this response time for particular request is reduce [1]. Content Distribution Network act as a heart of today's internet technology. Content Distribution Networks (CDNs) is most reliable and effective solution for providing data to the users with high performance. To improve the performance of Network CDN provide services like improve the accessibility of data, correctness of data through replication.

Many companies started CDNs services for providing distribution, replication and load balancing for content. Companies who provide these services are:

- Akamai
- Limelight
- CDNetworks
- Voxel
- Mirror Image
- Amazon Cloudfront
- BitGravity
- CacheFly
- Edgecast Networks

There are three basic components of CDN architecture [3]:

- Content provider

- CDN provider
- End users

Content provider provides the content to the end user through CDN provider. CDN provider is worked as a medium for end user for data fetching. End users are key components of CDN architecture who request for accessing particular web content. CDN providers give guarantee for the fast delivery of web content. End user can being touch with CDN for specifying request from Smartphone, Desktop, laptop etc. CDN providers take charges from their customer for delivery data to the end users.

II. CDN

A CDN is a collection of network elements that providing content to the end users.

Content Distribution Networks (CDNs) focuses on the following business goals [2]:

A. Scalability

Means expand the system to handle new and large size of documents, users and transactions with failure of servers. Scalability is the main business goal of CDN.

B. Security

One of the major issues of CDN is to provide security solution for content. Provide protection against unauthorized access.

C. Performance

Basically refers to the response time of web content from the CDN.

Benefits of CDN are as follows:

1. Minimize loss of packet
2. Faster accessing data
3. Provide linear network
4. Live delivery of data
5. Improved End users experience
6. Reduced Cost
7. Improve fault tolerance
8. Reduced Vulnerability

CDN serve a large fraction of the internet content today including web objects like texts, graphics, URLs and scripts downloadable objects like media files, software, documents, applications like e-commerce, portal, live streaming media and social networks.

Techniques of CDN [4]:-

CDN provides techniques on the bases of requirements of End users.

A. Location based techniques

This technique is basically used when content required physically nearer to the end users. This technique widely used for delivery of data between countries or continents.

B. Time based techniques

This technique is used when deliver data to the end users with specific time limit. This technique basically used for multimedia application.

C. Performance based techniques

This technique is used when end users wants some additional processing on receiving content from the servers.

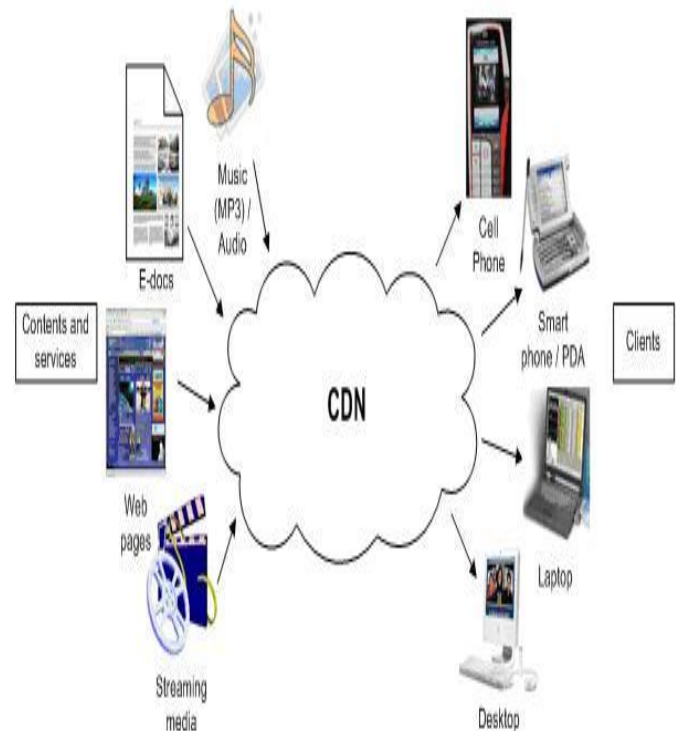


Fig.2 Content or Services provided by CDN [5]

Above fig. shows which content provided by content distribution network to their customer or end users. The ideal CDN provides the highest possible performance and quality of content to the end users with reducing the overall cost of content delivery.



Fig.1 Abstract architecture of CDN [5]

Above fig. shows the basic architecture of Content Distribution Networks. Such environment show that whenever end user request for fetching some web content then origin server reply those data with replicated server which nearer to the end user location. So the end users can get fast response from the server.

III. TOOLS AND TECHNOLOGY

A. Elastic Cloud Computing

Amazon Elastic Compute Cloud provides computing capacity in the Amazon Web Services cloud. Using Amazon EC2 you can develop and deploy applications faster. You can use Amazon EC2 to launch as many or as few virtual servers as you need, configure security and networking, and manage storage. Amazon EC2 enables you to scale up or down to handle changes in requirements or spikes in popularity, reducing your need to forecast traffic.

EC2 provide web based user interface.

Provide several options like:

- AWS command line interface
 - Enable command for a large set of AWS products.
- Amazon EC2 command line interface tools
 - Enable command for Amazon EC2, Amazon EBS, and Amazon VPC.
- AWS tools for windows power shell
 - Enable command for power shell script environments.

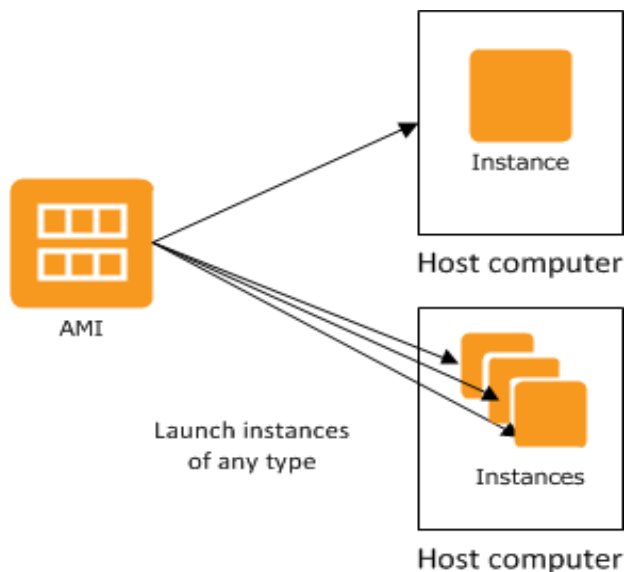


Fig. 3 AMI and Instances [11]

An Amazon Machine Image (AMI) provides the information required to launch an instance, which is a virtual server in the cloud. You specify an AMI when you launch an instance, and you can launch as many instances from the AMI as you need.

An AMI includes the following:

- A template for the root volume for the instance (for example, an operating system, an application server, and applications)
- Launch permissions that control which AWS accounts can use the AMI to launch instances.

B. Proposed Algorithm

Begin

1. Assume

- N – no. of server request
- N1 - current request from the end user
- L – load on the server
- R – response from the server to the end user
- C – CSA (content server algorithm)

2. Calculate

No. of request by Request() function Calculate total load on all server by
 $L = Capacity - Usage$ Calculate Round Trip time of Server by $r = |response\ time - request\ time|$

3. Initialization

- $C1 = r$
- $C2 = N$
- $C3 = L$

4. $C_4[I] = \min \{Li\}$

If $(C_4[I] < 0)$

Then

STOP

Else

End user request is sent to the servers which have a minimum load.

5. Now next Request.

6. Do step 2 to 4 up to no. of req. is complete.

C. Performance Analysis

	My Load Balancer Algorithm	Round Robin Algorithm
Average Response time (ms)	300.01	300.01
Data Processing time (ms)	0.36	0.34
Virtual Machine Cost(\$)	0.50	0.50
Data Transfer Cost(\$)	0.38	0.38

IV. CONCLUSION

By implementing, we conclude that cloud computing is attractive environment. Cloud provides many different services. One service is content distribution network. So delivering of data is more risky because of end users have to access their data in robust, secure and highly available manner. By the different researchers many issues are going to solve but some issues are remain as well. Those are not solved till today's time. So the research is going to harder in this field.

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