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Efficient data delivery through decentralized networks

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Abstract
Now a day, traffic over network is increasing day by day as increase in population and advancement of technology. In today's world, virtualization is spreading very drastically and everyone using internet as network for downloading information in any format like video, audio, text etc, due to which network congestion is also increasing in same ratio for downloading. This congestion is due to the centralization i.e. server where the information is stored will act as a centralized server and everyone across the globe will download from the same server which result in uncountable request and become a cause of network congestion at server side. To resolve such issue, we proposed an approach in which instead of downloading from main server, the same file or information get download from the user who have already downloaded i.e. making the downloading of information distributed over the network. This approach is very helpful in case, if failure of server happens then information gets shared or gets downloaded from distributed sources. This will reduce network congestion very easily and also fasten the downloading time.

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Keywords: Traffic congestion, decentralization, authentication, SDN

1. Introduction

We all download different type of files from internet some files are private secured file and some are public. Private files are secured so this file might be downloadable by one or group of persons and in case of public these files are downloadable by anyone. Generally public files are like Audio, Video, Text files, pdf files etc. this public files are downloaded from their respective servers by anyone what if the servers are getting more traffic to download those files? Does the server can hold such a fault tolerance capability? So eradicate this problem and make users download the files without any traffic congestion we introduce a solution which is decentralized content downloading service. Our solution works where users can download public files in a distributed manner. This files are downloaded by the help of SDN which stands for software defined networking [1] where we insist to have at every ISP provider where it will work by keep track of users downloading files, suppose take two users A and B who get internet access from same ISP provider where user A downloads the file SDN.
keeps tracks of downloaded file. If user B requests for the same file to download this SDN redirects to user A Computer and gets the file from the as computer securely [5]. They are many challenges to be faced while implementing this logic which are like which platform is used to fetch and download the file from other computers, how intelligently the SDN works by keep track of users download information, replication and duplication of fetched files from other user computer, comparing the speed of downloaded file from servers with distributed downloadable computer in this case the file should download fast when it compared with file downloaded from server [3]. Traffic congestion is basically occurring when two for more device or host request for the same resources from same single server or location. Over internet which is a wide network formed by many of many user's connections. If all request for the same information or resource form the same server at a same time then congestion of request packet over that server occurs, this also led to network break down. To manage such sort of problem at resource side,

many techniques are available but a very intelligent way of dealing with such system is still not found. This problem is basically occurring at server side and done my millions of user connected with that server for example when results out of any exams etc. Traffic management is one of the important step which should be taken especially targeting information which are in downloadable format

i.e. for accessing information firstly user have to download that file containing that needed information. Authentication of file is one of the most confidential parameter which is maintained by server as no user is able to change the information available over the server so as many users download that information but it never changes. The integrity of the information is maintained which is not dependent over the number of downloads due to which many user prefers that information should get downloaded from main server. To maintain this integrity, server always sends the duplicate copy to the user instead of sending the original print. Software Defined Network is basically described as a network which is controlled by software i.e. some frame work will be included into the network with help of which whole network process will be controlled. It is a very fine technology which comes in use very frequently now a day for maintaining and controlling the system network via framework which will be designed by developer by considering all conditions that should be meet in accordance to SDN as well as service to provide. [6] Traffic congestion over the internet or over any network can be controlled with the use of SDN. Network traffic management is very intelligently maintained by SDN by meeting all credentials.

2. Previous work

For content downloading from internet till now, it is all centralized downloading that means that content which user wants to download, is directly get downloaded from only from one server where it is stored. But for downloading multimedia content, games and graphics content, etc. new technology is provided to user called as torrents download. Torrents [2] is not software or not any external device, it a site over the internet which provides downloading of multimedia, games, graphic etc. contents. Working of torrents is like disturbed system but it stores the information or content especially in different location and then according to request it direct the request for downloading content. In this when the user request for any content especially related to multimedia content, then torrents first checks same content in it database, if there then provide download from there and if not then it transfer request to main server.

In torrent technology, some ISP according to the distance basis are maintaining the database of torrent and with the help of that database, torrent provides the information or increase the downloading speed of content as it maintains similar many copies of single content and increase seeders according to that. [4] As much copy it get, it will show that much of seeders. Torrent work is also like same done my main server but difference is achieved at the point of information storing. Torrent stores information in distributed manner and duplicates too. In many countries torrent is banned due to some security reasons which are not followed. But it is stick to multimedia, gaming and some software limits only. It is not able to maintain or provide other useful data other than these. The process of downloading a file from the torrent is same as from the main server but it added a smart way of copying the information when it gets downloaded. Up to now, torrent working in a small distributed manner as it is providing distributed downloading of information but not for all users as it data is maintained by ISP only and only few ISP work over that.

Firstly it store the copy of information when user firstly request for that content as at that time it direct the flow towards main server and while providing information also maintain one copy for future fast downloading process. Then, when the user request for that file or resource, it provides copy of that file and also maintain one more copy of that information by the use of user uploading speed. By this way, it increases the copy of information mostly needed to the user and provide them the way of fast downloading content without request forwarding to the server but if the information is not available at torrent side then it direct the flow to main server and also maintain a single copy in its database.

3. Methodology

This work is orientating on distributed system for downloading information or data from server by setting up an intelligence at ISP site which will make all systems acting like a distributed server by which traffic over main server will be decreased frequently. To establish this idea, the researchers follow:

1. Firstly, establish Software Defined Network over every ISP (Internet Service Provider). SDN has a property that user is able to form distributed network with the help of it. SDN will be inserted over the ISP so that every request and response packet will pass through it. It will play a very important role as it will only responsible for assigning a virtual unique key over every individual file which id requested for download.
2. It will also maintain the logs for maintaining this information. Every system who has downloaded any information from centralized server, data information will assign a unique key and it will act as a server for other systems who wants to download the same information.
3. From now first system, which has downloaded the information will start the chain of formation of distributed server for others.
4. Now, one more system request for the same information to get downloaded. The request before going or directing towards the main server, it will first arrive at SDN. SDN will check in it logs that, in past any system has downloaded such information or not.
5. If it will not get the positive response, then it will direct the request to main server to fulfill the request of user. But, if any system is get detected or found in the logs of SDN then it will not direct the request to main server.
6. After this, authentication step will come in which before directing request to distributed server for downloading information, it should be authenticated first. The authentication is needed as if any change is done by user after download then that information is not reliable for others. This authentication process will work by checking the unique key assigned over every download packet by SDN.
7. That unique key contains an intelligence that if that information or file is converted to write mode or user had done any changes inside that file, then that key will automatically get disappear or changed from original one. If keys get matched, it will direct to that distributed

server otherwise find other and at last send to main server if all option get closed.

Flow Diagram

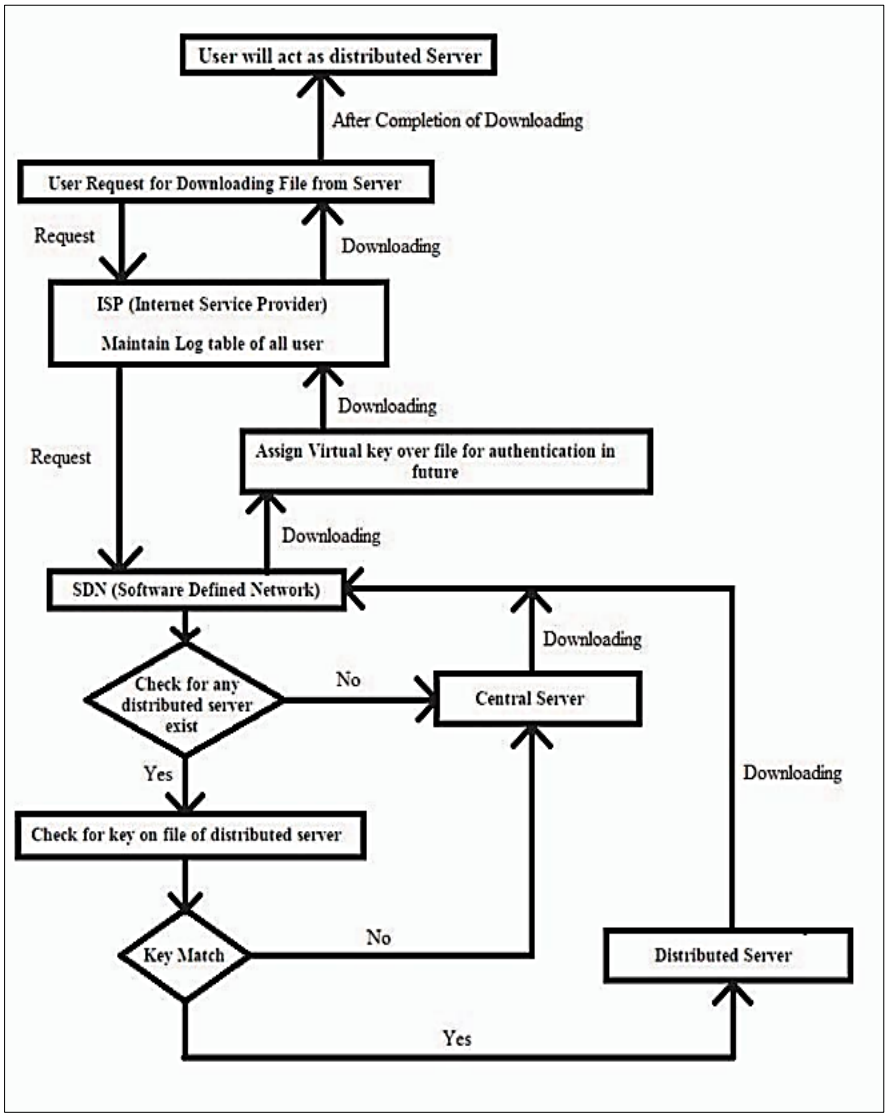

Fig 1: Process Flow

The above flow diagram is fully describing the working of proposed system in which all situations are considered. By adopting this idea, the traffic over main server will get down and distributed downloading process will get implemented.

Table 1: Comparing Efficiency: Proposed System v/s currently working System

System	Currently Working	Proposed System
Downloading From	Main Server always	Main Server or Distributed Sub Server
Speed of downloading any content	Depends on number of requests for downloading	Fast, Not depends on number of request
Traffic Congestion	High at server side according to request	Low in all conditions
Contact	User to main server	User to main server or distributed sub server

By adopting this methodology will build system much faster and efficient, and this methodology implementation will not be maintained by any third party vendors as proposed idea is fully capable to get bind over the currently working browsers or systems.

4. Conclusion

This proposed framework will result in the formation of distributed downloading of any content from internet. The traffic load over the main server will get reduced and the speed of fetching information will get increased. Downloading and browsing will increase as downloading flow will not research to main server by which browsing over that server will get increased. Problem of network congestion due to lots of request packets over one server will get decreased accordingly as many distributed clients will have converted into server. It is automatic process so it will also save time and speed will get incremented accordingly.

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