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Fast File Downloading Using Network Coding in Distributed System

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Abstract: ***Downloading any file quickly is a part of our social as well as professional living. The modern society can not work without various downloading facilities. There are many systems which are providing quick downloading of large files for personal and corporate world. If the server has 1GB data with the 100Mb/S transfer speed then theoretically it will take 10 to 20 seconds to transfer data to client PC. But it actually takes 60 to 90 seconds. It gives only 10% to 20% of actual throughput.***

Proposed system will provide facility for downloading file within minimum time with help of Network Coding. So that the client who will download the file for very first time, he will download it from server. When the other user will try to download it then the first downloaded image will work as replica for the current downloading. This system will use parallel file downloading protocols. The server will keep record of files present on every client in a tabular format. The concept of Distributed Storage can also be implemented. Hence the proposed system will increase the throughput upto 30% to 40%.

Keywords: Distributed System, Network Coding, Distributed Storage, Parallel Download.

1. Introduction

Proposed system will provide facility for downloading image within minimum time. So that if the client who will download the image for the first time he will download it from server. But when another user will try to download it, then the first downloaded image will act as replica for the current downloading. And the process will carried out so on. This system will use parallel file downloading protocols. When any user will start his system then his/her Torrent will also get start automatically, and it will keep record of every system on which it is installed. So that Torrent will keep track of each image which has been downloaded and on which system it has been downloaded.

2. Overview

In day to day life, we need to download content from internet or from other network. In existing file download systems various nodes connected in a network needs data from server and they download it from server. When no of node increases, load on the server increases and the download speed gets decreased. It may cause problems to user. The proposed system uses TCP-PARIS protocol that use parallel file downloading system.

The architecture contains a server framework and client side application. Server will keep track of all the files present on nodes. It will also keep updated record of how busy is a node. Client side will contain an application that will accept the name of file user want to download. It will search the name in the list maintained by server and hence the server will give the client a list of other clients that has the file.

The application will divide the file into parts according to busyness of corresponding node and will download it in parallel means. The server will update the record list

3. Literature Survey

[1]Peer-to-peer file sharing is more efficient over conventional file sharing means. In this paper the author have proposed peer-to-peer file sharing scheme based on network coding PPFEED.

The scheme can serve as peer-to-peer middleware created within the web services framework for web based file sharing applications.
[2]TCP-PARIS ensures a near optimal download coordination independent of file size and network bandwidth distribution.
[5] Distributed storage systems can give reliability of data storage, access over individually unreliable nodes. Storing data with the help of code, in fragments spread across nodes requires fewer lay-offs than simple replication.

4. Mathematical Model

Consider a set S consisting of all the elements related to a program. The mathematical model is given as below,

where, s= Initial state
e= End state
X= Input set
Y= Output set
F= F(me) +F(friend)
F(me)= Main function
F(friend)= Supportive function / inbuilt function
DD= Deterministic data
NDD= Non-deterministic data
CPUcorecnt= No. of cores
Memshared= Memory shared by processor
Success= Desired outcome is generated
Failures= Desired outcome is not generated
s= User will _re query for image
e= requested image downloaded
e1= image not available
X= Image name
Y= downloaded image or unavailability message

F(me) = F(search), F(selection), F(partition),F(download),F(merge),F(update)

- **Search** :
  F(search) = Searching will search requested image on the network.
  Input: Image name
  Output: Availability message and node count or unavailability message.
- **Selection** :
  F(selection) = Selection will select the node on which image is available.
  Input: Total node
  Output: Selected node will provide requested image.
- **Partition** :
  F(partition) = Partition will perform fragmentation of requested image accordingto node count.
  Input: Selected node count.
  Output: Fragmented image.
- **Download**:
  F(download) = Download function will parallel download fragmented image fromselected nodes.
  Input: Fragmented image and selected node count
  Output: Download message or failure message.
- **Merge**:
  F(merge) = Merge operation will perform merging of downloaded image.
  Input: Downloded image fragments
  Output: Merged image.
- **Update**:
  F(update) = Update will update the availability table.
  Input: System on which image is downloaded
  Output: System information will be added to availability table.
- **Success**: If image is available then downloading of image done successfully.

Failures : If image is available but not getting downloaded then it will report error message.

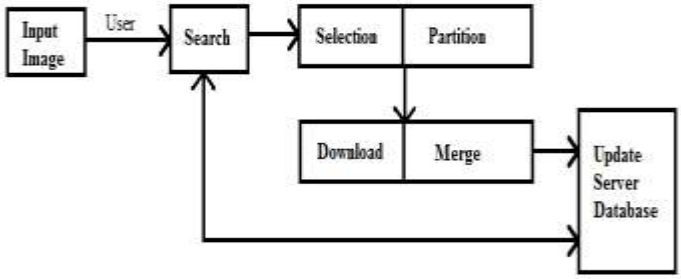

Figure 1: Data Model.

5. Future Scope

The proposed system can be implemented anywhere in file download systems such as Medical, school, college etc domains.

6. Conclusion

By this approach we are developing the system which will help to increase file download speed in any kind of network for any domain.

7. Acknowledgement

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