International Journal of Emerging Trend in Engineering and Basic Sciences (IJEEBS)
ISSN (Online) 2349-6967 *Volume 2 , Issue 1(Jan-Feb 2015), PP1-5*

PACK: Prediction-Based Traffic Redundancy Elimination System In Cloud

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Abstract:- In this paper, we use concept of PACK (predictive ACKs), which act like a traffic redundancy elimination (TRE) system, Designed for cloud computing customers. TRE is designed on cloud to reduce traffic as well as cost regarding TRE Computation and storage will be optimized. The main advantage of the Pack Cloud-server is its ability to span end clients TRE effort, thus minimizing processing costs prompted by the TRE Algorithm. Unlike previous solutions Pack does not require server to continuously keep track on customer to maintain the status of the server. Pack maintain computing environment that combine server and client movement to maintain cloud elasticity. Pack is based on TRE technology; TRE is used to eliminate the transmission of redundant content as well as allow client to use newly received chunk to identify previously received chunks chains, which in turn can be used as reliable predictors future transmitted chunks. In our proposed work we are using encryption concept. we will send the chunks in encrypted format. For encryption we are using RSA algorithm for key generation. This is using for security Purpose. We are going to secure our file from other traffics.

Keywords :- Cloud Computing, Traffic Redundancy Elimination, Predictive Acks, Network optimization, Secure Hash Algorithm-1.

I. INTRODUCTION

In cloud computing Environment, Cloud customers pay only for the actual use of computing resources, storage, and bandwidth, according to their changing needs, utilizing the cloud's scalable and elastic computational capabilities. cloud customers, applying a judicious use of the cloud's resources, are motivated to use various traffic reduction techniques, in particular traffic redundancy elimination (TRE), for reducing bandwidth costs.

In this paper,[1] we present a novel receiver-based end-to-end TRE solution that relies on the power of predictions to eliminate redundant traffic between the cloud and its end-users. In this solution, each receiver observes the incoming stream and tries to match its chunks with a previously received chunk chain or a chunk chain of a local file. Using the long-term chunks' metadata information kept locally, the receiver sends to the server predictions that include chunks' signatures and easy-to-verify hints of the sender's future data. The sender first examines the hint and performs the TRE operation only on a hint-match. The purpose of this procedure is to avoid the expensive TRE computation at the sender side in the absence of traffic redundancy. When redundancy is detected, the sender then sends to the receiver only the ACKs to the predictions, instead of sending the data.

On the receiver side, we propose a new computationally lightweight chunking (fingerprinting) scheme termed *PACK chunking*. PACK chunking is a new alternative for Rabin fingerprinting traditionally used by RE applications. Experiments show that our approach can reach data processing speeds over 3 Gb/s, at least 20% faster than Rabin fingerprinting. Offloading the computational effort from the cloud to a large group of clients forms a load distribution action, as each client processes only its TRE part. The receiver-based TRE solution addresses mobility problems common to quasi-mobile desktop/ laptops computational environments. One of them is cloud elasticity due to which the servers are dynamically relocated around the federated cloud, thus causing clients to interact with multiple changing servers. Another property is IP dynamics, which compel roaming users to frequently change IP addresses. In addition to the receiver-based operation, we also suggest a hybrid approach, which allows a battery-powered mobile device to shift the TRE computation overhead back to the cloud by triggering a sender-based end-to-end TRE similar to [2].

To validate the receiver-based TRE concept, we implemented, tested, and performed realistic experiments with PACK within a cloud environment. Our experiments demonstrate a cloud cost reduction achieved at a reasonable client effort while gaining additional bandwidth savings at the client side. The implementation code, over 25 000 lines of C and Java, can be obtained from [3]. Our implementation utilizes the TCP Options field, supporting all TCP-based applications such as Web, video streaming, P2P, e-mail, etc.

II. PREVIOUS WORK

In Department of Computer Science, Princeton University [4] , they have presented the design and implementation of Wanax, a flexible and scalable WAN accelerator targeting developing regions. Using a novel chunking technique, MRC, Wanax provides high compression and high throughput, while maintaining a small memory footprint. This profile enables it to run on resource-limited shared hardware, an important requirement in developing-world deployments. By exploiting MRC to direct load shedding, Wanax is designed to maximize the effective bandwidth even when disk performance is poor due to overloading. The peering scheme used in Wanax allows multiple servers in a region to share their resources, and thereby exploit faster and cheaper local-area connectivity instead of always using the WAN. In summary, through a careful design addressing the developing world challenges, Wanax provides customized, cost effective WAN acceleration to the region with commodity hardware

LBFS[5] is a network file system that saves bandwidth by taking advantage of commonality between files. LBFS breaks files into chunks based on contents, using the value of a hash function on small regions of the file to determine chunk boundaries. It indexes file chunks by their hash values, and subsequently looks up chunks to reconstruct files that contain the same data without sending that data over the network. Under common operations such as editing documents and compiling software, LBFS can consume over an order of magnitude less bandwidth than traditional file systems. Such a dramatic savings in bandwidth makes LBFS practical for situations where other file systems cannot be used.

[6]Despite the increasingly important role of redundancy elimination in the network infrastructure, very little is known about the range of benefits and tradeoff these approaches offer today, and the fundamental issues underlying their design. Using packet traces collected at twelve distinct network vantage points, they showed that packet-level redundancy elimination techniques can deliver average bandwidth savings of 15-60 for enterprise and university access links as well as the links connecting busy web servers. However, in the case of enterprise traffic, they found that the overall business of traffic was not significantly reduced and the savings during peak traffic periods was variable. They found several interesting characteristics of redundancy in network traffic, summarized in the previous section. One surprising implication of our findings was that a client-server redundancy elimination solution could provide approximately similar savings as a middlebox in small/medium, and to an extent, large enter prizes, obviating the need for deploying an expensive middle box-based redundancy elimination solution.

III. PROPOSED SYSTEM

3.1..Nature of the problem

To the best of our knowledge ,no one previous works have been addressed the requirement for cloud computing-friendly, end-to-end TRE which form PACK**.**

Traffic redundancy stems from common end users activities, such as repeatedly to access, download, upload (i.e., such as Backup, distributing, and modifying the same or similar information) items (documents, data, Web, and video). TRE is used to eliminate unnecessary transmission of content and, therefore, Important to reduce network costs.

we are using encryption concept. we will send the chunks in encrypted format. For encryption we are using RSA cryptographic algorithm. This is using for security Purpose. We are going to secure our file from other traffics.

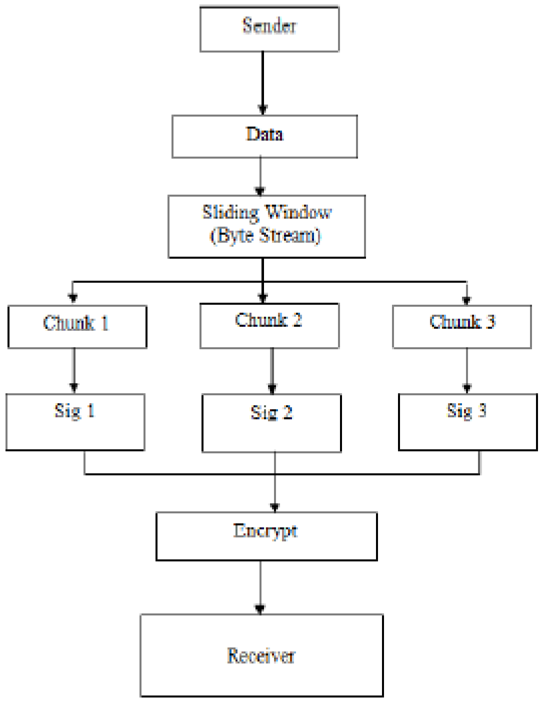

Fig. 1. Architecture Diagram Of PACK System With Encyption

IV. ARCHITECTURE OF PROPOSED SYSTEM MODEL

We have presented pack, a receiver-based, Cloud-friendly, end-to-end TRE that is based on speculative fiction the theory is that the latency and reduce operating costs to maintain a consistent Server pack required Customer status thus enabling cloud elasticity and mobility, While long-term redundancy protection. Also, Pack Content-based access enables eliminating redundancy a three-way without having to implement multiple server clients the handshake.

4.1. PACK Algorithm along with RSA-1 (Cryptographic algorithm)

Following is step that shows how algorithm works:

1. At PACK receiver side, stream of data received which is parse in sequence of variable size.
2. Chunk are then compared to receiver local storage also called chunk store. If matching chunk is found in local chunk store, receiver retrieves sequence of chunk referred as chain which follow LRU scheduling.
3. Using constructed scheduling, receiver send prediction to sender for subsequent data. Prediction sent by receiver include predicted data, hint and signature of chunk.
4. Sender identifies predicted range in its buffered data and verifies Hint for range, If result matches the received Hint, it continue to perform the more computationally SHA-1 signature operation.
5. Upon signature match sender send a confirmation message to receiver.

In this message transmission TCP wire protocol is used which help to reduce redundant data and receiver identifies that currently received chunk is identical to a chunk in its chunk store. for making more secure transmission RSA cryptographic algorithm may apply so that transmission become more secure against attacker.

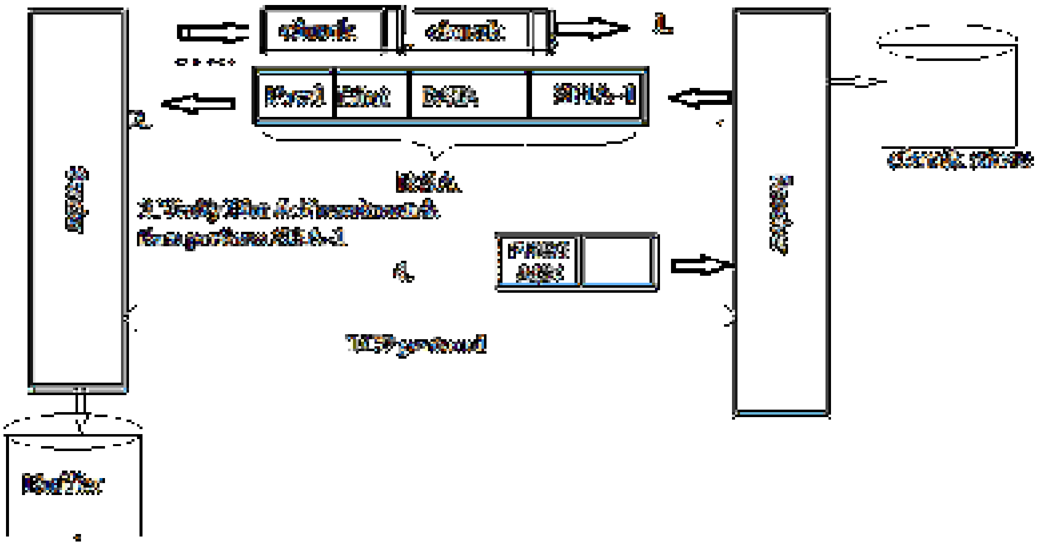

Fig.2: Working Of PACK Algorithm

4.2. Advantages

- provides high level security using RSA algorithm which prevent fraud and piracy.
- solve network traffic problem
- is suitable for use in a wide range of applications
- is fully specified and easily understood
- Eliminate redundancy
- provide reliable communication by using TCP protocol

VI. CONCLUSION

In Cloud computing platform, multiple users are accessing resources, storage and bandwidth at a time. so It may create much more traffic problem and also due to that problem traffic redundancy may increase day by day. Environmental clouds create redefines TRE system requirements, eliminate traffic redundancy over network.TRE is also used to Proprietary middle box solution inadequate that reduces a growing cloudy needs is operational the cost accounting application latencies, while user dynamics, and elasticity. The main advantage of the Pack Cloud-server is its ability to span end clients TRE effort, thus minimizing processing costs prompted by the PACK Algorithm. Unlike previous solutions don't need to Pack Frequent customer to maintain the status of server.

Limitations is that there is a security problem while sending a data in chunk for over a network so for solving this problem RSA cryptographic algorithm for key generation have to be used so that security can be achieved.

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