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CONGESTION CONTROLLING USING NETWORK BORDER PROTOCOL

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Abstract- Network congestion is basically a situation where the number of packets arriving is more than the number of packets leaving the network. Congestion in the network is increase due to the growth of usage of multimedia application. There are few primitives scheduling schemes to control the congestion in the network ,which worked only at end to end network, due to which they unable to prevent the congestion collapse and unfairness created by applications that are unresponsive to network congestion. This lead to unresponsive and misbehaving traffic flows. Using network border protocol framework we show the aggregation and connection admission control mechanisms into the NBP framework. The NBP framework provides a proper protocol designs which entails the exchange of feedback between routers at the borders of a network in order to detect and restrict unresponsive traffic flows before they enter the network, thereby preventing congestion within the network. So together we included those scheme and made improvement to make a more flexible solution for building a congestion control scheme in network using network border protocol.

Keyword- congestion control, congestion collapse, internet, network border protocol.

I. INTRODUCTION

Today rapid increase in usage of multimedia parallel the growth of internet. TCP being both a reliable protocol mostly suited for file transfer. This usually not work in transporting interactive video and sound, where reliability is a weakness rather than strength. It is called as a congestion collapse since most of the network resources transmit undelivered packets.

In this paper, we introduce and investigate a new Internet traffic control mechanism called Network Border Protocol. If packets are entered the network more faster than they leaving it, then network is like buffering or worse yet discarding the flow's packets. The network is received more packets than it handle. NBP prevent this by "protocolling" the network border, ensures that packets do not enter the network at a rate greater than they are able to leave that. This has the benefit of congestion collapse from undelivered packets, because of unresponsive flow otherwise undelivered packets never enter the network in the 1st place. First goal of NBP is to stop congestion collapse from undeliverable packet.

UDP has no mechanism to detect , or a control congestion ,which classifies it as unresponsive protocol. The low capacity sbecome a bottleneck and the network may enter into a congestion, UDP manages its transmission rate. It use almost all capacity of the link. When the self clocking TCP, congestion responsible, will slow and that decreases the good put that can go to zero. The number of TCP flow into internet is prevalent, the stableness of the network is guaranty by the congestion control mechanism as an integral part of the transport protocol.

In the presence of UDP, the situation changes, that make any existence of different transport protocols a virtual impossibility and the appearance of congestion. In research has focused on study and resolving that problems, in NBP ,all data flow are monitor and the sending rate are according to adjust

by traffic shaper placed at edge router. Next solution is the DCCP a short of a blend in UDP and TCP, where complexity is reduced to its congestion control feature. The another solution are still studying and experimented with which makes the question of suitable congestion control strategy when socially responsible and socially irresponsible protocol have to work, it is today on the internet.

II. LITERATURE SURVEY

1) **Congestion Free Router(CFR):** The paper publish in 2012 , they introduced the novel called as congestion free router(CFR). CFR is capable of preventing congestion collapse and improving the fairness of bandwidth allocations, these improvement do not come for free.
2) **Core Stateless Fair Queuing:**The university of California propose the mechanism Core Stateless Fair Queuing (CSFQ). It used to provide fair bandwidth allocation. They introduce this to promoting Fairness in the internet. This unfair bandwidth arises in the network by the variety of the reasons, like application which do not adapt to congestion.
3) **Round Trip Time(RTT):** In 2013, to maintain scalability they used the time interval feedback i.e. Round Trip Time(RTT). It is a shortest time observing algorithm. They also use the Time Sliding Window is a rate estimate algorithm that monitored each flow bit rate.
4) **Packet Drop Prevention(PDP):** In research paper publish in 2015, They propose the novel for Congestion avoidance known as Packet Drop Prevention(PDP). This help in faster data transfer without the loss of packets.

III. NETWORK BORDER PROTOCOL

NBP is a network layer congestion avoidance protocol that is placed with the stateless approach. The stateless approach, which has received a deal of research allows router on the edge of a network to perform flow and maintain flow per state but does not allows router at the network to do so. NBP control congestion collapse by a combination of flow per rate monitored at out router and flow per rate control at in router. Inrouter router send Outrouter router forward feedback packets to informs them about the flow that are control rate, and in router send Inrouter router backward feedback packets to inform them about the rate at which each flows packets are leaving the network.

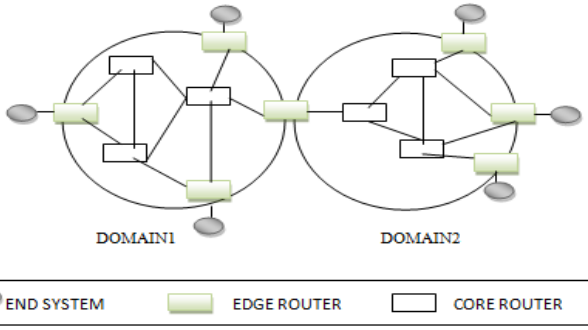


FIGURE: The core stateless internet architecture assumed by NBP

As in other work on stateless approach, we draw a distinction between two type of edge router. Based on which flow it is operating on an edge router may be viewed as an in router. An edge router operate on a flow passing into a network is called inrouter router, where as edge router operating on a flow passing out of a network is called an outrouter router.

IV. PROBLEM DEFINITION

EXISTING SYSTEM:

As a result of networks strict adherence to end to end congestion control, the current internet suffers from to maladies: 'congestion collapse' from undelivered packets and 'unfair bandwidth

allocation' between competing traffic flows. Congestion collapse from undelivered packets arises when packets that are dropped before reaching their destination continually consume. Unfair bandwidth arise due to the existence of the applications that do not respond properly to congestion to overcome the problems of congestion collapse the existing algorithms uses following concepts:

- **Retransmission of lost packets.**
- **Increment in size of queue.**
- **Slow data transmission.**

But these techniques are not advisable beyond certain limit. The internet protocols themselves can also introduce unfairness. The impact of emerging streaming media traffic on traditional data traffic is of growing concern in the internet community. Streaming media traffic is unresponsive to the congestion in a network, and it can aggravate congestion collapse and unfair bandwidth allocation.

PROPOSED SYSTEM:

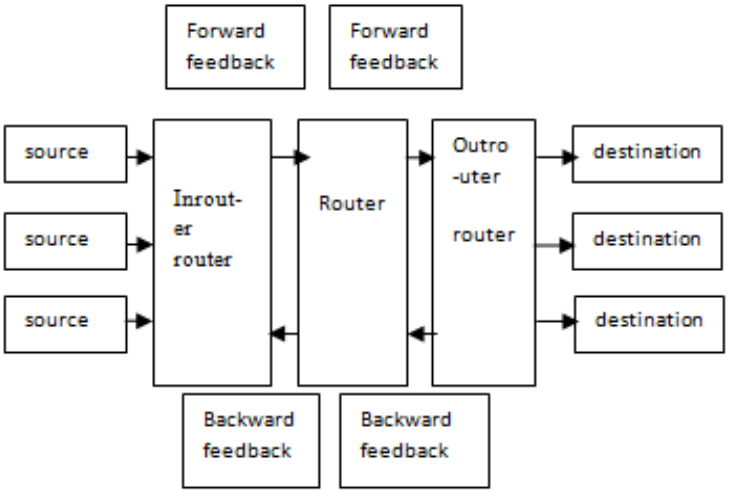
To address the maladies i.e. congestion collapse and unfair bandwidth allocation, in our proposed system we are introducing 'Congestion Free Router'. The basic principle of CFR is to compare the rate at which packets from each application flow are entering and leaving the network. If a flows packets are entered the network faster than they are leaves it, then the network is like buffer or, worse yet, discarding the flow's packet. In other word, the network is receiving more packets than it is capable of handling. CFR prevents this scenario by patrolling the networks borders, ensuring that each flows packets do not enter the network at a rate greater than they are able to leave the network. This patrolling prevents congestion collapse from undelivered packets, because unresponsive flow otherwise undelivered packets never enter the network in the first place.

To reduced the use of different types of mechanisms like Core Stateless Fair Queuing, Round trip time, Packet data prevention we introduced only single protocol i.e. Network Border Protocol (NBP).

Architectural Component:

The only component of the network that requires modification by CFR are edge routers; the input ports of OutRouter routers must be modified to perform per-flow monitoring of bit rates, and the output ports of Inrouter routers must be modified to perform per-flow rate control. In addition, both the Inrouter routers and the OutRouter routers must be modified to exchange and handle CFR feedback packets.

The input ports of OutRouter routers are enhanced in CFR.



V. IMPLEMENTATION

The various modules in the protocol are as follows:

- **SOURCE MODULE**
  The task of this module is to send the packet to the Inrouter router.
  INPUT DATA ENTITIES: Message to be transmitted from the source to the destination node in the form of packet with IP addresses for its identification.
- **INROUTER ROUTER MODULE**
  An edge router operating on a flow passing into a network is called an Inrouter router. Rate control allows an Inrouter router to police the rate at which each flows packets enter the network.
- **ROUTER MODULE**
  The task of this module is to accept the packet from the Inrouter router and send it to the Outrouter router.
- **OUTROUTER ROUTER**
  An edge router operating on a flow passing out of an network is called an Outrouter router. Rate monitoring allows an Outrouter router to determine how rapidly each flows packets are leaving the network.
- **DESTINATION MODULE**
  The task of this module is to accept the packets from the Outrouter router and stored in a file in the Destination module.

VI. CONCLUSION

To prevent Congestion, Retransmission of lost or dropped packets and increment in size of queue is not available. Also, there is a need of faster data transfer without the loss of packets while transmission. NBP is able to prevent congestion collapse by satisfying all the users demand. NBP provides proper utilization of bandwidth available to the systems. Hence based on our study packet drop preventing using NBP is a better technique for prevention of packets loss in the network.

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