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RESEARCH ARTICLE

Next Day Congestion &Traffic Management (EBFCN) with Intelligent Switch for Ethernet in Datacenters

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Abstract:

Internet 3.0 is the technology of next day which is come to replacing today's internet 2.0. The need of internet 3.0 is to make improvement in traditional networking techniques in the various sectors like lossless transmission, congestion free internet communication; minimize the delay of services especially in the Ethernet following approach at the data centers. As IEEE 802.11 standard are regulate to setup new standard of communication and data transmission with 30 years old techniques; but when the name of data centers is come it is not quite enough to work with ECM (Ethernet Congestion Management), BCN (Backward Congestion Notification), FECN (Forward Explicit Congestion Notification) or any high speed networking protocol like E-TCP, FAST TCP etc. In this paper we propose the new way of congestion control and traffic management with minimize the delay with controlling the problem of retransmission. Here we introduce the fusion of ECM, BCN and FECN as EBFCN. This is the show about EBFCN that how it perform better than the traditional proposals ECM, BCN, FECN an all the ways, a way to provide a technology based on context not on contents, support convergence instead of

complexity due to applying various techniques for same purpose with new concept of filtering as control on transmission rate of data and a brief introduction about the Intelligent Switch.

Introduction:

Since 1999when the term web 2.0 is introduce by Darcy Di Nucci& resurface in 2002 by Scott Dietzen who said that "Web in universal, standards based integration platform". Later supported by7 John Robb in inspiring words "it is a system that breaks with the old models of centralized web sites and moves the power of web/internet to the desktop". In 2004 first web 2.0 conference is held and admitted one grate feature of Web/internet as "web is platform". As the days are start crossing a rapid flood is come of technologies with intelligences are come in various applications having own standards & data bases, these intelligence named as the Harnessing collective intelligence. As the particular apps requires separate platform configuration, databases there is huge amount of data is arise at datacenters about almost all sectors of need to maintain even it is increasing day by day, this can be called as data inside Intel. The new technology are come with new features rapidly so for stay in demand and in use they need to improve their performance and this reintroduction of old face with new gadgets is formally known as versions. These new versions are advance with earlier support. All these are technical things but one more specially considerable effort done by internet 2.0 is the next level of social media it is the fire when the web start supporting tagging, blogging, sharing review, filtering, categorization and a lot of contents are available with single support. Once an object is hit on internet it becomes global itself, the users are experience the richness on internet society (be popular on social media web sites).look on the backend phase as the various technologies are arise with time now the focus is only on the light weight , fast, object oriented programming creations.

But the addition & updating can be done up to a limit because after limit it start covering the face of subject of application if all the contents which are belong or not belong to are added with single app, it causes complexity at that moment we need something that is fresh, wide, with the feature of support the previous day, today and may be in next day AND now call that name is "Web 3.0", the technology for the upcoming generation. The upcoming generation might be start using platform (web 2.0) as market. New Methods, distributed methods, load balancing, analyzing collected intelligence, defined parameters, sorted matches, filtered responses & improving speed of data transmission, categorizations of applications & database linking (which are complement of each other). As the platform is online no need to have permanent configuration; online users can operate as wish to direct through instructions. Richness be experiences good for a period but only exist when we off, it is for forever. Contexts have an explanation but contents create complexity to control, maintain & focus so simplification & self-description of web page is needed. The programming methods are also changes light weight programming is turn in to automated programming; which support the open source library, reusability of contents, virtual use of previous codes no need to define structure , objects or complete developments of backend actions that is effort to reduce the cost of software development. The various technologies are developed to control the congestion & flow of transmission. In the paper we introduce the EBFCN as the god of congestion control in Ethernet at data centers.

Existing Work

In the present day everyone want to be part of everything without being dedicated part of structure ,we wants every update is exist in our notification even no matter where we are. For solving this

communication with moving connection we organize our network under the name of Ethernet (a network or current age which is take over the other network models like high speed connection oriented internet). Because these regular technologies are make datacenters to be compatible with the lossy or delayed operations. Datacenter networks runs without accepting the loss of single packets to avoid the further repair techniques such as retransmission. As the datacenters works with high speed and heavy data loads there is high chance to get congestion during the transmission of packets from one end to another end. To establish an error free, congestion free we have to follow two rules:

1. The length of queue of data and file is should be small as it doesn't effect as wait state for another transmission of data.
2. Select a congestion control approach which is faster, stable, fair and on track regularly.

As we knows that the regular technologies are following various approach like TCP, HTCP, MTCP and many more since they developed, they might be helpful in future but when we discus as the huge amount of data as the rapid transmission of large data file at the datacenters networks it may be causes delay and the delay and loss of single packet is no acceptable because the sense of whole message is may be got disturbed and result may be very out of expectations. To recover from loss and delay we use these technologies ECM, BCN, FECN etc.

ECM (Ethernet congestion management) is work with negative sign because it feedback to reduce the rate of transmission when the hit rate is come to near the point of congestion or wait state the main limitation of Ethernet congestion management techniques is that it doesn't send an acknowledgement signal with the transmission rate may be improver. Here the improvement is stands when the transmission rate is quite low then the capability of the carrier medium to obtain the most utilization level and makes a considerable change in performance of the data transmissions at the datacenters networks.

BCN (Backward control notification) is work with spontaneous shot action phenomenon, it well known for its feature of immediate response when any error/disturbance/congestion occur when the data is transmitting between the end connection and the datacenters. The packet stream which is got break during transmission due to congestion or loss of path send an immediate single to the source to retransmit the data file when the well suit is found and receiver is sends acknowledgement single as the transmission is done in successful manner. Today BCN is considerably used because of its high throughput, low queue delay, fairness and robustness. When the all these considerable features are stand behind the name of BCN there is great problem of BCN is that it can performs only for the special formatted data transmission. The data/file should be formatted according to classification of format standards which can be recognize by the legacy switches of BCNs.

FECN (Forward Explicit Congestion Notifications) the function of operation is just similar to the BCN but it focus on the rate management and the check signal is sends after a fixed interval of time. This check signal (formally called probe) pass through the switches and returned to the sender end, this check signal is ensure that the working of the system is gradually according to the exact rate of transmission as the signal return source end is aware to keep the current rate of transmission or to reduce or to increase. As the each coin have two face FECN also have disadvantage that it might recognize error or congestion only when the signal stick back to the source end, what if the congestion occur when the signal passed or the delay in the way of transmission arise when the probe passed earlier because there is no way to avoid the

congestion until the probe detect the congestion sometimes it might be causes heavy congestion issues at the high rate and may be harmful for the continuous transmission of data files when the data is to be transmitted in large amount. Second drawback of FECN is its forward approach that the congestion is can be notice when the signal returns to the source end not like as in BCN immediate acknowledgement as the congestion arise. FECN support overhead control up to 20bytes that may be predictable at low level on the bases of similar cases in the past or sometimes beneficial for unconcerned problems in the form of first encounter of problem.

Way to Perform without Loss (purposed work)

ECM works with two phase the source end repair the path or retransmits the single immediately after the getting feedback from the congestion point in the reverse direction switch to source but it also reduces the transition rate of data files to reduce the work load and to control & setup a continuous error free link for long time but what is the proper connection is working below its performance that is expected form rate of transmission. ECM never respond to improve the rate of data transfer or the path density is below its capacity so we add the BCN, ECM, FECN inside single structure.

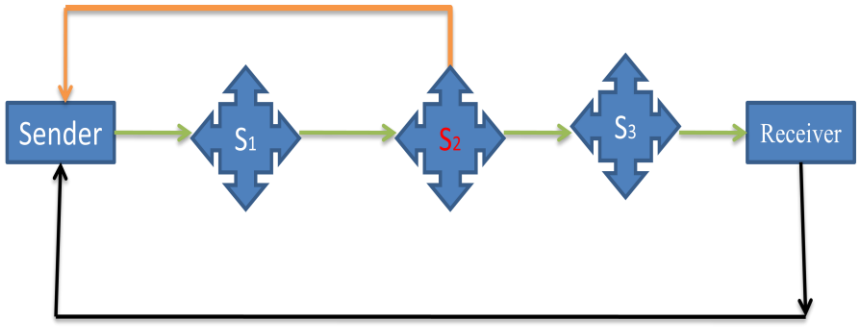
A centralized power controller of combination of these helps to keep the network congestion free and controls the flow of all particular functions of data centers.

Steps that to be Follow under the name of EBFCN:

1. The architecture to organize the transfer of data file at the data centers should be as in ECM, the switches will ends feedback direct the source end.
2. The transfer rate is control as per in BCN full strength of transmission is keep to obtain the maximum utilization of medium.
3. Flow rates should be keep smooth and simultaneously check as per in the FECN.
4. The switches experience the speed and congestion of packets so allows the switch to control the queue length of data.
5. A filter is to be set to measure the standard of transmission as average, danger and good. As the rate goes poor or below average it increase the transfer rate ;second if it good then keep it and third one as it reach a level of congestion it might be reduce the rate of transmission.

How it works:

We study the working of EBFCN by dividing it into three cases; each case contains the point of view how we deal with the problems in Ethernet at data centers.
Case (1):
Here we have two end points as Sender and Receiver with three switches S_1, S2, S3. The data is transfer from Sender to Receiver is through the switches as the transmission media is capable to keep the smooth transmission from one end to another end (as it shows in fig with the help of **orange line**). The switches will hand over the data/files to next one until the destination end is not come.



EBFCN model Diagram

Case (2):

As we know that no one network is can be 100% congestion free; lets discuses a situation as the congestion occur at switch S_2 then it works on the two phase architecture (as in ECM) the switch S_2 is capable to directly sends the acknowledgement to the source end (as shows in fig with the help of **green line** as in BCN) to retransmits that data streams without holding out all the data transmission (as in FECN).

Case (3):

Here we discuss the two greatest feature of EBFCN how it transmit the data & how it overcome the congestion circumstances. One more advance property of EBFCN that it consists of clock check feature as in FECN to justify that the all units are functionally performed as expected or not as this clock signal reached at the source end to destination point it will be retransmitted to the source end as per shows in fig with the help of **black line.**

A Predicted comparison of ECM, BCN, FECN and EBFCN

Parameters	ECM	BCN	FECN	EBFCN
2-Phase Architecture	Supported	Not-supported	Not-supported	Supported
Transfer rate control	Not- supported	Minimum	Good	Perfect
Low wait state	Not – supported	Supported	Not- fix	Improved
Clock check	Not supported	Not supported	Supported	Supported
Intelligent control	Not supported	Not supported	Not supported	Supported

Intelligent control: As the name of switch is encountered in the networking field then we have to say just few lines likes "Switch; it is networking device which is used to connect various computer, network devices and network segments with each other. It is the improver version of Network Bridge so sometimes it is also called as multi layered switch. Normally network switch is work on the data link layer. But today we can see the switches which are can be work on the network layer & transport layer these switches are named as the layer-3 switches as a switch can be work on the both data link layer and

network layer it can be named as multilayer switch". Here we want to purpose a new concept about the most common interconnecting device name as "Switch" under the name of Switch for Next Age. Our view is based on some real life approaches which are works like switches that are already in uses. For example: - some time we visit on a dam, there we can see a scale that contains some points like.

The level of water is measure with the help of that scale is it normal, low or danger. According to the situations the flow of water is controls with the help of Dam's gates. Here we want to use the Switch as the water measure scale and intelligent device that is capable of sends acknowledgement signal to the source end to control the transfer rate as per need.

Congestion region (>M-1), good (M-1), Average (M-1<AVG<poor), Poor (P<AVG

Transfer rate Management with the Advance age Switch.

When the transfer rate is below the good strength then it will sends a signal to the source end to increase the rate of data transmissions. On the another hand as it encounter the transfer rate of data is higher than the good sign then it will send another signal to source end to reduce the rate of data transmission to keep the error and congestion free data transmission. This will helps us to setup an intelligent control on the interconnecting devices or media to perform better.

Conclusion and Future Work

Various schemes are introduced for traffic and congestion management to IEE802.1standards. Many variations of these advance approaches like BCN, FECN in this paper we study how these approaches are not so beneficial as they discuss, and we introduce a new way of use of switches to build an intelligent control for the flow management. We discuss ECM as multiple two phase architecture used for error control mechanism in which the congestion unit is directly inform the source end to retransmission of data.

This paper contains the fusion version of multiple advance approaches to overcome their limited drawbacks. The support and advance face of next day congestion & traffic management is introduced with the name of EBFCN.

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