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Improvement Congestion Control in Computer Network

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***Abstract*: Congestion is understood to happen in the network while the resource demands more than the capability and packet lost because of traffic in the network. Throughput might be dropped to zero and path delay is too high during congestion. A congestion organizing system helps the network to recover from heavy traffic. Congestion avoidance systems permit a network to function in the section of small delay and elevated throughput. These systems avoid a network from incoming the overcrowded position. Congestion prevention is a preclusion method whereas congestion manages is a recovery system. To compare the congestion avoidance by means of flow control and congestion control. Various possibilities are there to avoid congestion, among few were selected for learning. The major goal of this study is efficient, fair, dynamic, convergent, robust, distributed, configuration independent, networks to be designed.**

***Keywords*: congestion control, flow control, congestion avoidance.**

1. Introduction

Current technical progress in computer networks results that considerable amplify in the bandwidth of networks. The ARPAnet was deliberated in 1970 by using telephone lines contains a bandwidth of 50 Kbps. LANs Ethernet and token ring are introduced in the month of 1980 with 10Mbps capacity [1]. The gradually growing bandwidth of networks would go ahead judge that congestion is a problem in networks. Congestion control has been receiving increased attention lately due to an increasing speed mismatch caused by the variety of links that compose a computer network today [2]. Concept of congestion as show in figure 1.

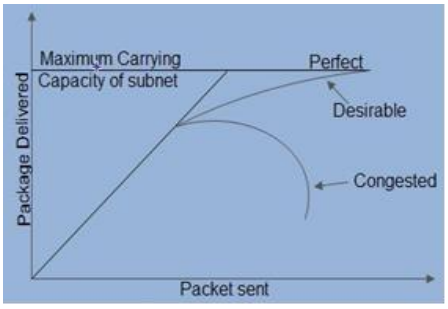

Fig. 1. Concepts of congestion

2. Basic concepts

The basic concepts of flow control, congestion control, and congestion avoidance are related but distinct. All the above parameters are interrelated and they are solved by using resource management. They are dissimilar since they resolve supply struggle either in dissimilar elements of the system or in a dissimilar way. We also indicate that how declining memory usage or rising relation bandwidth and workstation speed is not enough to solve.

A. Flow control

A simple two nodes are interconnected via a link as shown figure 2. Without control, the source will send packets with considerable fast to destination [03]. It causes the overflow and leakage at destination. The overflow leads to packet loss, retransmission etc. Different types of flow control protocols are as shown inn figure 3.

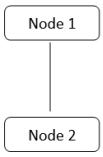

Fig. 2. Node to node connection

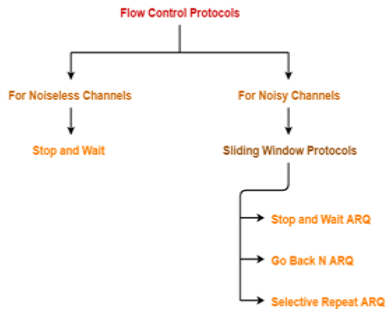

Fig. 3. Flow control protocols

B. Congestion control

In connection-oriented networks the congestion troubles are normally resolved by reserve the resources at all routers during connection. In connectionless networks it can be done by

Table 1
Increase/decrease algorithms

PROCEDURE increase(w,wmax,wused);	
REAL s;	!Computed window (real valued);
INTEGER smax;	!Window permitted by destination;
INTEGER sused;	!Window used (integer valued);
BEGIN	
s:=s + 1;	!Go up by 1;
IF (s > (sused + 1)) THEN s := sused + 1; !No more than 1 above last used;	
IF (s > smax) THEN s := smax;	!Obey destination;
sused:=Entier(s + 0:5);	!Entier(x) gives an integer x;
END of increase;	
PROCEDURE decrease(s,sused);	
REAL s;	!Computed window (real valued);
INTEGER sused;	!Window to be used (integer valued);
BEGIN	
s := 0:875 s;	!Multiplicative decrease;
IF (s < 1) THEN s := 1;	!Do not reduce below 1;
sused:=Entier(s + 0:5);	!Round-o ;
END of decrease;	

explicit messages (choke packets) from the network to the sources [4], or by implicit means such as timeout on a packet loss. Jain [5] and Ramakrishna [6] have discussed a number of schemes for congestion control and analyzed a timeout-based scheme in detail. Figure 4 shows the congestion in computer network. Figure 5 shows congestion prevention methods.

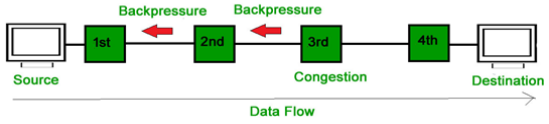

Fig. 4. Congestion in computer network

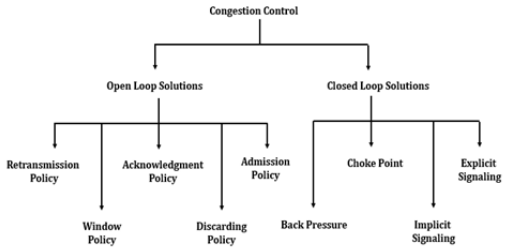

Fig. 5. Congestion control techniques

3. Design requirements

Before going to see various congestion control method, we have to know the design requirements. They are.

Performance metrics: The performance of the computer network can be measured by throughput and response time. Most important applications of computer network is mail, file transfer and remote login. The following increase/decrease algorithm controls network [7]. Considered two types of increase/decrease algorithms:

Additive - The window is increased or decreased by a fixed amount. s = s + K

s = s+ k2

Multiplicative - The window is increased or decreased by a fixed multiple. w = r1w; r1 > 1

s = r2s; 0 < r2 < 1

More general increase/decrease algorithms using linear and non-linear functions of the window were also considered and are described in Part 3 of this report series [08]. Here, we concentrate on choosing one of the following four combinations:

1. Multiplicative Increase, Multiplicative Decrease
2. Multiplicative Increase, Additive Decrease
3. Additive Increase, Additive Decrease
4. Additive Increase, Multiplicative Decrease

4. Conclusion

The paper presents controlling of congestion and flow control. Different protocols and methods are available. The proposed increased or decreased algorithm can improve the performance of the computer network.

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