International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 2 Issue 3, March - 2013

Queue Processing: Transmit A Packet From Source To Destination

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Abstract

we focus on concept of queue, is like a storage location containing the packets whose transmit from source to destination successfully. Queue is playing an important role for router, select the path .in autonomous system queue is between node to node to node delivery and select the path. here we also focusing on bit error rate.

Keywords- Queue,Bit Error Rate

1.Introduction

whenever a path established between source to destination the routing protocol establish a buffer/queue for every incoming packet to store and then forward packet to next node, containing no. of packets to be transfer.

1.1Queue:

A queue is a location (or buffer) containing a finite number of Data/Packets waiting for an action like transfer In networking, a queue is the place where packets wait to be transmitted packet In the simplest model, packets are transmitted in a first-come first-serve basis(FIFO),or simply Queue is a mechanism to transfer a packet from each intermediate node to destination node in first come(in) first serve(out) manner.

Incoming----------| |----------outgoing
Source---- (no of packets) -----Queue1-------- (no of packets)-----Queue2------(no of packets).....Destination

Note-From source to destination every incoming packets enters queue do process and out from queue as outgoing packets and these out going packets act as incoming packets for another queue and so on.....
A queue becomes much more interesting when coupled with other mechanisms which can delay packets, rearrange, drop and prioritize packets in multiple queues. Allow for complexity of behaviour in a scheduling operation.

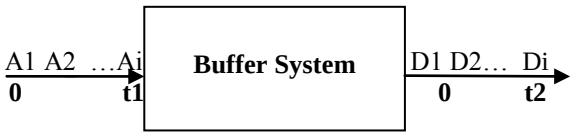


Figure 1. Buffer system with arrival and departing nodes

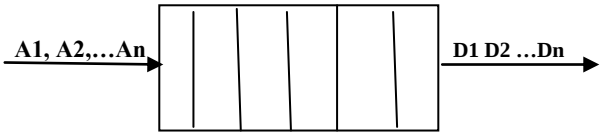
A1,A2,…Ai is the arrival packets and D1,D2,…Di is the departing Packets. 0-t1 and 0-t2 is the time interval for arrival and departing time.

1.2Queuing delay

Queuing delay is the time a job waits in a queue until it can be executed. When packets arrive at a router, they have to be processed and transmitted. A router can only process one packet at a time. If packets arrive faster than the router can process them (such as in a burst transmission) the router puts them into the queue (also called the buffer) until it can get around to transmitting them.
The maximum queuing delay is proportional to buffer size. The longer the line of packets waiting to be transmitted, the longer the average waiting time is, and when the buffer fills the router must drop packets.

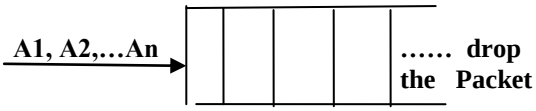
Example:
Arriving node [A1, A2, A3 ,.. An]
Departing node [D1, D2, D3,… Dn]
Queue length-depends upon packets
Time-1 m/s

Case-1 if no of packets is equally proportionate to capacity of buffer



N no. of packets to be stored

Case-2 If no of packets is larger than capacity of buffer then packets is drop and retransmit the packets.



2. Bit Error Rate

The bit error rate(BER) is an indication of how often a packet or other data unit has to be retransmitted because of an error. Too high a BER may indicate that a slower data rate would actually improve overall transmission time for a given amount of transmitted data since the BER might be reduced, lowering the number of packets that had to be resent. It is the percentage of bits that have errors relative to the total number of bits received in a transmission.

Table 1. Error rate differences

Source	B	C	D	E	F	G
A	5	6	5	5	6	4
B	3	4	4	5	5	4
C	6	5	5	6	4	6
D	2	3	3	4	3	5
E	4	3	5	4	3	3
F	5	6	5	5	6	4

For Row 1 difference is- 0+1+2/3=1
For Row 2 difference is-0+1/2=0.5≈1
For Row 3 difference is-0+1+2/3=1
For Row 4 difference is-0+1+2/3=1
For Row 5 difference is-0+1+2/3=1
For Row 6 difference is-0+1+2/3=1

Because of these errors the transmission is delay and resulting retransmit the packets, faced problem like repeated the process like buffering and very time consuming.

3.Mapping

Source ----.intermediate nodes-----incoming packets - router take packets and gave to --------- **buffering**-----outgoing packets-router fetch the packets……..**destination**

If receiving packets having errors then retransmit the packets.This mapping shows about the actual path established between source to destination and every intermediate node act as source node as well as destination node .

Figure2 shows intermediate node between source to destination,each node having buffer.

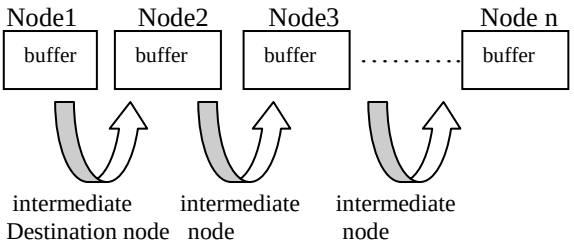


Figure 2. Communication using buffer between nodes

this figure shows node1 having buffer and used for stored data ,before transferring data/packet this act as source for node 2, is destination for node1 .
after receiving data node 2 act as source for node 3. After getting packets node2 act as source and node 3 is destination and so on.

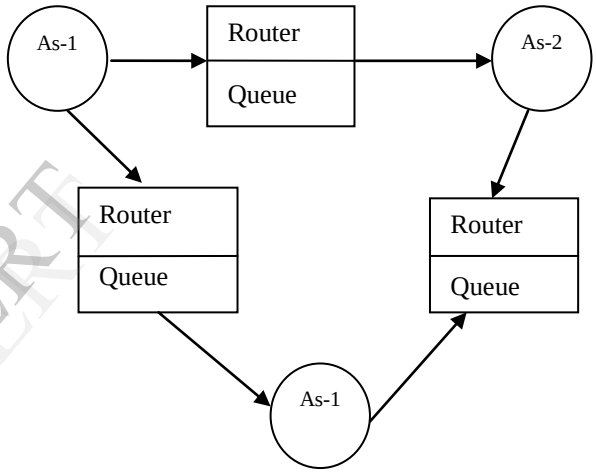


Figure 3. Autonomous system with router,communication with each other

Autonomous systems just like an interdomain network which no of nodes connected and communicate with each other. routing protocol use the buffering(means store packets for a time limit and forward), for transmit packet from node to another node and finally reach destination.AS-1,AS-2,AS-3 create a fully selected network for communication purpose. Structure of AS-1,2,3 like a simple network.

4.Conclusion

Packets transmit from source to destination router use the queue /buffer for forwarding the packets these queues working in FIFO manner. An autonomous system having multiple nodes and router using queue for transmit the packet from source to destination, but some reasons like delay, error rate causes retransmit the packet.

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