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RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

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- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

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UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

COMPARATIVE ANALYSIS OF THE PARAMETERS OF DYNAMIC CHANNEL ALLOCATION FOR COLLISION LESS DATA TRANSMISSION

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ABSTRACT

Channel allocation deals with the allocation of channels to cells in a cellular network. Once the channels are allocated, cells may then allow users within the cell to communicate via the available channels. Channels in a wireless communication system typically consist of time slots, frequency bands and/or CDMA pseudo noise sequences, but in an abstract sense, they can represent any generic transmission resource. In Dynamic Channel Allocation (DCA) frames are transmitted. During the transmission of the frames, collision might be occurring, which make the retransmission of the frames .Transmission of the frames can be done either in continuous time or in a slotted manner. Sensing of the channel is also providing help during the transmission. A single channel is used for the whole communication.

KEYWORDS

Channel acquisition, pseudo noise sequences, offered traffic, frequency reuse, non-uniform.

INTRODUCTION

In this paper we describe a description of channel's Parameter over Dynamic Channel Allocation. Parameters define about Channel Capacity, sensing, Multiple Channel Connections, Packet Transmission, Frame relay and Congestion over transmission.

In dynamic channel allocation all sufficiently high-quality, un-interfered channels can be allocated to users becoming active [3].The demand for wireless telephony and multimedia services is growing at an increasing rate [2].Access Point is the slot, Which is used to connect the multiple system with the common medium. Frequency allocation is similar for the channel. All APs share the same frequency, which increase collision that should be minimized and avoided if necessary, using parameters of channels. The Channel parameters in use should be tailored to the channel Conditions. In cell manner frequency can be reused so that channel utilization can be improved.

PARAMETERS FOR DCA

1:- STATION MODEL

The model consists of N independent stations. Each station generates one frame at a time, and is blocked until the previous frame has been successfully transmitted. That is, a station cannot have multiple frames queued for transmission. In practice, Ethernet, for example, requires a 100 bit transmission time gap between consecutive frames

FRAME TRANSMISSION

Whenever an end station MAC receives a transmit-frame request with the accompanying address and data information from the LLC sub layer, the MAC begins the transmission sequence by transferring the LLC information into the MAC frame buffer.

- The preamble and start-of-frame delimiter are inserted in the PRE and SOF fields.
- The destination and source addresses are inserted into the address fields.
- The LLC data bytes are counted, and the number of bytes is inserted into the Length/Type field.
- The LLC data bytes are inserted into the Data field. If the number of LLC data bytes is less than 46, a pad is added to bring the Data field length up to 46.
- An FCS value is generated over the DA, SA, Length/Type, and Data fields and is appended to the end of the Data field.

After the frame is assembled, actual frame transmission will depend on whether the MAC is operating in half-duplex or full-duplex mode.

The IEEE 802.3 standard currently requires that all Ethernet MACs support half-duplex operation, in which the MAC can be either transmitting or receiving a frame, but it cannot be doing both simultaneously. Full-duplex operation is an optional MAC capability that allows the MAC to transmit and receive frames simultaneously.

2:- SINGLE CHANNEL ASSUMPTION

A single Channel is available for all communication. All stations share one medium. All stations can transmit on it and all can receive from it. The QoS is always a major concern for the services offered through cellular systems and it is observed that there are always trade-offs among various parameters [5].

The increasing number of higher data rate devices clearly states that dynamic channel allocation with some innovative techniques will help solve the problem of spectrum efficiency [6].

3:- COLLISION ASSUMPTION

When two or more frames are transmitted at the same time and a collision takes place. Frames involved have to be retransmitted. If two devices send a frame at the same time, the two electrical, optical or radio signals that correspond to these frames will appear at the same time on the transmission medium and a receiver will not be

able to decode either frame. Such simultaneous transmissions are called collisions. A collision may involve frames transmitted by two or more devices attached. If transmitted frames overlap in time, the resulting signal is garbled. Frequency assignment is a major problem in designing wireless networks [4].

4:- TRANSMISSION DISCIPLINE

In computer networking and telecommunication, a frame is a digital data transmission unit that includes frame synchronization, i.e. a sequence of bits or symbols making it possible for the receiver to detect the beginning and end of the packet in the stream of symbols or bits. If a receiver is connected to the system in the middle of a frame transmission, it ignores the data until it detects a new frame synchronization sequence.

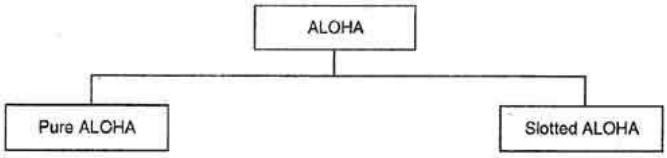
CONTINUOUS TIME

Frames can be transmitted at any time

Slotted time

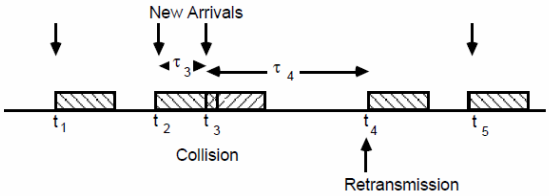
Frames can be transmitted at particular time points
During transmission frames may be collide with each other and they find acknowledge with the delivery that either frames are deliver or to be resend.
Aloha is a multiple access protocol at the data link layer and proposes how multiple terminals access the medium without interference or collision.
There are two different versior.s/types of ALOHA:

(I) PURE ALOHA



Types of ALOHA

- In pure ALOHA, the stations transmit frames whenever they have data to send.
- When two or more stations transmit simultaneously, there is collision and the frames are destroyed.
- In pure ALOHA, whenever any station transmits a frame, it expects the acknowledgement from the receiver.
- If acknowledgement is not received within specified time, the station assumes that the frame (or acknowledgement) has been destroyed.
- If the frame is destroyed because of collision the station waits for a random amount of time and sends it again. This waiting time must be random otherwise same frames will collide again and again.
- Therefore pure ALOHA dictates that when time-out period passes, each station must wait for a random amount of time before resending its frame. This randomness will help avoid more collisions.
- Figure shows an example of frame collisions in pure ALOHA.

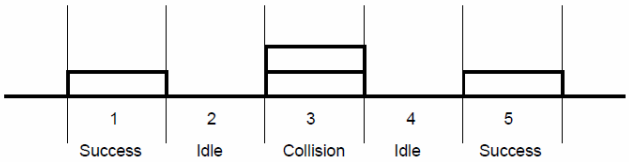


- In fig there are four stations that .contended with one another for access to shared channel. All these stations are transmitting frames. Some of these frames collide because multiple frames are in contention for the shared channel. Only two frames, frame 1.1 and frame 2.2 survive. All other frames are destroyed.

(II) SLOTTED ALOHA

When a node has a packet to send, it waits until the start of the next slot to send it – Requires Synchronization[1].

- Slotted ALOHA was invented to improve the efficiency of pure ALOHA as chances of collision in pure ALOHA are very high.
- In slotted ALOHA, the time of the shared channel is divided into discrete intervals called slots.
- The stations can send a frame only at the beginning of the slot and only one frame is sent in each slot.



- In slotted ALOHA, if any station is not able to place the frame onto the channel at the beginning of the slot *i.e.* it misses the time slot then the station has to wait until the beginning of the next time slot.
- In slotted ALOHA, there is still a possibility of collision if two stations try to send at the beginning of the same time slot as shown in fig.
- Slotted ALOHA still has an edge over pure ALOHA as chances of collision are reduced to one-half.

5:- SENSING CAPABILITY

A collision occurs when two or more workstations listen to the medium at the same moment, hear nothing, and then transmit their data at the same moment.
Station cannot sense the channel before trying to use it.
Stations can tell if the channel is in use before trying to use it
Listen while talking! If another transmission is sensed, discontinue the transmission. Send a jamming signal.

A. TIME DIVISION MULTIPLE ACCESS

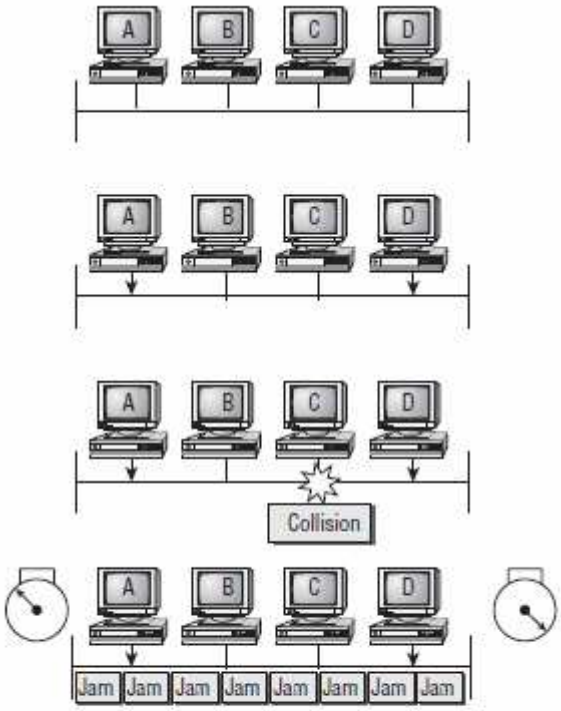
Time is slotted. A station gets the slot on a round robin fashion. A type of polling scheme (Hub polling as opposed to roll-call polling).
If station doesn't use its slot, it goes idle.
Highly efficient in heavy traffic, poor in low traffic

B. FREQUENCY-DIVISION MULTIPLE ACCESS:

Same as Time-division, but this time on a broadband cable allocating its frequency-bands to different stations on a rent or a lease basis.
Poor efficiency if not used.

C. BIT-MAP PROTOCOL

Time is slotted and these slots are to be grabbed. Stations indicate their willingness to grab a slot on a contention-slot train in the order of their ID. After that, they get the time slots in the order of their appearance on the train slot.
CSMA/CD was created to overcome the problem of those collisions that occur when packets are transmitted simultaneously from different nodes. And trust me—good collision management is crucial, because when a node transmits in a CSMA/CD network, all the other nodes on the network receive and examine that transmission. Only bridges and routers can effectively prevent a transmission from propagating throughout the entire network! When a host wants to transmit over the network, it first checks for the presence of a digital signal on the wire. If all is clear (no other host is transmitting), the host will then proceed with its transmission. But it doesn't stop there.



Carrier Sense Multiple Access with Collision Detection (CSMA/CD)

When a collision occurs on an Ethernet LAN, the following happens:

1. A jam signal informs all devices that a collision occurred.
2. The collision invokes a random backoff algorithm.
3. Each device on the Ethernet segment stops transmitting for a short time until their backoff timers expire.
4. All hosts have equal priority to transmit after the timers have expired.

CSMA/CD is a set of rules determining how network devices respond when two devices attempt to use a data channel simultaneously (called a collision). Standard Ethernet networks use CSMA/CD to physically monitor the traffic on the line at participating stations. If no transmission is taking place at the time, the particular station can transmit. If two stations attempt to transmit simultaneously, this causes a collision, which is detected by all participating stations. The stations that collided attempt to transmit again after a random time interval. If another collision occurs, the time intervals from which the random waiting time is selected are increased step by step. This is known as exponential back off.

CONCLUSION

Collision can never be halt but we just avoid it. With this paper we would like to show the role of parameters in dynamic channel allocation.

All the parameters work at their different level for the transmission of data. Frames collide some times with high traffic load and have to be retransmitted, so with these parameters DCA shows transmission of data with less collision.

Future work: - In channel allocation methods there are lots of factor which are change with time i.e., noise, load, number of users in limited network and so on. So a wide range of network is needed for the collision free fast transmission.

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6. Dynamic Channel Allocation Considering Random User Distribution and Mobility Rushabh Vora, Sagar Tamboli, Priyanshu Shah & Sukanya Kulkarni,Department of Electronics and Telecommunication, Sardar Patel Institute of Technology, Mumbai, India
7. DISTRIBUTED DYNAMIC CHANNEL ALLOCATION ALGORITHM FOR CELLULAR MOBILE NETWORK 1Megha Gupta, 2A.K. Sachan 1Research scholar, Deptt. of computer Sc. & Engg. S.A.T.I. VIDISHA (M.P) –INDIA.

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Thanking you profoundly

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