SMVS Page No. Date : Unit: 3: Data Link Layer When AREA Explain Data Link Layer with its Design Issues. X => Data Link Layer is second layer of OSI Model which is present after the Physical Layer al-dome not it al sind of Data Link Layer is maintane the data between host and nodes mother dur hand at and les mability includer Data Link Layer is transfer datagram across an individual link in Network M. Lihich Dro In this Layer, communication channel connects the nodes which is called link. The Data Link Layer it is divided into to sublayer. CJ Logical Link Control C2) Media Access Control સંચમઅને સાદગી દ્વારા જીવનમાં શાંતિ અને સંતોષ અનુભવાય છે.

SMVS Page No. Date 1 Logical Link Control: This Layer is control Flow control, synchronization and error checking in data link layer. Make contration 2 Media Access Control: BUT THAN This Layer is controls the flow and multiplexing For transmission medium. -> This are the main design issues in Data Link Layer in all a Services Provided to the Network Layer The Jata Link Layer is provides service interface to Network layer which transfer data From network layer to machine b Frame Synchronization: Data is send in the Forme of Frame in which we have to define starting and ending વાંચવા-વિચારવા કરતાં વર્તનમાં ઉતારવું વધુ જરૂરી છે.

SMUS Page No Date of each Frame by the destination machine. C Flow Control: Flow control is used to prevent the Flow of data Frame at the receiver end. Error Control: Error Control is used to prevent the duplication of Frame at the receiver end Explain Data Link Layers * Services. =>There are three types of Services is provides by a Data Link Layers. C1) Unacknowledged Connectionless Service C2) Acknowledged Connectionless Service C3) Acknowledged Connection-Oriented Service. સંચમઅને સાદગી દ્વારા જીવનમાં શાંતિ અને સંતોષ અનુભવાય છે.

SMVS Page No. Date : 1 Unacknowledged Connection-less Services In this services, there is no need need to create Logical connection and no need to get acknowledgement of connection. In this services, Source machine cand send the Frame without knowing the any problem. Source Machine does not require Frame transfer acknowledgement From destination machine. HIME DENGS There is no connection is create between source and destination machine IF any frame is lost, there is no need to attempt recovery From Source machine 2 Acknowledged Connection-less Services or out of white some In this services, there is no need to create the Logical ા મહાનુક વિવાચવા-વિચારવા કરતાં વર્તનમાં ઉતારવું વધુ જરૂરી છે.

SMVS Page No. Date : connection and no need to get acknowledgement of connection. In this service, source machine is send the data Frame and wait For get acknowledgement Form destination machine This service is follows stop and wait protocol was have Source Machine have to wait For get acknowledgement in some time period. IF According to time period Source Machine does not get acknowledement than it will be again send. adian Acknowledged Connection - Oriented Service: tourstation at In this service, source machine have to create logical connection to the destination machine. સંચમઅને સાદગી દ્વારા જીવનમાં શાંતિ અને સંતોષ અનુભવાય છે.

SMVS Page No. Source Machine have to wait For get acknowledgement From the destinction machine. In this service, every Frame has one number and according to its number Frame is transfer After every Frame transfer, source machine get acknowledgement. * Explain Framing in Data link layer =) In Data Link Layer, Data is transfer into Form of Frame. Source machine is send the Data in the Form OF Frame and destination machine is collect the Data in the Form of Frame. Frames provides a way for a source machine or sender to transfer the set of Data to the receiver િ લયગગામ આપણે વિવાચવા-વિચારવા કરતાં વર્તનમાં ઉતારવું વધુ જરૂરી છે.

SMVS Page No. Date : Erame Structure is content three parts. Adidable recit South Ci) Header cii) Data Ciii) Trailer 1 Am Header Data Trailer Frame Meader is consis contain the error - checking codes. A Providence There are two types of Frames. N RANNER T- I THAT AT ca) Fixed-size Cb) Variable - Size ALLA DOLLAR Eixed Size : and add The size of the Frame is Fixed and we do not have to Provide Frame Boundaries The length of the Frame is fixed So, We can send less Duta.

SMVS Page No. Date : 1 Variable Size: The size of the Frame is not not Fixed and we have to provides boundaries of the Frame We have to declare two things For this Frame. Ci)Length Field cii) End Delimiter cis Length Field : Length Field in a Frame which indicates the length of Frames. ciis End Delimiter: End Delimiter in a Frame which indicates the end of the Frames There are two way to solve End Delimiter. --- (at 10) Ca) Byte Stuffing CODBit Stuffing ALLE COMPANY AND Byte Stuffing: In this method, We have to stuffe the extra Byte in Frame ત લાગગાનુરુ ખીત્રો વિવાચવા-વિચારવા કરતાં વર્તનમાં ઉતારવું વધુ જરૂરી છે.

Page No. Date : Flag Header ESC Extra 2 byte stuffed ESC ESE Elas Header ESC T Extra Butes Bit Stuffing: In this method, we have to add extra bit in the Frame Explain Flow Control ¥ and Error Control in Data link layer. Flow Control Flow Control is used to prevent the Flow of data Frame at the receiver end. Flow Control is control the rate of Frame transmission at the receiver end संयमअने साहगी दारा जुवनमां शांति अने संतोष अनुलवाय छे.

SMVS Page No. Date : Flow control prevents the loss of Jata and avoid over running of receive buffers. Stop and Wait Protocol and Sliding Window Protocol are Flow Control method. => Error Controlington Error Control is used to prevent the duplication of Frame at the receiver end Error Control is used to transfer of error Free data from the sender to receiver machine. Error control is used to def detect and correct error occurred in the Frame at The main function is helps to dealing with damaged frames in Data link layer Stop and Wait ARQ Protocol and Sliding Window ARD Protocol are Error Control method ર કારમગુરાજ મંદ્રિઝ નિવાચવા-વિચારવા કરતાં વર્તનમાં ઉતારવું વધુ જરૂરી છે.

SMVS-Page No. Date : Explain Stop and Wait Protocol ¥ For Data Link Layer Stop and wait Protocol is $=\rangle$ Used to control Flow transfer between Sender and Receiver. There are Two type of Stop and Wait Protocolation 104 Ci)Simplex Stop and Wait cii) Stop and Wait with ARQ ci) Simplex Stop and Wait: his Protocol is used For transfer the data over ther noiseless channel Simplex Stop and wait Protocol is provides unidirectional data transmission Flow Sender can sends the one data packet at a time Sender can receive the data packet receive acknowledgment.

SMVS Page No. Date : Sender Receiver Data Acknowledgment Data Acknowled gment Receiver can receive the Data Packet that can be send by the sender Receiver can send the acknowledyment to the sender cii) Stop and Wait with ARQ: Sender can send the data packet to the receiver and wait For the receiver's acknowledgment In stop and wait with ARQ Protocol, we have to use two things, ાગગ્યાહાર ગાંધા િવાંચવા-વિચારવા કરતાં વર્તનમાં ઉતારવું વધુ જરૂરી છે.

SMVS Page No. Date : 1 cas Timeout CD) Retransmission cas Timeout: Sender can wait the receiver's Acknowledgment. In Timeout, w ther In this method, sender have to wait Particular time For receiver Acknowledgment. After the time out, sender can again send the data Packet Sender Receiver Data 1 Timeout Retransmission ACK-1

ાટલ તસંયમઅને સાદગી હારા જીવનમાં શાંતિ અને સંતોષ અનુભવાય છે.

SMVS Page No. Date : (1) Retransmission: AFter the timeout completion. Sender can retransmiste the Data Packet * Explain Sliding Window Protocol with its types. => The sliding Window Protocol is used to send multiple Frame at a time. This Protocol is remove the disadvantages of stop and wait Protocol. There are two types of sliding Window Protocol. - Ci) Go-Back-N ARQ cij Seletive Repeat ARQ (i) Go-Back -N ARQ: Using this Protocol, Sender can send the multiple data Packet at a time and Receiver can વાંચવા-વિચારવા કરતાં વર્તનમાં ઉતારવું વધુ જરૂરી છે.

SMVS Page No. Date : 1 1 send the multiple Acknowledgment at a time. and which I he IF Sender, want to send n Ex, data Packet a than sender can send the n data Packet at a time. After that Receiver can send the n data Packet receive acknowledgment. Sin true have in IF sender does not receive any acknowledgment than sender have to send again all the data packet 1 Ex. Sender Receiver Packet Packet-2 ACKacket ACK-2 Packet-4 ACK-3 Packet-3 Packet-4 ACK-3 ACK 4 ાં િંગ સંચમઅને સાદગી હારા જીવનમાં શાંતિ અને સંતોષ અનુભવાચ છે.

SMVS Page No. Date : EX TE Sender Want to send 4 Packet than sender can send the 4 Packet at a time. After that Receiver can send the acknowledgment. En IF Receiver does not send the Packet 3 Acknowledgment than sender have to send again Packet 3 and Packet 4 (ii) Selective Repeat ARQ: In this Protocol, Sender can send the multiple data packet at a time and receiver can receive the multiple data packet at a time After the receive the data Packet receiver can send acknowledg. ment to the sender IF & Sender does not get the acknowledgement than only this data packet have to send by sender. ાંગળ વિગારવા કરતાં વર્તનમાં ઉતારવં વધ જરરી છે.

SMVS Page No. Date : / / IF Sender does not get n acknowledgment than sender have to send only n data packet again. EX Sender Receiver NK ACK-2 Frame-2 Here, Sender send 3 Frame to the receiver. Receiver can send only 1 Frame and 3 Frame acknowledgment, So, Sender have to send only Frame 2 to the Receiver.

સંચમઅને સાદગી દ્વારા જીવનમાં શાંતિ અને સંતોષ અનુભવાય છે.