

# DM40 - Computer Networks

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# 1 Introduction

This project is the exam in the course DM40 - Computer Networks, IMADA, SDU in the fall semester 2007, taught by Peter Kornerup.

The task is, on top of the subnet program acting as the physical connection between stations, to implement and test a datalink layer (DL), a network layer (NL) and a transport layer (TL) as in the OSI model.

The datalink layer must be based on protocol 6 from chapter 3 in [1], creating a reliable point-to-point communication from station to station.

The reader of this report is expected to know the content of [1] including the code for the datalink layer protocol and the transport layer protocol. Only changes to these protocols will be discussed.

The network layer must be able to open and close end-to-end virtual circuits, using static routing information. No code is provided for the NL.

The transport layer should be based on the solution in chapter 6 in [1], but modified so selecting a connection id (cid) is done by the NL.

The assignment is 'proof of concept', so the implementation should be tested using a small network with four stations, connected like in figure 1. During the report suggestions for improvements are mentioned, should the implementation have been for a real life application. No optimisation has been made bitwise, everything is done using bytes.

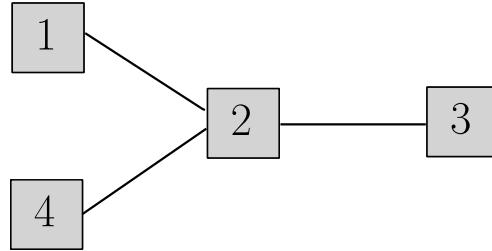


Figure 1: The topology of the network implemented.

Station 1 must send a message to station 3, which passes it on to station 4. Station 4 acknowledges with a short message to 3 and closes the connection. Station 3 acknowledges to station 1, and closes the connection. Station 2 doesn't contain any user processes, but only acts as an intermediate router.

In section 2 the design of the layers are discussed, in section 3 the implementation is described and the tests results can be found in section 4.

The implementation is made in ansi C with flag set for pedantic warnings, and the project compiles without any warnings.

## 2 Analysis

The transport layer receives data from the application layer, and includes the data in one or more transport protocol data unit (TPDU). The TPDU also includes information of what kind of TPDU it is ( CALL\_ACC, CLEAR\_REQ, CLEAR\_CONF, DATA\_PKT, CREDIT, CALL\_REQ), how many bytes of data is included and if the TPDU is the last in the communication (a more bit, m).

---

The TPDU is passed to the network layer, which cannot access the information inside. The network layer constructs a packet, adding a header to the TPDU including two pieces of information: which packet kind it is and what connection id it has.

The network layer passes the packet to the datalink layer for transmission, and the DL constructs a frame containing the packet and a header with sequence number, acknowledgement number and a kind field (ack, nak or data).

The TPDU, packet and frame can be seen in figure 2.

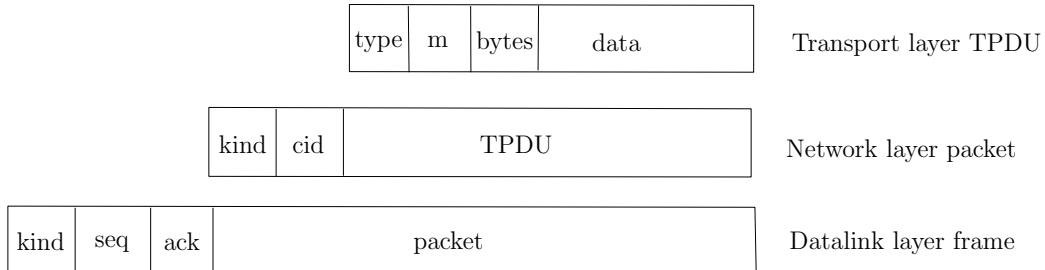


Figure 2: The content of a frame, packet and TPDU.

## 2.1 Event types

The subnet supplies the possibility to signal and wait for events. The `events frame_arrival` and `timeout` are defined in the subnet program. For the communication between DL and NL, the `network_layer_ready` event is defined, to signal when NL has a packet to transmit. When the DL has placed a packet in the incoming queue for the NL, a `network_layer_event` is signalled, to indicate the arrival.

The network layer uses a `network_layer_conn_ok` event, when waiting for an accept of the open connection packet sent to a distant router, when the transport layer request a connection id.

When the NL has data intended for the TL, a `transport_layer_packet_ready` event is signalled, allowing the TL to get the packet from the NL.

## 2.2 Threads needed

The datalink layer protocol has a thread running to handle arriving frames, timeouts and packets from the network layer. The network layer has a thread handling the creation of packets made of TPDU from the transport layer and the packets arriving from the datalink layer. Finally the transport layer has a thread responsible of listening for TPDU arrivals.

If an application wants to receive or send, then a thread from the application layer will call functions in the transport layer and block while waiting for the action is pending.

The interface to the physical layer consist of two methods, `ToSubnet` and `FromSubnet`, both of which are called exclusively from the DL.

## 2.3 The Datalink Layer

Several problems exist when trying to transmit data on an unreliable line. Messages can get delayed, lost and errors can occur inside each message. In the subnet, arriving frames are error

---

free, so no checksum has to be implemented. We must however be able to handle packets that are lost or late.

Protocol 6 from [1] is a sliding windows protocol, which for correctness uses a 8 bit sequence number (255), assuming that frames cannot delayed enough, so they will be equivalent mod 255. This is an important assumption since a delayed packet otherwise could be wrongfully acknowledged in place of the right one. The number of buffers are kept at 8, to save space in each station (which by the subnet program it is limited in each process).

The dataLink layer should not restart the acknowledgement timer when it is allready running, since it then wouldn't time out in time to acknowledge the frames that are correct received, causing the system too become slow.

## 2.4 The Network Layer

The responsibility of the network layer is to make an end-to-end connection for the transport layer, referenced by connection id (**cid**).

The packet can be of the following kind:

**NL\_CONN** Send when a station request a virtual circuit with another station.

**NL\_ACCEPT** Used when a station accepts the setup of a virtual circuit.

**NL\_CLOSE** Send to remove a virtual connection allready set up.

**NL\_DATA** Used when the packet contains data from the TL.

Once the TL calls `open_connection`, the station determines the next router and a possible **cid**, (one which is not used in the station and not used in any connection to the next router in the circuit). It adds the information to the virtual circuit table, and sends a **NL\_CONN** packet to the next router. Once the **NL\_CONN** packet reaches the final destination, it replies with a **NL\_ACCEPT** packet, likewise setting up the connection the opposite direction. Once the virtual circuit has been made, two entries in each VC table exist in each router on the path.

The routing table in the network layer is a static table, which since the assignment is to implement a connection oriented service, makes sense; all frames must travel of the same path for each connection.

Each router connected to a station should have its own queue, since the NL can be blocked for delivering packages to one router but not for another. These queues can be accessed by different processes, both from a sending process (coming from the TL) and from a receiving process (from the DL), these queues are therefore protected by a lock.

The enabled array can be accessed by more than one process, so this is also protected by a lock.

It is very important that only one signal for the DL layer is sent at a time, since there could be only one empty slot in the outgoing buffer. It is therefore imperative to keep record of for which packets a signal has been sent<sup>1</sup>. Initially `hasSignalled` is false for all connections, but set to true when a signal is sent. A signal can therefore only be sent when the network layer is enabled for a router and no signal has been sent since the last packet was picked up by the DL.

---

<sup>1</sup>If the `ClearEvent` method for the subnet had not generated a segmentation fault, this could have been used in the DL, resetting all but the signal used to get one packet.

---

## 2.5 The Transport Layer

In the code by Tanenbaum, the TL selects the `cid`, generating a bad interface to the NL. In this implementation, the TL request the NL for a `cid` by a call to `open_connection`, blocking until the virtual circuit has been set up. This generates a cleaner interface, but the TL must now also ask the NL to disconnect the virtual circuit by an explicit call to `disconnect`.

There are two different ways a virtual circuit can be disconnected. The first way is if both end stations simultaneously calls `disconnect`. Then both will sent a `CLEAR_REQ` from the TL, setting the state of the connection to disconnect. When the `CLEAR_REQ` reaches the destination, both routers will know that the connection is released. The second way is when one of the stations calls `disconnect`, sends a `CLEAR_REQ` and it reaches the other end of the VC. The other end replies with a `CLEAR_CONF`, and once it has reached the first station both stations know the circuit is closed. The `close_connection` in the NL must therefore be called the proper places, depending on which scenario is present.

The `clock` function from Tanenbaums code is not necessary in this small project, but is used for bigger networks, releasing the connections that has status timed out from the packet arrival function.

## 3 Implementation

The `main` function resides in the end of the `dataLinkLayer.c` file, as this was the first layer that was implemented. All it does is activates a thread for the DL, NL and TL in each of the four stations, and a user process/ application layer thread in the three stations that need it.

All definitions and the layout of the TPDU, packet and frame are located in the file `definitions.h`, making it easy to get an overview of the structures, event types and constants defined. Changing the frame header propagates all the way to the size off the data in the TPDU because of the limit from the subnet (64 bytes per message).

To log information, and also print it to the screen, a helping function has been implemented, called `logDebugLine` with the same input format as `printf`. This writes the string specified to the screen using `printf` and to the output log, including information of which station and process outputs. This was heavily inspired from the implementation of `printf`.

The timers in the subnet program has a void pointer to transfer information. Since only a station number is needed, this implementation treats the void pointer as an integer, this could make a problem should the system be used on a 64 bit machine, but no problems on a 32 bit machine.

### 3.1 The Datalink Layer

Most of the code for the DL comes from [1], but instead of being able to handle one-to-one communication, it is extended to handle many-to-many communication.

This is done by adding a dimension to the variables in the `dataLinkLayer` function, making variables to arrays and arrays to double arrays, each of size `NUM_OF_STATIONS`. This gives the DL the possibility to communicate to the other stations separately from each other, depending on where the NL will direct the packet. This information is delivered with the `network_layer_ready` signal.

The functions for enabling and disabling the network layer are moved to the NL where they more naturally belong, and they are added a station id as a parameter, so the datalink

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layer can enable sending to some stations and disable for others, where the outgoing buffer window is full.

### 3.2 The Network Layer

The control mechanism for the connections that has been enabled and signalled are two separate arrays, `networkLayerEnabled` and `allreadySignaled`. They are both protected by the same lock, since they are used at the same times.

The lock used for the queues and the enabled array are the ones supplied by the subnet program.

In this implementation, a queue is initialised for each existing station, even through a connection is not directly possible. Some space could of course be saved here, if a dynamic queue initialisation was used, only initialising queues respecting the topology in the network.

The virtual circuit entries are implemented using label switching, which means they have the following structure:

```
typedef struct {
    int from;
    int cid;
    int to;
    int outCid;
} VC;
```

It is here recorded which incoming `cid` is used, with the possibility to change the outgoing connection id.

The VC table is implemented as an array, if this had been for a real life application, an easier way to locate the right entry should be implemented, using hashing or binary search.

When the TL wants to send a file, it is allowed to add all packets to the sending queue at once, thus making the NL contain a large amount of data. A mechanism to only allow one packet at a time would have been nice, and could have been implemented using a signal-wait approach, which would mean the sending thread from above would be blocking while waiting to send the packages. Since only relative small files are sent in this project this is not implemented, but should be in real life. The NL still handles one packet at a time while signalling the DL.

### 3.3 The Transport Layer

The `q` bit marking a TPDU as being of type data or control is not needed, since the type has its own field in this implementation, it has therefore been removed through the transport layer protocol.

The `sleep` and `wakeup` functionality in the transport layer is implemented using the `Wait` and `Signal` methods of the subnet. This has a disadvantage, since a process cannot be marked with a tag and awaken using this tag. The possibility to wake a specific thread listening to a specific `cid` is therefore not possible in this implementation. It is not a problem in the test case for the implementation, since no two processes would sleep at once waiting for different `cid`'s in the same station.

---

### 3.4 The Application Layer

The application layer is not a complete layer, but three functions that performs the required test scenario. These functions are described in detail in section 4.

## 4 Test

In station 1 (see figure 1) the function `sendFile()` is started. It reads the file `testfile.txt`, then sleeps for a second, to allow the network to be initialised completely. Request a connect to station 3, blocking until a connection id has been returned. Then calls sends the textfile, and starts to receive (listens for replies). Once it has received a reply, it output it, and stops the simulation.

In station 3, the function `listenRecieveAndReSend()` starts out listening (`listen()`) for a connection. Once it has received a connection id, it calls `receive`, temporarily storing the textfile. Once it has received the file, it changes caps of the letters, request a connection to station 4, and transmits the textfile. When station 4 has replied, this answer is sent to station 1.

Station 4 has the `listenAndReceive()` function started, listening for a connection, once set up, receiving the textfile saving it to disk as `outfile.txt`. Sends a simple message: “Thanks” to station 3 and disconnects.

During this test scenario, run with error rate 10%, the complete log file is enclosed in section A.14, and the file sent over the network can be found in section A.13. It has been tested with error rate 99% and still works, however this rate of error is unrealistic, with the connections that exist now.

The test show several important examples, which will be described in the next subsections.

### Acknowledgements and NAK

In the first phase, only transport in one direction exist, so the ack timer in station 2 times out (line 25-26) shortly after NL in station 2 has decided to pass on the `NL_CONN` request on to station 3.

In line 92, station 3 receives a NAK frame from station 2, so a frame must have been lost causing station 2 to react when it receives a frame out of sync.

### Setting up Virtual Circuits

The lines 36 to 38 in the log output:

```
[[36]]<3>: networkLayer: NL: NL_CONN received, in. cid: 1
[[37]]<3>: networkLayer: NL: start: 1, end: 3
[[38]]<3>: networkLayer: NL: Send NL_ACCEPT
```

a request from the network layer in station 1 has reached station 3, answering with a `NL_ACCEPT` packet. The start station and end station has been correct extracted from the packet.

In lines 52-55, the NL in station 1 handles the accepting answer, answering the TL, which passes the cid on to the application layer:

```
[[52]]<1>: networkLayer: NL: NL_ACCEPT: nqe->from: 2 , nqe->p.cid: 1
```

---

```
[[53]]<1>: networkLayer: NL: VC table entry 1, is opposite
[[54]]<1>: networkLayer: NL: Acknowledge
[[55]]<1>:.sendFile: NL: ok for cid
```

The sendfile function can now send its file to station 3.

### Closing connections

In line 2572-2573 the network layer in station 1 closes the last open connection, the remaining parts of the log file are acknowledgements timeouts of the last `NL_CLOSE` frame, that are transmitting, also ending the test scenario.

### Transport Layer Functionality

In line 74, the TL in station 3 receives a `CALL_REQ`, waking up the waiting process in the following lines. It replies with a `CALL_ACC` message and a `CREDIT`, which station 1 receives in lines 119 to 122.

In line 2422 and 2443 station 3 and 4 receives each their `CLEAR_REQ`, closing the connection between them.

The messages are printed in lines: 1125 for the primary message in station 3, 2352 in station 4, and the acknowledgement in line 2404 (station 3) and line 2475 (station 1).

## 5 Conclusion

The protocols for a datalink, network and transport layer has been implemented on top of the subnet program simulating the physical layer. Even with unrealistically high error rates does the protocols ensure correct delivery of messages between the stations. All requirements of the assignment and the report have been fulfilled.

## References

- [1] Andrew S. Tanenbaum, *Computer Networks*, 4. ed., Person Educational Inc. 2003.
- [2] Brian W. Kernighan, Dennis Ritchie, *The C Programming Language*, 2. eds., Prentice Hall, 1988.

---

## A Source Code

### A.1 definitions.h

```
1 #ifndef DEFINITIONS_H_
2 #define DEFINITIONS_H_
3
4 typedef enum {false , true} boolean; /* boolean type */
5
6 /* Event numbers */
7 #define network_layer_ready 0x00000004
8 #define transport_layer_event 0x00000008
9 #define network_layer_event 0x00000010
10 #define network_layer_conn_ok 0x00000020
11 #define transport_layer_packet_ready 0x00000040
12
13
14
15 /* For the transport layer */
16 #define MAX_CONN 32 /* max number of simultaneous connections */
17 #define MAX_MSG_SIZE 8192 /* largest message in bytes */
18 #define MAX_PKT_SIZE 28 /* largest packet in bytes */
19 #define TIMEOUT 20
20 #define CRED 1
21 #define OK 0
22
23 #define ERR_FULL -1
24 #define ERR_REJECT -2
25 #define ERR_CLOSED -3
26 #define LOW_ERR -3
27 #define TIMER_ERROR -4
28
29
30 typedef int transport_address;
31 typedef enum {CALL_ACC,CLEAR_REQ,CLEAR_CONF,DATA_PKT,CREDIT,CALL_REQ} pkt_type;
32 typedef enum {IDLE,WAITING,QUEUED,ESTABLISHED,SENDING,RECEIVING,DISCONN}
33     cstate;
34
35 typedef struct { /* Transport Protocol Data Unit */
36     pkt_type type; /* Type of the TPDU */
37     int m; /* More indicator */
38     int bytes;
39     char data[MAX_PKT_SIZE]; /* The actual data to be transported */
40 } TPDU;
41
42
43
44 /* For the network layer */
45 #define MAX_PACKET_SIZE 44
46
47 typedef enum { NL_CONN , NL_ACCEPT , NL_DATA , NL_CLOSE } packet_kind;
48
49 typedef struct {
50     int from;
51     int cid;
52     int to;
```

---

```

53     int outCid;
54 } VC;
55
56 typedef struct { /* packet definition */
57     packet_kind kind;
58     int cid; /* Connection ID */
59     TPDU tpdu; /* Transport Layer TPDU */
60 } packet;
61
62 typedef struct {
63     packet *p;
64     int from;
65 } netQelem;
66
67
68 /* For the data link layer */
69 #define MAX_PKT 52 /* determines packet size in bytes */
70 #define MAX_SEND 64 /* Max package size in subnet */
71 #define MAX_SEQ 255 /* should be  $2^n - 1$  */
72 #define NR_BUFS 8 /*((MAX_SEQ + 1)/2)*/
73 #define event_type long int
74 #define TIMER_DELAY 500
75 #define ACK_DELAY 200
76
77 #define NUM_OF_STATIONS 5
78
79 typedef unsigned int seq_nr; /* sequence or ack numbers */
80 typedef enum {data, ack, nak} frame_kind; /* frame_kind definition */
81
82
83
84 typedef struct { /* frames are transported in this layer */
85     frame_kind kind; /* what kind of a frame is it? */
86     seq_nr seq; /* sequence number */
87     seq_nr ack; /* acknowledgement number */
88     packet info; /* the network layer packet */
89 } frame;
90
91
92
93 #endif /* DEFINITIONS_H_ */

```

---

## A.2 dataLinkLayer.h

```
1 #ifndef DATALINKLAYER_H_
2 #define DATALINKLAYER_H_
3
4 #include "definitions.h"
5
6 /* Wait for an event to happen; return its type in event. */
7 void wait_for_event(event_type *event);
8
9 /* Fetch a packet from the network layer for transmission on the channel. */
10 void from_network_layer(packet *p, int to);
11
12 /* Deliver information from an inbound frame to the network layer. */
13 void to_network_layer(packet *p, int from);
14
15 /* Go get an inbound frame from the physical layer and copy it to r. */
16 void from_physical_layer(frame *r, int *from, int *to);
17
18 /* Pass the frame to the physical layer for transmission. */
19 void to_physical_layer(frame *s, int to);
20
21 /* Start the clock running and enable the timeout event. */
22 void start_timer(seq_nr k, int to);
23
24 /* Stop the clock and disable the timeout event. */
25 void stop_timer(seq_nr k, int to);
26
27 /* Start an auxiliary timer and enable the ack_timeout event. */
28 void start_ack_timer( int to);
29
30 /* Stop the auxiliary timer and disable the ack_timeout event. */
31 void stop_ack_timer( int to);
32
33
34
35 /* Macro inc is expanded in-line: Increment k circularly. */
36 #define inc(k) if (k < MAX_SEQ) k = k + 1; else k = 0
37
38 #endif /* DATALINKLAYER_H_ */
```

---

### A.3 dataLinkLayer.c

```
1 #ifndef DATA_LINK_LAYER_C_
2 #define DATA_LINK_LAYER_C_
3 /*
4  * DESCRIPTION: Implementation of protocol 6 from Tanenbaum, Networks.
5  * Implements a data link layer
6  *
7  * Author: Jacob Aae Mikkelsen //Kokken
8  * Based on files from the book and from the course DM40, IMADA, SDU, DK
9  */
10
11 #include <subnet.h>
12 #include <subnetsupport.h>
13 #include <stdlib.h>
14 #include <stdio.h>
15 #include <string.h>
16 #include <ctype.h>
17 #include "dataLinkLayer.h"
18 #include "networkLayer.h"
19 #include "transportLayer.h"
20 #include "applicationLayer.h"
21 #include <unistd.h>
22 #include "debug.h"
23 #include "test.h"
24 #include "definitions.h"
25 #include <assert.h>
26
27 char *StationName;           /* programnavn. */
28 int ThisStation;             /* identificerer denne station.*/
29 log_type LogStyle = nolog;   /* Hvilken slags log skal systemet lave */
30                         /* 'nolog', 'separate' eller 'synchronized' */
31
32 boolean no_nak[NUM_OF_STATIONS]; /* no nak has been sent yet */
33 int act_timer_id[NUM_OF_STATIONS]; /* Timer for acknowledgement */
34
35 void *msg;                  /* For use with timers */
36 boolean ack_timer_running[NUM_OF_STATIONS]; /* don't start if it is running */
37
38 unsigned int timers[NUM_OF_STATIONS][NR_BUFS]; /* Array of timers */
39 extern lock_t *writeLock;
40
41
42 /* Function calculating if b is between a and c in a cyclic buffer structure */
43 static boolean between(seq_nr a, seq_nr b, seq_nr c)
44 {
45     return ((a <= b) && (b < c)) || ((c < a)&&(a <= b)) || ((b < c)&&(c < a));
46 }
47
48 /* En macro for at lette overfoerslen af korrekt navn til Activate */
49 #define ACTIVATE(n, f) Activate(n, f, #f)
50
51 /* If the timer ID is an Ack timer for any connection, return the station
52    number which corresponds to it. zero if not */
53 int getAckTimerProcess(int timerId)
54 {
55     int i;
```

---

```

56     for( i = 0 ; i < NUM_OF_STATIONS; i++) {
57         if( timerId == act_timer_id[ i ] ) {
58             return i ;
59         }
60     }
61     return 0;
62 }
63
64 int getSeq_nrFromTimer( seq_nr k , int timerId)
65 {
66     int i;
67     for( i = 0; i < NUM_OF_STATIONS; i++) {
68         if( timers[ i ][ k % NR_BUFS ] == timerId) {
69             return i ;
70         }
71     }
72     return TIMER_ERROR;
73 }
74
75 static void send_frame(frame_kind fk , seq_nr frame_nr , seq_nr frame_expected ,
76 packet buffer[] , int to)
77 {
78     /* Construct and send a data, ack, or nak frame. */
79     frame s;           /* scratch variable */
80     s.kind = fk;       /* kind == data, ack, or nak */
81     if (fk == data) {
82         s.info = buffer [frame_nr % NR_BUFS];
83     }
84     s.seq = frame_nr;      /* only meaningful for data frames */
85     s.ack = (frame_expected + MAX_SEQ) % (MAX_SEQ + 1);
86     if (fk == nak) {        /* one nak per frame, please */
87         no_nak[to] = false;
88     }
89     to_physical_layer(&s , to );      /* transmit the frame */
90     if (fk == data) {
91         start_timer(frame_nr , to );
92     }
93     stop_ack_timer( to );           /* no need for separate ack frame */
94 }
95 /* Start the clock running and enable the timeout event. */
96 void start_timer(seq_nr k, int to)
97 {
98     stop_timer(k , to); /* Stop any timer running on the same position*/
99     timers[to][k % NR_BUFS] = SetTimer( TIMER_DELAY , (void*) k );
100 }
101
102 /* Stop the clock and disable the timeout event. */
103 void stop_timer(seq_nr k, int to)
104 {
105     StopTimer( timers[to][k % NR_BUFS] , &msg );
106 }
107
108 /* Start an auxiliary timer and enable the ack_timeout event. */
109 /* Note, only if the timer is not running */
110 void start_ack_timer( int to)
111 {

```

---

```

112     if( !ack_timer_running[ to ] ) {
113         act_timer_id[ to ] = SetTimer( ACK_DELAY, ( void* ) -1 );
114         ack_timer_running[ to ] = true;
115     }
116 }
117
118 /* Stop the auxiliary timer and disable the ack_timeout event. */
119 void stop_ack_timer( int to )
120 {
121     ack_timer_running[ to ] = false;
122     StopTimer( act_timer_id[ to ] , &msg );
123 }
124
125 /* Fetch a packet from the network layer for transmission on the channel. */
126 void from_network_layer( packet *p , int to )
127 {
128     nl_to_datalink_layer( p , to );
129 }
130
131 /* Deliver information from an inbound frame to the network layer. */
132 void to_network_layer( packet *p , int from )
133 {
134     nl_from_datalink_layer(p , from );
135 }
136
137 /* Go get an inbound frame from the physical layer and copy it to r. */
138 void from_physical_layer( frame *r , int *from , int *to )
139 {
140     int length;
141     char buf[64];
142     length = MAX_SEND;
143     FromSubnet( from , to , buf,&length );
144     memcpy(r,&buf,MAX_SEND);
145 }
146
147 /* Pass the frame to the physical layer for transmission. */
148 void to_physical_layer( frame *s , int to )
149 {
150     ToSubnet( ThisStation , to , ( char* ) s , MAX_SEND );
151 }
152
153 void dataLinkLayer( void )
154 {
155     seq_nr *ack_expected;           /* lower edge of sender's window */
156     seq_nr *next_frame_to_send;    /* upper edge of sender's window + 1 */
157     seq_nr *frame_expected;        /* lower edge of receiver's window */
158     seq_nr *too_far;               /* upper edge of receiver's window + 1 */
159     int i,j,to,from;              /* index into buffer pool */
160     frame r;                     /* scratch variable */
161     packet out_buf[ NUM_OF_STATIONS ][ NR_BUFS ]; /* buffers, outbound stream */
162     packet in_buf[ NUM_OF_STATIONS ][ NR_BUFS ]; /* buffers, inbound stream */
163     boolean arrived[ NUM_OF_STATIONS ][ NR_BUFS ]; /* inbound bit map */
164     seq_nr nbuffered[ NUM_OF_STATIONS ];            /* buffers currently used */
165     event_type event;
166     event_t ev;
167     msg = malloc( 128* sizeof( char ) );             /* For use with timers */
168

```

---

```

169     ack_expected = malloc(NUM_OF_STATIONS*sizeof(seq_nr));
170     next_frame_to_send = malloc(NUM_OF_STATIONS*sizeof(seq_nr));
171     frame_expected= malloc(NUM_OF_STATIONS*sizeof(seq_nr));
172     too_far = malloc(NUM_OF_STATIONS*sizeof(seq_nr));
173
174
175     for(j = 0; j < NUM_OF_STATIONS; j++) {
176         ack_timer_running[j] = false;
177         act_timer_id[j] = -1;
178         ack_expected[j] = 0; /* next ack expected, inbound stream */
179         next_frame_to_send[j] = 0; /* number of next outgoing frame */
180         frame_expected[j] = 0;
181         too_far[j] = NR_BUFS;
182         nbuffered[j] = 0; /* initially no packets are buffered */
183         for(i = 0; i < NR_BUFS; i++) {
184             arrived[j][i] = false;
185         }
186     }
187
188     while(true) {
189         /* Wait for an event to happen */
190         event = Wait(&ev, frame_arrival | timeout | network_layer_ready);
191
192         switch(event) {
193             case network_layer_ready: /* accept, save, and transmit a new frame */
194                 to = (int) ev.msg;
195                 logDebugLine("DLL: EVENT: network_layer_ready..to: %i ack_exp: %i\n",
196                             next_frame_to_send[to], frame_expected[to]);
197                 nbuffered[to] = nbuffered[to] + 1; /* expand the window */
198                 from_network_layer(&out_buf[to][next_frame_to_send[to] % NR_BUFS],
199                                     to); /* fetch new packet */
200                 send_frame(data, next_frame_to_send[to], frame_expected[to],
201                            out_buf[to], to); /* transmit the frame */
202                 inc(next_frame_to_send[to]); /* advance upper window edge */
203                 break;
204
205             case frame_arrival: /* a data or control frame has arrived */
206                 from_physical_layer(&r, &from, &to); /* fetch incoming frame */
207                 logDebugLine("DLL: EVENT: frame_arrival: from %i, ack_expected: %i\n",
208                             from, ack_expected[from]);
209                 if((r.seq != frame_expected[from]) && no_nak[from]) {
210                     send_frame(nak, 0, frame_expected[from], out_buf[to],
211                                from);
212                 } else {
213                     start_ack_timer(from);
214                 }
215
216                 if(between(frame_expected[from], r.seq, too_far[from]) &&
217                     (arrived[from][(r.seq%NR_BUFS) == false])) {
218                     /* Frames may be accepted in any order. */
219                     arrived[from][(r.seq % NR_BUFS) = true; /* buffer full */

```

---

```

217             in_buf[from][r.seq % NR_BUFS] = r.info; /* insert data */
218             while (arrived[from][frame_expected[from] % NR_BUFS]) {
219                 /* Pass frames and advance window. */
220                 to_network_layer(&in_buf[from][frame_expected[from] %
221                                 NR_BUFS], from);
222                 no_nak[from] = true;
223                 arrived[from][frame_expected[from] % NR_BUFS] = false;
224                 inc(frame_expected[from]); /* advance lower edge of
225                                             window */
226                 inc(too_far[from]); /* advance upper edge of
227                                             window */
228                 start_ack_timer(from); /* to see if a separate ack
229                                         is needed */
230             }
231         }
232     }
233
234     if((r.kind==nak) &&
235        between(ack_expected[from],(r.ack+1)%(MAX_SEQ+1),next_frame_to_send[from])) {
236         logDebugLine("DLL:_NAK_frame_arrived,_resending\n");
237         send_frame(data,(r.ack+1)%(MAX_SEQ+1),
238                     frame_expected[from],out_buf[from],from);
239     }
240     if(r.kind==ack) {
241         logDebugLine("DLL:_ACK_frame_arrived\n");
242     }
243
244     while (between(ack_expected[from], r.ack,
245                   next_frame_to_send[from])) {
246         nbuffered[from] = nbuffered[from] - 1; /* handle piggybacked
247                                                 ack */
248         stop_timer(ack_expected[from], from); /* frame arrived intact
249                                                 */
250         inc(ack_expected[from]); /* advance lower edge of
251                               sender's window */
252     }
253     if(r.kind==ack || r.kind==nak) {
254         to = from; /* For use in enable network layer after switch. */
255     }
256     break;
257
258 case timeout:
259     logDebugLine("DLL:_EVENT:_Timeout:_msg:_%i,_timer_id:_%u\n",
260                 (int) ev.msg, ev.timer_id);
261     if( (int) ev.msg == -1 ) {
262         logDebugLine("DLL:_ACK_TIMER_TIMEOUT\n");
263         i = getAckTimerProcess(ev.timer_id);
264         ack_timer_running[i] = false;
265         send_frame(ack,0,frame_expected[i],out_buf[i],i); /* ack
266                                                 timer expired; send ack*/
267     } else { /* A frame timed out */
268         i = (int) ev.msg;
269         j = getSeq_nrFromTimer(i, ev.timer_id);
270         send_frame(data, i, frame_expected[j], out_buf[j], j);
271     }
272     break;

```

---

```
261         }
262         if ( nbuffered [ to ] < NR_BUFS ) {
263             enable_network_layer ( to );
264         } else {
265             disable_network_layer ( to );
266         }
267     }
268 }
269
270
271 int main( int argc , char *argv [] )
272 {
273     StationName = argv [ 0 ];
274     ThisStation = atoi ( argv [ 1 ] );
275     act_timer_id [ 0 ] = -1;
276
277     ACTIVATE ( 1 , networkLayer );
278     ACTIVATE ( 2 , networkLayer );
279     ACTIVATE ( 3 , networkLayer );
280     ACTIVATE ( 4 , networkLayer );
281
282     ACTIVATE ( 1 , transportLayer );
283     ACTIVATE ( 2 , transportLayer );
284     ACTIVATE ( 3 , transportLayer );
285     ACTIVATE ( 4 , transportLayer );
286
287     ACTIVATE ( 1 , dataLinkLayer );
288     ACTIVATE ( 2 , dataLinkLayer );
289     ACTIVATE ( 3 , dataLinkLayer );
290     ACTIVATE ( 4 , dataLinkLayer );
291
292     ACTIVATE ( 4 , listenAndReceive );
293
294     ACTIVATE ( 3 , listenRecieveAndReSend );
295
296     ACTIVATE ( 1 ,.sendFile );
297
298     Start ();
299
300     exit ( 0 );
301 }
302
303 #endif /* DATA_LINK_LAYER_C */
```

---

#### A.4 networkLayer.h

```
1 #ifndef NETWORK_LAYER_H_
2 #define NETWORK_LAYER_H_
3
4 #include "definitions.h"
5 #include "transportLayer.h"
6 #include <fifoqueue.h>
7
8 void networkLayer();
9
10 /* Allow the network layer to cause a network_layer_ready event. */
11 void enable_network_layer( int to );
12
13 /* Forbid the network layer from causing a network_layer_ready event. */
14 void disable_network_layer( int to );
15
16 int isNetworkLayerEnabled( int i );
17
18 int open_connection( transport_address to );
19
20 int close_connection( int cid );
21
22 void handle_packet();
23
24 void nl_from_datalink_layer( packet *p, int from );
25
26 void nl_to_datalink_layer( packet *p , int to );
27
28 void nl_to_transport_layer();
29
30 void nl_from_transport_layer( int cid , TPDU *tpdu );
31
32
33 #endif /* NETWORK_LAYER_H_ */
```

---

## A.5 networkLayer.c

```
1 #ifndef NETWORK_LAYER_C_
2 #define NETWORK_LAYER_C_
3
4 #include "definitions.h"
5 #include "debug.h"
6 #include "networkLayer.h"
7 #include "transportLayer.h"
8 #include <stdio.h>
9 #include <stdlib.h>
10 #include <string.h>
11 #include <assert.h>
12 #include <fifoqueue.h>
13 #include <subnet.h>
14 #include <subnetsupport.h>
15 #include <unistd.h>
16
17 extern int ThisStation;
18 int *routingtable;
19 boolean *networkLayerEnabled;
20 boolean *alreadySignaled;
21 VC *VCs;
22 FifoQueue *queues;
23 FifoQueue incoming;
24 FifoQueue upgoing;
25 lock_t *queueLock;
26 lock_t *enabledLock;
27 lock_t *writeLock;
28
29 void networkLayer()
30 {
31     event_type event;
32     event_t ev;
33     int i, t, u;
34
35     VCs = malloc((MAX_CONN+1)*sizeof(VC));
36     queues = malloc(NUM_OF_STATIONS*sizeof(FifoQueue));
37     networkLayerEnabled = malloc(NUM_OF_STATIONS*sizeof(boolean));
38     alreadySignaled = malloc(NUM_OF_STATIONS*sizeof(boolean));
39     routingtable = malloc(5*sizeof(int));
40
41     writeLock = (lock_t *) malloc(sizeof(lock_t));
42     Init_lock(writeLock);
43
44     /* Very explicit, so changes are easy to implement */
45     switch(ThisStation) {
46         case 1:
47             routingtable[2] = 2;
48             routingtable[3] = 2;
49             routingtable[4] = 2;
50             break;
51         case 2:
52             routingtable[1] = 1;
53             routingtable[3] = 3;
54             routingtable[4] = 4;
55             break;
56     }
57 }
```

---

```

56     case 3:
57         routingtable[1] = 2;
58         routingtable[2] = 2;
59         routingtable[4] = 2;
60         break;
61     case 4:
62         routingtable[1] = 2;
63         routingtable[2] = 2;
64         routingtable[3] = 2;
65         break;
66     }
67
68 for ( i = 0; i <= MAX_CONN; i++) {
69     VCs[i].from = 0;
70     VCs[i].cid = 0;
71 }
72
73 /* locks for variables */
74 queueLock = (lock_t *) malloc (sizeof(lock_t));
75 enabledLock = (lock_t *) malloc (sizeof(lock_t));
76 t = Init_lock(queueLock);
77 u = Init_lock(enabledLock);
78 if( t != 0 || u != 0) {
79     logDebugLine( "NL: ERROR, Lock not initialized !\n");
80 }
81
82 Lock(enabledLock);
83 for ( i = 1; i < NUM_OF_STATIONS; i++) {
84     queues[i] = InitializeFQ();
85     networkLayerEnabled[i] = true;
86     allreadySignaled[i] = false;
87     if(queues[i] == NULL) {
88         logDebugLine( "NL: ERROR, Queue not initialized !\n");
89     }
90     assert(queues[i] != NULL);
91 }
92 Unlock(enabledLock);
93
94 incoming = InitializeFQ();
95 upgoing = InitializeFQ();
96
97 while(1) {
98     event = Wait(&ev , network_layer_event);
99     handle_packet();
100 }
101 }
102
103 int getFreeVC( void)
104 {
105     int i;
106     for ( i = 1 ; i <= MAX_CONN; i++) {
107         if( VCs[i].from == 0 && VCs[i].cid == 0) {
108             break;
109         }
110     }
111     return i;
112 }
```

---

```

113
114 void printVCentry( int i)
115 {
116     logDebugLine( "NL: i : %i , from : %i , cid : %i , to : %i , outCid : %i\n" , i ,
117                 VCs[ i ].from , VCs[ i ].cid , VCs[ i ].to , VCs[ i ].outCid );
118 }
119 int getAllowedCid( int thisStation , int destRouter )
120 {
121     int i ;
122     int used[MAX_CONN+1]; /* 0 not used */
123
124     for( i = 1; i <= MAX_CONN ; i++) { /* Initializing table */
125         used[ i ] = 0;
126     }
127     for( i = 1; i <= MAX_CONN ; i++) { /* Removing used ones */
128         if( VCs[ i ].from == thisStation ) { /* Use thisStation as parameter so
129             it can be used for all stations */
130             used[ VCs[ i ].cid ] = 1; /* this cid is already used by this
131                                         station */
132         }
133         if( VCs[ i ].to == destRouter ) {
134             used[ VCs[ i ].outCid ] = 1; /* Already sending something to
135                                         nextRouter with this cid */
136         }
137     }
138     for( i = 1; i <= MAX_CONN ; i++) {
139         if( used[ i ] == 0) {
140             break;
141         }
142     }
143     return i;
144 }
145 /* Allow the network layer to cause a network_layer_ready event. */
146 void enable_network_layer( int to )
147 {
148     Lock( queueLock );
149     Lock( enabledLock );
150     if( ! EmptyFQ( queues[ to ] ) && alreadySignaled[ to ] == false ) {
151         /* There's something we can send, and no signal has been sent. */
152         Signal( network_layer_ready , (void *) to );
153         alreadySignaled[ to ] = true;
154     }
155     networkLayerEnabled[ to ] = true;
156     Unlock( enabledLock );
157     Unlock( queueLock );
158 }
159 /* Forbid the network layer from causing a network_layer_ready event. */
160 void disable_network_layer( int to )
161 {
162     Lock( enabledLock );
163     networkLayerEnabled[ to ] = false ;
164     Unlock( enabledLock );
165 }
```

---

```

166 void enqueuePacket( packet *p , int to)
167 {
168     FifoQueueEntry fqe;
169     /* Add it to the outgoing queue */
170     Lock(queueLock);
171     Lock(enabledLock);
172
173     fqe = NewFQE(p);
174     EnqueueFQ( fqe , queues[ to ] );
175
176     /* Signal if possible */
177     if( networkLayerEnabled[to] && alreadySignaled[to] == false ) {
178         alreadySignaled[to] = true;
179         Signal( network_layer_ready , (void *) to );
180     }
181     Unlock(enabledLock);
182     Unlock(queueLock);
183 }
184
185
186
187 /* Finds the cid for the connection , sends the open request to the other
   networklayers */
188 int open_connection( transport_address to)
189 {
190     int j , nextRouter , cid ;
191     packet *p;
192     int info [2];
193     event_type event;
194     event_t ev;
195
196     /* What is the next router in the VC */
197     nextRouter = routingtable[to];
198     logDebugLine( "NL: Open_to_router %i\n" , nextRouter );
199
200     /* Find unused cid (Must not be in use for that packages sent to the
       nextRouter , and not in use for this stations connections) */
201     cid = getAllowedCid( ThisStation , nextRouter );
202     logDebugLine( "NL: Gets_cid : %i\n" , cid );
203
204     /* Insert info in VC table */
205     j = getFreeVC();
206     VCs[j].from = ThisStation;
207     VCs[j].cid = cid;
208     VCs[j].to = nextRouter;
209     VCs[j].outCid = cid;
210     printVCEntry( j );
211
212     /* Making packet with information */
213     p = malloc( sizeof(packet) );
214     p->kind = NL_CONN;
215     p->cid = cid;
216     info[0] = ThisStation;
217     info[1] = to;
218     memcpy( &(p->tpdu) , info , sizeof(info) );
219
220     /* Add it to the outgoing queue */

```

---

```

221     enqueuePacket( p , nextRouter );
222
223     event = Wait( &ev , network_layer_conn_ok ) ; /* Wait for connection to be
224         ok 'ed */
225     if( cid == (int) ev.msg ) {
226         logDebugLine( "NL: ok for cid\n" );
227     }
228     return cid;
229 }
230 int close_connection( int cid )
231 {
232     int i, index, dest, outCid;
233     packet *p;
234
235     /* 'Little dirty' - Allow any CLEAR_CONF packets to be send before close */
236     sleep(1);
237
238     /* Find the connection. If it cannot be found, it is already removed
239      because the other end has called close_connection first */
240     index = 0;
241     for( i = 1; i <= MAX_CONN; i++ ) {
242         if( VCs[ i ].from == ThisStation && VCs[ i ].cid == cid ) {
243             index = i;
244             break;
245         }
246     }
247     /* Must already have released the connection */
248     if( index == 0 ) {
249         return 0;
250     }
251
252     /* Save information, and clear the VC table for the forward connection. */
253     dest = VCs[ index ].to;
254     outCid = VCs[ index ].outCid;
255
256     VCs[ index ].to = 0;
257     VCs[ index ].cid = 0;
258     VCs[ index ].from = 0;
259     VCs[ index ].outCid = 0;
260
261     /* Send the packet on to the next router */
262     p = malloc( sizeof(packet) );
263     p->kind = NL_CLOSE;
264     p->cid = outCid;
265     enqueuePacket( p , dest );
266     return 0;
267 }
268
269 void handle_packet()
270 {
271     packet *p;
272     netQelem *nqe;
273     FifoQueueEntry fqe;
274     int info[2];
275     int i,j,nextRouter,cid;
276     logDebugLine( "NL: handle_packet\n" );

```

---

```

277     Lock( queueLock ) ;
278     fqe = DequeueFQ( incoming ) ;
279     nqe = ValueOffQE( fqe ) ;
280     DeleteFQE( fqe ) ;
281     Unlock( queueLock ) ;
282
283
284     switch( nqe->p->kind ) {
285         case NL_CONN:
286             logDebugLine( "NL: NL_CONN received , in . cid : %i\n" , nqe->p->cid ) ;
287             memcpy( info , &nqe->p->tpdu , sizeof( info ) );
288             logDebugLine( "NL: start : %i , end: %i\n" , info [0] , info [1] ) ;
289
290             /* If this is the end station , send accept. */
291             if( info [1] == ThisStation ) {
292
293                 /* Find a connection id that can be used in this station */
294                 cid = getAllowedCid( ThisStation , nqe->from ) ;
295
296                 /* Find a free spot in the VC table for forward connection */
297                 i = getFreeVC() ;
298                 VCs[ i ].from = nqe->from ;
299                 VCs[ i ].cid = nqe->p->cid ;
300                 VCs[ i ].to = ThisStation ;
301                 VCs[ i ].outCid = cid ;
302
303                 logDebugLine( "NL: Send_NL_ACCEPT\n" ) ;
304                 /* Add the backward connection */
305                 j = getFreeVC() ;
306                 VCs[ j ].from = ThisStation ;
307                 VCs[ j ].cid = VCs[ i ].outCid ;
308                 VCs[ j ].to = nqe->from ;
309                 VCs[ j ].outCid = VCs[ i ].cid ;
310                 printVCentry( j ) ;
311
312                 /* Making packet with information */
313                 p = nqe->p ;
314                 p->kind = NL_ACCEPT ;
315                 p->cid = VCs[ j ].cid ;
316
317                 enqueuePacket( p , VCs[ j ].to ) ;
318                 free( nqe ) ;
319
320                 /* else get outgoing cid and pass on */
321             } else {
322                 logDebugLine( "NL: Not_end_station\n" ) ;
323                 nextRouter = routingtable[ info [1]] ;
324
325                 cid = getAllowedCid( -1 , nextRouter ) ; /*-1 not used anywhere
326                                         */
327                 i = getFreeVC() ;
328                 VCs[ i ].from = nqe->from ;
329                 VCs[ i ].cid = nqe->p->cid ;
330                 VCs[ i ].to = nextRouter ;
331                 VCs[ i ].outCid = cid ;
332                 printVCentry( i ) ;

```

---

```

333     p = nqe->p;
334     p->kind = NL_CONN;
335     p->cid = VCs[i].outCid;
336     memcpy( &(p->tpdu), info , sizeof(info));
337
338     enqueuePacket( p , nextRouter );
339     free( nqe );
340 }
341
342     break;
343 case NL_ACCEPT:
344     logDebugLine( "NL: NL_ACCEPT: nqe->from: %i , nqe->p . cid : %i \n"
345                 , nqe->from , nqe->p->cid );
346
347     /* Find the VC entry for the forward connection */
348     for( i = 1; i <= MAX_CONN; i++ ) {
349         if( VCs[i].to == nqe->from && VCs[i].outCid == nqe->p->cid
350             ) {
351             logDebugLine( "NL: VC_table_entry %i , is opposite\n" ,
352                         i );
353             break;
354         }
355     }
356     /* If this was the station that requested transmission. */
357     if( VCs[i].from == ThisStation ) {
358         logDebugLine( "NL: Acknowledge\n" );
359
360         j = getFreeVC();
361         VCs[j].from = nqe->from;
362         VCs[j].cid = nqe->p->cid;
363         VCs[j].to = ThisStation;
364         VCs[j].outCid = nqe->p->cid;
365
366         Signal( network_layer_conn_ok , (void *) VCs[i].cid );
367         free( nqe->p );
368         free( nqe );
369     } else {
370         j = getFreeVC();
371         VCs[j].from = nqe->from;
372         VCs[j].cid = nqe->p->cid;
373         VCs[j].to = VCs[i].from;
374         VCs[j].outCid = VCs[i].cid ;
375
376         nqe->p->cid = VCs[j].outCid;
377         p = nqe->p;
378         enqueuePacket( p , VCs[j].to );
379         free( nqe );
380     }
381     break;
382 case NL_DATA:
383     logDebugLine( "NL: NL_DATA\n" );
384     logDebugLine( "NL: NL_DATA: from: %i , cid: %i \n" , nqe->from ,
385                 nqe->p->cid );
386     for( i = 1; i <= MAX_CONN; i++ ) {
387         if( VCs[i].from == nqe->from && VCs[i].cid == nqe->p->cid
388             ) {

```

---

```

385                     break;
386                 }
387             }
388             /* If for this station, insert into upgoing queue, signal. */
389             if( VCs[ i ].to == ThisStation ) {
390                 Lock( queueLock );
391                 EnqueueFQ( NewFQE( nqe ), upgoing );
392                 Unlock( queueLock );
393                 Signal( transport_layer_packet_ready , (void *) VCs[ i ].cid );
394             } else {
395                 /* Send to next router*/
396                 nqe->p->cid = VCs[ i ].outCid;
397                 p = nqe->p;
398                 enqueuePacket( p , VCs[ i ].to );
399                 free( nqe );
400             }
401         break;
402     case NL_CLOSE:
403         logDebugLine( "NL:NL_CLOSE\n" );
404         /* Find entry if exist */
405         j = 0;
406         for( i = 1; i <= MAX_CONN; i++ ) {
407             if( VCs[ i ].from == nqe->from && VCs[ i ].cid == nqe->p->cid
408                 )
409                 j = i;
410                 break;
411             }
412
413             /* If not exist don't do more */
414             if( j == 0 ) {
415                 return; /* Must have been released */
416             }
417
418             if( VCs[ j ].to != ThisStation ) {
419                 /* Pass on */
420                 nqe->p->cid = VCs[ j ].outCid;
421                 p = nqe->p;
422                 enqueuePacket( p , VCs[ j ].to );
423                 free( nqe );
424             } else {
425                 logDebugLine( "NL:A connection has been closed!\n" );
426                 free( nqe->p ); /* End station, release memory*/
427                 free( nqe );
428             }
429             /* Delete entry */
430             VCs[ j ].from = 0;
431             VCs[ j ].cid = 0;
432             VCs[ j ].to = 0;
433             VCs[ j ].outCid = 0;
434         break;
435     }
436 }
437
438 void nl_from_datalink_layer( packet *p, int from)
439 {
440     /* Insert into queue, send signal to NL */

```

---

```

441     netQelem *nqe = malloc( sizeof(netQelem) );
442     nqe->p = malloc( sizeof(packet) );
443     logDebugLine( "NL: from_datalink_layer: received something\n" );
444     nqe->from = from;
445     Lock(queueLock);
446     memcpy( nqe->p , p , sizeof(packet) );
447     EnqueueFQ(NewFQE(nqe), incoming);
448     Signal( network_layer_event , (void *) 1 );
449     Unlock(queueLock);
450 }
451
452 void nl_to_datalink_layer( packet *p , int to )
453 {
454     FifoQueueEntry entry;
455     packet *fromQueue;
456
457     Lock(queueLock);
458     Lock(enabledLock);
459     alreadySignaled[to] = false;
460     if( EmptyFQ(queues[to]) ) {
461         logDebugLine( "NL: ERROR: queue empty, shouldn't be. %i\n" , to );
462     }
463
464     entry = DequeueFQ( queues[to] );
465     fromQueue = ValueOffQE(entry);
466
467     memcpy( p , fromQueue , MAX_PKT );
468
469     free(fromQueue);
470     DeleteFQE(entry);
471     Unlock(queueLock);
472     Unlock(enabledLock);
473 }
474
475 void nl_to_transport_layer( int *cid , TPDU* pdu)
476 {
477     FifoQueueEntry entry;
478     netQelem *nqe;
479
480     Lock(queueLock);
481     entry = DequeueFQ( upgoing );
482     nqe = ValueOffQE( entry );
483
484     *cid = nqe->p->cid;
485     memcpy( pdu , &(nqe->p->pdu) , sizeof(TPDU) );
486     free(nqe->p);
487     free(nqe);
488     DeleteFQE(entry);
489     Unlock(queueLock);
490 }
491
492 void nl_from_transport_layer( int cid , TPDU *pdu)
493 {
494     int destRouter, i;
495     packet *p = malloc( sizeof(packet)) ; /* Scratch variable */
496     assert( p != NULL );
497

```

---

```

498     p->kind = NL_DATA;
499     p->cid = cid;
500     memcpy( &(p->tpdu) , tpdu , sizeof(TPDU)) ;
502
503     /* Find destination router */
504     destRouter = 0;
505     for( i = 1; i <= MAX_CONN ; i++) {
506         printVCEntry( i );
507         if( VCs[ i ].from == ThisStation && VCs[ i ].outCid == cid) {
508             destRouter = VCs[ i ].to;
509             break;
510         }
511     }
512     if( destRouter == 0) {
513         logDebugLine( "NL: _ERROR_no_destRouter\n" );
514     }
515
516     /* Add to queue and signal if allowed.*/
517     Lock( queueLock );
518     if( queues[ destRouter ] == NULL) {
519         logDebugLine( "NL: _ERROR_with_a_queue\n" );
520     }
521     EnqueueFQ( NewFQE( p ) , queues[ destRouter ] );
522     Unlock( queueLock );
523     Lock( enabledLock );
524     if( networkLayerEnabled[ destRouter ] && alreadySignaled[ destRouter ] ==
525         false ) {
526         alreadySignaled[ destRouter ] = true;
527         Signal( network_layer_ready , (void *) destRouter );
528     }
529     Unlock( enabledLock );
530 }
531 #endif /* NETWORKLAYER_C_ */

```

---

## A.6 transportLayer.h

```
1 #ifndef TRANSPORTLAYER_H_
2 #define TRANSPORTLAYER_H_
3
4 #include "definitions.h"
5
6 typedef struct {
7     transport_address local_address;
8     transport_address remote_address;
9     cstate state;                                /* state of this connection */
10    unsigned char *user_buf_addr;                /* pointer to receive buffer */
11    int byte_count;                            /* send/receive count */
12    int clr_req_received;                      /* set when CLEAR_REQ packet received
13    */
14    int timer;                                /* used to time out CALL_REQ packets */
15    int credits;                             /* number of messages that may be sent
16    */
17 } connection;
18
19 void transportLayer(void);
20
21 void tl_sleep(void);
22
23 void to_net(int cid, int m, pkt_type pt, unsigned char *p, int bytes);
24
25 void from_net(int *cid, int *m, pkt_type *pt, unsigned char *p, int *bytes);
26
27 int listen(transport_address t);
28
29 int connect(transport_address locale, transport_address remote);
30
31 int send(int cid, unsigned char bufptr[], int bytes);
32
33 int receive(int cid, unsigned char bufptr[], int *bytes);
34
35 int disconnect(int cid);
36
37 void packet_arrival(void);
38
39
40 #endif /* TRANSPORTLAYER_H_ */
```

---

## A.7 transportLayer.c

```
1 #ifndef TRANSPORTLAYER_C_
2 #define TRANSPORTLAYER_C_
3
4 #include "transportLayer.h"
5 #include "networkLayer.h"
6 #include "debug.h"
7 #include <stdio.h>
8 #include <subnet.h>
9 #include <subnetsupport.h>
10 #include <string.h>
11
12 /* Global variables. */
13 transport_address listen_address;           /* local address being listened to */
14 int listen_conn;                            /* connection identifier for listen */
15 unsigned char packetData[MAX_PKT_SIZE];    /* scratch area for packet data */
16
17 connection *conn;
18
19
20
21 void transportLayer (void)
22 {
23     int i;
24     event_type event;
25     event_t ev;
26
27     conn = malloc( (MAX_CONN + 1)* sizeof(connection)); /* slot 0 is not used
28     */
28     for (i=0;i<MAX_CONN + 1; i++) {
29         conn [i].state = IDLE;
30     }
31
32     while(1) { /* Listen for incomming packages */
33     /*      logDebugLine("TL: Waiting for next event (packet arrival) \n");
34     */      event = Wait( &ev , transport_layer_packet_ready );
35     packet_arrival();
36     }
37 }
38
39
40 /* Transport layer sleep */
41 void tl_sleep(void)
42 {
43     event_type event;
44     event_t ev;
45     logDebugLine("Transportlayer_tl_sleeping\n");
46     event = Wait(&ev , transport_layer_event );
47 }
48
49 /* Transport layer wakeup */
50 void wakeup(void)
51 {
52     Signal(transport_layer_event , NULL);
53 }
```

---

```

55
56 void to_net(int cid, int m, pkt_type pt, unsigned char p[], int bytes)
57 {
58     TPDU tpdu;
59     tpdu.m = m;
60     tpdu.type = pt;
61     tpdu.bytes = bytes;
62     memcpy(tpdu.data, p, MAX_PKT_SIZE);
63     nl_from_transport_layer(cid, &tpdu);
64 }
65
66 void from_net(int *cid, int *m, pkt_type *pt, unsigned char *p, int *bytes)
67 {
68     TPDU tpdu;
69     nl_to_transport_layer(cid, &tpdu);
70
71     *m = tpdu.m;
72     *pt = tpdu.type;
73     *bytes = tpdu.bytes;
74     memcpy(p, tpdu.data, MAX_PKT_SIZE);
75     logDebugLine("TL: from_net:type: %i, m: %i, bytes: %i\n", tpdu.type,
76                 tpdu.m, tpdu.bytes);
76 }
77
78 int listen(transport_address t)
79 { /* User wants to listen for a connection. See if CALL_REQ has already
   arrived. */
80     int i, found = 0;
81     logDebugLine("TL: listen_funktionen\n");
82
83     for (i = 1; i <= MAX_CONN; i++) /* search the table for CALL_REQ */
84         if (conn[i].state == QUEUED && conn[i].local_address == t) {
85             found = i;
86             break;
87         }
88
89     if (found == 0) {
90         /* No CALL_REQ is waiting. Go to tl_sleep until arrival or timeout. */
91         listen_address = t;
92         tl_sleep();
93         i = listen_conn;
94     }
95     conn[i].state = ESTABLISHED;           /* connection is ESTABLISHED */
96     conn[i].timer = 0;                   /* timer is not used */
97     listen_conn = 0;                    /* 0 is assumed to be an invalid address */
98     logDebugLine("TL: Listen1\n");
99     to_net(i, 0, CALL_ACC, packetData, 0); /* tell net to accept connection */
100    logDebugLine("TL: Listen2\n");
101
102    return(i);                         /* return connection identifier */
103 }
104
105 /* Connect will request a connection id from the network layer */
106 int connect(transport_address locale, transport_address remote)
107 { /* User wants to connect to a remote process; send CALL_REQ packet. */
108     int i;
109     connection *cptr;

```

---

```

110     logDebugLine( "TL: connect\n" );
111
112     packetData[0] = remote;
113     packetData[1] = locale;      /* CALL_REQ packet needs these */
114
115     i = open_connection(remote); /* get cid from network layer */
116
117     if (conn[i].state == IDLE) {
118         /* Make a table entry that CALL_REQ has been sent. */
119         cptr = &conn[i];
120         cptr->local_address = locale;
121         cptr->remote_address = remote;
122         cptr->state = WAITING;
123         cptr->clr_req_received = 0;
124         cptr->credits = 0;
125         cptr->timer = 0;
126         to_net(i, 0, CALL_REQ, packetData, 2);
127         tl_sleep();           /* wait for CALL_ACC or CLEAR_REQ */
128         if (cptr->state == ESTABLISHED) {
129             return(i);
130         }
131         if (cptr->clr_req_received) {
132             /* Other side refused call. */
133             cptr->state = IDLE; /* back to IDLE state */
134             to_net(i, 0, CLEAR_CONF, packetData, 0); /* TODO replace with
135                 close_connection, to clean up the cid's in the network layer.*/
136             close_connection(i);
137             return(ERR_REJECT);
138         }
139     } else {
140         return(ERR_FULL);        /* reject CONNECT: no table space */
141     }
142     return 0;
143
144
145 int send(int cid, unsigned char bufptr[], int bytes)
146 { /* User wants to send a message. */
147     int i, count, m;
148
149     connection *cptr = &conn[cid];
150     logDebugLine("TL: send\n");
151
152     /* Enter SENDING state. */
153     cptr->state = SENDING;
154     cptr->byte_count = 0;          /* # bytes sent so far this message */
155     if (cptr->clr_req_received == 0 && cptr->credits == 0) {
156         tl_sleep();
157     }
158     if (cptr->clr_req_received == 0) {
159         /* Credit available; split message into packets if need be. */
160         do {
161             if (bytes - cptr->byte_count > MAX_PKT_SIZE) { /* multipacket
162                 message */
163                 count = MAX_PKT_SIZE;
164                 m = 1; /* more packets later */
165             } else { /* single packet message */

```

---

```

165         count = bytes - cptr->byte_count;
166         m = 0; /* last pkt of this message */
167     }
168     for (i = 0; i < count; i++) {
169         packetData[i] = bufptr[cptr->byte_count + i];
170     }
171     to_net(cid, m, DATA_PKT, packetData, count); /* send 1 packet */
172     cptr->byte_count = cptr->byte_count + count; /* increment bytes
173     sent so far */
174 } while (cptr->byte_count < bytes); /* loop until whole message sent */
175 cptr->credits--; /* each message uses up one credit */
176 cptr->state = ESTABLISHED;
177 return(OK);
178 } else {
179     cptr->state = ESTABLISHED; /* Er dette rigtigt?? */
180     return(ERR_CLOSED); /* send failed: peer wants to disconnect */
181 }
182
183 int receive(int cid, unsigned char bufptr[], int *bytes)
184 { /* User is prepared to receive a message. */
185
186     connection *cptr = &conn[cid];
187     logDebugLine("TL:receive\n");
188
189     if (cptr->clr_req_received == 0) {
190         /* Connection still established; try to receive. */
191         cptr->state = RECEIVING;
192         cptr->user_buf_addr = bufptr;
193         cptr->byte_count = 0;
194         packetData[0] = CRED;
195         packetData[1] = 1;
196         logDebugLine("TL:receive,sending credit\n");
197         to_net(cid, 0, CREDIT, packetData, 2); /* send credit */
198         tl_sleep(); /* block awaiting data */
199         *bytes = cptr->byte_count;
200     }
201     cptr->state = ESTABLISHED;
202     return(cptr->clr_req_received ? ERR_CLOSED : OK);
203 }
204
205
206 int disconnect(int cid)
207 { /* User wants to release a connection. */
208     connection *cptr = &conn[cid];
209     logDebugLine("TL:disconnect\n");
210
211     if (cptr->clr_req_received) { /* other side initiated termination */
212         cptr->state = IDLE; /* connection is now released */
213         to_net(cid, 0, CLEAR_CONF, packetData, 0);
214         close_connection(cid);
215     } else { /* we initiated termination */
216         cptr->state = DISCONN; /* not released until other side agrees */
217         to_net(cid, 0, CLEAR_REQ, packetData, 0);
218     }
219     return(OK);

```

---

```

221 }
222
223 void packet_arrival(void)
224 { /* A packet has arrived, get and process it. */
225     int cid;           /* connection on which packet arrived */
226     int count, i, m;
227     pkt_type ptype;   /* CALL_REQ, CALL_ACC, CLEAR_REQ, CLEAR_CONF, DATA_PKT,
228                         CREDIT */
228     unsigned char data[MAX_PKT_SIZE]; /* data portion of the incoming packet
229     */
230     connection *cptr;
231
232     logDebugLine("TL: packet_arrival\n");
233     from_net(&cid, &m, &ptype, data, &count); /* go get it */
234     cptr = &conn[cid];
235
236     switch (ptype) {
237         case CALL_REQ: /* remote user wants to establish connection */
238             logDebugLine("TL: CALL_REQ, data[0]: %i, data[1]: %i, "
239                         "listen_address: %i\n", data[0], data[1], listen_address);
240
241             cptr->local_address = data[0];
242             cptr->remote_address = data[1];
243             if (cptr->local_address == listen_address) {
244                 listen_conn = cid;
245                 cptr->state = ESTABLISHED;
246                 cptr->clr_req_received = 0;
247                 cptr->credits = 0;
248                 wakeup();
249             } else {
250                 logDebugLine("TL: Nobody is listening, wakeup is not "
251                             "called!\n");
252                 cptr->state = QUEUED;
253                 cptr->timer = TIMEOUT;
254                 cptr->clr_req_received = 0;
255                 cptr->credits = 0;
256             }
257             logDebugLine("TL: CALL_REQ processed\n");
258             break;
259
260         case CALL_ACC: /* remote user has accepted our CALL_REQ */
261             logDebugLine("TL: CALL_ACC\n");
262             cptr->state = ESTABLISHED;
263             wakeup();
264             break;
265
266         case CLEAR_REQ: /* remote user wants to disconnect or reject
267                           call */
268             logDebugLine("TL: CLEAR_REQ\n");
269
270             cptr->clr_req_received = 1;
271             if (cptr->state == DISCONN) {
272                 logDebugLine("TL: cptr->state == DISCONN\n");
273                 cptr->state = IDLE; /* clear collision */
274                 close_connection(cid);
275             }

```

---

```

272     if (cptr->state == WAITING || cptr->state == RECEIVING ||
273         cptr->state == SENDING) {
274         logDebugLine( "TL: cptr->state == WAITING || RECEIVING || "
275                     "SENDING\n" );
276         wakeup();
277     }
278     break;
279
280     case CLEAR_CONF:           /* remote user agrees to disconnect */
281         logDebugLine( "TL: CLEAR_CONF\n" );
282         cptr->state = IDLE;
283         close_connection( cid );
284         break;
285
286     case CREDIT:               /* remote user is waiting for data */
287         logDebugLine( "TL: CREDIT\n" );
288         cptr->credits += data[1];
289         if (cptr->state == SENDING) {
290             wakeup();
291         }
292         break;
293
294     case DATA_PKT:             /* remote user has sent data */
295         logDebugLine( "TL: DATA_PKT\n" );
296         for (i = 0; i < count; i++) {
297             cptr->user_buf_addr[cptr->byte_count + i] = data[i];
298             printf("%c", data[i]);
299         }
300         cptr->byte_count += count;
301         if (m == 0) {
302             wakeup();
303         }
304     }
305 #endif /* TRANSPORTAYER_C_ */

```

---

## A.8 applicationLayer.h

```
1 #ifndef APPLICATION_LAYER_H_
2 #define APPLICATION_LAYER_H_
3
4
5 void sendFile();
6
7 void listenRecieveAndReSend();
8
9 void listenAndReceive();
10
11#endif /* APPLICATION_LAYER_H_ */
```

---

## A.9 applicationLayer.c

```
1 #ifndef APPLICATION_LAYER_C_
2 #define APPLICATION_LAYER_C_
3
4 #include "transportLayer.h"
5 #include "definitions.h"
6 #include "debug.h"
7 #include <unistd.h>
8 #include <stdio.h>
9 #include <stdlib.h>
10 #include <string.h>
11 #include <subnet.h>
12 #include <subnetsupport.h>
13 #include <fcntl.h>
14 #include <assert.h>
15 #include <ctype.h>
16
17
18 extern int ThisStation;
19
20 void sendFile()
21 {
22     FILE *fp;
23     char str[4096];
24     int cid, bytes;
25
26     logDebugLine("AL: sendFile function\n");
27
28     /* Get text to transmit */
29     if ((fp = fopen("testfile.txt", "r")) == NULL){
30         logDebugLine("AL: Error opening file\n");
31         Stop();
32     }
33
34     fgets(str, 4096, fp);
35     fclose(fp);
36
37     /* Delay, (1 second) to make sure everything else is set up; */
38     sleep(1);
39
40     logDebugLine("AL: Will send text of length %i\n", strlen(str));
41
42     logDebugLine("AL: Attempting to connect\n");
43     cid = connect(1,3);
44     logDebugLine("AL: cid : %i\n", cid);
45
46     logDebugLine("AL: Sending\n");
47     bytes = strlen(str);
48     send( cid, (unsigned char *) str, bytes );
49
50     logDebugLine("AL: Waiting for answer, receiving\n");
51
52     receive( cid, (unsigned char *) str, &bytes );
53     logDebugLine("AL: RECEIVED: %s\n", str);
54
55     /* disconnect til 3 */
```

---

```

56     disconnect( cid );
57
58     /* Make time for disconnections */
59     sleep( 5 );
60
61     Stop();
62 }
63
64 void listenRecieveAndReSend()
65 {
66     char *str;
67     int i, cid, cid2, bytes;
68     bytes = 4096;
69
70     str = malloc( bytes * sizeof(char));
71
72     /* Delay, (1 second) to make sure everything else is set up; */
73     sleep( 1 );
74
75     logDebugLine( "AL: listening\n" );
76     cid = listen( ThisStation );
77     logDebugLine( "AL: Got cid: %i\n", cid );
78
79     logDebugLine( "AL: calling receive\n" );
80     receive( cid, (unsigned char*) str, &bytes );
81
82     logDebugLine( "AL: RECEIVED: %s\n", str );
83
84     for( i = 0; i <= bytes; i++ ) {
85         str[ i ] = toupper( str[ i ] );
86     }
87
88     logDebugLine( "AL: Attempting to connect to 4\n" );
89
90     cid2 = connect( 3, 4 );
91
92     logDebugLine( "AL: cid: %i\n", cid );
93
94     logDebugLine( "AL: calling send\n" );
95     bytes = strlen( str );
96     send( cid2, (unsigned char *) str, bytes );
97
98     logDebugLine( "AL: Waiting for answer, receiving\n" );
99     receive( cid2, (unsigned char*) str, &bytes );
100
102     /* disconnect to station 4 */
103
104     /* This sleep decides if both sides calls disconnect at the same time :)
105     */
105     sleep( 2 );
106
107     disconnect( cid2 );
108
109     logDebugLine( "AL: RECEIVED: %s\n", str );
110
111     logDebugLine( "AL: forwards acknowledgement\n" );

```

---

```

112     send( cid , ( unsigned char *) str , bytes );
113
114     disconnect( cid );
115 }
116 }
117
118 /* User proces in station 4 */
119 void listenAndReceive()
120 {
121     char *str,*str2;
122     int cid, bytes;
123     FILE *file;
124     bytes = 4096;
125
126     str = malloc (bytes * sizeof(char));
127
128     logDebugLine("AL: `kalder` listen\n");
129
130     /* Delay, (1 second) to make sure everything else is set up; */
131     sleep(1);
132
133     cid = listen( ThisStation );
134
135     logDebugLine("AL: `got` cid: `%i\n",cid);
136
137     logDebugLine("AL: `calling` receive`with`cid: `%i\n",cid);
138
139     receive( cid , ( unsigned char*) str , &bytes );
140
141     logDebugLine("AL: `RECIEVED: `"%s`\n` , str);
142     logDebugLine("AL: `saving` as `out.txt`\n");
143
144     file = fopen( "outfile.txt" , "w" );
145     assert( file != NULL );
146     fprintf(file , str);
147
148 /* fwrite(str , sizeof(char) , bytes , file);
149 */
150     fclose(file);
151
152     /* We have received a message. Acknowledge */
153     logDebugLine("AL: `sends` acknowledgement and closes\n");
154
155     str2 = "Thanks\n";
156     bytes = strlen(str);
157     send( cid , ( unsigned char*) str2 , strlen(str)+1 );
158
159     disconnect( cid );
160 }
161
162
163
164
165
166
167
168

```

---

```
169
170 #endif /* APPLICATION_LAYER_C */
```

---

## A.10 debug.h

```
1 #ifndef DEBUG_H_
2 #define DEBUG_H_
3
4 #define DEBUG 1
5
6 #include "dataLinkLayer.h"
7
8
9 int printDebug( const char* __restrict format, ... );
10
11 void logDebug( const char *data , int length);
12
13 void logDebugLine( const char* __restrict format, ... );
14
15 void printFrame(frame *f);
16
17 void printPackage ( packet *p);
18
19 void debugPacketBuffer ( packet *buf );
20
21 void debugArrivedArray ( boolean *arrived);
22
23
24 #endif /*DEBUG_H_*/
```

---

## A.11 debug.c

```
1 #ifndef DEBUG_C_
2 #define DEBUG_C_
3
4
5 #include <subnetsupport.h>
6 #include <subnet.h>
7 #include <stdlib.h>
8 #include <stdio.h>
9 #include <stdarg.h>
10 #include <string.h>
11 #include "networkLayer.h"
12 #include "debug.h"
13 #include "dataLinkLayer.h"
14 extern int ThisStation;
15 extern lock_t *writeLock;
16
17 int printDebug(const char* __restrict format, ...) {
18     if(DEBUG) {
19         char buffer[255] = "";
20         va_list arg;
21         int rv;
22         va_start(arg, format);
23         rv = vsnprintf(buffer, 255, format, arg);
24         va_end(arg);
25         printf(buffer, strlen(buffer));
26     }
27     return rv;
28 }
29
30
31 void logDebug( const char *data , int length)
32 {
33     if(DEBUG) {
34         SyncLog( data , length);
35     }
36
37 }
38
39 void logDebugLine( const char* __restrict format , ...)
40 {
41     Lock(writeLock);
42     if(DEBUG) {
43         char buffer[255] = "";
44         char buffer2[255] = "";
45         va_list arg;
46         int rv;
47         va_start(arg, format);
48         rv = vsnprintf(buffer, 255, format, arg);
49         va_end(arg);
50         sprintf(buffer2 , "%s:\%s" , GetProcessName() , buffer );
51         SyncLog(buffer2 , strlen(buffer2));
52         printf("%i:\,%s" , ThisStation , buffer2);
53     }
54     Unlock(writeLock);
55 }
```

---

```

56
57
58 void printFrame(frame *f)
59 {
60     switch( f->kind ) {
61         case data:
62             printf( "DATA_frame , seq: %i , ack: %i " , f->seq , f->ack );
63             printPackage( &(f->info) );
64             break;
65         case ack:
66             printf( "ACK_frame , seq: %i , ack: %i \n" , f->seq , f->ack );
67             break;
68         case nak:
69             printf( "NAK_frame , seq: %i , ack: %i \n" , f->seq , f->ack );
70             break;
71     }
72 }
73
74 void printPackage( packet *p )
75 {
76 /* logDebugLine( "Package data: %s | n" , p->data ); */
77 }
78
79 void debugPacketBuffer( packet *buf )
80 {
81     int i;
82
83     for( i = 0; i < NR_BUFS ; i++ ) {
84         logDebugLine( "%i " , i );
85         printPackage( &buf[ i ] );
86     }
87 }
88
89 void debugArrivedArray( boolean *arrived )
90 {
91     logDebugLine( "arrived buffer: %i %i %i %i \n" , arrived[ 0 ] , arrived[ 1 ] ,
92                   arrived[ 2 ] , arrived[ 3 ] );
93
94 }
95
96
97 #endif /*DEBUG_C*/

```

---

## A.12 makefile

```
1 # $Id: user.mk,v 1.7 1999/08/24 12:24:47 dim Exp $
2 #
3 # $RelId: DM40, subnet. Version 1.3 (#1) Sep 06 18:28:52 CEST 1999 $
4 #
5 # Makefile til testprogrammer og brugerprogrammer til subnetpakken.
6 # Denne makefile er arkiveret under navnet 'user.mk', men efter installation
7 # ændres navnet til 'makefile'.
8 #
9 # Steffen Schmidt.
10
11 #####
12 # Bemaerkninger:
13 #
14 # Der har været problemer med i forbindelse med forskellige versioner af 'ld',
15 # saa
16 # i tilfælde af at testprogrammerne "segmentation-fault 'er", prøv at
17 # tilføj:
18 # -B/usr/bin til CFLAGS
19 #
20 # 'normalt' makefile opstilling:
21 #
22 # o-filer:
23 # funk1.o : funk1.c
24 # ${CC} -c ${CFLAGS} ${LDFLAGS} funk1.c
25 #
26 # exec-filer:
27 # maketest : maketest.c funk1.o
28 # ${CC} ${CFLAGS} ${LDFLAGS} maketest.c funk1.o -o maketest ${LIBS}
29 #
30 #####
31 # macro definitioner:
32 #
33 # Henter makro definitioner.
34 include macro_def.mk
35
36 CFLAGS = -O -Wall -pedantic
37
38 .SUFFIXES : .o .c
39
40 PROGRAMFILES = dataLinkLayer
41
42 OBJECTFILES = debug.o Utilities.o networkLayer.o applicationLayer.o
43 transportLayer.o
44 #####
45 # suffix-regler til kompilering af testfiler
46
47 all : ${PROGRAMFILES}
48 .c :
49     ${CC} ${CFLAGS} ${LDFLAGS} $^ -o $@ ${LIBS}
50
51 .c.o :
52     ${CC} -c ${CFLAGS} ${LDFLAGS} $<
```

---

```
53
54
55 ##### Afhaengigheder for testfiler:
56 # Afhaengigheder for testfiler:
57
58 dataLinkLayer: debug.o networkLayer.o transportLayer.o applicationLayer.o
59
60
61 ##### Til oprydning:
62 # til oprydning:
63
64 clean:
65     make -f system.mk clean
66     rm -f ${PROGRAMFILES} ${OBJECTFILES}
```

---

### A.13 testfile.txt

The Answer to Life, the Universe, and Everything has a numeric solution in Douglas Adams' series *The Hitchhiker's Guide to the Galaxy*. In the story, a "simple answer" to The Ultimate Question is requested from the computer Deep Thought - specially built for this purpose. It takes Deep Thought 7 million years to compute and check the answer which turns out to be 42. When asked to provide The Ultimate Question, the computer says that it can't, but can help design an even more powerful computer (the Earth) which can. The programmers then embark on a further, ultimately futile, ten million year program to discover The Ultimate Question, hindered by Golgafrinchans after 8 million years, and in the last five minutes by the Vogons. The author was presented with many readers' theories about The Ultimate Question and The Ultimate Answer in his lifetime, all of which he rebutted with his own somewhat apocryphal explanations. According to *The Hitchhiker's Guide to the Galaxy*, a race of vast pan-dimensional hyper-intelligent beings constructed the second greatest computer in all of time and space, Deep Thought, to calculate The Ultimate Answer to The Great Question of Life, the Universe, and Everything. Distracted by a demarcation dispute with two philosophers, a "simple answer" is requested. After seven and a half million years of computing cycles, Deep Thought's answer is: forty two. (From wikipedia).

---

## A.14 Log output

```
Network log. Synchronized log-information:  
Log opened: 01/02-08, at 09:52:14  
Error-frequency: 0.100  
Active stations: 1 2 3 4  
-----  
[[ (log-number) ]]< (source) >: (data)  
-----  
[[1]]<1>: sendFile: AL: sendFile function  
[[2]]<4>: listenAndReceive: AL: kalder listen  
[[3]]<4>: listenAndReceive: TL: listen funktionen  
[[4]]<4>: listenAndReceive: Transportlayer tl_sleeping  
[[5]]<1>: sendFile: AL: Will send text of length 1416  
[[6]]<1>: sendFile: AL: Attempting to connect  
[[7]]<1>: sendFile: TL: connect  
[[8]]<1>: sendFile: NL: Open to router 2  
[[9]]<1>: sendFile: NL: Gets cid: 1  
[[10]]<1>: sendFile: NL: i: 1, from: 1, cid: 1, to: 2, outCid: 1  
[[11]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 0,  
next_frame_to_send: 0, frame_exp: 0  
[[12]]<3>: listenRecieveAndReSend: AL: listening  
[[13]]<3>: listenRecieveAndReSend: TL: listen funktionen  
[[14]]<3>: listenRecieveAndReSend: Transportlayer tl_sleeping  
[[15]]<1>: dataLinkLayer: DLL: EVENT: Timeout: msg: 0, timer_id: 1  
[[16]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 0,  
next_frame_to_send: 0, frame_expected: 0, too_far: 8  
[[17]]<2>: dataLinkLayer: DLL: DATA frame arrived  
[[18]]<2>: dataLinkLayer: NL: from_datalink_layer: received something  
[[19]]<2>: networkLayer: NL: handle_packet  
[[20]]<2>: networkLayer: NL: NL_CONN received, in. cid: 1  
[[21]]<2>: networkLayer: NL: start: 1, end: 3  
[[22]]<2>: networkLayer: NL: Not end station  
[[23]]<2>: networkLayer: NL: i: 1, from: 1, cid: 1, to: 3, outCid: 1  
[[24]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 0,  
next_frame_to_send: 0, frame_exp: 0  
[[25]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 1  
[[26]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT  
[[27]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: 0, timer_id: 2  
[[28]]<1>: dataLinkLayer: DLL: EVENT: Timeout: msg: 0, timer_id: 2  
[[29]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 0,  
next_frame_to_send: 0, frame_expected: 1, too_far: 9  
[[30]]<2>: dataLinkLayer: DLL: DATA frame arrived  
[[31]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 0,  
next_frame_to_send: 1, frame_expected: 0, too_far: 8  
[[32]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 0,  
next_frame_to_send: 0, frame_expected: 0, too_far: 8  
[[33]]<3>: dataLinkLayer: DLL: DATA frame arrived  
[[34]]<3>: dataLinkLayer: NL: from_datalink_layer: received something  
[[35]]<3>: networkLayer: NL: handle_packet  
[[36]]<3>: networkLayer: NL: NL_CONN received, in. cid: 1  
[[37]]<3>: networkLayer: NL: start: 1, end: 3  
[[38]]<3>: networkLayer: NL: Send NL_ACCEPT
```

---

```
[[39]]<3>: networkLayer: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[40]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 0,
next_frame_to_send: 0, frame_exp: 1
[[41]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 0,
next_frame_to_send: 1, frame_expected: 0, too_far: 8
[[42]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[43]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[44]]<2>: networkLayer: NL: handle_packet
[[45]]<2>: networkLayer: NL: NL_ACCEPT: nqe->from: 3 , nqe->p.cid: 1
[[46]]<2>: networkLayer: NL: VC table entry 1, is opposite
[[47]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 1 ack_exp: 0,
next_frame_to_send: 0, frame_exp: 1
[[48]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 1,
next_frame_to_send: 1, frame_expected: 0, too_far: 8
[[49]]<1>: dataLinkLayer: DLL: DATA frame arrived
[[50]]<1>: dataLinkLayer: NL: from_datalink_layer: received something
[[51]]<1>: networkLayer: NL: handle_packet
[[52]]<1>: networkLayer: NL: NL_ACCEPT: nqe->from: 2 , nqe->p.cid: 1
[[53]]<1>: networkLayer: NL: VC table entry 1, is opposite
[[54]]<1>: networkLayer: NL: Acknowledge
[[55]]<1>: sendFile: NL: ok for cid
[[56]]<1>: sendFile: NL: i: 1, from: 1, cid: 1, to: 2, outCid: 1
[[57]]<1>: sendFile: Transportlayer tl_sleeping
[[58]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 1,
next_frame_to_send: 1, frame_exp: 1
[[59]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 0,
next_frame_to_send: 1, frame_expected: 1, too_far: 9
[[60]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[61]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[62]]<2>: networkLayer: NL: handle_packet
[[63]]<2>: networkLayer: NL: NL_DATA
[[64]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[65]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 1,
next_frame_to_send: 1, frame_exp: 1
[[66]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 0,
next_frame_to_send: 1, frame_expected: 1, too_far: 9
[[67]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[68]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[69]]<3>: networkLayer: NL: handle_packet
[[70]]<3>: networkLayer: NL: NL_DATA
[[71]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[72]]<3>: transportLayer: TL: packet_arrival
[[73]]<3>: transportLayer: TL: from_net: type: 5, m: 0, bytes: 2
[[74]]<3>: transportLayer: TL: CALL_REQ, data[0]: 3, data[1]: 1, listen_address: 3
[[75]]<3>: transportLayer: TL: CALL_REQ processed
[[76]]<3>: listenRecieveAndReSend: TL: Listen1
[[77]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[78]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[79]]<3>: listenRecieveAndReSend: TL: Listen2
[[80]]<3>: listenRecieveAndReSend: AL: Got cid: 1
[[81]]<3>: listenRecieveAndReSend: AL: calling receive
[[82]]<3>: listenRecieveAndReSend: TL: receive
[[83]]<3>: listenRecieveAndReSend: TL: recieve, sending credit
```

---

```
[[84]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[85]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[86]]<3>: listenRecieveAndReSend: Transportlayer tl_sleeping
[[87]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 1,
next_frame_to_send: 1, frame_exp: 2
[[88]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 1,
next_frame_to_send: 2, frame_exp: 2
[[89]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 1,
next_frame_to_send: 2, frame_expected: 1, too_far: 9
[[90]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[91]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 1,
next_frame_to_send: 3, frame_expected: 2, too_far: 10
[[92]]<3>: dataLinkLayer: DLL: NAK frame arrived, resending
[[93]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 2,
next_frame_to_send: 2, frame_expected: 1, too_far: 9
[[94]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[95]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[96]]<2>: networkLayer: NL: handle_packet
[[97]]<2>: networkLayer: NL: NL_DATA
[[98]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 1
[[99]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[100]]<2>: networkLayer: NL: handle_packet
[[101]]<2>: networkLayer: NL: NL_DATA
[[102]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 1
[[103]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 1 ack_exp: 1,
next_frame_to_send: 1, frame_exp: 2
[[104]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 1 ack_exp: 1,
next_frame_to_send: 2, frame_exp: 2
[[105]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 1,
next_frame_to_send: 2, frame_expected: 1, too_far: 9
[[106]]<1>: dataLinkLayer: DLL: DATA frame arrived
[[107]]<1>: dataLinkLayer: NL: from_datalink_layer: received something
[[108]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 2,
next_frame_to_send: 2, frame_expected: 2, too_far: 10
[[109]]<1>: dataLinkLayer: DLL: DATA frame arrived
[[110]]<1>: dataLinkLayer: NL: from_datalink_layer: received something
[[111]]<1>: networkLayer: NL: handle_packet
[[112]]<1>: networkLayer: NL: NL_DATA
[[113]]<1>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[114]]<1>: networkLayer: NL: handle_packet
[[115]]<1>: networkLayer: NL: NL_DATA
[[116]]<1>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[117]]<1>: transportLayer: TL: packet_arrival
[[118]]<1>: transportLayer: TL: from_net: type: 0, m: 0, bytes: 0
[[119]]<1>: transportLayer: TL: CALL_ACC
[[120]]<1>: transportLayer: TL: packet_arrival
[[121]]<1>: transportLayer: TL: from_net: type: 4, m: 0, bytes: 2
[[122]]<1>: transportLayer: TL: CREDIT
[[123]]<1>: sendFile: AL: cid: 1
[[124]]<1>: sendFile: AL: Sending
[[125]]<1>: sendFile: TL: send
[[126]]<1>: sendFile: NL: i: 1, from: 1, cid: 1, to: 2, outCid: 1
[[127]]<1>: sendFile: NL: i: 1, from: 1, cid: 1, to: 2, outCid: 1
```



---

```
[[181]]<1>: sendFile: Transportlayer tl_sleeping
[[182]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 2,
next_frame_to_send: 2, frame_exp: 3
[[183]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 2,
next_frame_to_send: 3, frame_exp: 3
[[184]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 1,
next_frame_to_send: 3, frame_expected: 2, too_far: 10
[[185]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[186]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[187]]<2>: networkLayer: NL: handle_packet
[[188]]<2>: networkLayer: NL: NL_DATA
[[189]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[190]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[191]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[192]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[193]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 2,
next_frame_to_send: 2, frame_exp: 3
[[194]]<2>: networkLayer: NL: handle_packet
[[195]]<2>: networkLayer: NL: NL_DATA
[[196]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[197]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 2,
next_frame_to_send: 3, frame_exp: 3
[[198]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 2,
next_frame_to_send: 4, frame_exp: 3
[[199]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 2,
next_frame_to_send: 5, frame_exp: 3
[[200]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 4, too_far: 12
[[201]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[202]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[203]]<2>: networkLayer: NL: handle_packet
[[204]]<2>: networkLayer: NL: NL_DATA
[[205]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[206]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 2,
next_frame_to_send: 4, frame_exp: 3
[[207]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 2,
next_frame_to_send: 6, frame_exp: 3
[[208]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 5, too_far: 13
[[209]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[210]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[211]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 2,
next_frame_to_send: 7, frame_exp: 3
[[212]]<2>: networkLayer: NL: handle_packet
[[213]]<2>: networkLayer: NL: NL_DATA
[[214]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 2,
next_frame_to_send: 8, frame_exp: 3
[[215]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 6, too_far: 14
[[216]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[217]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[218]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
```

---

```
[[219]]<2>: networkLayer: NL: handle_packet
[[220]]<2>: networkLayer: NL: NL_DATA
[[221]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[222]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 7, too_far: 15
[[223]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[224]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[225]]<2>: networkLayer: NL: handle_packet
[[226]]<2>: networkLayer: NL: NL_DATA
[[227]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[228]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 8, too_far: 16
[[229]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[230]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[231]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 2,
next_frame_to_send: 5, frame_exp: 3
[[232]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 2,
next_frame_to_send: 6, frame_exp: 3
[[233]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 2,
next_frame_to_send: 7, frame_exp: 3
[[234]]<2>: networkLayer: NL: handle_packet
[[235]]<2>: networkLayer: NL: NL_DATA
[[236]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[237]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 2,
next_frame_to_send: 8, frame_exp: 3
[[238]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 2,
next_frame_to_send: 9, frame_exp: 3
[[239]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 9, too_far: 17
[[240]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[241]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[242]]<2>: networkLayer: NL: handle_packet
[[243]]<2>: networkLayer: NL: NL_DATA
[[244]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[245]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 2,
next_frame_to_send: 9, frame_exp: 3
[[246]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 1,
next_frame_to_send: 3, frame_expected: 2, too_far: 10
[[247]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[248]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[249]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[250]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[251]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[252]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 2,
next_frame_to_send: 10, frame_expected: 3, too_far: 11
[[253]]<2>: dataLinkLayer: DLL: NAK frame arrived, resending
[[254]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[255]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[256]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[257]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
```

---

```
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[258]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[259]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[260]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[261]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[262]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[263]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[264]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[265]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[266]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[267]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[268]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[269]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[270]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[271]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[272]]<3>: networkLayer: NL: handle_packet
[[273]]<3>: networkLayer: NL: NL_DATA
[[274]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[275]]<3>: networkLayer: NL: handle_packet
[[276]]<3>: networkLayer: NL: NL_DATA
[[277]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[278]]<3>: networkLayer: NL: handle_packet
[[279]]<3>: networkLayer: NL: NL_DATA
[[280]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[281]]<3>: networkLayer: NL: handle_packet
[[282]]<3>: networkLayer: NL: NL_DATA
[[283]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[284]]<3>: networkLayer: NL: handle_packet
[[285]]<3>: networkLayer: NL: NL_DATA
[[286]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[287]]<3>: networkLayer: NL: handle_packet
[[288]]<3>: networkLayer: NL: NL_DATA
[[289]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[290]]<3>: networkLayer: NL: handle_packet
[[291]]<3>: networkLayer: NL: NL_DATA
[[292]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[293]]<3>: networkLayer: NL: handle_packet
[[294]]<3>: networkLayer: NL: NL_DATA
[[295]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[296]]<3>: transportLayer: TL: packet_arrival
[[297]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[298]]<3>: transportLayer: TL: DATA_PKT
[[299]]<3>: transportLayer: TL: packet_arrival
[[300]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[301]]<3>: transportLayer: TL: DATA_PKT
[[302]]<3>: transportLayer: TL: packet_arrival
[[303]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[304]]<3>: transportLayer: TL: DATA_PKT
[[305]]<3>: transportLayer: TL: packet_arrival
[[306]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
```

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```
[[307]]<3>: transportLayer: TL: DATA_PKT
[[308]]<3>: transportLayer: TL: packet_arrival
[[309]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[310]]<3>: transportLayer: TL: DATA_PKT
[[311]]<3>: transportLayer: TL: packet_arrival
[[312]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[313]]<3>: transportLayer: TL: DATA_PKT
[[314]]<3>: transportLayer: TL: packet_arrival
[[315]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[316]]<3>: transportLayer: TL: DATA_PKT
[[317]]<3>: transportLayer: TL: packet_arrival
[[318]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[319]]<3>: transportLayer: TL: DATA_PKT
[[320]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 11
[[321]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[322]]<3>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 8
[[323]]<3>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[324]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 3,
next_frame_to_send: 10, frame_expected: 3, too_far: 11
[[325]]<2>: dataLinkLayer: DLL: ACK frame arrived
[[326]]<1>: dataLinkLayer: DLL: EVENT: Timeout: msg: 2, timer_id: 7
[[327]]<1>: dataLinkLayer: DLL: EVENT: Timeout: msg: 3, timer_id: 8
[[328]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 10, too_far: 18
[[329]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[330]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 10, too_far: 18
[[331]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[332]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 2,
next_frame_to_send: 10, frame_expected: 3, too_far: 11
[[333]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 10,
next_frame_to_send: 10, frame_exp: 3
[[334]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 10,
next_frame_to_send: 11, frame_exp: 3
[[335]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 10,
next_frame_to_send: 12, frame_exp: 3
[[336]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 10,
next_frame_to_send: 13, frame_exp: 3
[[337]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 10,
next_frame_to_send: 14, frame_exp: 3
[[338]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 10,
next_frame_to_send: 15, frame_exp: 3
[[339]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 10,
next_frame_to_send: 16, frame_exp: 3
[[340]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 10,
next_frame_to_send: 17, frame_exp: 3
[[341]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 10, too_far: 18
[[342]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[343]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[344]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 11, too_far: 19
[[345]]<2>: dataLinkLayer: DLL: DATA frame arrived
```

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```
[[346]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[347]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 12, too_far: 20
[[348]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[349]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[350]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 13, too_far: 21
[[351]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[352]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[353]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 14, too_far: 22
[[354]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[355]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[356]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 15, too_far: 23
[[357]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[358]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[359]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 16, too_far: 24
[[360]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[361]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[362]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 17, too_far: 25
[[363]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[364]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[365]]<2>: networkLayer: NL: handle_packet
[[366]]<2>: networkLayer: NL: NL_DATA
[[367]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[368]]<2>: networkLayer: NL: handle_packet
[[369]]<2>: networkLayer: NL: NL_DATA
[[370]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[371]]<2>: networkLayer: NL: handle_packet
[[372]]<2>: networkLayer: NL: NL_DATA
[[373]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[374]]<2>: networkLayer: NL: handle_packet
[[375]]<2>: networkLayer: NL: NL_DATA
[[376]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[377]]<2>: networkLayer: NL: handle_packet
[[378]]<2>: networkLayer: NL: NL_DATA
[[379]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[380]]<2>: networkLayer: NL: handle_packet
[[381]]<2>: networkLayer: NL: NL_DATA
[[382]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[383]]<2>: networkLayer: NL: handle_packet
[[384]]<2>: networkLayer: NL: NL_DATA
[[385]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[386]]<2>: networkLayer: NL: handle_packet
[[387]]<2>: networkLayer: NL: NL_DATA
[[388]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[389]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 10,
next_frame_to_send: 10, frame_exp: 3
[[390]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 10,
next_frame_to_send: 11, frame_exp: 3
```

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[[391]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 10,
next_frame_to_send: 12, frame_exp: 3
[[392]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 10,
next_frame_to_send: 13, frame_exp: 3
[[393]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 10,
next_frame_to_send: 14, frame_exp: 3
[[394]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 10,
next_frame_to_send: 15, frame_exp: 3
[[395]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 10,
next_frame_to_send: 16, frame_exp: 3
[[396]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 10,
next_frame_to_send: 17, frame_exp: 3
[[397]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 10, too_far: 18
[[398]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[399]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[400]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 11, too_far: 19
[[401]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[402]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[403]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 12, too_far: 20
[[404]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[405]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[406]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 13, too_far: 21
[[407]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[408]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[409]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 14, too_far: 22
[[410]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[411]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[412]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 15, too_far: 23
[[413]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[414]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[415]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 16, too_far: 24
[[416]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[417]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[418]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 17, too_far: 25
[[419]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[420]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[421]]<3>: networkLayer: NL: handle_packet
[[422]]<3>: networkLayer: NL: NL_DATA
[[423]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[424]]<3>: networkLayer: NL: handle_packet
[[425]]<3>: networkLayer: NL: NL_DATA
[[426]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[427]]<3>: networkLayer: NL: handle_packet
[[428]]<3>: networkLayer: NL: NL_DATA
[[429]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
```

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```
[[430]]<3>: networkLayer: NL: handle_packet
[[431]]<3>: networkLayer: NL: NL_DATA
[[432]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[433]]<3>: networkLayer: NL: handle_packet
[[434]]<3>: networkLayer: NL: NL_DATA
[[435]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[436]]<3>: networkLayer: NL: handle_packet
[[437]]<3>: networkLayer: NL: NL_DATA
[[438]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[439]]<3>: networkLayer: NL: handle_packet
[[440]]<3>: networkLayer: NL: NL_DATA
[[441]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[442]]<3>: networkLayer: NL: handle_packet
[[443]]<3>: networkLayer: NL: NL_DATA
[[444]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[445]]<3>: transportLayer: TL: packet_arrival
[[446]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[447]]<3>: transportLayer: TL: DATA_PKT
[[448]]<3>: transportLayer: TL: packet_arrival
[[449]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[450]]<3>: transportLayer: TL: DATA_PKT
[[451]]<3>: transportLayer: TL: packet_arrival
[[452]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[453]]<3>: transportLayer: TL: DATA_PKT
[[454]]<3>: transportLayer: TL: packet_arrival
[[455]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[456]]<3>: transportLayer: TL: DATA_PKT
[[457]]<3>: transportLayer: TL: packet_arrival
[[458]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[459]]<3>: transportLayer: TL: DATA_PKT
[[460]]<3>: transportLayer: TL: packet_arrival
[[461]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[462]]<3>: transportLayer: TL: DATA_PKT
[[463]]<3>: transportLayer: TL: packet_arrival
[[464]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[465]]<3>: transportLayer: TL: DATA_PKT
[[466]]<3>: transportLayer: TL: packet_arrival
[[467]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[468]]<3>: transportLayer: TL: DATA_PKT
[[469]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 21
[[470]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[471]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 10,
next_frame_to_send: 18, frame_expected: 3, too_far: 11
[[472]]<1>: dataLinkLayer: DLL: ACK frame arrived
[[473]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 18,
next_frame_to_send: 18, frame_exp: 3
[[474]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 18,
next_frame_to_send: 19, frame_exp: 3
[[475]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 18,
next_frame_to_send: 20, frame_exp: 3
[[476]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 18,
next_frame_to_send: 21, frame_exp: 3
[[477]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 18,
```

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next_frame_to_send: 22, frame_exp: 3
[[478]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 18,
next_frame_to_send: 23, frame_exp: 3
[[479]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 18,
next_frame_to_send: 24, frame_exp: 3
[[480]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 18,
next_frame_to_send: 25, frame_exp: 3
[[481]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 18, too_far: 26
[[482]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[483]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[484]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 19, too_far: 27
[[485]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[486]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[487]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 20, too_far: 28
[[488]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[489]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 20, too_far: 28
[[490]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[491]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 20, too_far: 28
[[492]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[493]]<2>: networkLayer: NL: handle_packet
[[494]]<2>: networkLayer: NL: NL_DATA
[[495]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[496]]<2>: networkLayer: NL: handle_packet
[[497]]<2>: networkLayer: NL: NL_DATA
[[498]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[499]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 20, too_far: 28
[[500]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[501]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 20, too_far: 28
[[502]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[503]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 18,
next_frame_to_send: 26, frame_expected: 3, too_far: 11
[[504]]<1>: dataLinkLayer: DLL: NAK frame arrived, resending
[[505]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 20,
next_frame_to_send: 26, frame_exp: 3
[[506]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 20,
next_frame_to_send: 27, frame_exp: 3
[[507]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 20, too_far: 28
[[508]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[509]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[510]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[511]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[512]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[513]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[514]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[515]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
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next_frame_to_send: 3, frame_expected: 26, too_far: 34
[[516]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[517]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[518]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 27, too_far: 35
[[519]]<2>: networkLayer: NL: handle_packet
[[520]]<2>: networkLayer: NL: NL_DATA
[[521]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[522]]<2>: networkLayer: NL: handle_packet
[[523]]<2>: networkLayer: NL: NL_DATA
[[524]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[525]]<2>: networkLayer: NL: handle_packet
[[526]]<2>: networkLayer: NL: NL_DATA
[[527]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[528]]<2>: networkLayer: NL: handle_packet
[[529]]<2>: networkLayer: NL: NL_DATA
[[530]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[531]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[532]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[533]]<2>: networkLayer: NL: handle_packet
[[534]]<2>: networkLayer: NL: NL_DATA
[[535]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[536]]<2>: networkLayer: NL: handle_packet
[[537]]<2>: networkLayer: NL: NL_DATA
[[538]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[539]]<2>: networkLayer: NL: handle_packet
[[540]]<2>: networkLayer: NL: NL_DATA
[[541]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[542]]<2>: networkLayer: NL: handle_packet
[[543]]<2>: networkLayer: NL: NL_DATA
[[544]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[545]]<3>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 9
[[546]]<3>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[547]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 10,
next_frame_to_send: 18, frame_expected: 3, too_far: 11
[[548]]<2>: dataLinkLayer: DLL: ACK frame arrived
[[549]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 18,
next_frame_to_send: 18, frame_exp: 3
[[550]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 18,
next_frame_to_send: 19, frame_exp: 3
[[551]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 18,
next_frame_to_send: 20, frame_exp: 3
[[552]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 18,
next_frame_to_send: 21, frame_exp: 3
[[553]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 18,
next_frame_to_send: 22, frame_exp: 3
[[554]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 18,
next_frame_to_send: 23, frame_exp: 3
[[555]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 18,
next_frame_to_send: 24, frame_exp: 3
[[556]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 18,
next_frame_to_send: 25, frame_exp: 3
[[557]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
```

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```
next_frame_to_send: 3, frame_expected: 18, too_far: 26
[[558]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[559]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[560]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 19, too_far: 27
[[561]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[562]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[563]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 20, too_far: 28
[[564]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[565]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[566]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 21, too_far: 29
[[567]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[568]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[569]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 22, too_far: 30
[[570]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[571]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[572]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 23, too_far: 31
[[573]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[574]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[575]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 24, too_far: 32
[[576]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[577]]<3>: networkLayer: NL: handle_packet
[[578]]<3>: networkLayer: NL: NL_DATA
[[579]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[580]]<3>: networkLayer: NL: handle_packet
[[581]]<3>: networkLayer: NL: NL_DATA
[[582]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[583]]<3>: networkLayer: NL: handle_packet
[[584]]<3>: networkLayer: NL: NL_DATA
[[585]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[586]]<3>: networkLayer: NL: handle_packet
[[587]]<3>: networkLayer: NL: NL_DATA
[[588]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[589]]<3>: networkLayer: NL: handle_packet
[[590]]<3>: networkLayer: NL: NL_DATA
[[591]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[592]]<3>: networkLayer: NL: handle_packet
[[593]]<3>: networkLayer: NL: NL_DATA
[[594]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[595]]<3>: transportLayer: TL: packet_arrival
[[596]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[597]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 18,
next_frame_to_send: 26, frame_expected: 3, too_far: 11
[[598]]<2>: dataLinkLayer: DLL: NAK frame arrived, resending
[[599]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 24,
next_frame_to_send: 26, frame_exp: 3
[[600]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 24,
next_frame_to_send: 27, frame_exp: 3
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[[601]]<3>: transportLayer: TL: DATA_PKT
[[602]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 24, too_far: 32
[[603]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[604]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[605]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[606]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 26, too_far: 34
[[607]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[608]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[609]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 27, too_far: 35
[[610]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[611]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[612]]<3>: transportLayer: TL: packet_arrival
[[613]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[614]]<3>: transportLayer: TL: DATA_PKT
[[615]]<3>: transportLayer: TL: packet_arrival
[[616]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[617]]<3>: transportLayer: TL: DATA_PKT
[[618]]<3>: transportLayer: TL: packet_arrival
[[619]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[620]]<3>: transportLayer: TL: DATA_PKT
[[621]]<3>: transportLayer: TL: packet_arrival
[[622]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[623]]<3>: transportLayer: TL: DATA_PKT
[[624]]<3>: transportLayer: TL: packet_arrival
[[625]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[626]]<3>: transportLayer: TL: DATA_PKT
[[627]]<3>: networkLayer: NL: handle_packet
[[628]]<3>: networkLayer: NL: NL_DATA
[[629]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[630]]<3>: networkLayer: NL: handle_packet
[[631]]<3>: networkLayer: NL: NL_DATA
[[632]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[633]]<3>: networkLayer: NL: handle_packet
[[634]]<3>: networkLayer: NL: NL_DATA
[[635]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[636]]<3>: transportLayer: TL: packet_arrival
[[637]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[638]]<3>: transportLayer: TL: DATA_PKT
[[639]]<3>: transportLayer: TL: packet_arrival
[[640]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[641]]<3>: transportLayer: TL: DATA_PKT
[[642]]<3>: transportLayer: TL: packet_arrival
[[643]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[644]]<3>: transportLayer: TL: DATA_PKT
[[645]]<3>: networkLayer: NL: handle_packet
[[646]]<3>: networkLayer: NL: NL_DATA
[[647]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[648]]<3>: transportLayer: TL: packet_arrival
[[649]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[650]]<3>: transportLayer: TL: DATA_PKT
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[[651]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 31
[[652]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[653]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 20,
next_frame_to_send: 28, frame_expected: 3, too_far: 11
[[654]]<1>: dataLinkLayer: DLL: ACK frame arrived
[[655]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 28,
next_frame_to_send: 28, frame_exp: 3
[[656]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 28,
next_frame_to_send: 29, frame_exp: 3
[[657]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 28,
next_frame_to_send: 30, frame_exp: 3
[[658]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 28,
next_frame_to_send: 31, frame_exp: 3
[[659]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 28,
next_frame_to_send: 32, frame_exp: 3
[[660]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 28,
next_frame_to_send: 33, frame_exp: 3
[[661]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 28,
next_frame_to_send: 34, frame_exp: 3
[[662]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 28,
next_frame_to_send: 35, frame_exp: 3
[[663]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 28, too_far: 36
[[664]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[665]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[666]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 29, too_far: 37
[[667]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[668]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[669]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 30, too_far: 38
[[670]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[671]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[672]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 31, too_far: 39
[[673]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[674]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[675]]<2>: networkLayer: NL: handle_packet
[[676]]<2>: networkLayer: NL: NL_DATA
[[677]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[678]]<2>: networkLayer: NL: handle_packet
[[679]]<2>: networkLayer: NL: NL_DATA
[[680]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[681]]<2>: networkLayer: NL: handle_packet
[[682]]<2>: networkLayer: NL: NL_DATA
[[683]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[684]]<2>: networkLayer: NL: handle_packet
[[685]]<2>: networkLayer: NL: NL_DATA
[[686]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[687]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 32, too_far: 40
[[688]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[689]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
```

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[[690]]<2>: networkLayer: NL: handle_packet
[[691]]<2>: networkLayer: NL: NL_DATA
[[692]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[693]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 33, too_far: 41
[[694]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[695]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[696]]<2>: networkLayer: NL: handle_packet
[[697]]<2>: networkLayer: NL: NL_DATA
[[698]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[699]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 34, too_far: 42
[[700]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[701]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[702]]<2>: networkLayer: NL: handle_packet
[[703]]<2>: networkLayer: NL: NL_DATA
[[704]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[705]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 35, too_far: 43
[[706]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[707]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[708]]<2>: networkLayer: NL: handle_packet
[[709]]<2>: networkLayer: NL: NL_DATA
[[710]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[711]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 24,
next_frame_to_send: 28, frame_exp: 3
[[712]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 28, too_far: 36
[[713]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[714]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[715]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 24,
next_frame_to_send: 29, frame_exp: 3
[[716]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 29, too_far: 37
[[717]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[718]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[719]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 24,
next_frame_to_send: 30, frame_exp: 3
[[720]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 30, too_far: 38
[[721]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[722]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[723]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 24,
next_frame_to_send: 31, frame_exp: 3
[[724]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 31, too_far: 39
[[725]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[726]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[727]]<3>: networkLayer: NL: handle_packet
[[728]]<3>: networkLayer: NL: NL_DATA
[[729]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[730]]<3>: networkLayer: NL: handle_packet
[[731]]<3>: networkLayer: NL: NL_DATA
```

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[[732]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[733]]<3>: transportLayer: TL: packet_arrival
[[734]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[735]]<3>: transportLayer: TL: DATA_PKT
[[736]]<3>: networkLayer: NL: handle_packet
[[737]]<3>: networkLayer: NL: NL_DATA
[[738]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[739]]<3>: transportLayer: TL: packet_arrival
[[740]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[741]]<3>: transportLayer: TL: DATA_PKT
[[742]]<3>: networkLayer: NL: handle_packet
[[743]]<3>: networkLayer: NL: NL_DATA
[[744]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[745]]<3>: transportLayer: TL: packet_arrival
[[746]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[747]]<3>: transportLayer: TL: DATA_PKT
[[748]]<3>: transportLayer: TL: packet_arrival
[[749]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[750]]<3>: transportLayer: TL: DATA_PKT
[[751]]<3>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 11
[[752]]<3>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[753]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 24,
next_frame_to_send: 32, frame_expected: 3, too_far: 11
[[754]]<2>: dataLinkLayer: DLL: ACK frame arrived
[[755]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 32,
next_frame_to_send: 32, frame_exp: 3
[[756]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 32,
next_frame_to_send: 33, frame_exp: 3
[[757]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 32,
next_frame_to_send: 34, frame_exp: 3
[[758]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 32,
next_frame_to_send: 35, frame_exp: 3
[[759]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 32, too_far: 40
[[760]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[761]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[762]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 33, too_far: 41
[[763]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[764]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[765]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 34, too_far: 42
[[766]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[767]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[768]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 35, too_far: 43
[[769]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[770]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[771]]<3>: networkLayer: NL: handle_packet
[[772]]<3>: networkLayer: NL: NL_DATA
[[773]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[774]]<3>: networkLayer: NL: handle_packet
[[775]]<3>: networkLayer: NL: NL_DATA
```

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```
[[776]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[777]]<3>: networkLayer: NL: handle_packet
[[778]]<3>: networkLayer: NL: NL_DATA
[[779]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[780]]<3>: networkLayer: NL: handle_packet
[[781]]<3>: networkLayer: NL: NL_DATA
[[782]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[783]]<3>: transportLayer: TL: packet_arrival
[[784]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[785]]<3>: transportLayer: TL: DATA_PKT
[[786]]<3>: transportLayer: TL: packet_arrival
[[787]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[788]]<3>: transportLayer: TL: DATA_PKT
[[789]]<3>: transportLayer: TL: packet_arrival
[[790]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[791]]<3>: transportLayer: TL: DATA_PKT
[[792]]<3>: transportLayer: TL: packet_arrival
[[793]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[794]]<3>: transportLayer: TL: DATA_PKT
[[795]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 43
[[796]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[797]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 28,
next_frame_to_send: 36, frame_expected: 3, too_far: 11
[[798]]<1>: dataLinkLayer: DLL: ACK frame arrived
[[799]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 36,
next_frame_to_send: 36, frame_exp: 3
[[800]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 36,
next_frame_to_send: 37, frame_exp: 3
[[801]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 36,
next_frame_to_send: 38, frame_exp: 3
[[802]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 36,
next_frame_to_send: 39, frame_exp: 3
[[803]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 36,
next_frame_to_send: 40, frame_exp: 3
[[804]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 36,
next_frame_to_send: 41, frame_exp: 3
[[805]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 36,
next_frame_to_send: 42, frame_exp: 3
[[806]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 36,
next_frame_to_send: 43, frame_exp: 3
[[807]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 36, too_far: 44
[[808]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[809]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[810]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 37, too_far: 45
[[811]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[812]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[813]]<2>: networkLayer: NL: handle_packet
[[814]]<2>: networkLayer: NL: NL_DATA
[[815]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[816]]<2>: networkLayer: NL: handle_packet
[[817]]<2>: networkLayer: NL: NL_DATA
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[[818]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[819]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 32,
next_frame_to_send: 36, frame_exp: 3
[[820]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 32,
next_frame_to_send: 37, frame_exp: 3
[[821]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 38, too_far: 46
[[822]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[823]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[824]]<2>: networkLayer: NL: handle_packet
[[825]]<2>: networkLayer: NL: NL_DATA
[[826]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[827]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 39, too_far: 47
[[828]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[829]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[830]]<2>: networkLayer: NL: handle_packet
[[831]]<2>: networkLayer: NL: NL_DATA
[[832]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[833]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 40, too_far: 48
[[834]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[835]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[836]]<2>: networkLayer: NL: handle_packet
[[837]]<2>: networkLayer: NL: NL_DATA
[[838]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[839]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 41, too_far: 49
[[840]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[841]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[842]]<2>: networkLayer: NL: handle_packet
[[843]]<2>: networkLayer: NL: NL_DATA
[[844]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[845]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 42, too_far: 50
[[846]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[847]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[848]]<2>: networkLayer: NL: handle_packet
[[849]]<2>: networkLayer: NL: NL_DATA
[[850]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[851]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 32,
next_frame_to_send: 38, frame_exp: 3
[[852]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 32,
next_frame_to_send: 39, frame_exp: 3
[[853]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 43, too_far: 51
[[854]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[855]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[856]]<2>: networkLayer: NL: handle_packet
[[857]]<2>: networkLayer: NL: NL_DATA
[[858]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[859]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 44, too_far: 52
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```
[[860]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[861]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 36, too_far: 44
[[862]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[863]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[864]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 37, too_far: 45
[[865]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[866]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[867]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 38, too_far: 46
[[868]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[869]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[870]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 39, too_far: 47
[[871]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[872]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[873]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 36,
next_frame_to_send: 44, frame_expected: 3, too_far: 11
[[874]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 44,
next_frame_to_send: 44, frame_exp: 3
[[875]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 44,
next_frame_to_send: 45, frame_exp: 3
[[876]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 44,
next_frame_to_send: 46, frame_exp: 3
[[877]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 44,
next_frame_to_send: 47, frame_exp: 3
[[878]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 44,
next_frame_to_send: 48, frame_exp: 3
[[879]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 44,
next_frame_to_send: 49, frame_exp: 3
[[880]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 44,
next_frame_to_send: 50, frame_exp: 3
[[881]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 44,
next_frame_to_send: 51, frame_exp: 3
[[882]]<3>: networkLayer: NL: handle_packet
[[883]]<3>: networkLayer: NL: NL_DATA
[[884]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[885]]<3>: networkLayer: NL: handle_packet
[[886]]<3>: networkLayer: NL: NL_DATA
[[887]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[888]]<3>: networkLayer: NL: handle_packet
[[889]]<3>: networkLayer: NL: NL_DATA
[[890]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[891]]<3>: networkLayer: NL: handle_packet
[[892]]<3>: networkLayer: NL: NL_DATA
[[893]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[894]]<3>: transportLayer: TL: packet_arrival
[[895]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[896]]<3>: transportLayer: TL: DATA_PKT
[[897]]<3>: transportLayer: TL: packet_arrival
[[898]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[899]]<3>: transportLayer: TL: DATA_PKT
```

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[[900]]<3>: transportLayer: TL: packet_arrival
[[901]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[902]]<3>: transportLayer: TL: DATA_PKT
[[903]]<3>: transportLayer: TL: packet_arrival
[[904]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[905]]<3>: transportLayer: TL: DATA_PKT
[[906]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 44, too_far: 52
[[907]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[908]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[909]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 45, too_far: 53
[[910]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[911]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[912]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 46, too_far: 54
[[913]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[914]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[915]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 47, too_far: 55
[[916]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[917]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[918]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 48, too_far: 56
[[919]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[920]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[921]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 49, too_far: 57
[[922]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[923]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[924]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 50, too_far: 58
[[925]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[926]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[927]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 51, too_far: 59
[[928]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[929]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[930]]<2>: networkLayer: NL: handle_packet
[[931]]<2>: networkLayer: NL: NL_DATA
[[932]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[933]]<2>: networkLayer: NL: handle_packet
[[934]]<2>: networkLayer: NL: NL_DATA
[[935]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[936]]<2>: networkLayer: NL: handle_packet
[[937]]<2>: networkLayer: NL: NL_DATA
[[938]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[939]]<2>: networkLayer: NL: handle_packet
[[940]]<2>: networkLayer: NL: NL_DATA
[[941]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[942]]<2>: networkLayer: NL: handle_packet
[[943]]<2>: networkLayer: NL: NL_DATA
[[944]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
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[[945]]<2>: networkLayer: NL: handle_packet
[[946]]<2>: networkLayer: NL: NL_DATA
[[947]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[948]]<2>: networkLayer: NL: handle_packet
[[949]]<2>: networkLayer: NL: NL_DATA
[[950]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[951]]<2>: networkLayer: NL: handle_packet
[[952]]<2>: networkLayer: NL: NL_DATA
[[953]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[954]]<3>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 12
[[955]]<3>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[956]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 32,
next_frame_to_send: 40, frame_expected: 3, too_far: 11
[[957]]<2>: dataLinkLayer: DLL: ACK frame arrived
[[958]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 40,
next_frame_to_send: 40, frame_exp: 3
[[959]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 40,
next_frame_to_send: 41, frame_exp: 3
[[960]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 40,
next_frame_to_send: 42, frame_exp: 3
[[961]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 40,
next_frame_to_send: 43, frame_exp: 3
[[962]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 40,
next_frame_to_send: 44, frame_exp: 3
[[963]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 40,
next_frame_to_send: 45, frame_exp: 3
[[964]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 40,
next_frame_to_send: 46, frame_exp: 3
[[965]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 40,
next_frame_to_send: 47, frame_exp: 3
[[966]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 40, too_far: 48
[[967]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[968]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[969]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 41, too_far: 49
[[970]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[971]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[972]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 42, too_far: 50
[[973]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[974]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[975]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 43, too_far: 51
[[976]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[977]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[978]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 44, too_far: 52
[[979]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[980]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[981]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 45, too_far: 53
[[982]]<3>: dataLinkLayer: DLL: DATA frame arrived
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[[983]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[984]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 46, too_far: 54
[[985]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[986]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[987]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 47, too_far: 55
[[988]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[989]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[990]]<3>: networkLayer: NL: handle_packet
[[991]]<3>: networkLayer: NL: NL_DATA
[[992]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[993]]<3>: networkLayer: NL: handle_packet
[[994]]<3>: networkLayer: NL: NL_DATA
[[995]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[996]]<3>: networkLayer: NL: handle_packet
[[997]]<3>: networkLayer: NL: NL_DATA
[[998]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[999]]<3>: networkLayer: NL: handle_packet
[[1000]]<3>: networkLayer: NL: NL_DATA
[[1001]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1002]]<3>: networkLayer: NL: handle_packet
[[1003]]<3>: networkLayer: NL: NL_DATA
[[1004]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1005]]<3>: networkLayer: NL: handle_packet
[[1006]]<3>: networkLayer: NL: NL_DATA
[[1007]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1008]]<3>: networkLayer: NL: handle_packet
[[1009]]<3>: networkLayer: NL: NL_DATA
[[1010]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1011]]<3>: networkLayer: NL: handle_packet
[[1012]]<3>: networkLayer: NL: NL_DATA
[[1013]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1014]]<3>: transportLayer: TL: packet_arrival
[[1015]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1016]]<3>: transportLayer: TL: DATA_PKT
[[1017]]<3>: transportLayer: TL: packet_arrival
[[1018]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1019]]<3>: transportLayer: TL: DATA_PKT
[[1020]]<3>: transportLayer: TL: packet_arrival
[[1021]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1022]]<3>: transportLayer: TL: DATA_PKT
[[1023]]<3>: transportLayer: TL: packet_arrival
[[1024]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1025]]<3>: transportLayer: TL: DATA_PKT
[[1026]]<3>: transportLayer: TL: packet_arrival
[[1027]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1028]]<3>: transportLayer: TL: DATA_PKT
[[1029]]<3>: transportLayer: TL: packet_arrival
[[1030]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1031]]<3>: transportLayer: TL: DATA_PKT
[[1032]]<3>: transportLayer: TL: packet_arrival
[[1033]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
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[[1034]]<3>: transportLayer: TL: DATA_PKT
[[1035]]<3>: transportLayer: TL: packet_arrival
[[1036]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1037]]<3>: transportLayer: TL: DATA_PKT
[[1038]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 57
[[1039]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[1040]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 44,
next_frame_to_send: 52, frame_expected: 3, too_far: 11
[[1041]]<1>: dataLinkLayer: DLL: ACK frame arrived
[[1042]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 52,
next_frame_to_send: 52, frame_exp: 3
[[1043]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 52,
next_frame_to_send: 53, frame_exp: 3
[[1044]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 52, too_far: 60
[[1045]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1046]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1047]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 53, too_far: 61
[[1048]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1049]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1050]]<2>: networkLayer: NL: handle_packet
[[1051]]<2>: networkLayer: NL: NL_DATA
[[1052]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[1053]]<2>: networkLayer: NL: handle_packet
[[1054]]<2>: networkLayer: NL: NL_DATA
[[1055]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[1056]]<3>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 13
[[1057]]<3>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[1058]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 40,
next_frame_to_send: 48, frame_expected: 3, too_far: 11
[[1059]]<2>: dataLinkLayer: DLL: ACK frame arrived
[[1060]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 48,
next_frame_to_send: 48, frame_exp: 3
[[1061]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 48,
next_frame_to_send: 49, frame_exp: 3
[[1062]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 48,
next_frame_to_send: 50, frame_exp: 3
[[1063]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 48,
next_frame_to_send: 51, frame_exp: 3
[[1064]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 48,
next_frame_to_send: 52, frame_exp: 3
[[1065]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 48,
next_frame_to_send: 53, frame_exp: 3
[[1066]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 48, too_far: 56
[[1067]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[1068]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[1069]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 49, too_far: 57
[[1070]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[1071]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[1072]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
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next_frame_to_send: 3, frame_expected: 50, too_far: 58
[[1073]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[1074]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 50, too_far: 58
[[1075]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[1076]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 50, too_far: 58
[[1077]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 48,
next_frame_to_send: 54, frame_expected: 3, too_far: 11
[[1078]]<2>: dataLinkLayer: DLL: NAK frame arrived, resending
[[1079]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[1080]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 50, too_far: 58
[[1081]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[1082]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[1083]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[1084]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[1085]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[1086]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 54, too_far: 62
[[1087]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[1088]]<3>: networkLayer: NL: handle_packet
[[1089]]<3>: networkLayer: NL: NL_DATA
[[1090]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1091]]<3>: networkLayer: NL: handle_packet
[[1092]]<3>: networkLayer: NL: NL_DATA
[[1093]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1094]]<3>: transportLayer: TL: packet_arrival
[[1095]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1096]]<3>: transportLayer: TL: DATA_PKT
[[1097]]<3>: networkLayer: NL: handle_packet
[[1098]]<3>: networkLayer: NL: NL_DATA
[[1099]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 50,
next_frame_to_send: 54, frame_expected: 3, too_far: 11
[[1100]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1101]]<3>: transportLayer: TL: packet_arrival
[[1102]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1103]]<3>: transportLayer: TL: DATA_PKT
[[1104]]<3>: transportLayer: TL: packet_arrival
[[1105]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1106]]<3>: transportLayer: TL: DATA_PKT
[[1107]]<3>: networkLayer: NL: handle_packet
[[1108]]<3>: networkLayer: NL: NL_DATA
[[1109]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1110]]<3>: networkLayer: NL: handle_packet
[[1111]]<3>: networkLayer: NL: NL_DATA
[[1112]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1113]]<3>: networkLayer: NL: handle_packet
[[1114]]<3>: networkLayer: NL: NL_DATA
[[1115]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1116]]<3>: transportLayer: TL: packet_arrival
[[1117]]<3>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1118]]<3>: transportLayer: TL: DATA_PKT
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[[1119]]<3>: transportLayer: TL: packet_arrival
[[1120]]<3>: transportLayer: TL: from_net: type: 3, m: 0, bytes: 16
[[1121]]<3>: transportLayer: TL: DATA_PKT
[[1122]]<3>: transportLayer: TL: packet_arrival
[[1123]]<3>: transportLayer: TL: from_net: type: 4, m: 0, bytes: 2
[[1124]]<3>: transportLayer: TL: CREDIT
[[1125]]<3>: listenRecieveAndReSend: AL: RECIEVED: The Answer to Life, the Universe, and Everything ha
[[1127]]<3>: listenRecieveAndReSend: TL: connect
[[1128]]<3>: listenRecieveAndReSend: NL: Open to router 2
[[1129]]<3>: listenRecieveAndReSend: NL: Gets cid: 2
[[1130]]<3>: listenRecieveAndReSend: NL: i: 3, from: 3, cid: 2, to: 2, outCid: 2
[[1131]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 3,
next_frame_to_send: 3, frame_exp: 54
[[1132]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 54,
next_frame_to_send: 54, frame_expected: 3, too_far: 11
[[1133]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1134]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1135]]<2>: networkLayer: NL: handle_packet
[[1136]]<2>: networkLayer: NL: NL_CONN received, in. cid: 2
[[1137]]<2>: networkLayer: NL: start: 3, end: 4
[[1138]]<2>: networkLayer: NL: Not end station
[[1139]]<2>: networkLayer: NL: i: 3, from: 3, cid: 2, to: 4, outCid: 1
[[1140]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 0,
next_frame_to_send: 0, frame_exp: 0
[[1141]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 66
[[1142]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[1143]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 52,
next_frame_to_send: 54, frame_expected: 3, too_far: 11
[[1144]]<1>: dataLinkLayer: DLL: ACK frame arrived
[[1145]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 74
[[1146]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[1147]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 4, frame_expected: 54, too_far: 62
[[1148]]<3>: dataLinkLayer: DLL: ACK frame arrived
[[1149]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: 0, timer_id: 75
[[1150]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 0,
next_frame_to_send: 0, frame_expected: 0, too_far: 8
[[1151]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1152]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1153]]<4>: networkLayer: NL: handle_packet
[[1154]]<4>: networkLayer: NL: NL_CONN received, in. cid: 1
[[1155]]<4>: networkLayer: NL: start: 3, end: 4
[[1156]]<4>: networkLayer: NL: Send NL_ACCEPT
[[1157]]<4>: networkLayer: NL: i: 2, from: 4, cid: 1, to: 2, outCid: 1
[[1158]]<4>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 0,
next_frame_to_send: 0, frame_exp: 1
[[1159]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 0,
next_frame_to_send: 1, frame_expected: 0, too_far: 8
[[1160]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1161]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1162]]<2>: networkLayer: NL: handle_packet
[[1163]]<2>: networkLayer: NL: NL_ACCEPT: nqe->from: 4 , nqe->p.cid: 1
[[1164]]<2>: networkLayer: NL: VC table entry 3, is opposite
```

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[[1165]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 54,
next_frame_to_send: 54, frame_exp: 4
[[1166]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 4,
next_frame_to_send: 4, frame_expected: 54, too_far: 62
[[1167]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[1168]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[1169]]<3>: networkLayer: NL: handle_packet
[[1170]]<3>: networkLayer: NL: NL_ACCEPT: nqe->from: 2 , nqe->p.cid: 2
[[1171]]<3>: networkLayer: NL: VC table entry 3, is opposite
[[1172]]<3>: networkLayer: NL: Acknowledge
[[1173]]<3>: listenRecieveAndReSend: NL: ok for cid
[[1174]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[1175]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[1176]]<3>: listenRecieveAndReSend: NL: i: 3, from: 3, cid: 2, to: 2, outCid: 2
[[1177]]<3>: listenRecieveAndReSend: Transportlayer tl_sleeping
[[1178]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 4,
next_frame_to_send: 4, frame_exp: 55
[[1179]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 54,
next_frame_to_send: 55, frame_expected: 4, too_far: 12
[[1180]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1181]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1182]]<2>: networkLayer: NL: handle_packet
[[1183]]<2>: networkLayer: NL: NL_DATA
[[1184]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1185]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 1,
next_frame_to_send: 1, frame_exp: 1
[[1186]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 0,
next_frame_to_send: 1, frame_expected: 1, too_far: 9
[[1187]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1188]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1189]]<4>: networkLayer: NL: handle_packet
[[1190]]<4>: networkLayer: NL: NL_DATA
[[1191]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1192]]<4>: transportLayer: TL: packet_arrival
[[1193]]<4>: transportLayer: TL: from_net: type: 5, m: 0, bytes: 2
[[1194]]<4>: transportLayer: TL: CALL_REQ, data[0]: 4, data[1]: 3, listen_address: 4
[[1195]]<4>: listenAndReceive: TL: Listen1
[[1196]]<4>: listenAndReceive: NL: i: 1, from: 2, cid: 1, to: 4, outCid: 1
[[1197]]<4>: listenAndReceive: NL: i: 2, from: 4, cid: 1, to: 2, outCid: 1
[[1198]]<4>: listenAndReceive: TL: Listen2
[[1199]]<4>: listenAndReceive: AL: got cid: 1
[[1200]]<4>: listenAndReceive: AL: calling receive with cid: 1
[[1201]]<4>: listenAndReceive: TL: receive
[[1202]]<4>: listenAndReceive: TL: recieve, sending credit
[[1203]]<4>: listenAndReceive: NL: i: 1, from: 2, cid: 1, to: 4, outCid: 1
[[1204]]<4>: listenAndReceive: NL: i: 2, from: 4, cid: 1, to: 2, outCid: 1
[[1205]]<4>: listenAndReceive: Transportlayer tl_sleeping
[[1206]]<4>: transportLayer: TL: CALL_REQ processed
[[1207]]<4>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 1,
next_frame_to_send: 1, frame_exp: 2
[[1208]]<4>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 1,
next_frame_to_send: 2, frame_exp: 2
[[1209]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 1,
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next_frame_to_send: 2, frame_expected: 1, too_far: 9
[[1210]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1211]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1212]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 2,
next_frame_to_send: 2, frame_expected: 2, too_far: 10
[[1213]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1214]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1215]]<2>: networkLayer: NL: handle_packet
[[1216]]<2>: networkLayer: NL: NL_DATA
[[1217]]<2>: networkLayer: NL: NL_DATA: from: 4, cid: 1
[[1218]]<2>: networkLayer: NL: handle_packet
[[1219]]<2>: networkLayer: NL: NL_DATA
[[1220]]<2>: networkLayer: NL: NL_DATA: from: 4, cid: 1
[[1221]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 55,
next_frame_to_send: 55, frame_exp: 5
[[1222]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 55,
next_frame_to_send: 56, frame_exp: 5
[[1223]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 4,
next_frame_to_send: 5, frame_expected: 55, too_far: 63
[[1224]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[1225]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[1226]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 5,
next_frame_to_send: 5, frame_expected: 56, too_far: 64
[[1227]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[1228]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[1229]]<3>: networkLayer: NL: handle_packet
[[1230]]<3>: networkLayer: NL: NL_DATA
[[1231]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 2
[[1232]]<3>: networkLayer: NL: handle_packet
[[1233]]<3>: networkLayer: NL: NL_DATA
[[1234]]<3>: transportLayer: TL: packet_arrival
[[1235]]<3>: transportLayer: TL: from_net: type: 0, m: 0, bytes: 0
[[1236]]<3>: transportLayer: TL: CALL_ACC
[[1237]]<3>: listenRecieveAndReSend: AL: cid: 1
[[1238]]<3>: listenRecieveAndReSend: AL: calling send
[[1239]]<3>: listenRecieveAndReSend: TL: send
[[1240]]<3>: listenRecieveAndReSend: Transportlayer tl_sleeping
[[1241]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 2
[[1242]]<3>: transportLayer: TL: packet_arrival
[[1243]]<3>: transportLayer: TL: from_net: type: 4, m: 0, bytes: 2
[[1244]]<3>: transportLayer: TL: CREDIT
[[1245]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[1246]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[1247]]<3>: listenRecieveAndReSend: NL: i: 3, from: 3, cid: 2, to: 2, outCid: 2
[[1248]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[1249]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[1250]]<3>: listenRecieveAndReSend: NL: i: 3, from: 3, cid: 2, to: 2, outCid: 2
[[1251]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[1252]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[1253]]<3>: listenRecieveAndReSend: NL: i: 3, from: 3, cid: 2, to: 2, outCid: 2
[[1254]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[1255]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[1256]]<3>: listenRecieveAndReSend: NL: i: 3, from: 3, cid: 2, to: 2, outCid: 2
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[[1405]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[1406]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[1407]]<3>: listenRecieveAndReSend: NL: i: 3, from: 3, cid: 2, to: 2, outCid: 2
[[1408]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[1409]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[1410]]<3>: listenRecieveAndReSend: NL: i: 3, from: 3, cid: 2, to: 2, outCid: 2
[[1411]]<3>: listenRecieveAndReSend: AL: Waiting for answer, receiving
[[1412]]<3>: listenRecieveAndReSend: TL: receive
[[1413]]<3>: listenRecieveAndReSend: TL: recieve, sending credit
[[1414]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[1415]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[1416]]<3>: listenRecieveAndReSend: NL: i: 3, from: 3, cid: 2, to: 2, outCid: 2
[[1417]]<3>: listenRecieveAndReSend: Transportlayer tl_sleeping
[[1418]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 55,
    next_frame_to_send: 57, frame_expected: 5, too_far: 13
[[1419]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1420]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1421]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
    next_frame_to_send: 57, frame_expected: 6, too_far: 14
[[1422]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1423]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1424]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
    next_frame_to_send: 57, frame_expected: 7, too_far: 15
[[1425]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1426]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
    next_frame_to_send: 57, frame_expected: 7, too_far: 15
[[1427]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1428]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
    next_frame_to_send: 57, frame_expected: 7, too_far: 15
[[1429]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 5,
    next_frame_to_send: 13, frame_expected: 57, too_far: 65
[[1430]]<3>: dataLinkLayer: DLL: NAK frame arrived, resending
[[1431]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 7,
    next_frame_to_send: 13, frame_exp: 57
[[1432]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1433]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
    next_frame_to_send: 57, frame_expected: 7, too_far: 15
[[1434]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1435]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
    next_frame_to_send: 57, frame_expected: 7, too_far: 15
[[1436]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1437]]<2>: networkLayer: NL: handle_packet
[[1438]]<2>: networkLayer: NL: NL_DATA
[[1439]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1440]]<2>: networkLayer: NL: handle_packet
[[1441]]<2>: networkLayer: NL: NL_DATA
[[1442]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1443]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 2,
    next_frame_to_send: 2, frame_exp: 3
[[1444]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 2,
    next_frame_to_send: 3, frame_exp: 3
[[1445]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
    next_frame_to_send: 3, frame_expected: 2, too_far: 10
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[[1446]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1447]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1448]]<4>: networkLayer: NL: handle_packet
[[1449]]<4>: networkLayer: NL: NL_DATA
[[1450]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1451]]<4>: transportLayer: TL: packet_arrival
[[1452]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1453]]<4>: transportLayer: TL: DATA_PKT
[[1454]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 7,
next_frame_to_send: 14, frame_exp: 57
[[1455]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 7, too_far: 15
[[1456]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1457]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1458]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1459]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1460]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1461]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1462]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1463]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 13, too_far: 21
[[1464]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1465]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1466]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 14, too_far: 22
[[1467]]<2>: networkLayer: NL: handle_packet
[[1468]]<2>: networkLayer: NL: NL_DATA
[[1469]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1470]]<2>: networkLayer: NL: handle_packet
[[1471]]<2>: networkLayer: NL: NL_DATA
[[1472]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1473]]<2>: networkLayer: NL: handle_packet
[[1474]]<2>: networkLayer: NL: NL_DATA
[[1475]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1476]]<2>: networkLayer: NL: handle_packet
[[1477]]<2>: networkLayer: NL: NL_DATA
[[1478]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1479]]<2>: networkLayer: NL: handle_packet
[[1480]]<2>: networkLayer: NL: NL_DATA
[[1481]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1482]]<2>: networkLayer: NL: handle_packet
[[1483]]<2>: networkLayer: NL: NL_DATA
[[1484]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1485]]<2>: networkLayer: NL: handle_packet
[[1486]]<2>: networkLayer: NL: NL_DATA
[[1487]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1488]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1489]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 2,
next_frame_to_send: 4, frame_exp: 3
[[1490]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 2,
next_frame_to_send: 5, frame_exp: 3
[[1491]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 2,
next_frame_to_send: 6, frame_exp: 3
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[[1492]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 2,
next_frame_to_send: 7, frame_exp: 3
[[1493]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 2,
next_frame_to_send: 8, frame_exp: 3
[[1494]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 2,
next_frame_to_send: 9, frame_exp: 3
[[1495]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1496]]<2>: networkLayer: NL: handle_packet
[[1497]]<2>: networkLayer: NL: NL_DATA
[[1498]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1499]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[1500]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1501]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[1502]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1503]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[1504]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1505]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[1506]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1507]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[1508]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1509]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[1510]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 2,
next_frame_to_send: 10, frame_expected: 3, too_far: 11
[[1511]]<2>: dataLinkLayer: DLL: NAK frame arrived, resending
[[1512]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 3,
next_frame_to_send: 10, frame_exp: 3
[[1513]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1514]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 3, too_far: 11
[[1515]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1516]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1517]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1518]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1519]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1520]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1521]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1522]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1523]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 10, too_far: 18
[[1524]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1525]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1526]]<4>: networkLayer: NL: handle_packet
[[1527]]<4>: networkLayer: NL: NL_DATA
[[1528]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1529]]<4>: networkLayer: NL: handle_packet
[[1530]]<4>: networkLayer: NL: NL_DATA
[[1531]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
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[[1532]]<4>: networkLayer: NL: handle_packet
[[1533]]<4>: networkLayer: NL: NL_DATA
[[1534]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1535]]<4>: networkLayer: NL: handle_packet
[[1536]]<4>: networkLayer: NL: NL_DATA
[[1537]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1538]]<4>: networkLayer: NL: handle_packet
[[1539]]<4>: networkLayer: NL: NL_DATA
[[1540]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1541]]<4>: networkLayer: NL: handle_packet
[[1542]]<4>: networkLayer: NL: NL_DATA
[[1543]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1544]]<4>: networkLayer: NL: handle_packet
[[1545]]<4>: networkLayer: NL: NL_DATA
[[1546]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1547]]<4>: networkLayer: NL: handle_packet
[[1548]]<4>: networkLayer: NL: NL_DATA
[[1549]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1550]]<4>: transportLayer: TL: packet_arrival
[[1551]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1552]]<4>: transportLayer: TL: DATA_PKT
[[1553]]<4>: transportLayer: TL: packet_arrival
[[1554]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1555]]<4>: transportLayer: TL: DATA_PKT
[[1556]]<4>: transportLayer: TL: packet_arrival
[[1557]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1558]]<4>: transportLayer: TL: DATA_PKT
[[1559]]<4>: transportLayer: TL: packet_arrival
[[1560]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1561]]<4>: transportLayer: TL: DATA_PKT
[[1562]]<4>: transportLayer: TL: packet_arrival
[[1563]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1564]]<4>: transportLayer: TL: DATA_PKT
[[1565]]<4>: transportLayer: TL: packet_arrival
[[1566]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1567]]<4>: transportLayer: TL: DATA_PKT
[[1568]]<4>: transportLayer: TL: packet_arrival
[[1569]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1570]]<4>: transportLayer: TL: DATA_PKT
[[1571]]<4>: transportLayer: TL: packet_arrival
[[1572]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1573]]<4>: transportLayer: TL: DATA_PKT
[[1574]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 86
[[1575]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[1576]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 7,
next_frame_to_send: 15, frame_expected: 57, too_far: 65
[[1577]]<3>: dataLinkLayer: DLL: ACK frame arrived
[[1578]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 15,
next_frame_to_send: 15, frame_exp: 57
[[1579]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 15,
next_frame_to_send: 16, frame_exp: 57
[[1580]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 15,
next_frame_to_send: 17, frame_exp: 57
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[[1581]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 15,
next_frame_to_send: 18, frame_exp: 57
[[1582]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 15,
next_frame_to_send: 19, frame_exp: 57
[[1583]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 15,
next_frame_to_send: 20, frame_exp: 57
[[1584]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 15,
next_frame_to_send: 21, frame_exp: 57
[[1585]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 15,
next_frame_to_send: 22, frame_exp: 57
[[1586]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 15, too_far: 23
[[1587]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1588]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1589]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 16, too_far: 24
[[1590]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1591]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1592]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 17, too_far: 25
[[1593]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1594]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1595]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 18, too_far: 26
[[1596]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1597]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1598]]<2>: networkLayer: NL: handle_packet
[[1599]]<2>: networkLayer: NL: NL_DATA
[[1600]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1601]]<2>: networkLayer: NL: handle_packet
[[1602]]<2>: networkLayer: NL: NL_DATA
[[1603]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1604]]<2>: networkLayer: NL: handle_packet
[[1605]]<2>: networkLayer: NL: NL_DATA
[[1606]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1607]]<2>: networkLayer: NL: handle_packet
[[1608]]<2>: networkLayer: NL: NL_DATA
[[1609]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1610]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 19, too_far: 27
[[1611]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1612]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1613]]<2>: networkLayer: NL: handle_packet
[[1614]]<2>: networkLayer: NL: NL_DATA
[[1615]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1616]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 20, too_far: 28
[[1617]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1618]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1619]]<2>: networkLayer: NL: handle_packet
[[1620]]<2>: networkLayer: NL: NL_DATA
[[1621]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1622]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
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next_frame_to_send: 57, frame_expected: 21, too_far: 29
[[1623]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1624]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1625]]<2>: networkLayer: NL: handle_packet
[[1626]]<2>: networkLayer: NL: NL_DATA
[[1627]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1628]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 22, too_far: 30
[[1629]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1630]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1631]]<2>: networkLayer: NL: handle_packet
[[1632]]<2>: networkLayer: NL: NL_DATA
[[1633]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1634]]<4>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 7
[[1635]]<4>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[1636]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 3,
next_frame_to_send: 11, frame_expected: 3, too_far: 11
[[1637]]<2>: dataLinkLayer: DLL: ACK frame arrived
[[1638]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 11,
next_frame_to_send: 11, frame_exp: 3
[[1639]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 11,
next_frame_to_send: 12, frame_exp: 3
[[1640]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 11, too_far: 19
[[1641]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 11,
next_frame_to_send: 13, frame_exp: 3
[[1642]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 11,
next_frame_to_send: 14, frame_exp: 3
[[1643]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 11,
next_frame_to_send: 15, frame_exp: 3
[[1644]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1645]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 11,
next_frame_to_send: 16, frame_exp: 3
[[1646]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 11,
next_frame_to_send: 17, frame_exp: 3
[[1647]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1648]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 12, too_far: 20
[[1649]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1650]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1651]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 13, too_far: 21
[[1652]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1653]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1654]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 14, too_far: 22
[[1655]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1656]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1657]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 15, too_far: 23
[[1658]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1659]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1660]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
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next_frame_to_send: 3, frame_expected: 16, too_far: 24
[[1661]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1662]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1663]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 17, too_far: 25
[[1664]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1665]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1666]]<4>: networkLayer: NL: handle_packet
[[1667]]<4>: networkLayer: NL: NL_DATA
[[1668]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1669]]<4>: networkLayer: NL: handle_packet
[[1670]]<4>: networkLayer: NL: NL_DATA
[[1671]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1672]]<4>: networkLayer: NL: handle_packet
[[1673]]<4>: networkLayer: NL: NL_DATA
[[1674]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1675]]<4>: networkLayer: NL: handle_packet
[[1676]]<4>: networkLayer: NL: NL_DATA
[[1677]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1678]]<4>: networkLayer: NL: handle_packet
[[1679]]<4>: networkLayer: NL: NL_DATA
[[1680]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1681]]<4>: networkLayer: NL: handle_packet
[[1682]]<4>: networkLayer: NL: NL_DATA
[[1683]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1684]]<4>: networkLayer: NL: handle_packet
[[1685]]<4>: networkLayer: NL: NL_DATA
[[1686]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1687]]<4>: transportLayer: TL: packet_arrival
[[1688]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1689]]<4>: transportLayer: TL: DATA_PKT
[[1690]]<4>: transportLayer: TL: packet_arrival
[[1691]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1692]]<4>: transportLayer: TL: DATA_PKT
[[1693]]<4>: transportLayer: TL: packet_arrival
[[1694]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1695]]<4>: transportLayer: TL: DATA_PKT
[[1696]]<4>: transportLayer: TL: packet_arrival
[[1697]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1698]]<4>: transportLayer: TL: DATA_PKT
[[1699]]<4>: transportLayer: TL: packet_arrival
[[1700]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1701]]<4>: transportLayer: TL: DATA_PKT
[[1702]]<4>: transportLayer: TL: packet_arrival
[[1703]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1704]]<4>: transportLayer: TL: DATA_PKT
[[1705]]<4>: transportLayer: TL: packet_arrival
[[1706]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1707]]<4>: transportLayer: TL: DATA_PKT
[[1708]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 11,
next_frame_to_send: 18, frame_exp: 3
[[1709]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 18, too_far: 26
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[[1710]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1711]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1712]]<4>: networkLayer: NL: handle_packet
[[1713]]<4>: networkLayer: NL: NL_DATA
[[1714]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1715]]<4>: transportLayer: TL: packet_arrival
[[1716]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1717]]<4>: transportLayer: TL: DATA_PKT
[[1718]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 97
[[1719]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[1720]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 15,
next_frame_to_send: 23, frame_expected: 57, too_far: 65
[[1721]]<3>: dataLinkLayer: DLL: ACK frame arrived
[[1722]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 23,
next_frame_to_send: 23, frame_exp: 57
[[1723]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 23,
next_frame_to_send: 24, frame_exp: 57
[[1724]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 23,
next_frame_to_send: 25, frame_exp: 57
[[1725]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 23,
next_frame_to_send: 26, frame_exp: 57
[[1726]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 23,
next_frame_to_send: 27, frame_exp: 57
[[1727]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 23,
next_frame_to_send: 28, frame_exp: 57
[[1728]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 23,
next_frame_to_send: 29, frame_exp: 57
[[1729]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 23,
next_frame_to_send: 30, frame_exp: 57
[[1730]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 23, too_far: 31
[[1731]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1732]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1733]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 24, too_far: 32
[[1734]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1735]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1736]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 25, too_far: 33
[[1737]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1738]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1739]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 26, too_far: 34
[[1740]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1741]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1742]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 27, too_far: 35
[[1743]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1744]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1745]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 28, too_far: 36
[[1746]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1747]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
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[[1748]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 29, too_far: 37
[[1749]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1750]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1751]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 30, too_far: 38
[[1752]]<4>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 8
[[1753]]<4>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[1754]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1755]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1756]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 11,
next_frame_to_send: 19, frame_expected: 3, too_far: 11
[[1757]]<2>: dataLinkLayer: DLL: ACK frame arrived
[[1758]]<2>: networkLayer: NL: handle_packet
[[1759]]<2>: networkLayer: NL: NL_DATA
[[1760]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1761]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 19,
next_frame_to_send: 19, frame_exp: 3
[[1762]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 19,
next_frame_to_send: 20, frame_exp: 3
[[1763]]<2>: networkLayer: NL: handle_packet
[[1764]]<2>: networkLayer: NL: NL_DATA
[[1765]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1766]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 19,
next_frame_to_send: 21, frame_exp: 3
[[1767]]<2>: networkLayer: NL: handle_packet
[[1768]]<2>: networkLayer: NL: NL_DATA
[[1769]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1770]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 19, too_far: 27
[[1771]]<2>: networkLayer: NL: handle_packet
[[1772]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1773]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1774]]<4>: networkLayer: NL: handle_packet
[[1775]]<4>: networkLayer: NL: NL_DATA
[[1776]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1777]]<4>: transportLayer: TL: packet_arrival
[[1778]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1779]]<4>: transportLayer: TL: DATA_PKT
[[1780]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 20, too_far: 28
[[1781]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1782]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1783]]<4>: networkLayer: NL: handle_packet
[[1784]]<4>: networkLayer: NL: NL_DATA
[[1785]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1786]]<4>: transportLayer: TL: packet_arrival
[[1787]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1788]]<4>: transportLayer: TL: DATA_PKT
[[1789]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 21, too_far: 29
[[1790]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1791]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
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[[1792]]<4>: networkLayer: NL: handle_packet
[[1793]]<4>: networkLayer: NL: NL_DATA
[[1794]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1795]]<4>: transportLayer: TL: packet_arrival
[[1796]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1797]]<4>: transportLayer: TL: DATA_PKT
[[1798]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 19,
    next_frame_to_send: 22, frame_exp: 3
[[1799]]<2>: networkLayer: NL: NL_DATA
[[1800]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1801]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 19,
    next_frame_to_send: 23, frame_exp: 3
[[1802]]<2>: networkLayer: NL: handle_packet
[[1803]]<2>: networkLayer: NL: NL_DATA
[[1804]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1805]]<2>: networkLayer: NL: handle_packet
[[1806]]<2>: networkLayer: NL: NL_DATA
[[1807]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
    next_frame_to_send: 3, frame_expected: 22, too_far: 30
[[1808]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1809]]<2>: networkLayer: NL: handle_packet
[[1810]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1811]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1812]]<4>: networkLayer: NL: handle_packet
[[1813]]<4>: networkLayer: NL: NL_DATA
[[1814]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1815]]<4>: transportLayer: TL: packet_arrival
[[1816]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1817]]<4>: transportLayer: TL: DATA_PKT
[[1818]]<2>: networkLayer: NL: NL_DATA
[[1819]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1820]]<2>: networkLayer: NL: handle_packet
[[1821]]<2>: networkLayer: NL: NL_DATA
[[1822]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1823]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 19,
    next_frame_to_send: 24, frame_exp: 3
[[1824]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
    next_frame_to_send: 3, frame_expected: 23, too_far: 31
[[1825]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 19,
    next_frame_to_send: 25, frame_exp: 3
[[1826]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 19,
    next_frame_to_send: 26, frame_exp: 3
[[1827]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1828]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1829]]<4>: networkLayer: NL: handle_packet
[[1830]]<4>: networkLayer: NL: NL_DATA
[[1831]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1832]]<4>: transportLayer: TL: packet_arrival
[[1833]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1834]]<4>: transportLayer: TL: DATA_PKT
[[1835]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
    next_frame_to_send: 3, frame_expected: 24, too_far: 32
[[1836]]<4>: dataLinkLayer: DLL: DATA frame arrived
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[[1837]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 24, too_far: 32
[[1838]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1839]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 106
[[1840]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[1841]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 23,
next_frame_to_send: 31, frame_expected: 57, too_far: 65
[[1842]]<3>: dataLinkLayer: DLL: ACK frame arrived
[[1843]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 31,
next_frame_to_send: 31, frame_exp: 57
[[1844]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 31,
next_frame_to_send: 32, frame_exp: 57
[[1845]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 31,
next_frame_to_send: 33, frame_exp: 57
[[1846]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 31,
next_frame_to_send: 34, frame_exp: 57
[[1847]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 31,
next_frame_to_send: 35, frame_exp: 57
[[1848]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 31,
next_frame_to_send: 36, frame_exp: 57
[[1849]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 31,
next_frame_to_send: 37, frame_exp: 57
[[1850]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 31,
next_frame_to_send: 38, frame_exp: 57
[[1851]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 31, too_far: 39
[[1852]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1853]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1854]]<2>: networkLayer: NL: handle_packet
[[1855]]<2>: networkLayer: NL: NL_DATA
[[1856]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1857]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 32, too_far: 40
[[1858]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1859]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1860]]<2>: networkLayer: NL: handle_packet
[[1861]]<2>: networkLayer: NL: NL_DATA
[[1862]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1863]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 33, too_far: 41
[[1864]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1865]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1866]]<2>: networkLayer: NL: handle_packet
[[1867]]<2>: networkLayer: NL: NL_DATA
[[1868]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1869]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 34, too_far: 42
[[1870]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1871]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1872]]<2>: networkLayer: NL: handle_packet
[[1873]]<2>: networkLayer: NL: NL_DATA
[[1874]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1875]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
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next_frame_to_send: 57, frame_expected: 35, too_far: 43
[[1876]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1877]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1878]]<2>: networkLayer: NL: handle_packet
[[1879]]<2>: networkLayer: NL: NL_DATA
[[1880]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1881]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 36, too_far: 44
[[1882]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1883]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1884]]<2>: networkLayer: NL: handle_packet
[[1885]]<2>: networkLayer: NL: NL_DATA
[[1886]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1887]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 37, too_far: 45
[[1888]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1889]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1890]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 38, too_far: 46
[[1891]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1892]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1893]]<2>: networkLayer: NL: handle_packet
[[1894]]<2>: networkLayer: NL: NL_DATA
[[1895]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1896]]<2>: networkLayer: NL: handle_packet
[[1897]]<2>: networkLayer: NL: NL_DATA
[[1898]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1899]]<4>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 10
[[1900]]<4>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[1901]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 115
[[1902]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[1903]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 31,
next_frame_to_send: 39, frame_expected: 57, too_far: 65
[[1904]]<3>: dataLinkLayer: DLL: ACK frame arrived
[[1905]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 39,
next_frame_to_send: 39, frame_exp: 57
[[1906]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 39,
next_frame_to_send: 40, frame_exp: 57
[[1907]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 39,
next_frame_to_send: 41, frame_exp: 57
[[1908]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 39,
next_frame_to_send: 42, frame_exp: 57
[[1909]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 39,
next_frame_to_send: 43, frame_exp: 57
[[1910]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 39,
next_frame_to_send: 44, frame_exp: 57
[[1911]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 39,
next_frame_to_send: 45, frame_exp: 57
[[1912]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 39,
next_frame_to_send: 46, frame_exp: 57
[[1913]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 39, too_far: 47
[[1914]]<2>: dataLinkLayer: DLL: DATA frame arrived
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[[1915]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1916]]<2>: networkLayer: NL: handle_packet
[[1917]]<2>: networkLayer: NL: NL_DATA
[[1918]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1919]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 40, too_far: 48
[[1920]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1921]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1922]]<2>: networkLayer: NL: handle_packet
[[1923]]<2>: networkLayer: NL: NL_DATA
[[1924]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1925]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 41, too_far: 49
[[1926]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1927]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1928]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 42, too_far: 50
[[1929]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1930]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1931]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 43, too_far: 51
[[1932]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1933]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1934]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 44, too_far: 52
[[1935]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1936]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1937]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 45, too_far: 53
[[1938]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[1939]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[1940]]<2>: networkLayer: NL: handle_packet
[[1941]]<2>: networkLayer: NL: NL_DATA
[[1942]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1943]]<2>: networkLayer: NL: handle_packet
[[1944]]<2>: networkLayer: NL: NL_DATA
[[1945]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1946]]<2>: networkLayer: NL: handle_packet
[[1947]]<2>: networkLayer: NL: NL_DATA
[[1948]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1949]]<2>: networkLayer: NL: handle_packet
[[1950]]<2>: networkLayer: NL: NL_DATA
[[1951]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1952]]<2>: networkLayer: NL: handle_packet
[[1953]]<2>: networkLayer: NL: NL_DATA
[[1954]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[1955]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: 19, timer_id: 107
[[1956]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: 20, timer_id: 108
[[1957]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: 21, timer_id: 109
[[1958]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 24, too_far: 32
[[1959]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1960]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
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next_frame_to_send: 3, frame_expected: 24, too_far: 32
[[1961]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1962]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 24, too_far: 32
[[1963]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1964]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: 22, timer_id: 110
[[1965]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 24, too_far: 32
[[1966]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1967]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: 23, timer_id: 111
[[1968]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: 24, timer_id: 112
[[1969]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: 25, timer_id: 113
[[1970]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: 26, timer_id: 114
[[1971]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 24, too_far: 32
[[1972]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1973]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 24, too_far: 32
[[1974]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1975]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1976]]<4>: networkLayer: NL: handle_packet
[[1977]]<4>: networkLayer: NL: NL_DATA
[[1978]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1979]]<4>: transportLayer: TL: packet_arrival
[[1980]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1981]]<4>: transportLayer: TL: DATA_PKT
[[1982]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1983]]<4>: networkLayer: NL: handle_packet
[[1984]]<4>: networkLayer: NL: NL_DATA
[[1985]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1986]]<4>: transportLayer: TL: packet_arrival
[[1987]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1988]]<4>: transportLayer: TL: DATA_PKT
[[1989]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[1990]]<4>: networkLayer: NL: handle_packet
[[1991]]<4>: networkLayer: NL: NL_DATA
[[1992]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[1993]]<4>: transportLayer: TL: packet_arrival
[[1994]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[1995]]<4>: transportLayer: TL: DATA_PKT
[[1996]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 27, too_far: 35
[[1997]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[1998]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 27, too_far: 35
[[1999]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2000]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 19,
next_frame_to_send: 27, frame_expected: 3, too_far: 11
[[2001]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 27,
next_frame_to_send: 27, frame_exp: 3
[[2002]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 27,
next_frame_to_send: 28, frame_exp: 3
[[2003]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 27,
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next_frame_to_send: 29, frame_exp: 3
[[2004]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 27,
next_frame_to_send: 30, frame_exp: 3
[[2005]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 27,
next_frame_to_send: 31, frame_exp: 3
[[2006]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 27,
next_frame_to_send: 32, frame_exp: 3
[[2007]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 27,
next_frame_to_send: 33, frame_exp: 3
[[2008]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 27,
next_frame_to_send: 34, frame_exp: 3
[[2009]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 27, too_far: 35
[[2010]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2011]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2012]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 28, too_far: 36
[[2013]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2014]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2015]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 29, too_far: 37
[[2016]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2017]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2018]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 30, too_far: 38
[[2019]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2020]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2021]]<4>: networkLayer: NL: handle_packet
[[2022]]<4>: networkLayer: NL: NL_DATA
[[2023]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2024]]<4>: networkLayer: NL: handle_packet
[[2025]]<4>: networkLayer: NL: NL_DATA
[[2026]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2027]]<4>: networkLayer: NL: handle_packet
[[2028]]<4>: networkLayer: NL: NL_DATA
[[2029]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2030]]<4>: transportLayer: TL: packet_arrival
[[2031]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2032]]<4>: transportLayer: TL: DATA_PKT
[[2033]]<4>: transportLayer: TL: packet_arrival
[[2034]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2035]]<4>: transportLayer: TL: DATA_PKT
[[2036]]<4>: transportLayer: TL: packet_arrival
[[2037]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2038]]<4>: transportLayer: TL: DATA_PKT
[[2039]]<4>: networkLayer: NL: handle_packet
[[2040]]<4>: networkLayer: NL: NL_DATA
[[2041]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2042]]<4>: transportLayer: TL: packet_arrival
[[2043]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2044]]<4>: transportLayer: TL: DATA_PKT
[[2045]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 31, too_far: 39
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[[2046]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2047]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2048]]<4>: networkLayer: NL: handle_packet
[[2049]]<4>: networkLayer: NL: NL_DATA
[[2050]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2051]]<4>: transportLayer: TL: packet_arrival
[[2052]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2053]]<4>: transportLayer: TL: DATA_PKT
[[2054]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 32, too_far: 40
[[2055]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2056]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2057]]<4>: networkLayer: NL: handle_packet
[[2058]]<4>: networkLayer: NL: NL_DATA
[[2059]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2060]]<4>: transportLayer: TL: packet_arrival
[[2061]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2062]]<4>: transportLayer: TL: DATA_PKT
[[2063]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 33, too_far: 41
[[2064]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2065]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2066]]<4>: networkLayer: NL: handle_packet
[[2067]]<4>: networkLayer: NL: NL_DATA
[[2068]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2069]]<4>: transportLayer: TL: packet_arrival
[[2070]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2071]]<4>: transportLayer: TL: DATA_PKT
[[2072]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 34, too_far: 42
[[2073]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2074]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2075]]<4>: networkLayer: NL: handle_packet
[[2076]]<4>: networkLayer: NL: NL_DATA
[[2077]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2078]]<4>: transportLayer: TL: packet_arrival
[[2079]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2080]]<4>: transportLayer: TL: DATA_PKT
[[2081]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 116
[[2082]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[2083]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 39,
next_frame_to_send: 47, frame_expected: 57, too_far: 65
[[2084]]<3>: dataLinkLayer: DLL: ACK frame arrived
[[2085]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 46,
next_frame_to_send: 47, frame_exp: 57
[[2086]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 46,
next_frame_to_send: 48, frame_exp: 57
[[2087]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 46,
next_frame_to_send: 49, frame_exp: 57
[[2088]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 46,
next_frame_to_send: 50, frame_exp: 57
[[2089]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 46,
next_frame_to_send: 51, frame_exp: 57
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[[2090]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 46,
next_frame_to_send: 52, frame_exp: 57
[[2091]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 46,
next_frame_to_send: 53, frame_exp: 57
[[2092]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 46, too_far: 54
[[2093]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2094]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 46,
next_frame_to_send: 54, frame_expected: 57, too_far: 65
[[2095]]<3>: dataLinkLayer: DLL: NAK frame arrived, resending
[[2096]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 46, too_far: 54
[[2097]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2098]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 46, too_far: 54
[[2099]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2100]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 46, too_far: 54
[[2101]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2102]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 46, too_far: 54
[[2103]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2104]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 46, too_far: 54
[[2105]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2106]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 46, too_far: 54
[[2107]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2108]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 46, too_far: 54
[[2109]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2110]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2111]]<2>: networkLayer: NL: handle_packet
[[2112]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2113]]<2>: networkLayer: NL: handle_packet
[[2114]]<2>: networkLayer: NL: NL_DATA
[[2115]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[2116]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2117]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2118]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2119]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2120]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2121]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2122]]<2>: networkLayer: NL: handle_packet
[[2123]]<2>: networkLayer: NL: NL_DATA
[[2124]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[2125]]<2>: networkLayer: NL: handle_packet
[[2126]]<2>: networkLayer: NL: NL_DATA
[[2127]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[2128]]<2>: networkLayer: NL: handle_packet
[[2129]]<2>: networkLayer: NL: NL_DATA
[[2130]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[2131]]<2>: networkLayer: NL: handle_packet
```

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[[2132]]<2>: networkLayer: NL: NL_DATA
[[2133]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[2134]]<2>: networkLayer: NL: handle_packet
[[2135]]<2>: networkLayer: NL: NL_DATA
[[2136]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[2137]]<2>: networkLayer: NL: handle_packet
[[2138]]<2>: networkLayer: NL: NL_DATA
[[2139]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[2140]]<4>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 12
[[2141]]<4>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[2142]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 27,
next_frame_to_send: 35, frame_expected: 3, too_far: 11
[[2143]]<2>: dataLinkLayer: DLL: ACK frame arrived
[[2144]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 35,
next_frame_to_send: 35, frame_exp: 3
[[2145]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 35, too_far: 43
[[2146]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2147]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2148]]<4>: networkLayer: NL: handle_packet
[[2149]]<4>: networkLayer: NL: NL_DATA
[[2150]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2151]]<4>: transportLayer: TL: packet_arrival
[[2152]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2153]]<4>: transportLayer: TL: DATA_PKT
[[2154]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 35,
next_frame_to_send: 36, frame_exp: 3
[[2155]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 35,
next_frame_to_send: 37, frame_exp: 3
[[2156]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 35,
next_frame_to_send: 38, frame_exp: 3
[[2157]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 35,
next_frame_to_send: 39, frame_exp: 3
[[2158]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 35,
next_frame_to_send: 40, frame_exp: 3
[[2159]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 35,
next_frame_to_send: 41, frame_exp: 3
[[2160]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 35,
next_frame_to_send: 42, frame_exp: 3
[[2161]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 36, too_far: 44
[[2162]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2163]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2164]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 37, too_far: 45
[[2165]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2166]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2167]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 38, too_far: 46
[[2168]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2169]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2170]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 39, too_far: 47
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[[2171]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2172]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2173]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 40, too_far: 48
[[2174]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2175]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2176]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 41, too_far: 49
[[2177]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2178]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2179]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 42, too_far: 50
[[2180]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2181]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2182]]<4>: networkLayer: NL: handle_packet
[[2183]]<4>: networkLayer: NL: NL_DATA
[[2184]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2185]]<4>: networkLayer: NL: handle_packet
[[2186]]<4>: networkLayer: NL: NL_DATA
[[2187]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2188]]<4>: networkLayer: NL: handle_packet
[[2189]]<4>: networkLayer: NL: NL_DATA
[[2190]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2191]]<4>: networkLayer: NL: handle_packet
[[2192]]<4>: networkLayer: NL: NL_DATA
[[2193]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2194]]<4>: networkLayer: NL: handle_packet
[[2195]]<4>: networkLayer: NL: NL_DATA
[[2196]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2197]]<4>: networkLayer: NL: handle_packet
[[2198]]<4>: networkLayer: NL: NL_DATA
[[2199]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2200]]<4>: networkLayer: NL: handle_packet
[[2201]]<4>: networkLayer: NL: NL_DATA
[[2202]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2203]]<4>: transportLayer: TL: packet_arrival
[[2204]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2205]]<4>: transportLayer: TL: DATA_PKT
[[2206]]<4>: transportLayer: TL: packet_arrival
[[2207]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2208]]<4>: transportLayer: TL: DATA_PKT
[[2209]]<4>: transportLayer: TL: packet_arrival
[[2210]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2211]]<4>: transportLayer: TL: DATA_PKT
[[2212]]<4>: transportLayer: TL: packet_arrival
[[2213]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2214]]<4>: transportLayer: TL: DATA_PKT
[[2215]]<4>: transportLayer: TL: packet_arrival
[[2216]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2217]]<4>: transportLayer: TL: DATA_PKT
[[2218]]<4>: transportLayer: TL: packet_arrival
[[2219]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2220]]<4>: transportLayer: TL: DATA_PKT
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[[2221]]<4>: transportLayer: TL: packet_arrival
[[2222]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2223]]<4>: transportLayer: TL: DATA_PKT
[[2224]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 133
[[2225]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[2226]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 46,
next_frame_to_send: 54, frame_expected: 57, too_far: 65
[[2227]]<3>: dataLinkLayer: DLL: ACK frame arrived
[[2228]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 54,
next_frame_to_send: 54, frame_exp: 57
[[2229]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 54,
next_frame_to_send: 55, frame_exp: 57
[[2230]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 54,
next_frame_to_send: 56, frame_exp: 57
[[2231]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 54, too_far: 62
[[2232]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2233]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2234]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 55, too_far: 63
[[2235]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2236]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2237]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 56, too_far: 64
[[2238]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2239]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2240]]<2>: networkLayer: NL: handle_packet
[[2241]]<2>: networkLayer: NL: NL_DATA
[[2242]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[2243]]<2>: networkLayer: NL: handle_packet
[[2244]]<2>: networkLayer: NL: NL_DATA
[[2245]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[2246]]<2>: networkLayer: NL: handle_packet
[[2247]]<2>: networkLayer: NL: NL_DATA
[[2248]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[2249]]<4>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 13
[[2250]]<4>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[2251]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 35,
next_frame_to_send: 43, frame_expected: 3, too_far: 11
[[2252]]<2>: dataLinkLayer: DLL: ACK frame arrived
[[2253]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 43,
next_frame_to_send: 43, frame_exp: 3
[[2254]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 43,
next_frame_to_send: 44, frame_exp: 3
[[2255]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 43,
next_frame_to_send: 45, frame_exp: 3
[[2256]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 43, too_far: 51
[[2257]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2258]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 43, too_far: 51
[[2259]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2260]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
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next_frame_to_send: 3, frame_expected: 43, too_far: 51
[[2261]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2262]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2263]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2264]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2265]]<4>: networkLayer: NL: handle_packet
[[2266]]<4>: networkLayer: NL: NL_DATA
[[2267]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2268]]<4>: networkLayer: NL: handle_packet
[[2269]]<4>: networkLayer: NL: NL_DATA
[[2270]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2271]]<4>: networkLayer: NL: handle_packet
[[2272]]<4>: networkLayer: NL: NL_DATA
[[2273]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2274]]<4>: transportLayer: TL: packet_arrival
[[2275]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2276]]<4>: transportLayer: TL: DATA_PKT
[[2277]]<4>: transportLayer: TL: packet_arrival
[[2278]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2279]]<4>: transportLayer: TL: DATA_PKT
[[2280]]<4>: transportLayer: TL: packet_arrival
[[2281]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2282]]<4>: transportLayer: TL: DATA_PKT
[[2283]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 43,
next_frame_to_send: 46, frame_exp: 3
[[2284]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 43,
next_frame_to_send: 47, frame_expected: 3, too_far: 11
[[2285]]<2>: dataLinkLayer: DLL: NAK frame arrived, resending
[[2286]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 46, too_far: 54
[[2287]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 43,
next_frame_to_send: 47, frame_exp: 3
[[2288]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 43,
next_frame_to_send: 48, frame_exp: 3
[[2289]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 43,
next_frame_to_send: 49, frame_exp: 3
[[2290]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 43,
next_frame_to_send: 50, frame_exp: 3
[[2291]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2292]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2293]]<4>: networkLayer: NL: handle_packet
[[2294]]<4>: networkLayer: NL: NL_DATA
[[2295]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2296]]<4>: transportLayer: TL: packet_arrival
[[2297]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2298]]<4>: transportLayer: TL: DATA_PKT
[[2299]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 47, too_far: 55
[[2300]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2301]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 47, too_far: 55
[[2302]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 43,
next_frame_to_send: 51, frame_expected: 3, too_far: 11
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[[2303]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2304]]<2>: dataLinkLayer: DLL: NAK frame arrived, resending
[[2305]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2306]]<4>: networkLayer: NL: handle_packet
[[2307]]<4>: networkLayer: NL: NL_DATA
[[2308]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2309]]<4>: transportLayer: TL: packet_arrival
[[2310]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2311]]<4>: transportLayer: TL: DATA_PKT
[[2312]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 48, too_far: 56
[[2313]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2314]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2315]]<4>: networkLayer: NL: handle_packet
[[2316]]<4>: networkLayer: NL: NL_DATA
[[2317]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2318]]<4>: transportLayer: TL: packet_arrival
[[2319]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2320]]<4>: transportLayer: TL: DATA_PKT
[[2321]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 49, too_far: 57
[[2322]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2323]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2324]]<4>: networkLayer: NL: handle_packet
[[2325]]<4>: networkLayer: NL: NL_DATA
[[2326]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2327]]<4>: transportLayer: TL: packet_arrival
[[2328]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2329]]<4>: transportLayer: TL: DATA_PKT
[[2330]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 50, too_far: 58
[[2331]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2332]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2333]]<4>: networkLayer: NL: handle_packet
[[2334]]<4>: networkLayer: NL: NL_DATA
[[2335]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2336]]<4>: transportLayer: TL: packet_arrival
[[2337]]<4>: transportLayer: TL: from_net: type: 3, m: 1, bytes: 28
[[2338]]<4>: transportLayer: TL: DATA_PKT
[[2339]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 47,
next_frame_to_send: 51, frame_exp: 3
[[2340]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 47,
next_frame_to_send: 52, frame_exp: 3
[[2341]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 51, too_far: 59
[[2342]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2343]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 51, too_far: 59
[[2344]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2345]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2346]]<4>: networkLayer: NL: handle_packet
[[2347]]<4>: networkLayer: NL: NL_DATA
[[2348]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
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[[2349]]<4>: transportLayer: TL: packet_arrival
[[2350]]<4>: transportLayer: TL: from_net: type: 3, m: 0, bytes: 16
[[2351]]<4>: transportLayer: TL: DATA_PKT
[[2352]]<4>: listenAndReceive: AL: RECIEVED: THE ANSWER TO LIFE, THE UNIVERSE, AND EVERYTHING HAS A NU
[[2354]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 47,
next_frame_to_send: 53, frame_expected: 3, too_far: 11
[[2355]]<2>: dataLinkLayer: DLL: NAK frame arrived, resending
[[2356]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 52, too_far: 60
[[2357]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2358]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2359]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 3, frame_expected: 53, too_far: 61
[[2360]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2361]]<4>: networkLayer: NL: handle_packet
[[2362]]<4>: networkLayer: NL: NL_DATA
[[2363]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2364]]<4>: transportLayer: TL: packet_arrival
[[2365]]<4>: transportLayer: TL: from_net: type: 4, m: 0, bytes: 2
[[2366]]<4>: transportLayer: TL: CREDIT
[[2367]]<4>: listenAndReceive: AL: sends acknowledgement and closes
[[2368]]<4>: listenAndReceive: TL: send
[[2369]]<4>: listenAndReceive: NL: i: 1, from: 2, cid: 1, to: 4, outCid: 1
[[2370]]<4>: listenAndReceive: NL: i: 2, from: 4, cid: 1, to: 2, outCid: 1
[[2371]]<4>: listenAndReceive: TL: disconnect
[[2372]]<4>: listenAndReceive: NL: i: 1, from: 2, cid: 1, to: 4, outCid: 1
[[2373]]<4>: listenAndReceive: NL: i: 2, from: 4, cid: 1, to: 2, outCid: 1
[[2374]]<4>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 3,
next_frame_to_send: 3, frame_exp: 53
[[2375]]<4>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 3,
next_frame_to_send: 4, frame_exp: 53
[[2376]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 51,
next_frame_to_send: 53, frame_expected: 3, too_far: 11
[[2377]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 53,
next_frame_to_send: 53, frame_expected: 3, too_far: 11
[[2378]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2379]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2380]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 53,
next_frame_to_send: 53, frame_expected: 4, too_far: 12
[[2381]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2382]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2383]]<2>: networkLayer: NL: handle_packet
[[2384]]<2>: networkLayer: NL: NL_DATA
[[2385]]<2>: networkLayer: NL: NL_DATA: from: 4, cid: 1
[[2386]]<2>: networkLayer: NL: handle_packet
[[2387]]<2>: networkLayer: NL: NL_DATA
[[2388]]<2>: networkLayer: NL: NL_DATA: from: 4, cid: 1
[[2389]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 57,
next_frame_to_send: 57, frame_exp: 57
[[2390]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 57,
next_frame_to_send: 58, frame_exp: 57
[[2391]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 54,
next_frame_to_send: 57, frame_expected: 57, too_far: 65
```

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[[2392]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[2393]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[2394]]<3>: networkLayer: NL: handle_packet
[[2395]]<3>: networkLayer: NL: NL_DATA
[[2396]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 2
[[2397]]<3>: transportLayer: TL: packet_arrival
[[2398]]<3>: transportLayer: TL: from_net: type: 3, m: 0, bytes: 8
[[2399]]<3>: transportLayer: TL: DATA_PKT
[[2400]]<3>: listenRecieveAndReSend: TL: disconnect
[[2401]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[2402]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[2403]]<3>: listenRecieveAndReSend: NL: i: 3, from: 3, cid: 2, to: 2, outCid: 2
[[2404]]<3>: listenRecieveAndReSend: AL: RECIEVED: Thanks<0a>
[[2405]]<3>: listenRecieveAndReSend: AL: forwards acknowledgement
[[2406]]<3>: listenRecieveAndReSend: TL: send
[[2407]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[2408]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[2409]]<3>: listenRecieveAndReSend: TL: disconnect
[[2410]]<3>: listenRecieveAndReSend: NL: i: 1, from: 2, cid: 1, to: 3, outCid: 1
[[2411]]<3>: listenRecieveAndReSend: NL: i: 2, from: 3, cid: 1, to: 2, outCid: 1
[[2412]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 57,
next_frame_to_send: 57, frame_expected: 58, too_far: 66
[[2413]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[2414]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[2415]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 57,
next_frame_to_send: 57, frame_exp: 59
[[2416]]<3>: networkLayer: NL: handle_packet
[[2417]]<3>: networkLayer: NL: NL_DATA
[[2418]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 2
[[2419]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 57,
next_frame_to_send: 58, frame_exp: 59
[[2420]]<3>: transportLayer: TL: packet_arrival
[[2421]]<3>: transportLayer: TL: from_net: type: 1, m: 0, bytes: 0
[[2422]]<3>: transportLayer: TL: CLEAR_REQ
[[2423]]<3>: transportLayer: TL: cpt->state == DISCONN
[[2424]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 57,
next_frame_to_send: 59, frame_exp: 59
[[2425]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 57,
next_frame_to_send: 59, frame_expected: 57, too_far: 65
[[2426]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2427]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2428]]<2>: networkLayer: NL: handle_packet
[[2429]]<2>: networkLayer: NL: NL_DATA
[[2430]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 2
[[2431]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 59,
next_frame_to_send: 59, frame_expected: 58, too_far: 66
[[2432]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2433]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2434]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 53,
next_frame_to_send: 53, frame_exp: 5
[[2435]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 3,
next_frame_to_send: 5, frame_expected: 53, too_far: 61
[[2436]]<4>: dataLinkLayer: DLL: DATA frame arrived
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[[2437]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2438]]<4>: networkLayer: NL: handle_packet
[[2439]]<4>: networkLayer: NL: NL_DATA
[[2440]]<4>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2441]]<4>: transportLayer: TL: packet_arrival
[[2442]]<4>: transportLayer: TL: from_net: type: 1, m: 0, bytes: 0
[[2443]]<4>: transportLayer: TL: CLEAR_REQ
[[2444]]<4>: transportLayer: TL: cptr->state == DISCONN
[[2445]]<2>: networkLayer: NL: handle_packet
[[2446]]<2>: networkLayer: NL: NL_DATA
[[2447]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 1
[[2448]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 1 ack_exp: 3,
next_frame_to_send: 3, frame_exp: 54
[[2449]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 59,
next_frame_to_send: 59, frame_expected: 59, too_far: 67
[[2450]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2451]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2452]]<2>: networkLayer: NL: handle_packet
[[2453]]<2>: networkLayer: NL: NL_DATA
[[2454]]<2>: networkLayer: NL: NL_DATA: from: 3, cid: 1
[[2455]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 1 ack_exp: 3,
next_frame_to_send: 4, frame_exp: 54
[[2456]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 54,
next_frame_to_send: 54, frame_expected: 3, too_far: 11
[[2457]]<1>: dataLinkLayer: DLL: DATA frame arrived
[[2458]]<1>: dataLinkLayer: NL: from_datalink_layer: received something
[[2459]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 54,
next_frame_to_send: 54, frame_expected: 4, too_far: 12
[[2460]]<1>: dataLinkLayer: DLL: DATA frame arrived
[[2461]]<1>: dataLinkLayer: NL: from_datalink_layer: received something
[[2462]]<1>: networkLayer: NL: handle_packet
[[2463]]<1>: networkLayer: NL: NL_DATA
[[2464]]<1>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2465]]<1>: networkLayer: NL: handle_packet
[[2466]]<1>: networkLayer: NL: NL_DATA
[[2467]]<1>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2468]]<1>: transportLayer: TL: packet_arrival
[[2469]]<1>: transportLayer: TL: from_net: type: 3, m: 0, bytes: 8
[[2470]]<1>: transportLayer: TL: DATA_PKT
[[2471]]<1>: transportLayer: TL: packet_arrival
[[2472]]<1>: transportLayer: TL: from_net: type: 1, m: 0, bytes: 0
[[2473]]<1>: transportLayer: TL: CLEAR_REQ
[[2474]]<1>: transportLayer: TL: cptr->state == WAITING || RECEIVING || SENDING
[[2475]]<1>: sendFile: AL: RECIEVED: Thanks<0a>
[[2476]]<1>: sendFile: TL: disconnect
[[2477]]<1>: sendFile: NL: i: 1, from: 1, cid: 1, to: 2, outCid: 1
[[2478]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 54,
next_frame_to_send: 54, frame_exp: 5
[[2479]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 3,
next_frame_to_send: 5, frame_expected: 54, too_far: 62
[[2480]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2481]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2482]]<2>: networkLayer: NL: handle_packet
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[[2483]]<2>: networkLayer: NL: NL_DATA
[[2484]]<2>: networkLayer: NL: NL_DATA: from: 1, cid: 1
[[2485]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 59,
next_frame_to_send: 59, frame_exp: 60
[[2486]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 57,
next_frame_to_send: 60, frame_expected: 59, too_far: 67
[[2487]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[2488]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[2489]]<3>: networkLayer: NL: handle_packet
[[2490]]<3>: networkLayer: NL: NL_DATA
[[2491]]<3>: networkLayer: NL: NL_DATA: from: 2, cid: 1
[[2492]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 60,
next_frame_to_send: 60, frame_expected: 60, too_far: 68
[[2493]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[2494]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 59,
next_frame_to_send: 60, frame_expected: 60, too_far: 68
[[2495]]<4>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 19
[[2496]]<4>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[2497]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 53,
next_frame_to_send: 54, frame_expected: 5, too_far: 13
[[2498]]<2>: dataLinkLayer: DLL: ACK frame arrived
[[2499]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 163
[[2500]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[2501]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 54,
next_frame_to_send: 55, frame_expected: 5, too_far: 13
[[2502]]<1>: dataLinkLayer: DLL: ACK frame arrived
[[2503]]<3>: transportLayer: TL: packet_arrival
[[2504]]<3>: transportLayer: TL: from_net: type: 2, m: 0, bytes: 0
[[2505]]<3>: transportLayer: TL: CLEAR_CONF
[[2506]]<4>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 5,
next_frame_to_send: 5, frame_exp: 54
[[2507]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 60,
next_frame_to_send: 60, frame_exp: 60
[[2508]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 54,
next_frame_to_send: 54, frame_expected: 5, too_far: 13
[[2509]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2510]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2511]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 60,
next_frame_to_send: 60, frame_expected: 60, too_far: 68
[[2512]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2513]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2514]]<2>: networkLayer: NL: handle_packet
[[2515]]<2>: networkLayer: NL: NL_CLOSE
[[2516]]<2>: networkLayer: NL: handle_packet
[[2517]]<2>: networkLayer: NL: NL_CLOSE
[[2518]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 60,
next_frame_to_send: 60, frame_exp: 61
[[2519]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 4 ack_exp: 54,
next_frame_to_send: 54, frame_exp: 6
[[2520]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 60,
next_frame_to_send: 61, frame_expected: 60, too_far: 68
[[2521]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[2522]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
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[[2523]]<3>: networkLayer: NL: handle_packet
[[2524]]<3>: networkLayer: NL: NL_CLOSE
[[2525]]<3>: networkLayer: NL: A connection has been closed!
[[2526]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 61,
next_frame_to_send: 61, frame_expected: 61, too_far: 69
[[2527]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[2528]]<4>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 5,
next_frame_to_send: 6, frame_expected: 54, too_far: 62
[[2529]]<4>: dataLinkLayer: DLL: DATA frame arrived
[[2530]]<4>: dataLinkLayer: NL: from_datalink_layer: received something
[[2531]]<4>: networkLayer: NL: handle_packet
[[2532]]<4>: networkLayer: NL: NL_CLOSE
[[2533]]<4>: networkLayer: NL: A connection has been closed!
[[2534]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 60,
next_frame_to_send: 61, frame_expected: 61, too_far: 69
[[2535]]<1>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 55,
next_frame_to_send: 55, frame_exp: 5
[[2536]]<4>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 21
[[2537]]<4>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[2538]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 4 , ack_expected: 54,
next_frame_to_send: 55, frame_expected: 6, too_far: 14
[[2539]]<2>: dataLinkLayer: DLL: ACK frame arrived
[[2540]]<1>: dataLinkLayer: DLL: EVENT: Timeout: msg: 55, timer_id: 64
[[2541]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 5,
next_frame_to_send: 5, frame_expected: 55, too_far: 63
[[2542]]<2>: dataLinkLayer: DLL: DATA frame arrived
[[2543]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2544]]<2>: networkLayer: NL: handle_packet
[[2545]]<2>: networkLayer: NL: NL_CLOSE
[[2546]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 3 ack_exp: 61,
next_frame_to_send: 61, frame_exp: 61
[[2547]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 61,
next_frame_to_send: 61, frame_expected: 61, too_far: 69
[[2548]]<3>: dataLinkLayer: DLL: DATA frame arrived
[[2549]]<3>: dataLinkLayer: NL: from_datalink_layer: received something
[[2550]]<3>: networkLayer: NL: handle_packet
[[2551]]<3>: networkLayer: NL: NL_CLOSE
[[2552]]<3>: networkLayer: NL: A connection has been closed!
[[2553]]<3>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 81
[[2554]]<3>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[2555]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 169
[[2556]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[2557]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 61,
next_frame_to_send: 62, frame_expected: 61, too_far: 69
[[2558]]<2>: dataLinkLayer: DLL: ACK frame arrived
[[2559]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 55,
next_frame_to_send: 56, frame_expected: 5, too_far: 13
[[2560]]<1>: dataLinkLayer: DLL: ACK frame arrived
[[2561]]<3>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 2 ack_exp: 61,
next_frame_to_send: 61, frame_exp: 62
[[2562]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 3 , ack_expected: 62,
next_frame_to_send: 62, frame_expected: 61, too_far: 69
[[2563]]<2>: dataLinkLayer: DLL: DATA frame arrived
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[[2564]]<2>: dataLinkLayer: NL: from_datalink_layer: received something
[[2565]]<2>: networkLayer: NL: handle_packet
[[2566]]<2>: networkLayer: NL: NL_CLOSE
[[2567]]<2>: dataLinkLayer: DLL: EVENT: network_layer_ready. to: 1 ack_exp: 5,
next_frame_to_send: 5, frame_exp: 56
[[2568]]<1>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 56,
next_frame_to_send: 56, frame_expected: 5, too_far: 13
[[2569]]<1>: dataLinkLayer: DLL: DATA frame arrived
[[2570]]<1>: dataLinkLayer: NL: from_datalink_layer: received something
[[2571]]<1>: networkLayer: NL: handle_packet
[[2572]]<1>: networkLayer: NL: NL_CLOSE
[[2573]]<1>: networkLayer: NL: A connection has been closed!
[[2574]]<2>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 171
[[2575]]<1>: dataLinkLayer: DLL: EVENT: Timeout: msg: -1, timer_id: 66
[[2576]]<2>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[2577]]<3>: dataLinkLayer: DLL: EVENT: frame_arrival: from 2 , ack_expected: 61,
next_frame_to_send: 62, frame_expected: 62, too_far: 70
[[2578]]<3>: dataLinkLayer: DLL: ACK frame arrived
[[2579]]<1>: dataLinkLayer: DLL: ACK_TIMER TIMEOUT
[[2580]]<2>: dataLinkLayer: DLL: EVENT: frame_arrival: from 1 , ack_expected: 5,
next_frame_to_send: 6, frame_expected: 56, too_far: 64
[[2581]]<2>: dataLinkLayer: DLL: ACK frame arrived

>> end of log.
```