

Data Networking

Layering and Protocol Design for Milestone 2

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1 Introduction

The goal of this project is to transfer textfiles as sequence of characters through a network with reliable data transfer. In this paper we will present our layering and protocol design of milestone 2.

2 Layering and Protocol Design

Beside the two layers, physical and application layer, cnet provides we implement three additional layers between them. We call them *link layer*, *network layer*, and *transport layer*, from bottom to top. Data in the link layer are called *frame*, in the network layer *datagram*, in the transport layer *segment*, and data from the application layer are called *messages*.

2.1 Link Layer

The link layer provides basic "point2point" connections between neighboring nodes. It can handle the transmission of arbitrary large packets (limited by the buffer size, which is large enough to handle all messages in this scenario) independently of the MTU of the link because it has the ability of fra(g)mentation. This means that data from the upper layer are split into several frames which fit to the MTU and put together on the receiver side. This mechanism is guarded by the fact that no reordering of frames on one link occur. This layer also guarantees that all datagram which are handed to the upper layer are *free of corruption*. Corrupt frames are recognized by computing a checksum and all frames with errors which are not repairable are dropped. **FIXME will we implement error handling** Finally, the data in this layer are handed to the physical layer in a first come first serve fairness. Figure 1 illustrates the receiver side of the link layer.

2.2 Network Layer

In the second milestone the network layer has no function. It only hands the data from the upper layer to the lower one and vice versa. It will get the function of maintaining and building a routing / forwarding table as well as rout datagrams through the network.

2.3 Transport Layer

In the second milestone the transport layer has no function. It only hands the data from the upper layer to the lower one and vice versa. It will get the function to guarantee reliable data transfer, congestion and flow control, segment messages to decrease the number of resend messages in case of corruption. To improve throughput it will buffer reordered messages.

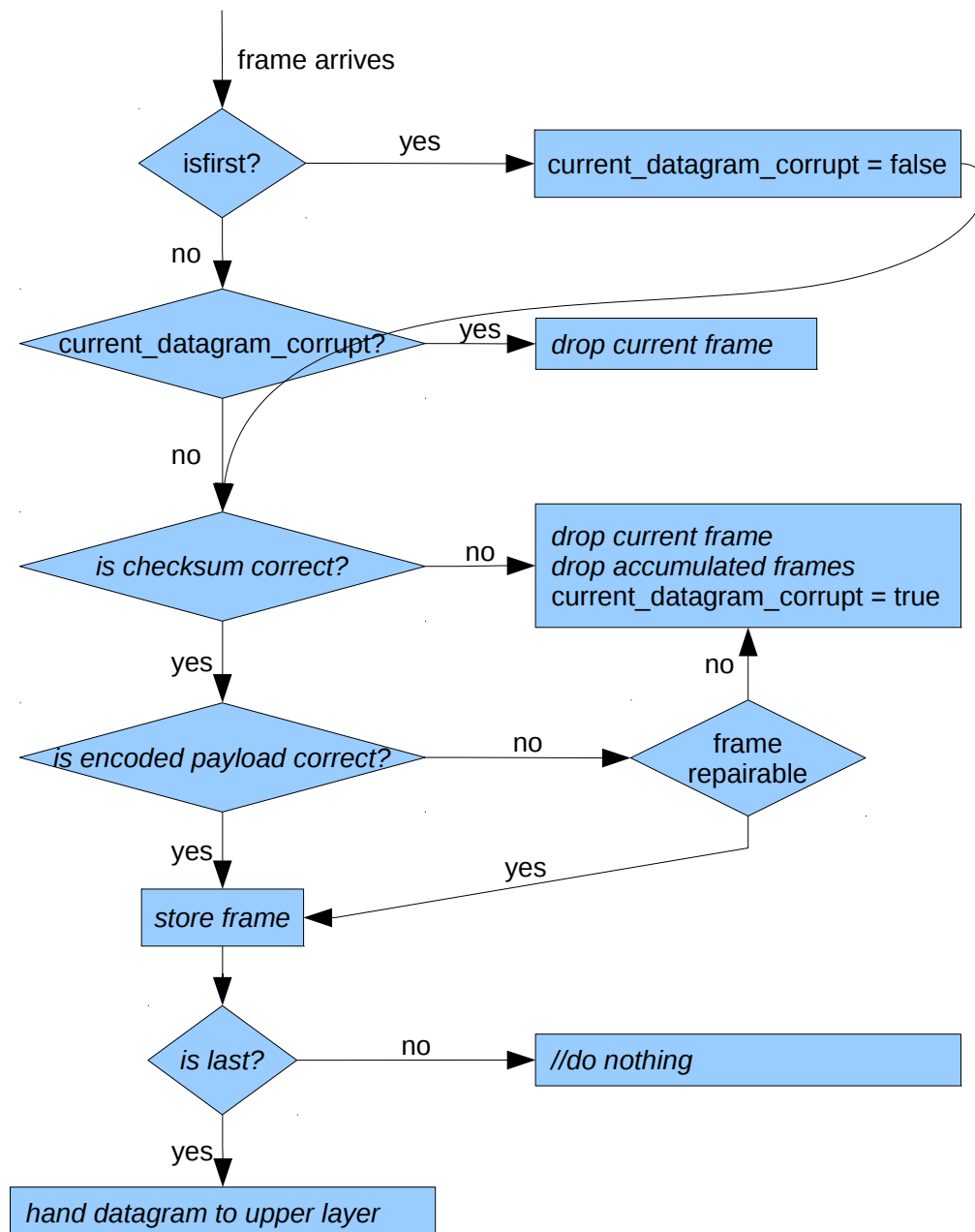


Figure 1: Receiver side of link layer. The flow graph shows how data on the receiver side of the link layer are handled.