TEKNOTRAIT SOLUTIONS

TEKNOTRAIT SOLUTIONS PVT. LTD.

#14, Ground Floor, 35th Main, 4th Cross, KAS Officers Colony, BTM Layout 2nd Stage,
Bangalore, Karnataka – 560076 • Phone : 080-42 01 31 80

Email : info@teknotrait.com • website : www.teknotrait.com

Testing a data stream parser

Introduction

In this task you will produce a test script for a software module, which you will submit to Teknotrait Solutions Pvt. Ltd for examination.

The purpose of this test is to demonstrate your ability to read and understand a specification, your problem-solving skills, creativity and attention to detail as a tester in order to derive a sample test script.

Overview

This document contains a specification of a software module. This software module is responsible for extracting a valid message from a stream of data bytes. Messages follow a protocol with a message header, trailer and checksum bytes, as described below.

Message Protocol

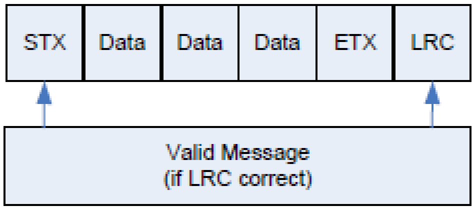
The following describes the message protocol which is often used to interconnect serial devices using an RS232 connection. Data is transferred within a message as `STX <DATA> ETX LRC` where:

Component	**Value (in hexadecimal)**	**Description**
`STX`	`0x2`	Signifies the start of data
`ETX`	`0x3`	Signifies the end of data
`DLE`	`0x10`	Escape character. Used in front of any `0x2`, `0x3`, `0x10` which are data bytes and not STX, ETX, DLE respectively
`<DATA>`	byte stream	The data is made up of a stream of bytes. Any data values which are `0x2`, `0x3` or `0x10` are escaped to avoid confusion with STX, ETX and DLE control characters, e.g.: *Data value* `0x02` *becomes* `0x10 0x02` *Data value* `0x03` *becomes* `0x10 0x03` *Data value* `0x10` *becomes* `0x10 0x10` All other data is sent as it is.

`LRC`	byte value	The LRC is calculated as an 'XOR' on <DATA **excluding** any DLEs> **including** ETX but **excluding** STX. **LRC values are not escaped** even if they are `0x2`, `0x3` or `0x10`. For example, given a valid message:
		`0x2 0x10 0x2 0xA 0x10 0x10 0x7 0x8 0x3 0x14`
		`STX DLE DLE ETX LRC`
		The LRC value 0x14 was calculated by XOR-ing the highlighted bytes.

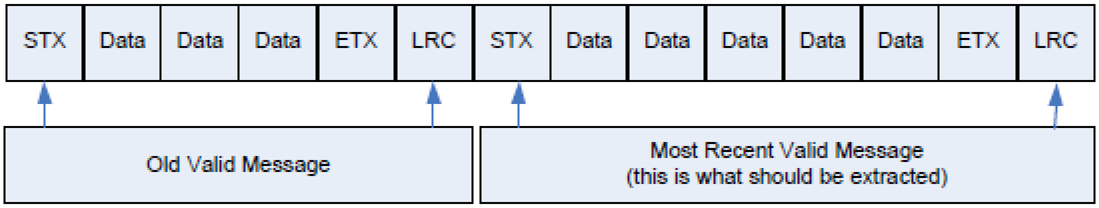
A Valid Message

A valid message is a message which starts with an STX, has the data correctly escaped, ends with an ETX and is followed by an LRC of correct value:



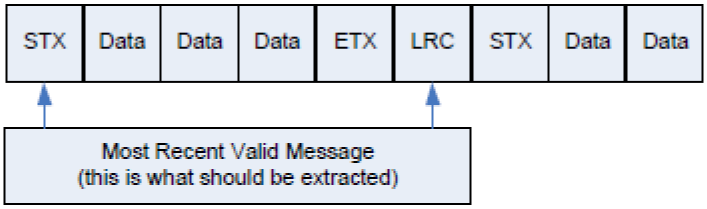
Multiple Messages in the Data Stream

The data stream may contain multiple 'Valid Messages', the software module is required to extract the most recent 'Valid Message':



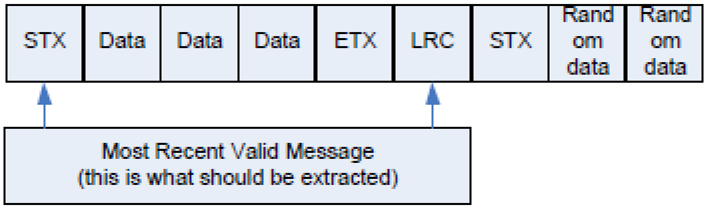
Incomplete Message in the Data Stream

The data stream may also contain incomplete messages, the software module is required to extract the most recent 'Valid Message', even though there may be redundant data at the end of the LRC (shown below):



Random Values in the Data Stream

The data stream may also contain spurious data outside of 'Valid Messages':



Requirements of the Software Module

The software module is required to perform one simple job – to take any data stream as input, and output the data in the most recent valid message (according to the Message Protocol specification above).

For example, given a data stream as input:

```
0x2 0x10 0x2 0xA 0x10 0x10 0x7 0x8 0x3 0x14
STX  DLE           DLE                ETX  LRC
```

In this example, the stream only contains a single valid message, so it would output the data from that message:

```
0x2 0xA 0x10 0x7 0x8
```

If no valid messages are found in the stream, an error is generated.

Your task

Your task is to produce a test script for such a software module, including the creation of test data to try and test to find fault with the application. There is already one simple example data stream given above; you should create other test data streams to ensure that your test cases are able to effectively test the issues of multiple messages in the stream, incomplete messages and random data between messages.

Your test plan should also show how you would record any test results, the templates you might use, and any other relevant information such as test strategies or third-party tools you would consider using.

The test plan should be submitted as a PDF, Microsoft Word, Microsoft Excel, LibreOffice Writer or LibreOffice Calc document.