Transport Specification: MLLP, Release 1

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Table of Contents

1. Minimal Lower Layer Protocol (MLLP)

1.1 Introduction

This document specifies the Minimal Lower Layer protocol (MLLP, a.k.a. MLP). The MLLP protocol has a long history of use within the HL7 community, although it has never been formally part of the HL7 standard itself.

The MLLP protocol is a minimalistic OSI-session layer framing protocol. It is assumed that the MLLP protocol will be used only in a network environment. Most of the details of error detection and correction are handled by the lower levels of any reasonable network protocol (e.g. TCP/IP, SNA) and do not require any supplementation.

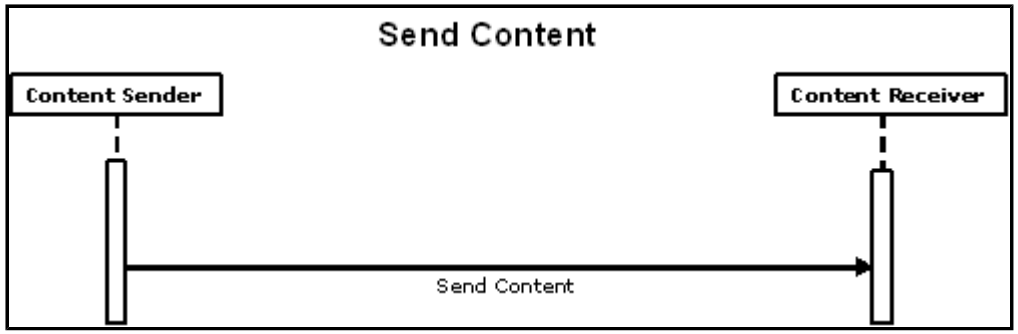

Figure 1 Interaction Diagram

The goal of this lower level protocol is to provide an interface between HL7 and the network that uses minimal overhead. This protocol is extensively used for the transport of HL7 version 2 messages. MLLP has limited support for character encodings, see below for details. This Transport Specification supports (amongst other message encodings and ITSs) the vertical bar and XML HL7 version 2 message encodings and the version 3 XML ITS. This transport protocol may not be applicable to some HL7 version 3 ITSs.

1.2 Block Format

HL7 content is enclosed by special characters to form a block.
The block format is as follows: **<SB> dddd< EB> < CR>**

Element	Description
<SB>	Start Block character (1 byte). ASCII <VT>, i.e., <0x0B>. This should not be confused with the ASCII characters SOH or STX.
dddd	Data (variable number of bytes). This is the HL7 data content of the block. The data can contain any single-byte values greater than 0x1F (see next paragraph for issues related to character encodings) and the ASCII carriage return character, <CR>.
<EB>	End Block character (1 byte). ASCII <FS>, i.e., <0x1C>. This should not be confused with the ASCII characters ETX or EOT.
<CR>	Carriage Return (1 byte). The ASCII carriage return character, i.e., <0x0D>.

1.3 Limitations of MLLP

The MLLP block is framed by single-byte values. The characters transmitted within the MLLP block have to be encoded according to a character encoding that does not conflict with the byte values used for framing. Some multi-byte character encodings (e.g. UTF-16, UTF-32)

may result in byte values equal to the MLLP framing characters or byte values lower than 0x1F, resulting in errors. These character encodings are therefore not supported by MLLP.

MLLP supports all single-byte character encodings (e.g. iso-8859-x, cp1252) as well as UTF-8 and Shift_JIS.

The sending and receiving systems will have to mutually agree upon the encoding used for a given connection. Most applications within a certain geographic/language area share the same character encoding. U.S./Canadian implementations of MLLP typically use the UTF-8 encoding; Western European (Germanic and Latin language areas) implementations typically use the ISO 8859-1 encoding.

1.4 Examples

This section contains a number of examples of MLLP-framed HL7 payloads, where <SB> <EB> and <CR> are used to denote the non-printable MLLP-framing single-byte values 0x0B, 0x1C and 0x0D. They are not to be interpreted as XML-tags.

1: HL7 version 2 Example

```
<SB>
MSH|^~\&|ZIS|1^AHospital|||199605141144||ADT^A01|20031104082400|P|2.3|||
AL|NE|||8859/15|<CR>EVN|A01|20031104082400.0000+0100|20031104082400
PID||""|10||Vries^Danny^D.^^de||19951202|M|||Rembrandlaan^7^Leiden^^7301TH^""
^^P||""|""||""|||||||""|""<CR>PV1||I|3w^301^""^01|S|||100^van den Berg^^A.S.
^^""^dr|""||9||||H||||20031104082400.0000+0100<CR>
<EB><CR>
```

2: HL7 version 3 Example

```
<SB>
<?xml version="1.0" encoding="ISO-8859-15"?>
        <Message xmlns="urn:hl7-org:v3" xmlns:voc="urn:hl7-org:v3/voc"
                 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
        <id extension="10213" root="2.16.840.1.113883.2.4.99.1.700222.1"/>
        <creationTime value="20030216140000"/>
        <versionId>V3PR1_ballot5</versionId>
        <interactionId extension="MFMT_IN100010NL" root="2.16.840.1.113883"/>
        <processingCode code="P"/>
        . . .
        . . .
        </Message>
<EB><CR>
```

3: CDA Release 2 Example

```
<SB>
<?xml version="1.0"?>
     <ClinicalDocument xmlns="urn:hl7-org:v3" xmlns:voc="urn:hl7-org:v3/voc"
     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
     xsi:schemaLocation="urn:hl7-org:v3 CDA.ReleaseTwo.CommitteeBallot01.July.2003.xsd">

        <id extension="c266" root="2.16.840.1.113883.3.933"/>
        <code code="11488-4" codeSystem="2.16.840.1.113883.6.1"
```

```
                displayName="Consultation note"/>
        <title>Good Health Clinic Consultation Note</title>
        <effectiveTime value="20000407"/>
        <setId extension="BB35" root="2.16.840.1.113883.3.933"/>
        <versionNumber value="2"/>
                        . . .
                        . . .
    </ClinicalDocument>
<EB><CR>
```

1.5 References

This specification is based on the HL7 Implementation Guide for HL7 version 2.3.1, appendix C "Lower Layer Protocols", section C.4.3.