esoc

European Space Operations Centre  
Robert-Bosch-Strasse 5  
D-64293 Darmstadt  
Germany

T +49 (0)6151 900  
F +49 (0)6151 90495  
www.esa.int

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| MAL-SPP deviations for OPS-SAT |



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# Introduction

The document was produced to have a concise record of the deviations from the original MAL-SPP deviations ESA’s OPS-SAT mission.

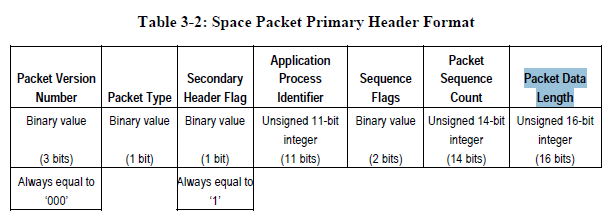
Complementing, the document holds the Mapping Configuration Parameters (MCP) of the MAL-SPP Binding. This is the so called “out-of-band agreement” between a consumer and a provider that uses this binding.

# MAL-SPP Transport Binding

The MAL-SPP Transport Binding used in OPS-SAT does not completely follow the “CCSDS Mission Operations - MAL-SPP Transport Binding and Binary Encoding” book.

There are 2 octets being appended at the end of the Space Packet containing the CRC checksum of the message.

Consequently, the Packet Data Length of the Space Packet Primary Header is incremented by 2:



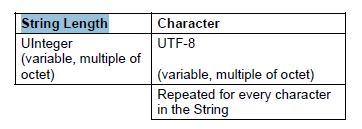
# Binary Encoding

The Binary Encoding used in OPS-SAT does not completely follow the “CCSDS Mission Operations - MAL-SPP Transport Binding and Binary Encoding” book. [insert reference]

The following MAL Data Types do not follow the Binary Encoding prescriptions: MAL::Identifier, MAL:: String, MAL::URI.

The String length is not being encoded as UInteger according to requirement 5.21.3:

***5.21.3*** *The field ‘String Length’ shall be encoded as a UInteger (see 5.18).*



In OPS-SAT, the Binary Encoding does not follow this specification and instead the String Length field is encoded as an unsigned 16-bit integer.

According to GMV’s Design Document, the reason for this change is to conform with the S2K data generation/processing. Further assessment should be taken to guarantee that this is still valid.

Note: UInteger is encoded as an unsigned 32-bit integer according to requirement 5.18.2:

***5.18.2*** *If the MCP VARINT\_SUPPORTED is FALSE, then a MAL::UInteger shall be encoded as an Unsigned 32-bit Integer (see 5.25).*

Unsigned 16-bit integer corresponds to MAL::UShort type (per 5.16.2):

***5.16.2*** *If the MCP VARINT\_SUPPORTED is FALSE, then a MAL::UShort shall be*

*encoded as an Unsigned 16-bit Integer (see 5.25).*

# Mapping Configuration Parameters (MCP)

MCP’s values should be agreed upon and put into OBSW ICD.

The MCP’s used in OPS-SAT are following:

| Parameter Name | Type | Description | Value |
| --- | --- | --- | --- |
| AUTHENTICATION\_ID | MAL:Blob | Value to be assigned to the MAL header field ‘Authentication Id’ if the QoS property AUTHENTICATION\_ID\_FLAG is FALSE |  |
| DOMAIN | List<MAL::Identifier> | Value to be assigned to the MAL header field ‘Domain’ if the QoS property DOMAIN\_FLAG is FALSE |  |
| DURATION\_CODE\_FORMAT | MAL::Blob | P-Field of the CUC Time Code Format to be applied to the MAL::Duration elements | 00101111 |
| DURATION\_UNIT | MAL::String | Name of the time unit used by the Time Code Format for MAL::Duration, e.g., second, millisecond. | seconds |
| FINE\_TIME\_CODE\_FORMAT | MAL::Blob | P-Field of the Time Code Format to be applied to the MAL::FineTime elements | 00101111 |
| FINE\_TIME\_EPOCH | MAL::String | Epoch in ISO-8601 format to be applied to the MAL::FineTime elements | 2000-01-01T00:00:00.000 |
| FINE\_TIME\_EPOCH\_TIMESCALE | MAL::String | Name of the time scale for the MAL::FineTime epoch, either “TAI” or “UTC”. | TAI |
| FINE\_TIME\_UNIT | MAL::String | Name of the time unit used by the Time Code Format for MAL::FineTime, e.g., second, millisecond. | Seconds |
| NETWORK\_ZONE | MAL::Identifier | Value to be assigned to the MAL header field ‘Network Zone’ if NETWORK\_ZONE\_FLAG is FALSE |  |
| PRIORITY | MAL::UInteger | Value to be assigned to the MAL header field ‘Priority’ if PRIORITY\_FLAG is FALSE |  |
| TIME\_CODE\_FORMAT | MAL::Blob | P-Field of the Time Code Format to be applied to the MAL::Time elements | 00101111 |
| TIME\_EPOCH | MAL::String | Epoch in ISO-8601 format to be applied to the MAL::Time elements | 2000-01-01T00:00:00.000 |
| TIME\_EPOCH\_TIMESCALE | MAL::String | Name of the time scale for the MAL::Time epoch, either “TAI” or “UTC”. | TAI |
| TIME\_UNIT | MAL::String | Name of the time unit used by the Time Code Format for MAL::Time, e.g., second, millisecond. | seconds |
| SESSION\_NAME | MAL::Identifier | Value to be assigned to the MAL header field ‘Session Name’ if SESSION\_NAME\_FLAG is FALSE |  |
| VARINT\_SUPPORTED | MAL::Boolean | Boolean indicating whether the ‘Varint’ encoding format is supported or not | false |
| SOURCE\_ID | MAL::String | Value to be assigned to the MAL header field ‘Source Id’ if SOURCE\_ID\_FLAG is FALSE |  |
| DESTINATION\_ID | MAL::String | Value to be assigned to the MAL header field ‘Destination Id’ if DESTINATION\_ID\_FLAG is FALSE |  |