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Intelligent transport systems - Traffic and travel information via transport protocol experts group, generation 2(TPEG2) —

Part 6: Message management container (TPEG2-MMC)

Systèmes intelligents de transport — Informations sur le trafic et le tourisme via le groupe expert du protocole de transport, génération 2 (TPEG2) —

Partie 6: Conteneur de gestion de message (TPEG2-MMC)

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Foreword

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The committee responsible for this document is ISO/TC 204 *Intelligent transport systems*, in cooperation with the Traveller Information Services Association (TISA), TPEG Applications Working Group through Category A Liaison status.

ISO/TS 21219 consists of the following parts, under the general title *Intelligent transport systems — Traffic and travel information (TTI) via transport protocol expert group, generation 2 (TPEG2)*:

— *Part 2: UML modelling rules* [Technical Specification]

— *Part 3: UML to binary conversion rules* [Technical Specification]

— *Part 4: UML to XML conversion rules* [Technical Specification]

— *Part 5: Service framework* [Technical Specification]

— *Part 6: Message management container* [Technical Specification]

— *Part 7: Location referencing container* [Technical Specification]

— *Part 18: Traffic flow and prediction application* [Technical Specification]

The following parts are planned:

— *Part 1: Introduction, numbering and versions* [Technical Specification]

— *Part 9: Service and network information* [Technical Specification]

— *Part 10: Conditional access information* [Technical Specification]

— *Part 14: Parking information application* [Technical Specification]

— *Part 15: Traffic event compact application* [Technical Specification]

— *Part 16: Fuel price information application* [Technical Specification]

— *Part 19: Weather information application* [Technical Specification]

— *Part 20: Extended TMC location referencing* [Technical Specification]

— *Part 21: Geographic location referencing* [Technical Specification]

— Part 22: *OpenLR·location·referencing* [Technical Specification]

— Part 23: *Roads·and·multi-modal·routes·application* [Technical Specification]

Introduction

History

TPEG technology was originally proposed by the European Broadcasting Union (EBU) Broadcast Management Committee, who established the B/TPEG project group in the autumn of 1997 with a brief to develop, as soon as possible, a new protocol for broadcasting traffic and travel-related information in the multimedia environment. TPEG technology, its applications and service features were designed to enable travel-related messages to be coded, decoded, filtered and understood by humans (visually and/or audibly in the user's language) and by agent systems. Originally a byte-oriented data stream format, which may be carried on almost any digital bearer with an appropriate adaptation layer, was developed. Hierarchically structured TPEG messages from service providers to end-users were designed to transfer information from the service provider database to an end-user's equipment.

One year later in December 1998, the B/TPEG group produced its first EBU specifications. Two documents were released. Part 2 (TPEG-SSF, which became ISO/TS 18234-2) described the Syntax, Semantics and Framing structure, which was used for all TPEG applications. Meanwhile Part 4 (TPEG-RTM, which became ISO/TS 18234-4) described the first application, for Road Traffic Messages.

Subsequently in March 1999, CEN TC 278/WG 4, in conjunction with ISO/TC 204/WG 10, established a project group comprising members of the former EBU B/TPEG and they continued the work concurrently. Further parts were developed to make the initial set of four parts, enabling the implementation of a consistent service. Part 3 (TPEG-SNI, ISO/TS 18234-3) described the Service and Network Information Application, used by all service implementations to ensure appropriate referencing from one service source to another.

Part 1 (TPEG-INV, ISO/TS 18234-1), completed the series, by describing the other parts and their relationship; it also contained the application IDs used within the other parts. Additionally, Part 5, the Public Transport Information Application (TPEG-PTI, ISO/TS 18234-5), was developed. The so-called TPEG-LOC location referencing method, which enabled both map-based TPEG-decoders and non map-based ones to deliver either map-based location referencing or human readable text information, was issued as ISO/TS 18234-6 to be used in association with the other applications parts of the ISO/TS 18234-series to provide location referencing.

The ISO/TS 18234-series has become known as TPEG Generation 1.

TPEG Generation 2

With the inauguration of the Traveller Information Services Association (TISA) in December 2007 derived from former Forums and the CEN/ISO development project group, the TPEG Applications Working Group took over development work for TPEG technology.

It was about this time that the (then) new Unified Modelling Language (UML) was seen as having major advantages for the development of new TPEG Applications in communities who would not necessarily have binary physical format skills required to extend the original TPEG TS work. It was also realized that the XML format for TPEG described within the ISO/TS 24530-series (now superseded) had a greater significance than previously foreseen; especially in the content-generation segment and that keeping two physical formats in synchronism, in different standards series, would be rather difficult.

As a result TISA set about the development of a new TPEG structure that would be UML based – this has subsequently become known as TPEG Generation 2.

TPEG2 is embodied in the ISO/TS 21219-series and it comprises many parts that cover introduction, rules, toolkit and application components. TPEG2 is built around UML modelling and has a core of rules that contain the modelling strategy covered in Parts 2, 3, 4 and the conversion to two current physical formats: binary and XML; others could be added in the future. TISA uses an automated tool to convert from the agreed UML model XMI file directly into an MS Word document file, to minimize drafting errors, that forms the Annex for each physical format.

TPEG2 has a three container conceptual structure: Message Management (Part 6), Application (many Parts) and Location Referencing (Part 7). This structure has flexible capability and can accommodate many differing use cases that have been proposed within the TTI sector and wider for hierarchical message content.

TPEG2 also has many location referencing options as required by the service provider community, any of which may be delivered by vectoring data included in the Location Referencing Container. The following classification provides a helpful grouping of the different TPEG2 parts according to their intended purpose:

Toolkit parts: TPEG2-INV (Part 1), TPEG2-UML (Part 2), TPEG2-UBCR (Part 3), TPEG2-UXCR (Part 4), TPEG2-SFW (Part 5), TPEG2-MMC (Part 6), TPEG2-LRC (Part 7)

Special applications: TPEG2-SNI (Part 9), TPEG2-CAI (Part 10)

Location referencing: TPEG2-ULR (Part 11), TPEG2-ETL (Part 20), TPEG2-GLR (Part 21), TPEG2-OLR (Part 22)

Applications: TPEG2-PKI (Part 14), TPEG2-TEC (Part 15), TPEG2-FPI (Part 16), TPEG2-TFP (Part 18), TPEG2-WEA (Part 19), TPEG2-RMR (Part 23)

TPEG2 has been developed to be broadly (but not totally) backward compatible with TPEG1 to assist in transitions from earlier implementations, while not hindering the TPEG2 innovative approach and being able to support many new features, such as dealing with applications having both long-term, unchanging content and highly dynamic content, such as Parking Information.

This Technical Specification is based on the TISA specification technical/editorial version number: TPEG2-MMC/1.1/001.

Intelligent transport systems - Traffic and travel information via transport protocol experts group, generation 2(TPEG2) —

Part 6:
Message management container (TPEG2-MMC)

1 Scope

This Technical Specification adds a basic toolkit definition to the ISO 21219 series specifying the Message Management Container (MMC), which is used by all TPEG applications to provide information about the handling of messages on the TPEG client side. The MMC holds administrative information allowing a decoder to handle the message appropriately. This information is not aimed at the end user. The MMC is a toolkit and not a stand-alone application but is included by TPEG applications.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/TS 18234-3, *Intelligent transport systems — Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format — Part 3: Service and network information (TPEG1-SNI)*

ISO/TS 21219-2, *Intelligent transport — Traffic and travel information (TTI) via transport protocol experts group, generation 2 (TPEG2) — Part 2: UML modelling rules*

ISO/TS 21219-3, *Intelligent transport systems — Traffic and travel information (TTI) via transport protocol experts group, generation 2 (TPEG2) — Part 3: UML to binary conversion rules*

ISO/TS 21219-4, *Intelligent transport systems — Traffic and travel information (TTI) via transport protocol experts group, generation 2 (TPEG2) — Part 4: UML to XML conversion rules*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
Message
unit of information that is controlled under a message ID and contains a MessageManagementContainer, MMCMasterMessage or MMCMessagePart component

3.1.2
Monolithic Message Management
message management that allows versioning of messages by updating complete messages only

Note 1 to entry: See 4.1.3.

3.1.3
Multipart Message Management
message management that allows parts of messages being transmitted in packets independently

Note 1 to entry: See 4.1.4.

3.1.4
Top Level Container
any component that is on the same level as the message management container

3.1.5
TPEG Server
device or entity on the sending side of the TPEG transmission chain

Note 1 to entry: May consist, e.g. of a TPEG encoder, a stream encoder, a network transmission unit.

3.1.6
TPEG Client
device or entity on the receiving side of the TPEG transmission chain

Note 1 to entry: May consist, e.g. of a broadcast receiver, a TPEG decoder unit.

3.2 Abbreviated terms

MMC	Message Management Container
LRC	Location Referencing Container
ADC	Application Data Container

4 MMC components and capabilities

4.1 Overview

4.1.1 Structure

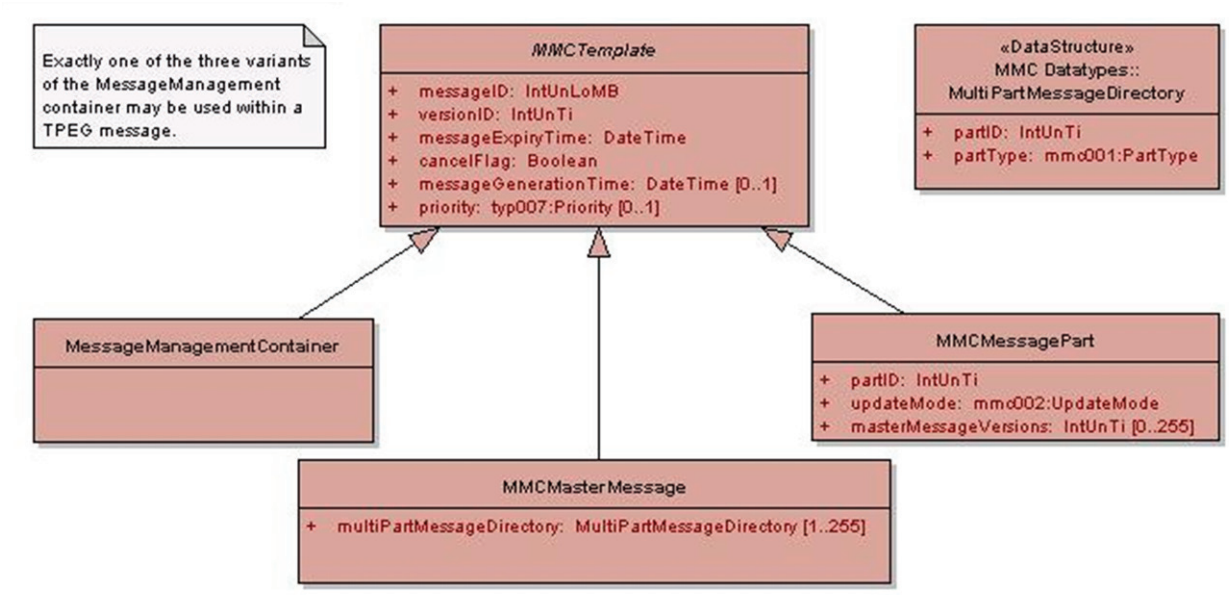

Figure 1 — Structure of the Message Management Container

4.1.2 Capabilities

Any TPEG message typically consists of the following top level containers (see also Figure 2 below):

— Exactly one Message Management Container (MMC)

— Optionally one or several Application Data Container(s) (ADC)

— Optionally one Location Reference Container (LRC)

The MMC contains no data dedicated for the user but only administrative information for the TPEG decoder to handle the message appropriately.

While the ADC part is defined specifically by the related TPEG application specification, the TPEG MMC toolkit is specified by this Technical Specification for all TPEG applications. The general capabilities and features of the MMC toolkit may be restricted or further detailed by the particular TPEG applications.

The MMC is always stereotyped as ordered component and shall be the first component in the TPEG Message. The other parts of the message may as well be stereotyped as “UnorderedComponent”.

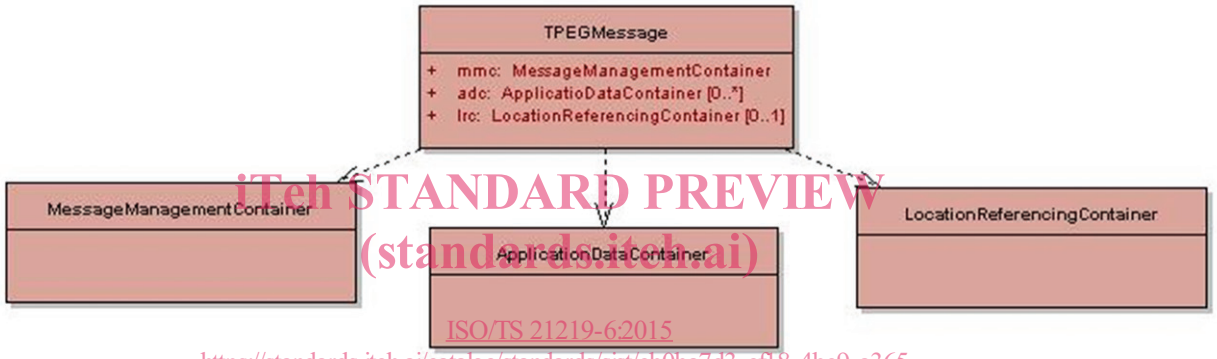

Figure 2 — General structure of a TPEG message

The MMC toolkit includes two basic mechanisms for message management, the Monolithic Message Management and Multipart Message Management, which are described in the following sub-clauses.

Both mechanisms exclude each other, i.e. for a given time there shall either be a message delivered by Monolithic or by Multipart Message Management. Therefore, if a TPEG Client receives a monolithic message and already has a multipart-combined message with the same messageID in its repository it shall remove this message from its repository and shall replace it by the received monolithic message. Vice versa, a monolithic message shall be replaced by a new multipart-message as well.

4.1.3 Monolithic Message Management

The usage of monolithic message management enables the replacement of a complete TPEG message by a more recent version of the same message. Thus, this message management method is suitable for TPEG services where most parts of the message are changing during the message updates.

The monolithic message management applies the class ‘MessageManagementContainer’ only which inherits all attributes from the parent class ‘MMCTemplate’ and adds no further ones. The replacement process described above is signalled by using the same value of the attribute ‘messageID’ and an increased value of the attribute ‘versionID’ (see Figure 3 below).