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Publicly Available Specification (PAS); Intelligent Transport Systems (ITS); MirrorLink®; Part 27: Basic Meta Data Service

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Intelligent Transport Systems (ITS).

The present document is part 27 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.1].

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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1 Scope

The present document is part of the MirrorLink® specification which specifies an interface for enabling remote user interaction of a mobile device via another device. The present document is written having a vehicle head-unit to interact with the mobile device in mind, but it will similarly apply for other devices, which provide a colour display, audio input/output and user input mechanisms.

The present document specifies the basic meta data service based on SBP (Service Binary Protocol) framework. The service is used as a basis for other meta information data services, providing MirrorLink Client's with MirrorLink Server services.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference.

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The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 103 544-6 (V1.3.0): "Publicly Available Specification (PAS); Intelligent Transport Systems (ITS); MirrorLink®; Part 6: Service Binary Protocol (SBP)".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI TS 103 544-1 (V1.3.0): "Publicly Available Specification (PAS); Intelligent Transport Systems (ITS); MirrorLink®; Part 1: Connectivity".

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

SBP Service Binary Protocol

4 Data Service Definition

4.1 Basic Meta Data Service Version 1.0

```
/** The specification defines a meta information umbrella service.
 *  This specification is used as a basis for any Meta Information
 *  Data service, improving on the low-level introspection mechanisms
 *  offered by the CDB and SBP protocols. The service cannot be used
 *  as a standalone service.
 *  Any Meta Data Service, building on the Basic Meta Data Service
 *  shall follow the following definition of data objects:
 *  - Readable Objects are provided from the data source to any data
 *    sink. Readable object can’t be written to from the data sink.
 *    Readable Objects only have readable elements.
 *  - Writeable Objects can be modified by any data sink and returned
 *    back to a to any data source. I.e. all writeable objects can be
 *    read. Writeable Objects have only writeable elements.
 *  - Configuration Objects can be acquired by only one data sink at
 *    a time, modified by that sink and returned to any data source.
 *    Configurable Objects have only writeable elements.
 *  Support for all objects, and elements within objects is mandatory
 *  unless otherwise specified.
 *  @version 1.0
 */
SERVICE com.mirrorlink.meta.basic {

/** Enumeration bit mask values of the subscription types.
 */
ENUM<BYTE> SubscriptionTypes {

  /** Subscription to the object is not possible.
   */
  NONE = 0x00,

  /** Object allows only subscription at regular-time intervals.
   *  Minimum and maximum interval times are provided separately.
   */
  REGULAR = 0x01,

  /** Object allows only subscription on-change.
   */
  ON_CHANGE = 0x02,

  /** Object allows subscription on-change and at regular-time
   *  intervals.
   */
  BOTH = 0x03,

  /** Object allows automatic subscription, where the data source can
   *  decide, whether to regular-interval or on-change subscription is
   *  best.
   */
  AUTOMATIC = 0x04
  };

/** Enumeration values of access types.
 */
ENUM<BYTE> AccessTypes {

  /** Object is read-only.
   *  Read access shall be supported via SBP::GET.
```

```
    *  Read access should be supported via SBP::SUBSCRIBE.
    */
  READABLE = 0x00,

  /** Object can be written and read-back.
    *  Read request to the object shall return a previously written
    *  value. A read without prior write shall return a default value.
    *  Write access shall be supported via SBP::SET.
    *  Read access shall be supported via SBP::GET.
    *  Read access should not be supported via SBP::SUBSCRIBE.
    */
  WRITABLE = 0x02,

  /** Object can be written by only a single data sink.
    *  The use of this object shall be limited to service configuration
    *  or service setup.
    *  Only one Data Sink shall be allowed to write to the object.
    *  Access control shall be enforced from the Data Sink endpoint.
    *  Write access from multiple Data Sink endpoints may result in
    *  instable Data Service behavior.
    *  Write access shall be supported via SBP::SET.
    *  Read access is allowed from multiple Data Sink endpoints.
    *  Read access shall be supported via SBP::GET.
    *  Read access may be supported via SBP::SUBSCRIBE.
    */
  CONFIGURABLE = 0x03
  };

/** The ObjectDescription structure holds all meta data related to a
 *  specific meta data service object.
 */
STRUCTURE ObjectDescription {

  /** The object's universal identifier (uid), as defined by the data
    *  service.
    *  @mandatory, @uid 0x31c7eeeb
    */
  INT uid;

  /** The object's access rights.
    *  @mandatory, @uid 0xe6d3cde3
    */
  ENUM<AccessTypes> accessType;

  /** The subscription types, the object supports. The bit masks for
    *  the different types are provided in subscriptionTypeBitMask.
    *  More than one subscription type can be support. A value of zero
    *  indicates, that the object does not support subscription. Shall
    *  be provided if object is readable.
    *  @mandatory, @uid 0x3dd534bc
    */
  ENUM<SubscriptionTypes> subscriptionType;

  /** Minimum subscription time, the object supports for regular-
    *  interval subscription. Value given in ms. The top 8 bits shall
    *  be "0", as SBP allows only for a 24-bit representation. Shall
    *  be provided, if object support regular-interval subscription.
    *  @conditional, @unit ms, @uid 0xd353665f
    */
  INT minIntervalTime;

  /** Maximum subscription time, the object supports for regular-
    *  interval subscription. Value given in ms. The top 8 bits shall
    *  be "0", as SBP allows only for a 24-bit representation. Shall
```

```
    *  be provided, if object support regular-interval subscription.
    *  @conditional, @unit ms, @uid 0x3ca36e71
    */
   INT maxIntervalTime;
   };

 /** The MetaInfoObjects objects contains the list of available SBP
  *  objects available through the respective data service.
  *  @mandatory, @readable, @version 1.0, @uid 0xe5b9efdc
  */
 OBJECT MetaInfoObjects {

   /** List of available objects from the date service.
    *  @mandatory, @uid 0xa1065962
    */
   STRUCTURE_ARRAY<ObjectDescription> objectList;
   };

 };
```

5 SBP Binding

The *MetaInfoObjects* object provides details on how the SBP Sink can access SBP objects from the SBP Source. An SBP Source shall allow access to each object, as defined within its *MetaInfoObjects* object. In case the SBP Sink attempts to access any of the SBP objects outside the allowed mechanism, the SBP Source shall send an SBP *Response* message with a respective error code, as defined in [1]:

- Access to an object with a not-included UID value; error code `0x10000001` (Unknown UID).
- Write access to read-only objects; error code `0x1000000C` (Write not allowed).
- Subscription interval outside the provide minimum and maximum values; error code `0x10000003` (Wrong subscription interval).
- Subscription type not supported; error code `0x10000004` (Wrong subscription type).

Additional requirements may be defined within the respective Meta Information data service specification, which are using this Basic Meta data service, but the above requirements shall not change.

6 Theory of Operation

6.1 Basic Operation

The following sequence diagram shows the basic operation of the Basic Meta Information data service.

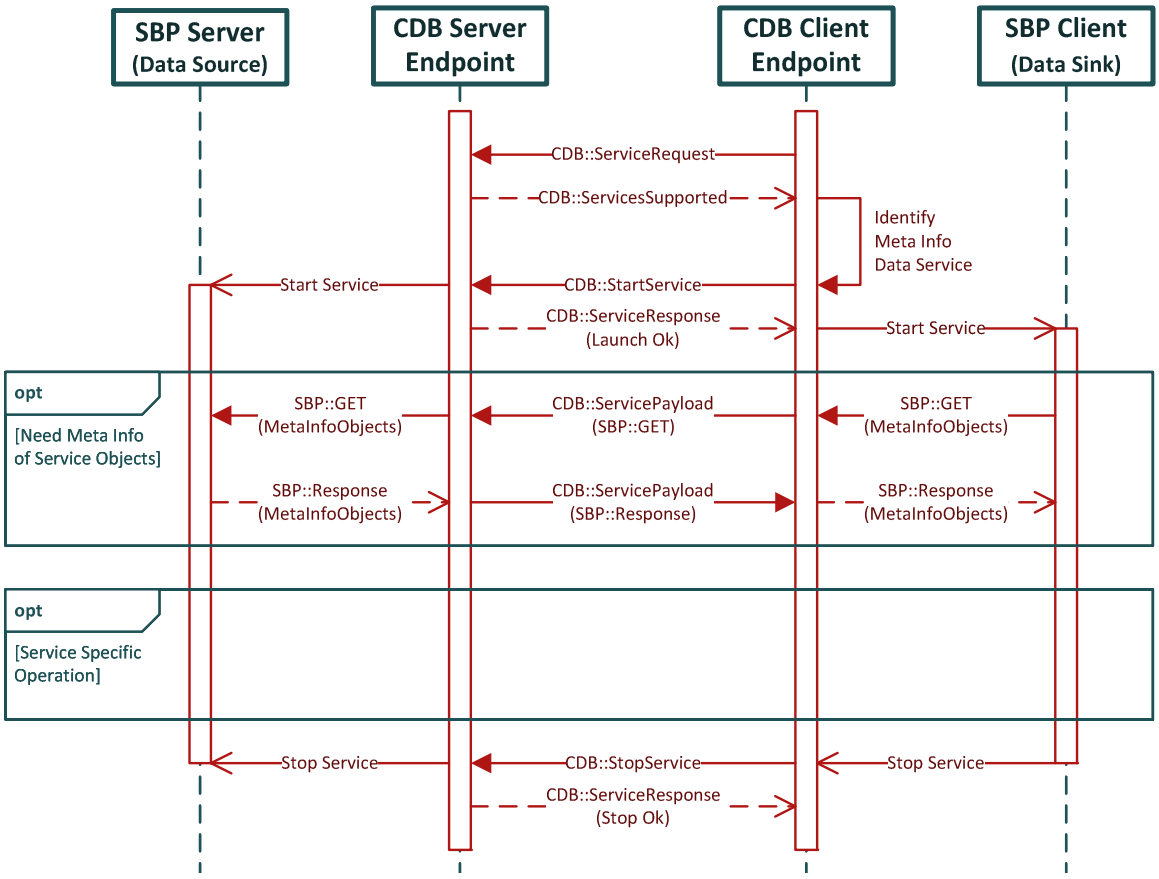

Figure 1: Sequence Diagram of Basic Service Operation

It consists of the following steps:

1) CDB Client Endpoint sends a CDB *ServicesRequest* message, requesting the list of data services, provided from the CDB Server Endpoint.

2) CDB Server Endpoint replies with a CDB *ServicesSupported* message, listing the supported data services. The list includes all data services, for which the CDB Server Endpoint implements the data source.

3) CDB Client Endpoint identifies the data service, it intends to start.

4) CDB Client Endpoints sends a CDB *StartService* message, requesting the CDB Server Endpoint to start the respective data service.

5) CDB Server Endpoint sends a CDB Response message with error code `0x0001` (Launch ok).

6) SBP Data Sink sends an SBP *GET* message for the *MetaInfoObjects* object, which will be included from CDB Client Endpoint as the data payload of the CDB *ServicePayload* message. The message is optional, and will be send in case the SBP Data Sink needs to understand the data service objects' details.

7) SBP Data Source sends an SBP *Response* message containing the requested *MetaInfoObjects* object, which will be included from CDB Server Endpoint as the data payload of the CDB *ServicePayload* message.

8) SBP Data Source and Data Sink will exchange service specific messages, accessing data service objects, using SBP *GET*, *SET* or *SUBSCRIBE* messages. These messages and responses to them will be included as the data payload of the CDB *ServicePayload* message.

9) CDB Client Endpoints sends a CDB *StopService* message, requesting the CDB Server Endpoint to stop the respective data service, once the data service is not needed anymore.

10) CDB Server Endpoint sends a CDB *Response* message with error code `0x0002` (Stop ok).

Annex A (informative): Authors and Contributors

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History

Document history		
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