**HERMES 1.7 support Hermes Side Channel (HSC)**

**Proposal how to support Transfer of more Data with Hermes including Custom Attributes**

Customer feedback shows a demand for transferring more data with Hermes, e.g., removing the limitations of SubBoards, and for allowing custom attributes. However, adding more payload to *BoardAvailable* will only increase the challenges concerning message data size and will not remove any of the existing limitations.

Hence a Hermes Side Channel (HSC) shall be added to The Hermes Standard, and it shall use the Hermes Vertical Channel (HVC) to overcome the existing limitations on data payload.

* The HSC provides a communication channel between machines and an HSC Server.
* For each board, this HSC Server can receive data and store it using the Hermes Board GUID as a unique identifier.
* Each machine may send board data to the HSC Server and query board data from the HSC Server.
* The HSC Server will retain data for at least 48 hours.
* Three messages will support communication between machines and HSC Server:
+ *AddExtendedBoardInfo* Machine sends board data to HSC Server, existing data will
 be overwritten
 🡪 BoardId and, if needed, SubBoards without limitation
 🡪 Optional custom attribute(s)
+ *QueryExtendedBoardInfo* Machine queries HSC Server for data of a specific board
 identified by BoardId
 🡪 BoardId to identify board for which information is queried
+ *SendExtendedBoardInfo* HSC Server replies with board data to a previous
 *QueryExtendedBoardInfo*
 🡪 Result: Board known or unknown
 🡪 Available queried SubBoards without limitation
 🡪 Available queried custom attributes

**Notes**:

* For now, only SubBoards is specified as optional data besides custom attributes. In the future, frequently used custom attributes may be added as specified optional data.
* In addition to SubBoards, any data in the *BoardAvailable* message may be transferred as custom attributes, e.g., due to one machine in the line only supporting a lower version of Hermes.

**Workflow**

The communication workflow between machine and HSC Server is as follows:

* Machine receives BoardId from upstream with *BoardAvailable* message.
* Machine sends *QueryExtendedBoardInfo* with received BoardId and a list of attributes to query for.
**Note**: *QueryExtendedBoardInfo* may be sent multiple times
* HSC Server replies with *SendExtendedBoardInfo*. If board data identified by BoardId exists, machine receives queried data from HSC Server.
* Machine does its work.
* If needed, machine updates received data and sends it back to HSC Server latest before sending *BoardAvailable* to downstream machine.
**Note**: Machine may send *AddExtendedBoardInfo* multiple times before passing the board on to downstream machine.

**Modelling of the three new Messages**

The *AddExtendedBoardInfo* is sent by a machine via Hermes vertical channel to the HSC Server to add data for a particular board, which is identified by its BoardId. The sent data may contain SubBoards and custom attributes.
Data that already exists on the HSC Server will be overwritten.

| **AddExtendedBoardInfo** | **Type** | **Range / Multiplicity** | **Optional** | **Description** |
| --- | --- | --- | --- | --- |
| nodeBoardId | string | GUID(36 bytes) | no | Indicating the ID of the available board. |
| folderSubBoards | SB [] | 0…n | yes | A list of SubBoards |
| folderCustom | Custom [] | 0…n | yes | A list of custom attributes. |
| node<Custom 1> | string |  | yes | Name and value of custom attribute, e.g.<Custom\_1> “Custom\_1 value” </Custom\_1> |
| node<Custom 2> | string |  | yes | Name and value of custom attribute |
| node<Custom 3> | string |  | yes | Name and value of custom attribute |
| node<Custom 4> | string |  | yes | Name and value of custom attribute |

The *QueryExtendedBoardInfo* is sent by a machine via Hermes vertical channel to the HSC Server to query data for a board, which is identified by its BoardId.

| **QueryExtendedBoardInfo** | **Type** | **Range / Multiplicity** | **Optional** | **Description** |
| --- | --- | --- | --- | --- |
| nodeBoardId | string | GUID(36 bytes) | no | Indicating the ID of the available board. |
| folderSubBoards | SB [] | 0 | yes |  |
| folderCustom | Custom [] | 0…n | yes | A list of custom attributes to be queried for.An empty list indicates a query for all existing custom attributes. |
| node<Custom 1> | string |  | yes | Name of custom attribute to query for |
| node<…> | string |  | yes | Name of custom attribute to query for |

The *SendExtendedBoardInfo* is sent by the HSC Server via Hermes vertical channel to a machine. This message contains a BoardId to identify the board for which additional data will be sent and, if available and requested, SubBoards and custom attributes.

| **SendExtendedBoardInfo** | **Type** | **Range / Multiplicity** | **Optional** | **Description** |
| --- | --- | --- | --- | --- |
| nodeResult | int | 0...1 | no | Result of query for data of board identified by previously received BoardId. |
| folderSubBoards | SB [] | 0…n  | yes | A list of SubBoardsempty list if SubBoards info does not exist |
| folderCustom | Custom [] | 0…n | yes | A list of custom attributes that were queried for, empty list if queried custom attributes are all unknown |
| node<Custom 1> | string |  | yes | Value of “Custom 1” attribute, e.g.<Custom\_1> “Custom\_1 value” </Custom\_1> |
| node<…> | string |  | yes | Value of … |

Result may be one of the following values:

1. No data for board identified by BoardId available
2. Data for board identified by BoardId available

**Extension of 3.19 Supervisory Service Description**

The list of *SupervisoryFeatures* needs to be extended by a FeatureHermesSideChannel.

| **SupervisoryFeature** | **Type** | **Range / Multiplicity** | **Optional** | **Description** |
| --- | --- | --- | --- | --- |
| folderFeatureConfiguration | FeatureConfiguration | 1 | yes | Indication of configuration functions implementation. |
| folderFeatureCheckAliveResponse | FeatureCheckAliveResponse | 1 | yes | Indication of CheckAliveResponse function implementation. |
| folderFeatureBoardTracking | FeatureBoardTracking | 1 | yes | Indication of board tracking functions implementation. |
| folderFeatureQueryWorkOrderInfo | FeatureQueryWorkOrderInfo | 1 | yes | Indication of QueryWorkOrderInfo function implementation. |
| folderFeatureSendWorkOrderInfo | FeatureSendWorkOrderInfo | 1 | yes | Indication of SendWorkOrderInfo function implementation. |
| folderFeatureReplyWorkOrderInfo | FeatureReplyWorkOrderInfo | 1 | yes | Indication of ReplyWorkOrderInfo function implementation. |
| folderFeatureHermesSideChannel | FeatureHermesSideChannel | 1 | yes | Indication of Hermes Side Channel implementation. |