Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature – List Browser Protocol

AHU Infotainment Subsystem Part Specific Specification (SPSS)

Version 1.4

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Version Date: August 30, 2017

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Revision History

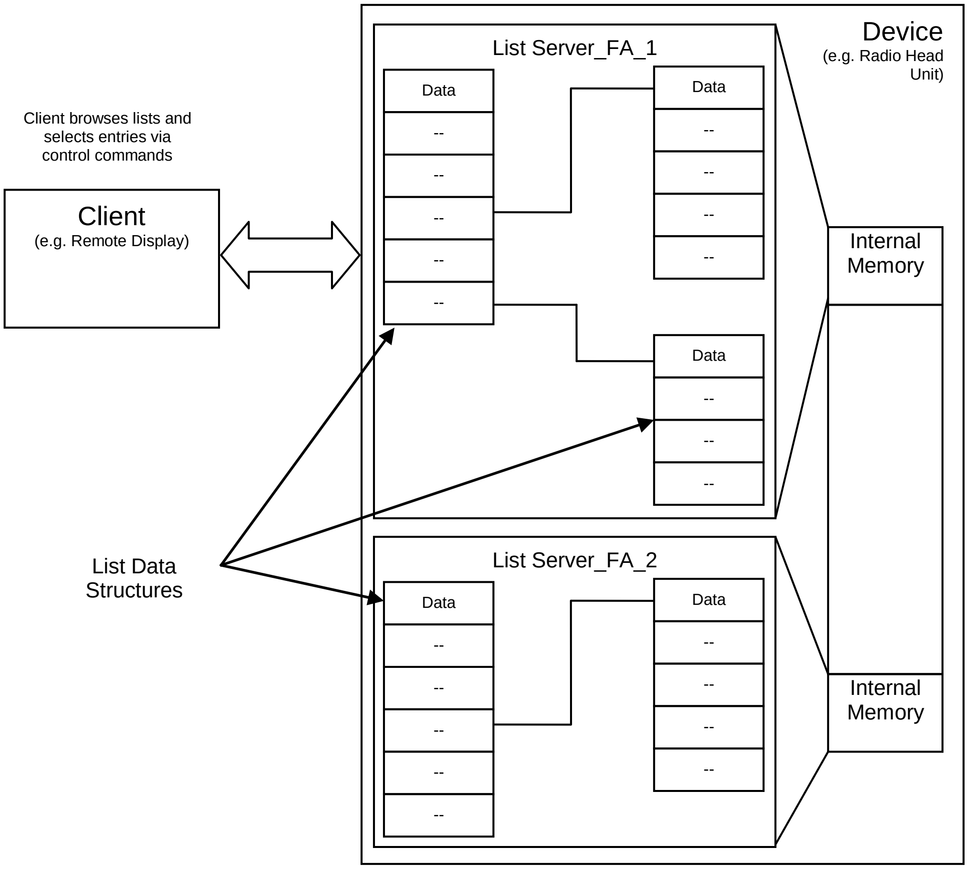
Date	Ver	Notes	
April 1, 2015	**1.0**	**Initial Release**	
October 26, 2015	**1.1**	**Updated Release**	
	LBPv2-SR-REQ-128955/B-Item Descriptor Attribute+		rpaquet2 - Added Radio Mixed Presets to the table.
	LBPv2-SR-REQ-128955/C-Item Descriptor Attribute		sberg15: Added item descriptor 0x61 Phone Call Category and 0xA4 Radio Source
	LBPv2-SR-REQ-128954/B-Avaliable List Servers		sberg15: Added information that list server 0x07 RadioDataService1 is used for "Basic" EPG; added new list server 0x09 RadioDataService3 for "Advanced" EPG data.
	STR-202865/B-Functional Definition		rpaquet2 - Added Server List Update
	STR-202923/B-Requirements		sberg15: added server structure for DadioDataService3 - Advanved EPG;
	LBP-REQ-019753/B-Source Icons (TcSE ROIN-301569-1)		sberg15: Separated AM/FM icon ID into a single AM and FM ID; Added icon ID for DAB;
	LBPv2-REQ-128758/B-List Server Generic Radio 1 - Radio List Structure for Cluster HMI		sberg15: Changed server structure to support audio source icons in the root list.
	LBP-REQ-132690/B-List Server RadioDataService1 - EPG List Structure for Centerstack HMI		sberg15: removed Advanced EPG Root server structure.
	LBP-REQ-132691/B-List Server RadioDataService2 - Journaline List Structure for Centerstack HMI		sberg15: Reduced number of list items in root list from 65534 to 51.
March 24, 2016	**1.2**	**Updated Release**	
	STR-202861/B-List Data Structure		rpaquet2 - removed 19787 and replaced it with 205695.
	LBPv2-SR-REQ-128955/D-Item Descriptor Attribute		rpaquet2 - Updated 0xA3 Radio Mixed Presets to include a parameter for PresetState. sberg15 - Updated 0xA2 Radio Journaline Data to include a parameter for ChildStatus.
	LBPv2-IIR-REQ-130597/B-LBPClient_LBPServer		rpaquet2 - removed MD 130388 PrefetchState_St.
December 22, 2016	**1.3**	**Updated Release**	
	LBPv2-SR-REQ-128954/C-Avaliable List Servers		rpaquet2 - Added 0x0A Radio 2 for providing source list from AHU to rear display.
	LBPv2-MD-REQ-130389/B-ListServerUpdate_Ind		sberg15: corrected typo in ListServer literal All decription field; Added value 0xFFFF All Lists to parameter ListID.
	LBP-FUR-REQ-019741/B-Unavailable Source (TcSE ROIN-294529-2)		rpaquet2 - Added note to indicate response is for source internal to the responder.
	LBPv2-REQ-128758/C-List Server Generic Radio 1 - Radio List Structure for Cluster HMI		sberg15: added clarification for server structure notation.
August 30, 2017	**1.4**	**Updated Release**	
	LBPv2-SR-REQ-128955/E-Item Descriptor Attribute		sberg15: added 0xA5 Radio Mixed Station item descriptor
	LBPv2-SR-REQ-128954/D-Avaliable List Servers+		rpaquet2 - Added new list server for Considerate Prompts POI lists
	LBPv2-SR-REQ-128954/E-Avaliable List Servers		sberg15: Added value 0x0C Radio Data Service 4 for Mixed Station List

Table of Contents

1 Architectural Design

The List Browser Protocol is a general way for devices (e.g. radio head unit, remote display) to store and share information across the network. The strategy is based upon devices storing information in a standardized list data structure which can then be used for sharing information between clients and servers. The protocol has been developed to allow any client the ability to browse through and select entries from a list of entries located on any device also implementing this protocol. Lists can be navigated up and down to select entries and traversed forward and backward between parent and child lists. The protocol is flexible in that one common strategy can be applied to browse multiple types of data (e.g. song lists, play lists, audio sources, folders, etc.). The interface can be developed to support the specific data types but can also be flexible and generic to allow new types of data to be accessed without requiring a software update on the client.

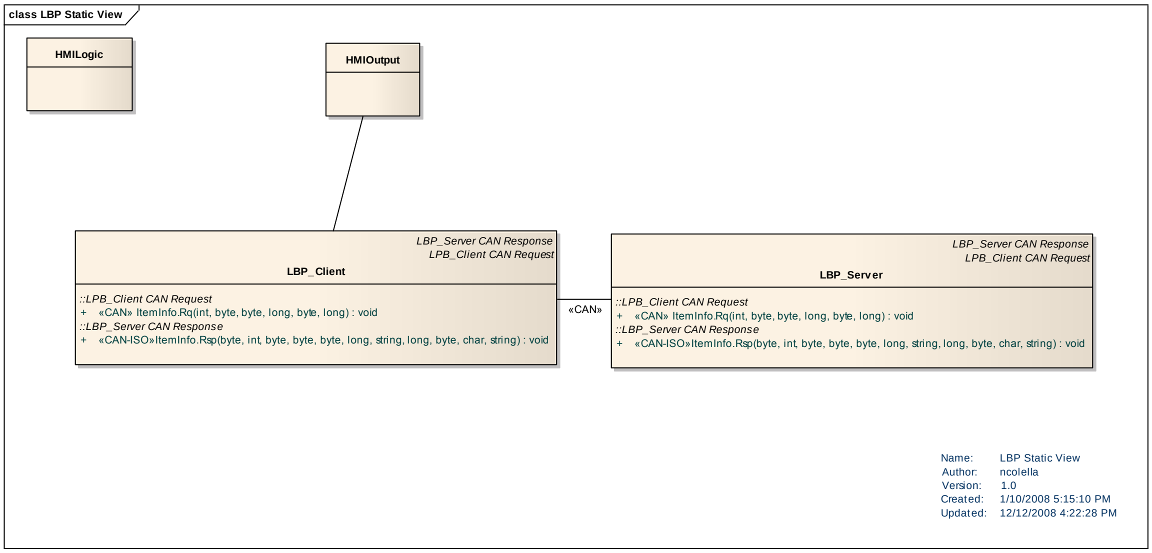
The following figure is a high-level view of the LBP. In the figure a device is shown which contains multiple list severs each dedicated to specific functional area. Other implementation may have one list server dedicated to several functional areas.



This primary section serves to define the underlining strategy of the list browser protocol. The actual usage of the strategy will be defined in other Functional Area Specifications (FAS) with references back to this primary section. The following sub-sections shall provide further descriptions of the list data structure, hierarchy within list and sub-lists, and navigating through lists.

1.1 LBP-SV-REQ-019803/A-Static View (TcSE ROIN-40393-1)

The following is a logical view of the list browser protocol architecture.


class LBP Static View
HMILogic
HMIOutput
LBP_Server CAN Response
LPB_Client CAN Request
LBP_Client
::LPB_Client CAN Request
+ «CAN» ItemInfo.Rq(int, byte, byte, long, byte, long) : void
::LBP_Server CAN Response
+ «CAN-ISO»ItemInfo.Rsp(byte, int, byte, byte, byte, long, string, long, byte, char, string) : void
«CAN»
LBP_Server CAN Response
LPB_Client CAN Request
LBP_Server
::LPB_Client CAN Request
+ «CAN» ItemInfo.Rq(int, byte, byte, long, byte, long) : void
::LBP_Server CAN Response
+ «CAN-ISO»ItemInfo.Rsp(byte, int, byte, byte, byte, long, string, long, byte, char, string) : void
Name: LBP Static View
Author: ncolella
Version: 1.0
Created: 1/10/2008 5:15:10 PM
Updated: 12/12/2008 4:22:28 PM

1.2 LBP-CLD-REQ-019804/A-List Browser Client (TcSE ROIN-159174-1)

The List Brower Client is responsible for addressing list servers and requesting/activating items. The client also is responsible for the HMI output of the information received from the server.

1.3 LBP-CLD-REQ-019805/A-List Browser Server (TcSE ROIN-159175-1)

The List Brower Server is responsible for navigating the lists, keeping track of the active list and the providing information back to the client.

1.4 List Data Structure

The List Data Structure is an information interface which allows a server to present its features and other types of information to clients in a standardized form. By using this protocol and the data structures defined, servers can utilize a standard interface for sharing information with clients.

1.4.1 LBP-SR-REQ-019800/A-List Data Structure (TcSE ROIN-177591-1)

The list data structure is realized as a container for sub-lists and list entries. Each list data structure shall contain the following attributes for each item (list or entry) in a list:

Item Index	Data Type	Activation Event	Object Type	Object State	Item Descriptor
0x0001	0x00-0xFF	Supported/Not Supported	Entry/List	Active/In-Active	{Descriptor Tag}
..	..	..	..	..	..
0xFFFF	..	..	..	..	..

The actual implementation of the storage of the list data structures is left to the device implementer but the method for exchange of information is defined herein.

1.4.2 LBP-SR-REQ-019780/A-Item Index Attribute (TcSE ROIN-40421-1)

The item index is used to denote the position of the item within the list that was specified by the ActiveListID field. Entries shall be numbered so that the first item in a list begins with index number 0x0001, the second position is 0x0002, and so on. The largest addressable item in an ActiveListID is 0xFFFE (65534). 0xFFFF is reserved.

1.4.3 LBP-SR-REQ-019799/A-Object Type Attribute (TcSE ROIN-173633-1)

The Object Type attribute within the list data structure is used to indicate if the object is a "List" object or an "Entry" object. "List" objects are lists that can be navigated via the GetItemInfo.Rq() method or selected for activation via the SetItemInfo.Rq() method. "Entry" objects can only be selected for activation via the SetItemInfo.Rq() method.

1.4.4 LBP-SR-REQ-019801/A-Object State Attribute (TcSE ROIN-177707-1)

The Object State attribute within the list data structure shall be used to indicate if the object is currently activated/in use on the server. This attribute typically pertains to "Entry" objects but may be used by "List" objects.

For example, an entry within a list of song tracks represents a track that is actively playing on the server. When the browsing client requests the list of tracks from the server the server will indicate, via the Object State attribute, that this item is currently active within the list. The client may then provide an indication to the user that this entry is currently active on this server.

1.4.5 LBP-SR-REQ-019781/A-Data Type Attribute (TcSE ROIN-40318-2)

The Data Type attribute within the list data structure is used to denote the information stored in the Item Descriptor attribute for each item. The Data Type attribute shall be used to indicate the type of information the item represents. For example, if the data type is "Album" then the client knows that this item represents the name of an album.

1.4.6 LBPv2-SR-REQ-128955/E-Item Descriptor Attribute

Each item shall also possess the Item Descriptor attribute which can also be used by the client for HMI purposes. The Item Descriptor is typically a large text string which contains a concatenated set of text fields. Each of these fields can be parsed by the client and used for HMI purposes.

The following table defines the link between Data Type Attribute and the Item Descriptor Attribute:

Encoding	Data Type	Item Descriptor	Descriptor Length
0x00	General Reserved		
0x01	General Reserved		
0x02	Generic Text	{Generic Text}	25 characters + EOS
…	General Reserved		
0x1F	General Reserved		
0x20	Media Type	{SourceIcon}{MediaSourceName}	{$0-$FF represents Source icon, $0 = Invalid }{25 characters + EOS}
0x21	Metadata Category	{CatIcon}{CatName}	{$0-$FF represents Category icon, $0 = Invalid}{25 characters + EOS}
…	Media Reserved		
0x3F	Media Reserved		
0x40	Navigation POI	{Direction}{Distance}{POIName}	{$0-$FF Represents direction icon, $0 = Invalid }{8 characters + EOS}{25 characters + EOS} Info: POI name could also be a destination name.

…	Navigation Reserved		
0x5F	Navigation Reserved		
0x60	Phone CallerID	{CallTypeIcon}{PhoneTypeIcon}{CallerID}	{$0-$FF Represents call type icon, $0 = Invalid }{$0-$FF Represents phone type icon, $0 = Invalid }{25 characters + EOS}
0x61	Phone Call Category	{ CallTypeIcon }{CatName}	{$0-$FF Represents call type icon, $0 = Invalid }{25 characters + EOS}
…	Phone Reserved		
0x7F	Phone Reserved		
0x80	BT Device	{DeviceID}{ConnectedIcon}{DeviceName}	{$0-$F Represents the index of the bonded BT device, $0 = Invalid}{$0-$FF Represents the connected icon, $0 = Invalid}{25 characters + EOS}
…	BT Device Reserved		
0x9F	BT Device Reserved		
0xA0	Radio Station	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	{$1 = AM, $2 = FM, $3 = DAB, $4 = SDARS, $5 = HD, $0 = Invalid}{$0-$1E Represents the stored station number, $0 = Invalid}{}{$0-$FFFF Represents the frequency, BlockID, SDARS channel number}{$0-$FF Represents a station icon (e.g. HD), $0 = Invalid}{16 characters + EOS}
0xA1	Radio EPG Data	{Icon}{Hour}{Minute}{ProgramName}	{$0-$F Represents EPG program icon, $0 = Invalid }{$0-$17 Represents the hour, $FF = Invalid}{$0-$3B Represents the minute, $FF = Invalid}{128 characters + EOS}
0xA2	Radio Journaline Data	{JournalineListEntry}{ChildStatus}	{50 characters + EOS}{$1 = NotAvailable, $2 = Available, $0 = Invalid}

0xA3	Radio Mixed Presets	{PresetNumber}{PresetState}{RadioBand}{Frequency}{HD Number}{StationNameShort}{StationNameLong}	{$1-$1E, $0 = Invalid}{$0 = Empty, $1 = Available}
			{$1 = AM, $2 = FM, $3 = DAB, $4 = SDARS, $0 = Invalid}
			{$0-$FFFF Represents

			the frequency, DAB BlockID, SDARS channel number}
			{HD Number = $0 - $F}
			{StationNameShort = 9 characters max + EOS, RDS Markets: PSName = 8 characters max, No PSName = xxx.yyMHz, Non RDS Markets: AM = xxxx kHz, FM = xxx.y MHz, AM HD = AM, FM HD1 = FM, FM HD2+ = xxx.y HDz, SDARS: Shortname = 8 characters max, DAB: ServiceName = 8 characters DAB No Station Name = Blockxxx to APIM and Block xxx to the IPC or MFD}
			{StationNameLong = DAB: ServiceName = 16 character long name max plus EOS AMFM and SDARS = EOS}

0xA4	Radio Source	{SourceIcon}{RadioSourceName}	{$0-$FF represents Source icon, $0 = Invalid }{25 characters + EOS}
0xA5	Radio Mixed Station	{SourceIcon}{StationNameLong}{StationNameShort}	{$0-$FF represents Source icon, $0 = Invalid}{StationNameLong = DAB: ServiceName = 16 character long name max plus EOS; AMFM and SDARS = EOS}{StationNameShort = 9 characters max + EOS, RDS Markets: PSName = 8 characters max}
…	Radio Reserved		
0xAF	Radio Station Reserved		

Note: A list server can contain multiple data types.

1.4.7 LBPv2-SR-REQ-205695/A-Activation Event Attribute

The Activation Event attribute is used to indicate whether an item can be selected or not via the SetItemInfo.Rq() method. Entry Objects that do not support an Activation Event should be indicated as not selectable via the HMI (e.g. empty preset etc.). List Objects may or may not support an Activation Event depending on the server's usage of the object. If a List Object supports an Activation Event it can be selected via SetItemInfo.Rq() method or entered via the GetItemInfo.Rq() method.

1.5 List Hierarchy

This protocol assembles lists, sub-lists, and entry data structures into a hierarchy which is useful when representing information that can be categorized in a hierarchal manner.

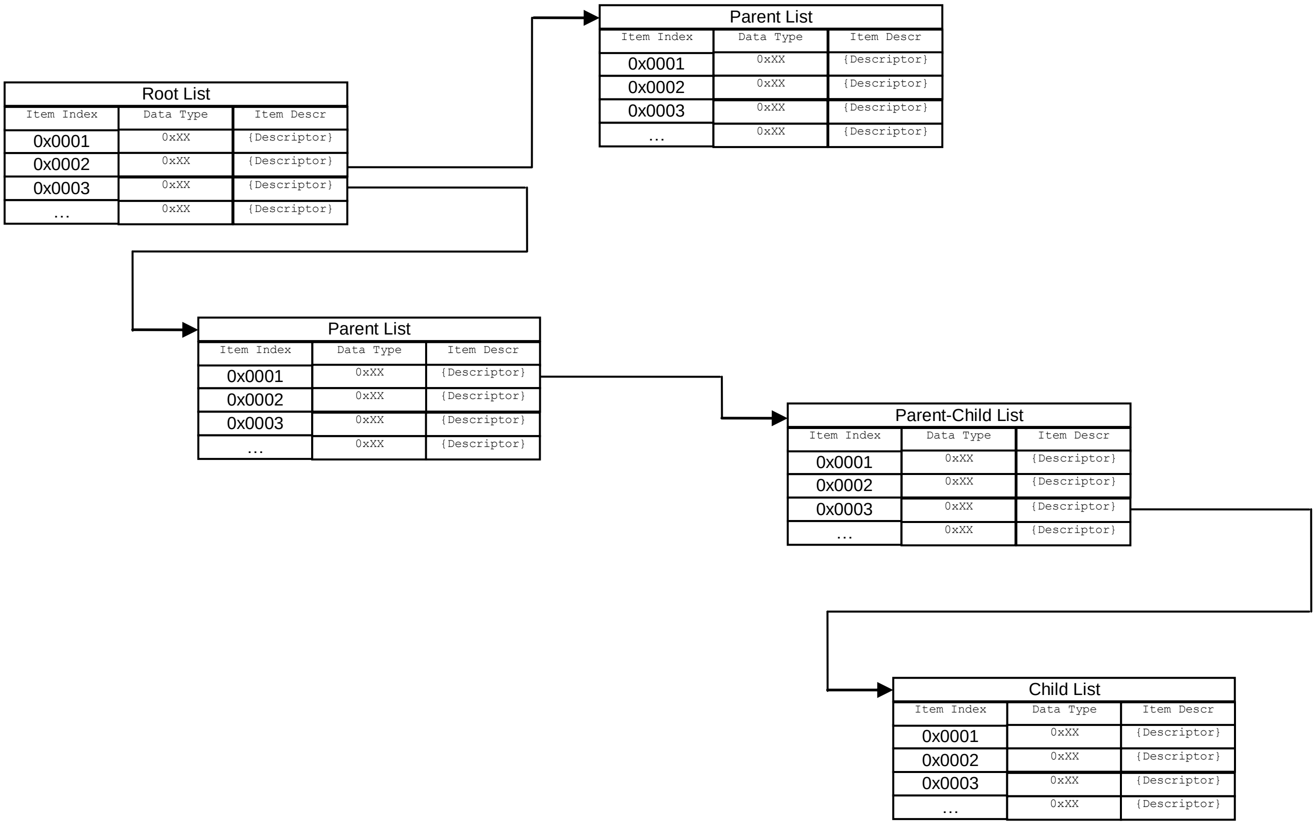
1.5.1 Root List

At the highest level exists the "Root List" and at the minimum the Root List must exist on the server. The contents of the root list are specific to each device. Root Lists can contain sub-lists and root entries.

1.5.2 Parent-Child Lists and List Entries

At the next level exist sub-lists and list entries. List and sub-lists can better be defined as having a parent-child relationship. Therefore, the next levels in the hierarchy can be defined as the Parent lists followed by Child lists. Parent lists can contain child lists and parent entries. Child Lists contain child entries and also sub-lists (i.e. become parents and spawn further child lists).

List Entries exist at the bottom of the hierarchy and are the lowest selectable element which can be traversed in a list (i.e. an entry can not be navigated any further).
The following diagram illustrates the general relationship between the kinds of lists and how they form a hierarchy.



Root List

Item Index	Data Type	Item Descr
0x0001	0xXX	{Descriptor}
0x0002	0xXX	{Descriptor}
0x0003	0xXX	{Descriptor}
…	0xXX	{Descriptor}

Parent List

Item Index	Data Type	Item Descr
0x0001	0xXX	{Descriptor}
0x0002	0xXX	{Descriptor}
0x0003	0xXX	{Descriptor}
…	0xXX	{Descriptor}

Parent List

Item Index	Data Type	Item Descr
0x0001	0xXX	{Descriptor}
0x0002	0xXX	{Descriptor}
0x0003	0xXX	{Descriptor}
…	0xXX	{Descriptor}

Parent-Child List

Item Index	Data Type	Item Descr
0x0001	0xXX	{Descriptor}
0x0002	0xXX	{Descriptor}
0x0003	0xXX	{Descriptor}
…	0xXX	{Descriptor}

Child List

Item Index	Data Type	Item Descr
0x0001	0xXX	{Descriptor}
0x0002	0xXX	{Descriptor}
0x0003	0xXX	{Descriptor}
…	0xXX	{Descriptor}

Figure 1 – Lists-Entry Hierarchy

1.5.3 LBP-SR-REQ-019782/A-List Identifier (TcSE ROIN-40422-2)

A unique list ID, which is assigned by the list server, identifies each list within the list server. The list ID shall be constant during the life of the list.

1.5.4 LBP-SR-REQ-019788/A-Root Index (TcSE ROIN-40430-1)

Each list server shall have a Root List associated to List_ID 0x0000. The Root List shall always be accessible from any point in a list.

1.5.5 LBPv2-SR-REQ-128954/E-Avaliable List Servers

The following are the available addressable list servers:

List Server ID	Name	Comment
0x01	Navigation Info	Used for browsing Nav POIs, previous dest, etc.
0x02	Generic Media 1	Used for browsing media data (e.g. Artist names, titles, etc.)
0x03	Phone Info	Used for browsing phone book, call lists, etc.
0x04	Generic List 1	Contains only items with Data Types 0,1,2.
0x05	Radio 1	Used for browsing radio data (e.g. Preset lists for AM/FM/DAB/SDARS, etc.) started from cluster.
0x06	Remote CD1	Used for browsing media data (e.g. Artist names, titles, etc.)
0x07	Radio Data Service1	Used to transmit DAB data service Basic EPG.
0x08	Radio Data Service2	Used to transmit DAB data service Journaline.
0x09	Radio Data Service3	Used to transmit DAB data service Advanced EPG.
0x0A	Radio 2	Used for browsing radio Source information (e.g. AM,FM,SAT,DAB,CD.) started from Rear Display.
0x0B	Considerate Prompt 1	Static List used to transmit POI list related to Considerate Prompts
0x0C	Radio Data Service4	Used to transmit a mixed station list to the client.
0x0D – 0xFF	Reserved	

1.6 Interface Requirements

1.6.1 LBPv2-IIR-REQ-130597/B-LBPClient_LBPServer

1.6.1.1 LBPv2-MD-REQ-130601/A-ItemInfo_Rq

Message Type: Request

This request signal is used to get or set list content from the list browse server.

Name	Literals	Value	Description
OpCode	-	-	Parameter OpCode is used to distinguish between requesting list data or select an executable item.

	Inactive	0x0	
	GetItemInfo_Rq	0x1	Value GetItemInfo_Rq is used to request list data from a list object.
	SetItemInfo_Rq	0x2	Value SetItemInfo_rq is used by the Client to activate a selected item index during browsing of the device. The value shall only be used on items which support an ActivationEvent. Parameter NbrOfItems and StartItemInd shall be set to 0x0 in this case.
	Reserved	0x3	

SetListServ	-	-	Parameter setListServ is used to address the requested list server.
	Inactive	0x00	
	ServerID_1	0x01	
	…	0x02	
	All	0xFF	Value All is used address all available list servers.

ActiveListID	-	-	Parameter ActiveListID contains the list ID from which the items are being selected. This information is provided by the server's response method.
	Root	0x0000	
	List ID1	0x0001	
	….	0x0002	
	List ID 65534	0xFFFE	
	Reserved	0xFFFF	

ItemIndex	-	-	Parameter ItemIndex contains the selected item Index for the requested list.
	BrowseActiveListID	0x0000	Value BrowseActiveListID is used if the client is only browsing up/down the entries of the active list. In this case this value shall be set to 0x0000 (BrowseActiveListID) which indicates to the server to provide the items requested for the active list.
	EntryIndex_1	0x0001	
	….		
	ParentOfActiveListID	0xFFFF	Value ParentOfActiveListID is used if the client needs to retrieve the parent list of the active list. In this case this value shall be set to 0xFFFF (ParentOfActiveListID).

			This is an indication to the server to navigate to the parent list of the active list and provide that data as requested.
NbrOfItems			Parameter NbrOfItems is used to indicate how many items to provide in the response message.
	Inactive	0x0	
	1 item	0x1	
	…		
	63 items	0x3F	
StartItemInd			Parameter StartItemInd is used to adreess the index value of where to start the request in the response message
	Inactive	0x0000	
	1	0x0001	
	…		
	65534	0xFFFE	
	Reserved	0xFFFF	

1.6.2 LBPv2-IIR-REQ-130599/A-LBPServer_LBPClient

1.6.2.1 LBPv2-MD-REQ-130602/A-ItemInfo_Rsp

Message Type: Response

This response signal is used to transmit the requested list content to the list browse client.

Name	**Literals**	**Value**	**Description**
RspListServ	-	-	Parameter RspListServ is used to indicate which list server is providing the response.
	Inactive	0x00	
	ServerID_1	0x01	
	…		
	Reserved	0xFF	
OpCodeRsp	-	-	Parameter OpCodeRsp is used to return the value of the OpCode associated with the data in the response message.
	Inactive	0x00	
	GetItemInfoRsp	0x01	
	SetItemInfoRsp	0x02	
ActiveListID	-	-	Parameter ActiveListID shall contain the current list ID from

			which the items are being selected.
	Root	0x0000	
	List ID1	0x0001	
	….	0x0002	
	List ID 65534	0xFFFE	

ParentListID	-	-	The parameter ListID shall contain the parent list ID of the current ActiveListID.
	Root	0x0000	
	List ID1	0x0001	
	….	0x0002	
	List ID 65534	0xFFFE	
	Reserved	0xFFFF	

NbrOfItemsRtn	-	-	Parameter NbrOfItemsRtn is used to indicate how many items provided in the response message
	0	0x0000	
	1	0x0001	
	….		
	30	0x1E	

NbrItemsInSelection			Parameter NbrItemsInSelection is used to indicate the total number of all items in the active list id.
	0	0x0000	
	1	0x0001	
	….		
	65535	0xFFFF	

stringItemContent (Array(1.. NbrOfItemsRtn) of record (ItemIndex, DataType, ActivationEvent, ObjectType, ObjectState, ItemDescriptor)			

ItemIndex	List Title	0x0000	Parameter ItenIndex is used to associate an index to each list item.
	1	0x0001	
	…		
	65535	0xFFFF	

DataType	Reserved	0x00	
	DataTypeID_1	0x01	
	…		
	Reserved	0xFF	

ActivationEvent			Parameter ActivationEvent is used

			to indicate if a list entry is able to be activated or not.
	Not Supported	0x0	
	Supported	0x1	

ObjectType			Parameter ObjectType is used to indicate if the returned list entry is a List or Entry Object. List objects can contain additional data, entry objects can be executed.
	List Label	0x0	
	Entry Object	0x1	
	List Object	0x2	

ObjectState			The parameter ObjectState is used to indicate if the returned list entry is the active on the server or not.
	Inactive	0x0	
	Active	0x1	

ItemDescriptor			The parameter Item Descriptor is typically a large text string which contains a concatenated set of text fields. Each of these fields can be parsed by the client and used for HMI purposes.
	{Descriptor Tag}		

Example ItemContent:

Item Index	Data Type	ActivationEvent	ObjectType	Item Descriptor
0x0000	0x02	No	List Label	{Generic Text}
0x0001	0x00-0xFE	Yes/No	..	{Descriptor Tag}
..	..	..	..	
0xFFFE	..	..	..	

1.6.2.2 LBPv2-MD-REQ-130389/B-ListServerUpdate_Ind

Message Type: Indication

This indication method is used to indicate a server list update to the client. This indication can be used to start fetching the updated list content. This method shall not be used during initial server list build up.

Name	Literals	Value	Description
ListServer	-	-	Parameter ListServer is used to address the list server which is/was updated.
	Inactive	0x00	
	ServerID_1	0x01	
	…	0x02	
	All	0xFF	Value All is used to address all available list servers.

ListID	-	-	The parameter ListID is used to indicate which server list is getting updated.
	Root	0x0	Root List is getting updated
	ListID1	0x0001	ListID1 is getting updated
	ListID2	0x0002	ListID2 is getting updated
	…		
	List ID65534	0xFFFE	ListID65534 is getting updated
	All Lists	0xFFFF	Value All Lists is used to indicate that all Lists within a server have been changed.

ParentID	-	-	The parameter ParentID is used to indicate the parent list which contains the updating ListID.
	Root	0x0	Root List is ParentID
	ListID1	0x0001	ListID1 is ParentID
	ListID2	0x0002	ListID2 is ParentID
	…		
	List ID65534	0xFFFE	ListID65534 is ParentID
	Reserved	0xFFFF	

EntryIndex	-	-	The parameter EntryIndex shall be used to indicate which list entry from the ParentID is getting

			updated. This could be used to indicate this update via HMI output (e.g. grey out list entry etc.)
	NoDataExists	0x0000	NoDataExisis shall be set if the root list is getting updated.
	EntryIndex1	0x0001	Entry 1 from parent list is getting updated.
	EntryIndex2	0x0002	Entry 2 from parent list is getting updated.
	…		
	EntryIndex65534	0xFFFE	Entry 65534 from parent list is getting updated.
	Reserved	0xFFFF	
ListStatus	-	-	The parameter is used to transmit the different states of the server list.
	Inactive	0x0	
	Valid	0x1	Valid is set if the list is updated and ready.
	Updating	0x2	Updating is set if the list is getting updated with new data.
	Reserved	0x3	

1.7 Navigating Devices and List Servers

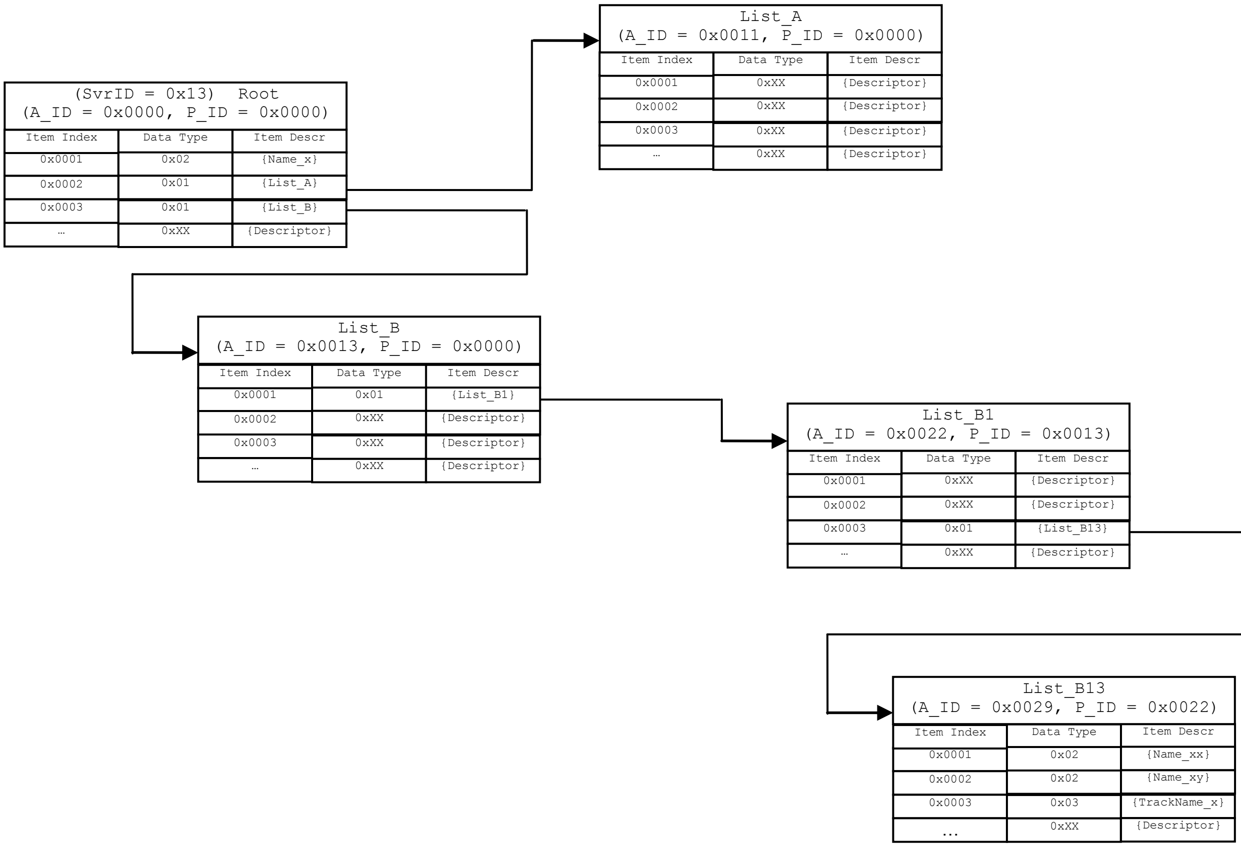
The process of an HMI client browsing the information available on a particular device begins with the client first accessing a particular list server present on the device. Once an HMI client has accessed a particular list server, the client can scroll up and down through items in the list and then request an entry in the list. The client can also move forward and backward between lists and sub-lists by requesting the particular (parent or child) list from the list server.

Several methods are provided for navigating the hierarchy and retrieval of information, GetItemInfo.Request(), SetItemInfo.Request(), and GeItemtInfo.Response(). The client utilizes the GetItemInfo.Request() methods for requesting item information and utilizes the SetItemInfo.Request for item activation. The server utilizes the GetItemInfo.Response() method for responding to information requests. The details of these methods are defined in the Interface Requirements portion of this section.

1.7.1 LBP-SR-REQ-019786/A-Requesting List Contents (TcSE ROIN-40428-1)

The browsing client shall utilize the GetItemInfo.Rq() method for managing the retrieval of data from a particular list server. To browse through a device via the HMI, the client must address a particular list server. For example, to view the contents of a USB device, the client shall target the USB list server and based on the list data structures (retrieved earlier) stored on this server the HMI can then browse through parent-child lists (e.g. artists, albums, etc.).

To support an example, imagine a server contains the following items:



(SvrID = 0x13) Root
(A_ID = 0x0000, P_ID = 0x0000)

Item Index	Data Type	Item Descr
0x0001	0x02	{Name_x}
0x0002	0x01	{List_A}
0x0003	0x01	{List_B}
…	0xXX	{Descriptor}

List_A
(A_ID = 0x0011, P_ID = 0x0000)

Item Index	Data Type	Item Descr
0x0001	0xXX	{Descriptor}
0x0002	0xXX	{Descriptor}
0x0003	0xXX	{Descriptor}
…	0xXX	{Descriptor}

List_B
(A_ID = 0x0013, P_ID = 0x0000)

Item Index	Data Type	Item Descr
0x0001	0x01	{List_B1}
0x0002	0xXX	{Descriptor}
0x0003	0xXX	{Descriptor}
…	0xXX	{Descriptor}

List_B1
(A_ID = 0x0022, P_ID = 0x0013)

Item Index	Data Type	Item Descr
0x0001	0xXX	{Descriptor}
0x0002	0xXX	{Descriptor}
0x0003	0x01	{List_B13}
…	0xXX	{Descriptor}

List_B13
(A_ID = 0x0029, P_ID = 0x0022)

Item Index	Data Type	Item Descr
0x0001	0x02	{Name_xx}
0x0002	0x02	{Name_xy}
0x0003	0x03	{TrackName_x}
…	0xXX	{Descriptor}

Where A_ID is the ActiveListID and P_ID is the ParentListID of the ActiveList. If the client is in the root list and wishes to request the contents of item 3 (List_B) within the root list, then the request parameters would be set to the following, ActiveListID = 0x0000 (root is being browsed), ItemIndex = 0x0003 (item selected), NumberOfItems = 0x05 (number of entries requested), StartItemInd = 0x0001 (starting index of entries to return).

The response back from the server would be A_ID = 0x0013, P_ID = 0x0000 with the data structure depicted for List_B in the figure above.

If the client now wishes to select item 1 (List_B1) within the active sub-list, then the request parameters would be set to the following, ActiveListID = 0x0013 (active list), ItemIndex = 0x0001 (item selected), NumberOfItems = 0x05 (number of entries requested), StartItemInd = 0x0001 (starting index of entries to return)..

The response back from the server would be A_ID = 0x0022, P_ID = 0x0013 with the data structure depicted for List_B1 in the figure above.

1.7.2 LBP-SR-REQ-019790/A-Selecting List Entry (TcSE ROIN-40732-2)

The browsing client shall utilize the SetItemInfo.Rq() method for activation of a particular item within the ActiveListID. This method can only be used by items which support ActivationEvents.

To support the example described previously: If the active list is reported A_ID = 0x0022, P_ID = 0x0013 with the data structure depicted for List_B1 in the figure above. If the client now wishes to select and activate item 3, assuming the ActivationEvent is supported for this item, within the active sub-list, then the settings for the SetItemInfo.Rq() method would be as follows: ActiveListID = 0x0022 (active list), ItemIndex = 0x0003 (item selected).

1.7.3 LBP-SR-REQ-019791/A-Tracking (TcSE ROIN-41670-1)

The server shall be responsible for tracking the navigation between the lists.

1.7.4 LBP-SR-REQ-019784/A-SetItem - Audio Resource Request (TcSE ROIN-40314-1)

If a SetItemInfo.Rq() requires a change to the audio resources, the server shall be responsible for issuing the request for connection of the respective audio resource.

1.7.5 LBP-SR-REQ-019785/A-Label of List (TcSE ROIN-40317-2)

Each list within a list server shall have an associated textual label/title. The server shall provide the label of each list to the client.

Within GetItemInfo.Rsp(), the ItemIndex equal to 0x0000 shall be used to contain the label of the active list. The Data Type for the label shall be set equal to 0x02 (Generic text). The ActivationEvent shall be set to "No" for labels. The Object Type shall be set to 0x00 (List Label).

The label shall be provided when the StartItemIndex of GetItemInfo.Rq() is equal to 0x0001.
The label shall not be counted as a member of NbrItemsInSelection.

The label shall be counted as a member of NbrOfItemsRtn by both the client and the server. Therefore, when the client requests information starting at index 0x0001and would like five items of information returned, the client must request NbrOfItems equal to six. Likewise the server will respond back with NbrOfItemsRtn equal to six. With a starting index greater then 0x0001 with five items requested, the client would request NbrOfItems equal to five with the server responding back with NbrOfItemsRtn equal to five.

1.7.6 LBP-SR-REQ-019795/A-Client requests invalid parent-child list (TcSE ROIN-31400-1)

If the client requests a parent-child that is either out of range or does not exist, the server shall respond back with CES = 0x14 (Final Result – Failure, requested index out of range).

1.7.7 LBP-SR-REQ-019796/A-Client selects invalid entry (TcSE ROIN-31407-1)

If the client selects invalid entry that is either out of range or does not exist, the server shall respond back with CES = 0x14 (Final Result – Failure, requested index out of range).

1.7.8 LBP-SR-REQ-019797/A-Client selects invalid parent-child list (TcSE ROIN-31414-1)

If the client selects a parent-child that is either out of range or does not exist, the server shall respond back with CES = 0x14 (Final Result – Failure, requested index out of range).

1.7.9 LBP-SR-REQ-019798/A-SetItem - Server Response (TcSE ROIN-160332-1)

Upon reception of a valid SetItemInfo.Rq(), the server shall provide a response with CES = 0x01 (Final Result – Success). All fields after the CES field will not be transmitted.

1.7.10 LBP-SR-REQ-129269/A-Data Prefetch

While the List Browse Client is in prefetch state then the List Browse Server shall ignore the activation event attribute if the client requests for list objects which have an activation event supported. This is required to avoid e.g. activation of a radio band when requesting its list content.

2 Functional Definition

2.1 LBP-FUN-REQ-019707/A-Request Root List (TcSE ROIN-293807-1)

2.1.1 Use Cases

2.1.1.1 LBP-UC-REQ-019708/A-Request Root List (TcSE ROIN-292216-1)

Actors	System
Pre-conditions	Infotainment Network is active.
Scenario Description	Client requests Root List from server.
Post-conditions	Root List is retrieved from server.
List of Exception Use Cases	N/A
Interfaces	G-HMI, Vehicle System Interface

2.1.2 White Box View

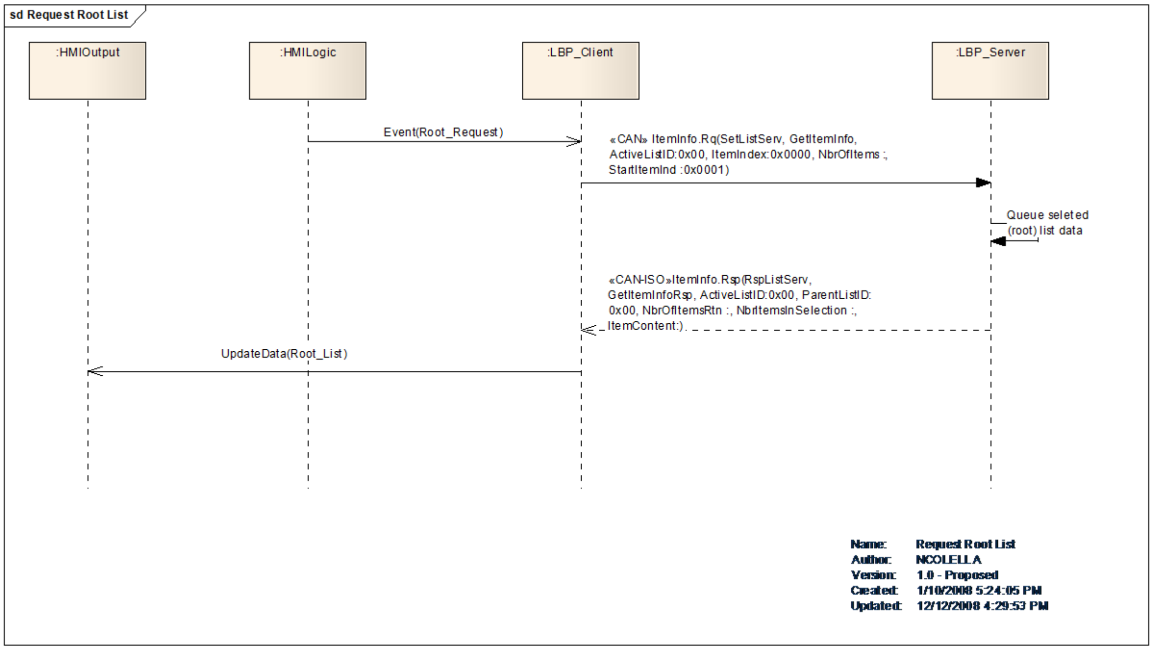
2.1.2.1 White Box Scenarios

2.1.2.1.1 LBP-SD-REQ-019709/A-Request Root List from List Server (TcSE ROIN-39796-1)

Linked Elements

LBP-UC-REQ-019762/A-Request Root List (TcSE ROIN-30390-1)

Sequence Diagram


sd Request Root List
:HMIOutput
:HMILogic
:LBP_Client
:LBP_Server
Event(Root_Request)
«CAN» ItemInfo.Rq(SetListServ, GetItemInfo, ActiveListID:0x00, ItemIndex:0x0000, NbrOfItems :, StartItemInd :0x0001)
Queue seleted (root) list data
«CAN-ISO»ItemInfo.Rsp(RspListServ, GetItemInfoRsp, ActiveListID:0x00, ParentListID: 0x00, NbrOfItemsRtn :, NbrItemsInSelection :, ItemContent:)
UpdateData(Root_List)
Name: Request Root List
Author: NCOLELLA
Version: 1.0 - Proposed
Created: 1/10/2008 5:24:05 PM
Updated: 12/12/2008 4:29:53 PM

2.2 LBP-FUN-REQ-019710/A-Browse a parent List from Root List (TcSE ROIN-293810-1)

2.2.1 Use Cases

2.2.1.1 LBP-UC-REQ-019711/A-Browse a Parent List from the Root List (TcSE ROIN-292217-1)

Actors	System
Pre-conditions	Infotainment Network is active. The root list has been obtained from the server. Root list contains parent lists.
Scenario Description	The client requests a parent list within the root list for browsing. For example, the root list contains several folders and the user selects a folder to browse/read its contents.
Post-conditions	Server responds with requested parent list structure.
List of Exception Use Cases	N/A
Interfaces	G-HMI, Vehicle System Interface

2.2.2 White Box View

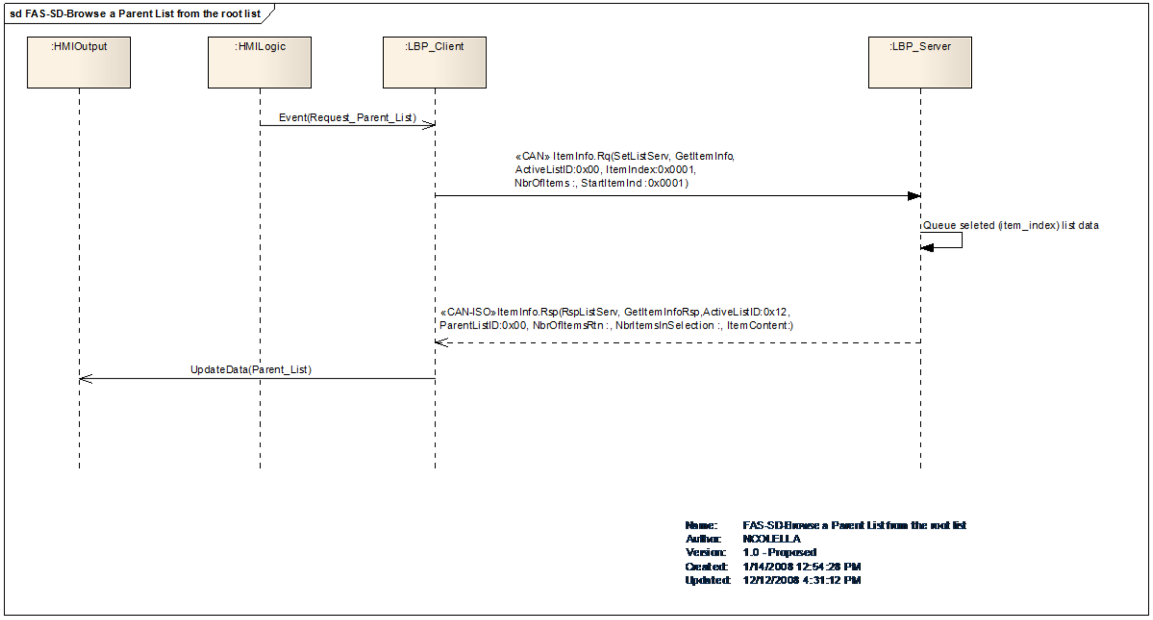
2.2.2.1 White Box Scenarios

2.2.2.1.1 LBP-SD-REQ-019712/A-Browse a Parent List from the root list (TcSE ROIN-39798-1)

Linked Elements

LBP-UC-REQ-019764/A-Browse a Parent List from the Root List (TcSE ROIN-30397-1)

Sequence Diagram


sd FAS-SD-Browse a Parent List from the root list
:HMIOutput
:HMILogic
:LBP_Client
:LBP_Server
Event(Request_Parent_List)
«CAN» ItemInfo.Rq(SetListServ, GetItemInfo, ActiveListID:0x00, ItemIndex:0x0001, NbrOfItems :, StartItemInd :0x0001)
Queue seleted (item_index) list data
«CAN-ISO»ItemInfo.Rsp(RspListServ, GetItemInfoRsp,ActiveListID:0x12, ParentListID:0x00, NbrOfItemsRtn :, NbrItemsInSelection :, ItemContent:)
UpdateData(Parent_List)
Name: FAS-SD-Browse a Parent List from the root list
Author: NICOLELLA
Version: 1.0 - Proposed
Created: 1/14/2008 12:54:28 PM
Updated: 12/12/2008 4:31:12 PM

2.3 LBP-FUN-REQ-019713/A-Selecting an Entry from Root List (TcSE ROIN-293813-1)

2.3.1 Use Cases

2.3.1.1 LBP-UC-REQ-019714/A-Selecting an Entry from the Root List (TcSE ROIN-292218-1)

Actors	System
Pre-conditions	Infotainment Network is active.

	The root list has been obtained from the server. The root list contains selectable entries.
Scenario Description	The client selects an entry from the root list.
Post-conditions	Server responds with activation of the selected entry.
List of Exception Use Cases	N/A
Interfaces	G-HMI, Vehicle System Interface

2.3.2 White Box View

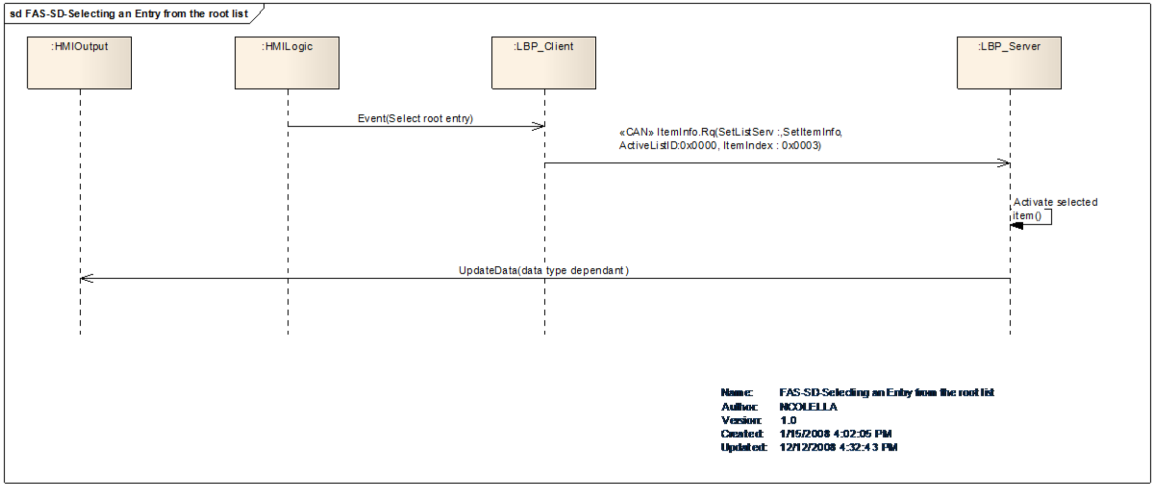
2.3.2.1 White Box Scenarios

2.3.2.1.1 LBP-SD-REQ-019715/A-Selecting an Entry from the root list (TcSE ROIN-39799-1)

Linked Elements

LBP-UC-REQ-019766/A-Selecting a Entry from the Root List (TcSE ROIN-30421-1)

Sequence Diagram


sd FAS-SD-Selecting an Entry from the root list
:HMIOutput
:HMILogic
:LBP_Client
:LBP_Server
Event(Select root entry)
«CAN» ItemInfo.Rq(SetListServ :,SetItemInfo, ActiveListID:0x0000, ItemIndex : 0x0003)
Activate selected item()
UpdateData(data type dependant)
Name: FAS-SD-Selecting an Entry from the root list
Author: NICOLELLA
Version: 1.0
Created: 1/15/2008 4:02:05 PM
Updated: 12/12/2008 4:32:43 PM

2.4 LBP-FUN-REQ-019716/A-Browsing Child List from Parent List (TcSE ROIN-293816-1)

2.4.1 Use Cases

2.4.1.1 LBP-UC-REQ-019717/A-Browsing a Child List from a Parent List (TcSE ROIN-292219-1)

Actors	System
Pre-conditions	Infotainment Network is active. The client is browsing a parent list which contains child lists.
Scenario Description	The client requests a child list from within a parent list. For example, the user is browsing Folder_A (parent) which contains several folders (children). The user selects one of the child folders for browsing.
Post-conditions	The server responds with contents of selected child list.
List of Exception Use Cases	N/A
Interfaces	G-HMI, Vehicle System Interface

2.4.2 White Box View

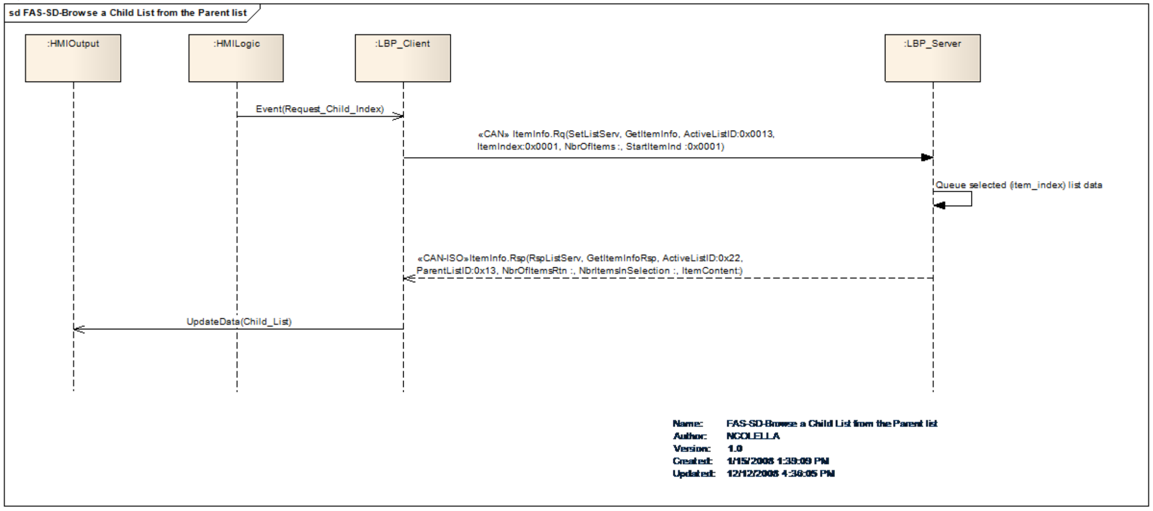
2.4.2.1 White Box Scenarios

2.4.2.1.1 LBP-SD-REQ-019718/A-Browse a Child List from the Parent list (TcSE ROIN-39800-1)

Linked Elements

LBP-UC-REQ-019768/A-Browsing a Child List from a Parent List (TcSE ROIN-30427-1)

Sequence Diagram


sd FAS-SD-Browse a Child List from the Parent list
:HMIOutput
:HMILogic
:LBP_Client
:LBP_Server
Event(Request_Child_Index)
«CAN» ItemInfo.Rq(SetListServ, GetItemInfo, ActiveListID:0x0013, ItemIndex:0x0001, NbrOfItems :, StartItemInd :0x0001)
Queue selected (item_index) list data
«CAN-ISO»ItemInfo.Rsp(RspListServ, GetItemInfoRsp, ActiveListID:0x22, ParentListID:0x13, NbrOfItemsRtn :, NbrItemsInSelection :, ItemContent:)
UpdateData(Child_List)
Name: FAS-SD-Browse a Child List from the Parent list
Author: NCOLELLA
Version: 1.0
Created: 1/15/2008 1:39:09 PM
Updated: 12/12/2008 4:36:05 PM

2.5 LBP-FUN-REQ-019719/A-Selecting and Entry from a parent/Child List (TcSE ROIN-293819-1)

2.5.1 Use Cases

2.5.1.1 LBP-UC-REQ-019720/A-Selecting an Entry from a Parent-Child List (TcSE ROIN-292220-1)

Actors	System
Pre-conditions	Infotainment Network is active. The parent-child list contains selectable entries.
Scenario Description	The client selects an entry from the parent-child list.
Post-conditions	Server responds with activation of the selected entry.
List of Exception Use Cases	N/A
Interfaces	G-HMI, Vehicle System Interface

2.5.2 White Box View

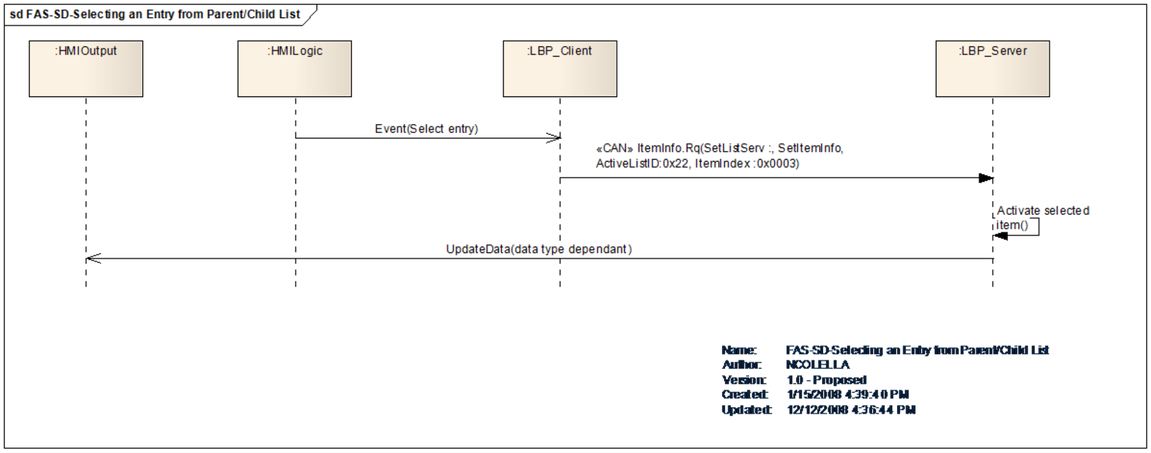
2.5.2.1 White Box Scenarios

2.5.2.1.1 LBP-SD-REQ-019721/A-Selecting an Entry from Parent/Child List (TcSE ROIN-39801-1)

Linked Elements

LBP-UC-REQ-019770/A-Selecting an Entry from a Parent-Child List (TcSE ROIN-30439-1)

Sequence Diagram


sd FAS-SD-Selecting an Entry from Parent/Child List
:HMIOutput
:HMILogic
:LBP_Client
:LBP_Server
Event(Select entry)
«CAN» ItemInfo.Rq(SetListServ :, SetItemInfo,
ActiveListID:0x22, ItemIndex :0x0003)
Activate selected
item()
UpdateData(data type dependant)
Name: FAS-SD-Selecting an Entry from Parent/Child List
Author: NCOLELLA
Version: 1.0 - Proposed
Created: 1/15/2008 4:39:40 PM
Updated: 12/12/2008 4:36:44 PM

2.6 LBP-FUN-REQ-019722/A-Traversing up the Hierarchy from child to parent list (TcSE ROIN-293822-1)

2.6.1 Use Cases

2.6.1.1 LBP-UC-REQ-019723/A-Traversing up the Hierarchy from Child to Parent (TcSE ROIN-292221-1)

Actors	System
Pre-conditions	Infotainment Network is active. Client currently browsing a Child List.
Scenario Description	The client requests the parent list of the current child list. For example, the user is browsing Folder_B which is a child of Folder_A and wishes to view the content list of Folder_A.
Post-conditions	Server responds back with the Parent List of the current Child List.
List of Exception Use Cases	N/A
Interfaces	G-HMI, Vehicle System Interface

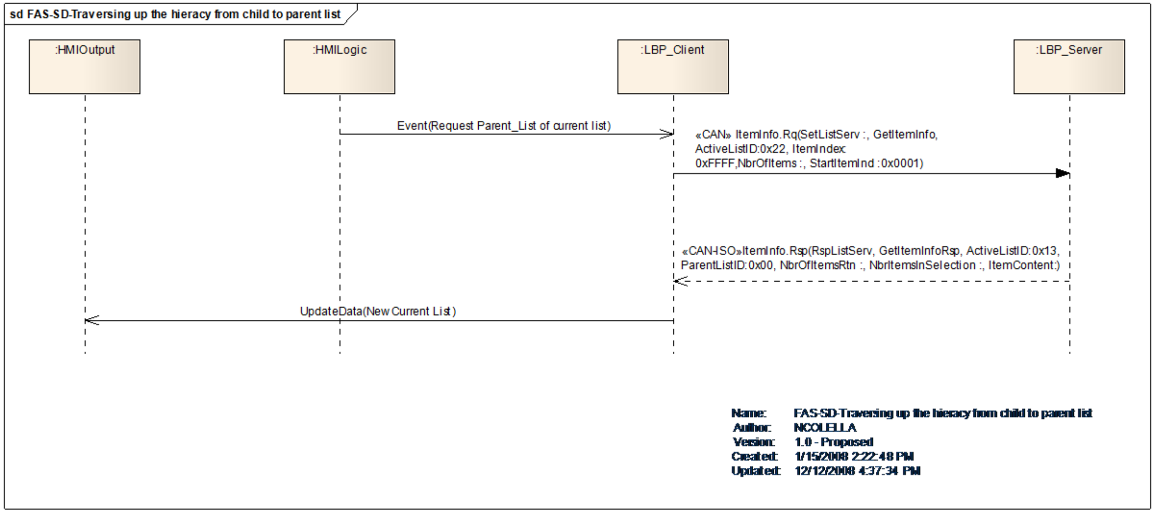
2.6.2 White Box View

2.6.2.1 White Box Scenarios

2.6.2.1.1 LBP-SD-REQ-019724/A-Traversing up the hieracy from child to parent list (TcSE ROIN-39802-1)

Linked Elements
LBP-UC-REQ-019772/A-Traversing up the hierarchy from Child to Parent (TcSE ROIN-30445-1)

Sequence Diagram


sd FAS-SD-Traversing up the hieracy from child to parent list
:HMIOutput
:HMILogic
:LBP_Client
:LBP_Server
Event(Request Parent_List of current list)
«CAN» ItemInfo.Rq(SetListServ :, GetItemInfo, ActiveListID:0x22, ItemIndex 0xFFFF,NbrOfItems :, StartItemInd :0x0001)
«CAN-ISO»ItemInfo.Rsp(RspListServ, GetItemInfoRsp, ActiveListID:0x13, ParentListID:0x00, NbrOfItemsRtn :, NbrItemsInSelection :, ItemContent:)
UpdateData(New Current List)
Name: FAS-SD-Traversing up the hieracy from child to parent list
Author: NICOLELLA
Version: 1.0 - Proposed
Created: 1/15/2008 2:22:48 PM
Updated: 12/12/2008 4:37:34 PM

2.7 LBP-FUN-REQ-019725/A-Traversing up the Hierarchy from Parent to Root (TcSE ROIN-293825-1)

2.7.1 Use Cases

2.7.1.1 LBP-UC-REQ-019726/A-Traversing up the Hierarchy from Parent to Root (TcSE ROIN-292222-1)

Actors	System
Pre-conditions	Infotainment Network is active. Client currently browsing a Parent List.
Scenario Description	The client requests the root list of the current parent list. For example, the user is browsing Folder_A which is a Parent in the Root List and wishes to view the content list of the Root list.
Post-conditions	Server responds back with the Root List of the current Parent list.
List of Exception Use Cases	N/A
Interfaces	G-HMI, Vehicle System Interface

2.7.2 White Box View

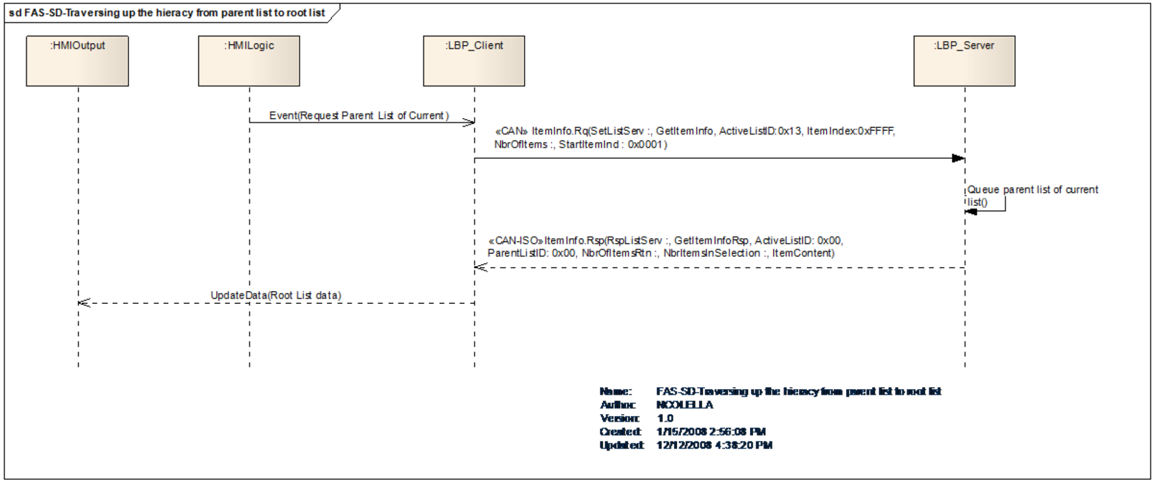
2.7.2.1 White Box Scenarios

2.7.2.1.1 LBP-SD-REQ-019727/A-Traversing up the hieracy from parent list to root list (TcSE ROIN-39810-1)

Linked Elements

LBP-UC-REQ-019774/A-Traversing up the hierarchy from Parent to Root (TcSE ROIN-30451-1)

Sequence Diagram


sd FAS-SD-Traversing up the hieracy from parent list to root list
:HMIOutput
:HMILogic
:LBP_Client
:LBP_Server
Event(Request Parent List of Current)
«CAN» ItemInfo.Rq(SetListServ :, GetItemInfo, ActiveListID:0x13, ItemIndex:0xFFFF, NbrOfItems :, StartItemInd : 0x0001)
Queue parent list of current list()
«CAN-ISO» ItemInfo.Rsp(RspListServ :, GetItemInfoRsp, ActiveListID: 0x00, ParentListID: 0x00, NbrOfItemsRtn :, NbrItemsInSelection :, ItemContent)
UpdateData(Root List data)
Name: FAS-SD-Traversing up the hieracy from parent list to root list
Author: NCOLELLA
Version: 1.0
Created: 1/15/2008 2:56:08 PM
Updated: 12/12/2008 4:38:20 PM

2.8 LBP-FUN-REQ-019728/A-Browsing down a list (TcSE ROIN-293828-1)

2.8.1 Use Cases

2.8.1.1 LBP-UC-REQ-019729/A-Browsing down a List (TcSE ROIN-292223-1)

Actors	System
Pre-conditions	Infotainment Network is active. Client is currently browsing a list.
Scenario Description	The client is browsing a list and requests the next index of entries.
Post-conditions	Server responds back with requested index of entries.
List of Exception Use Cases	N/A
Interfaces	G-HMI, Vehicle System Interface

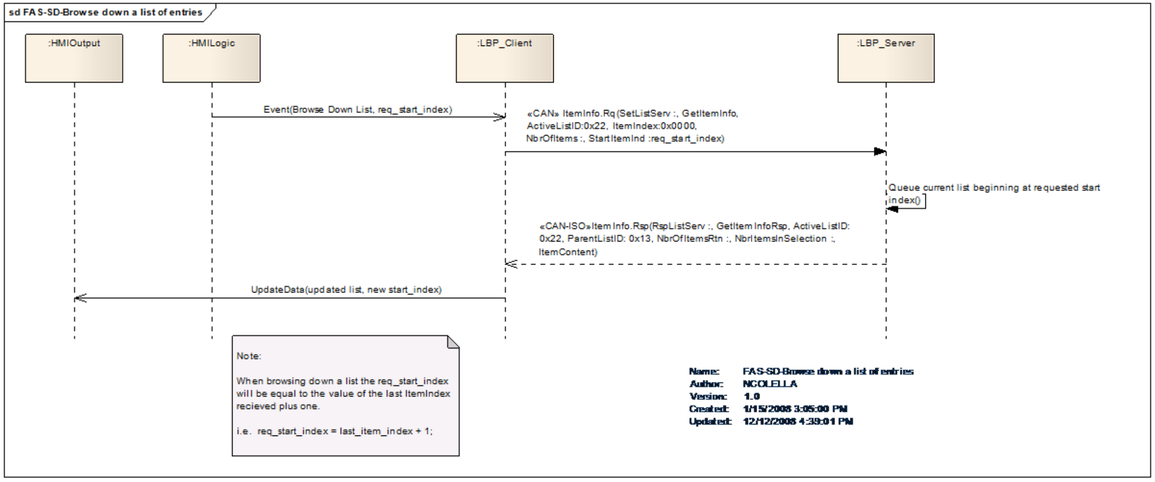
2.8.2 White Box View

2.8.2.1 White Box Scenarios

2.8.2.1.1 LBP-SD-REQ-019730/A-Browse down a list of entries (TcSE ROIN-39811-1)

Linked Elements
LBP-UC-REQ-019776/A-Browsing down a list (TcSE ROIN-30463-1)

Sequence Diagram


sd FAS-SD-Browse down a list of entries
:HMIOutput
:HMILogic
:LBP_Client
:LBP_Server
Event(Browse Down List, req_start_index)
«CAN» ItemInfo.Rq(SetListServ :, GetItemInfo, ActiveListID:0x22, ItemIndex:0x0000, NbrOfItems :, StartItemInd :req_start_index)
Queue current list beginning at requested start index()
«CAN-ISO»ItemInfo.Rsp(RspListServ :, GetItemInfoRsp, ActiveListID: 0x22, ParentListID: 0x13, NbrOfItemsRtn :, NbrItemsInSelection :, ItemContent)
UpdateData(updated list, new start_index)

Note:

When browsing down a list the req_start_index will be equal to the value of the last ItemIndex recieved plus one.

i.e. req_start_index = last_item_index + 1;

Name:	FAS-SD-Browse down a list of entries
Author:	NCOLELLA
Version:	1.0
Created:	1/15/2008 3:05:00 PM
Updated:	12/12/2008 4:39:01 PM

2.9 LBP-FUN-REQ-019731/A-Browsing up a list (TcSE ROIN-293831-1)

2.9.1 Use Cases

2.9.1.1 LBP-UC-REQ-019732/A-Browsing up a List (TcSE ROIN-292224-1)

Actors	System
Pre-conditions	Infotainment Network is active. Client is currently browsing a list.
Scenario Description	The client is browsing a list and requests the previous index of entries.
Post-conditions	Server responds back with requested index of entries.
List of Exception Use Cases	N/A
Interfaces	G-HMI, Vehicle System Interface

2.9.2 White Box View

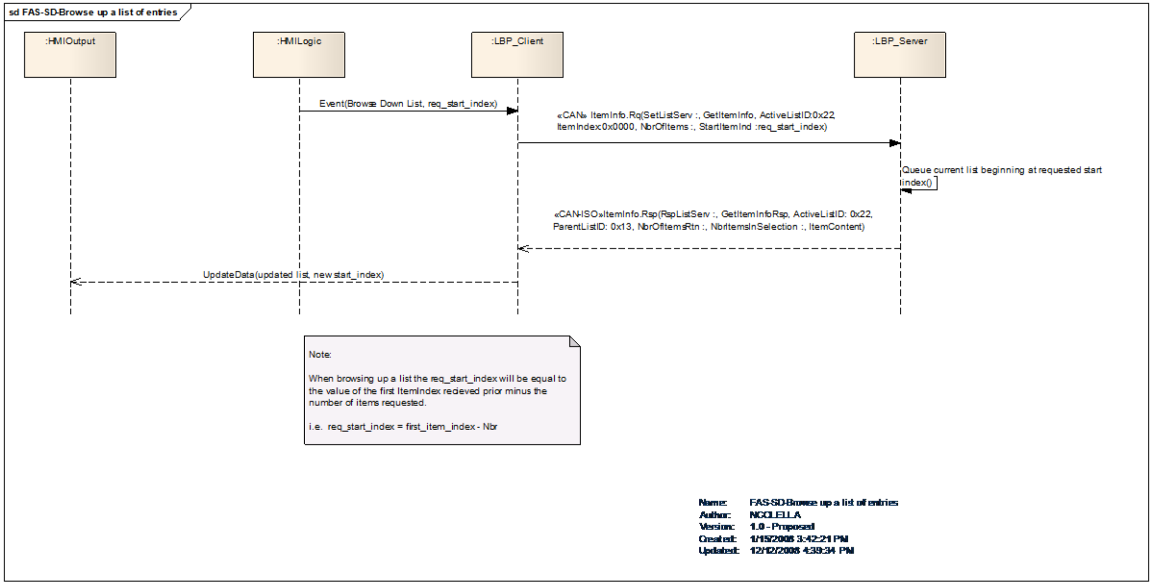
2.9.2.1 White Box Scenarios

2.9.2.1.1 LBP-SD-REQ-019733/A-Browse up a list of entries (TcSE ROIN-39812-1)

Linked Elements

LBP-UC-REQ-019778/A-Browsing up a list (TcSE ROIN-30469-1)

Sequence Diagram


sd FAS-SD-Browse up a list of entries
:HMIOutput
:HMILogic
:LBP_Client
:LBP_Server
Event(Browse Down List, req_start_index)
«CAN» ItemInfo.Rq(SetListServ :, GetItemInfo, ActiveListID:0x22, ItemIndex:0x0000, NbrOfItems :, StartItemInd :req_start_index)
Queue current list beginning at requested start index()
«CAN-ISO»ItemInfo.Rsp(RspListServ :, GetItemInfoRsp, ActiveListID: 0x22, ParentListID: 0x13, NbrOfItemsRtn :, NbrItemsInSelection :, ItemContent)
UpdateData(updated list, new start_index)
Note:
When browsing up a list the req_start_index will be equal to the value of the first ItemIndex recieved prior minus the number of items requested.
i.e. req_start_index = first_item_index - Nbr
Name: FAS-SD-Browse up a list of entries
Author: NCOLELLA
Version: 1.0 - Proposed
Created: 1/15/2008 3:42:21 PM
Updated: 12/12/2008 4:39:34 PM

2.10 LBP-FUN-REQ-130790/A-Prefetch inidcation

2.10.1 Use Cases

2.10.1.1 LBP-UC-REQ-129268/A-Indicate Data Prefetch State

Actors	System
Pre-conditions	Infotainment Network is active.
Scenario Description	The client system is prefetching data from the list server.
Post-conditions	The prefetch status gest indicated to the list server.
List of Exception Use Cases	N/A
Interfaces	G-HMI, Vehicle System Interface

2.10.2 White Box View

2.10.2.1 White Box Scenarios

2.10.2.1.1 LBP-SD-REQ-130401/A-Indicate data prefetch

Scenarios

Normal Usage

The client is fetching list data from the server.

Constraints

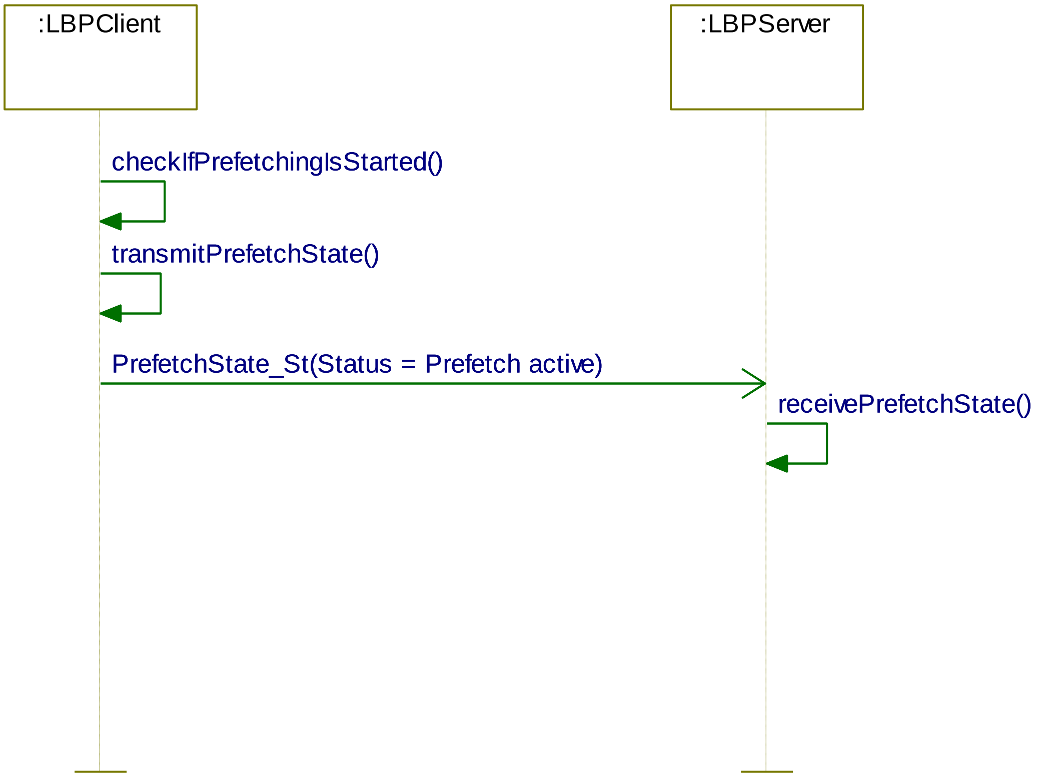
Pre-condition

Network is active.

Post-condition

The prefetching status is indicated to the user.

Sequence Diagram


:LBPClient
:LBPServer
checkIfPrefetchingIsStarted()
transmitPrefetchState()
PrefetchState_St(Status = Prefetch active)
receivePrefetchState()

2.11 LBPv5-FUN-REQ-132838/A-List Browser Icon and Structured Data

2.11.1 Requirements

2.11.1.1 LBP-FUR-REQ-019735/A-Translations (TcSE ROIN-294523-1)

All text strings must reference the MUI database for full language support and match the current system language as selected in the System Settings menu.

2.11.1.2 LBP-FUR-REQ-019736/A-Get Item Request (TcSE ROIN-294524-2)

If the List Browser Server receives a getitem request of 0xFFFF then return to the parent menu. Refer to SPSS Requirment LBP-GREQ-41673-1 for further clarification.

2.11.1.3 LBP-FUR-REQ-019738/A-Source Name (TcSE ROIN-294526-2)

The {source name} shall be the name of the selected List Browser Server audio source.

2.11.1.4 LBP-FUR-REQ-019741/B-Unavailable Source (TcSE ROIN-294529-2)

If the getitem is requesting an unavailable source, the List Browser Server shall return a Command Execution Status of 0x15 (Final Result-Failure, connected environment not reacting). Refer to requirement TP-GREQ-138094-2-CES.

Note: This requirement applies to sources internal to the responding Server ID (sources contained in the request Module). No response required for Server ID which is requested outside of the module.

2.11.1.5 LBP-FUR-REQ-019743/A-Object State (TcSE ROIN-294531-2)

When the List Browser Server is returning a list for Media sources, the Object State must be given. For example if the USB source is active and you are browsing the media source list, Object State must be Active. Refer to requirement LBP-GREQ-177707-Object State Attribute.

2.11.1.6 LBP-FUR-REQ-019744/A-Response Time (TcSE ROIN-294532-2)

The List Browser Server must respond to a List Browser Client request in <100ms with the fully populated list i.e. the user should never see the 'Please Wait' while navigating through the cluster menus. The Navigation POI list (Active List0x0005) is the only exception and must have a fully populated list in < 5 seconds.

2.11.1.7 LBP-REQ-019753/B-Source Icons (TcSE ROIN-301569-1)

Icon Name	Source Icon ID
Invalid	0x00
AM	0x01
CD	0x02
Sirius	0x03
Audio Video In	0x04
User device - USB	0x05
User device - phone	0x06
User device - media player	0x07
User device - SD Card	0x08
User device - WiFi	0x09
User Device- Bluetooth Audio	0x0A
Line In	0x0B
FM	0x0C
DAB	0x0D
Reserved	0x0E…0xFD
Blank	0xFE
Unknown Source	0xFF

2.11.1.8 LBPv2-REQ-128758/C-List Server Generic Radio 1 - Radio List Structure for Cluster HMI

- Number of Preset banks depends on configuration (e.g. Touch, Non-Touch screen).
- DAB and SDARS can only be available separately based on configuration (EU or NA)

Radio Root

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Radio Root (0x0000)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	8

ItemIndex	DataType	ActivationEvent	ObjectType	ObjectState	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	'Radio'	Invalid	Invalid
0x0001	Radio Source (0xA4)	Supported (0x1)	List Object (0x2)	Inactive (0x0) || active (0x1) *	{SourceIcon=0x0C}FM1	(Goto ActiveListID 0x0001 AND Activate FM1 Radio) OR 0x0009	Invalid
0x0002	Radio Source (0xA4)	Supported (0x1)	List Object (0x2)	Inactive (0x0) || active (0x1) *	{SourceIcon=0x0C}FM2	(Goto ActiveListID 0x0002 AND Activate FM2 Radio) OR 0x0009	Invalid
0x0003	Radio Source (0xA4)	Supported (0x1)	List Object (0x2)	Inactive (0x0) || active (0x1) *	{SourceIcon=0x01}AM1	(Goto ActiveListID 0x0003 AND Activate AM1 Radio) OR 0x0009	Invalid
0x0004	Radio Source (0xA4)	Supported (0x1)	List Object (0x2)	Inactive (0x0) || active (0x1) *	{SourceIcon=0x01}AM2	(Goto ActiveListID 0x0004 AND Activate AM1 Radio) OR 0x0009	Invalid
0x0005	Radio Source (0xA4)	Supported (0x1)	List Object (0x2)	Inactive (0x0) || active (0x1) *	{SourceIcon=0x0D}DAB1	(Goto ActiveListID 0x0005 AND Activate DAB1 Radio) OR 0x0009	Invalid
0x0006	Radio Source (0xA4)	Supported (0x1)	List Object (0x2)	Inactive (0x0) || active (0x1) *	{SourceIcon=0x0D}DAB2	(Goto ActiveListID 0x0006 AND Activate DAB2 Radio) OR 0x0009	Invalid
0x0007	Radio Source (0xA4)	Supported (0x1)	List Object (0x2)	Inactive (0x0) || active (0x1) *	{SourceIcon=0x03}SDARS1	(Goto ActiveListID 0x0007 AND Activate SDARS1 Radio) OR 0x0009	Invalid
0x0008	Radio Source (0xA4)	Supported (0x1)	List Object (0x2)	Inactive (0x0) || active (0x1) *	{SourceIcon=0x03}SDARS2	(Goto ActiveListID 0x0008 AND Activate SDARS2 Radio) OR 0x0009	Invalid

*ObjectState shall reflect to current active band.

FM1 Preset List

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Radio FM1 (0x0001)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	30

ItemIndex	DataType	ActivationEvent	ObjectType	ObjectState	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	FM1	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
...							
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

*ObjectState shall reflect to current active preset.

FM2 Preset List

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Radio FM2 (0x0002)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	30

ItemIndex	DataType	ActivationEvent	ObjectType	ObjectState	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	FM2	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
...							
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

*ObjectState shall reflect to current active preset.

AM1 Preset List

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Radio AM1 (0x0003)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	30

ItemIndex	DataType	ActivationEvent	ObjectType		ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	AM1	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
...							
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

*ObjectState shall reflect to current active preset.

AM2 Preset List

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Radio AM2 (0x0004)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	30

ItemIndex	DataType	ActivationEvent	ObjectType		ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	AM2	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
...							
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

*ObjectState shall reflect to current active preset.

DAB1 Preset List

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Radio DAB1 (0x0005)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	30

ItemIndex	DataType	ActivationEvent	ObjectType		ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	DAB1	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
...							
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

*ObjectState shall reflect to current active preset.

DAB2 Preset List

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Radio DAB2 (0x0006)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	30

ItemIndex	DataType	ActivationEvent	ObjectType		ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	DAB2	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
...							
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

*ObjectState shall reflect to current active preset.

SDARS1 Preset List

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Radio SDARS1 (0x0007)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	30

ItemIndex	DataType	ActivationEvent	ObjectType		ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	SDARS1	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
...							
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

*ObjectState shall reflect to current active preset.

SDARS2 Preset List

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Radio SDARS2 (0x0008)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	30

ItemIndex	DataType	ActivationEvent	ObjectType		ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	SDARS2	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
...							
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

*ObjectState shall reflect to current active preset.

Empty

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Empty (0x0009)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	1

ItemIndex	DataType	ActivationEvent	ObjectType		ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	{Radio Bank} empty	Invalid	Invalid
0x0001	Generic Text (0x02)	Not Supported (0x0)	Entry Object (0x1)	Inactive (0x0)	OK	Invalid	Invalid

FM Station List

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Radio FM (0x000A)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	253

ItemIndex	DataType	ActivationEvent	ObjectType		ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	FM	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequ		ctivate Station6
...							
0x00FE	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequ		ctivate Station30

*ObjectState shall reflect to current active preset.

Future protection:
- added to support station list browsing capabilities.

DAB Station List

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Radio DAB (0x000B)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	253

ItemIndex	DataType	ActivationEvent	ObjectType		ItemDescriptor		etItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	DAB		valid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequ		ctivate Station1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequ		ctivate Station2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station6
...							
0x00FE	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station30

*ObjectState shall reflect to current active preset.

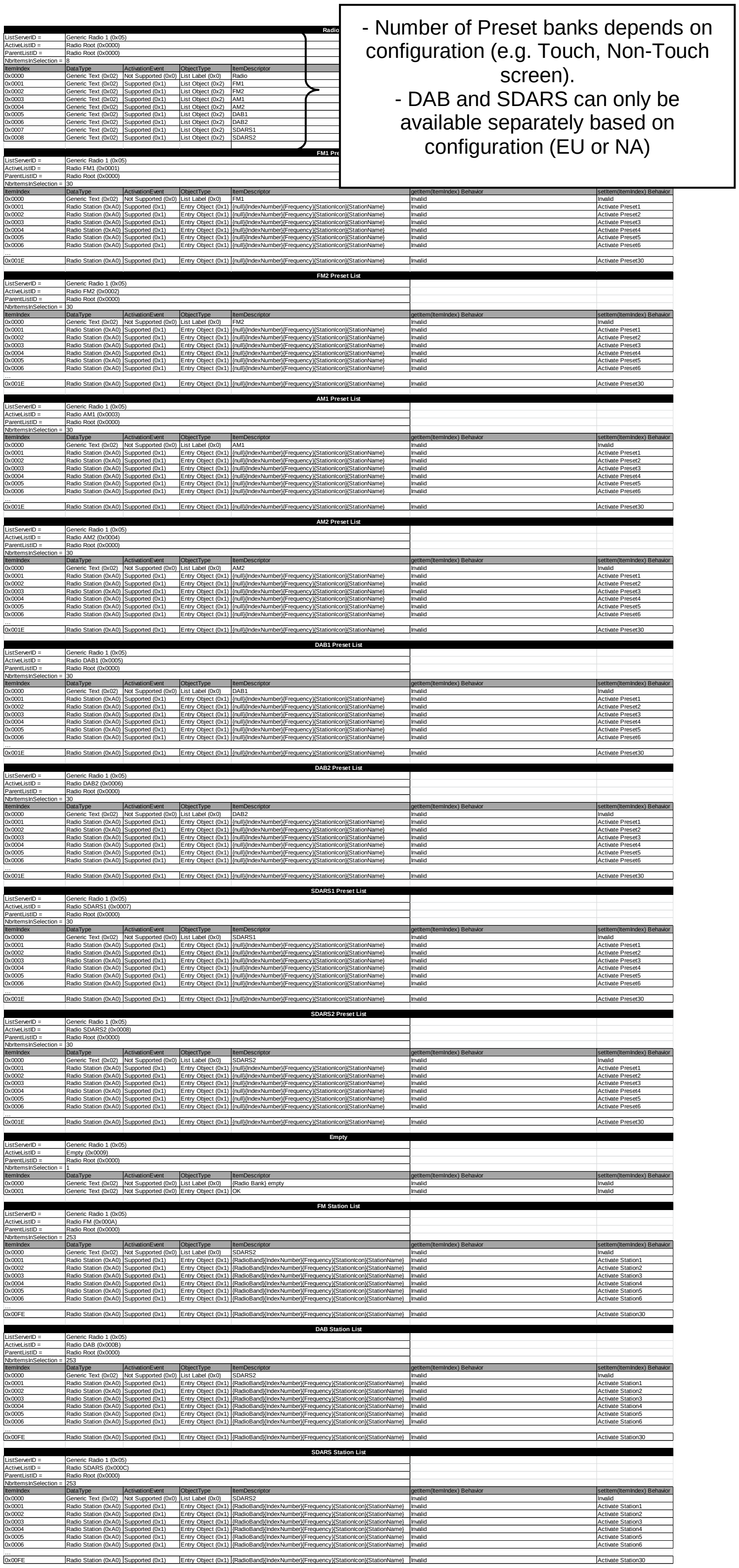
SDARS Station List

ListServerID =	Generic Radio 1 (0x05)
ActiveListID =	Radio SDARS (0x000C)
ParentListID =	Radio Root (0x0000)
NbrItemsInSelection =	253

ItemIndex	DataType	ActivationEvent	ObjectType		ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Inactive (0x0)	SDARS	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station6
...							
0x00FE	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	Inactive (0x0) || active (0x1) *	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station30

*ObjectState shall reflect to current active preset.

2.11.1.9 LBPv2-REQ-140537/A-List Server Generic Radio 1 - Radio List Structure for Centerstack HMI



- Number of Preset banks depends on configuration (e.g. Touch, Non-Touch screen).
- DAB and SDARS can only be available separately based on configuration (EU or NA)

Radio

ListServerID =	Generic Radio 1 (0x05)			
ActiveListID =	Radio Root (0x0000)			
ParentListID =	Radio Root (0x0000)			
NbrItemsInSelection =	8			
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	Radio
0x0001	Generic Text (0x02)	Supported (0x1)	List Object (0x2)	FM1
0x0002	Generic Text (0x02)	Supported (0x1)	List Object (0x2)	FM2
0x0003	Generic Text (0x02)	Supported (0x1)	List Object (0x2)	AM1
0x0004	Generic Text (0x02)	Supported (0x1)	List Object (0x2)	AM2
0x0005	Generic Text (0x02)	Supported (0x1)	List Object (0x2)	DAB1
0x0006	Generic Text (0x02)	Supported (0x1)	List Object (0x2)	DAB2
0x0007	Generic Text (0x02)	Supported (0x1)	List Object (0x2)	SDARS1
0x0008	Generic Text (0x02)	Supported (0x1)	List Object (0x2)	SDARS2

FM1 Pre

ListServerID =	Generic Radio 1 (0x05)					
ActiveListID =	Radio FM1 (0x0001)					
ParentListID =	Radio Root (0x0000)					
NbrItemsInSelection =	30					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	FM1	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
…						
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

FM2 Preset List

ListServerID =	Generic Radio 1 (0x05)					
ActiveListID =	Radio FM2 (0x0002)					
ParentListID =	Radio Root (0x0000)					
NbrItemsInSelection =	30					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	FM2	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
…						
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

AM1 Preset List

ListServerID =	Generic Radio 1 (0x05)					
ActiveListID =	Radio AM1 (0x0003)					
ParentListID =	Radio Root (0x0000)					
NbrItemsInSelection =	30					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	AM1	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
…						
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

AM2 Preset List

ListServerID =	Generic Radio 1 (0x05)					
ActiveListID =	Radio AM2 (0x0004)					
ParentListID =	Radio Root (0x0000)					
NbrItemsInSelection =	30					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	AM2	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
…						
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

DAB1 Preset List

ListServerID =	Generic Radio 1 (0x05)					
ActiveListID =	Radio DAB1 (0x0005)					
ParentListID =	Radio Root (0x0000)					
NbrItemsInSelection =	30					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	DAB1	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
…						
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

DAB2 Preset List

ListServerID =	Generic Radio 1 (0x05)					
ActiveListID =	Radio DAB2 (0x0006)					
ParentListID =	Radio Root (0x0000)					
NbrItemsInSelection =	30					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	DAB2	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
…						
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

SDARS1 Preset List

ListServerID =	Generic Radio 1 (0x05)					
ActiveListID =	Radio SDARS1 (0x0007)					
ParentListID =	Radio Root (0x0000)					
NbrItemsInSelection =	30					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	SDARS1	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
…						
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

SDARS2 Preset List

ListServerID =	Generic Radio 1 (0x05)					
ActiveListID =	Radio SDARS2 (0x0008)					
ParentListID =	Radio Root (0x0000)					
NbrItemsInSelection =	30					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	SDARS2	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset6
…						
0x001E	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{null}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Preset30

Empty

ListServerID =	Generic Radio 1 (0x05)					
ActiveListID =	Empty (0x0009)					
ParentListID =	Radio Root (0x0000)					
NbrItemsInSelection =	1					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	{Radio Bank} empty	Invalid	Invalid
0x0001	Generic Text (0x02)	Not Supported (0x0)	Entry Object (0x1)	OK	Invalid	Invalid

FM Station List

ListServerID =	Generic Radio 1 (0x05)					
ActiveListID =	Radio FM (0x000A)					
ParentListID =	Radio Root (0x0000)					
NbrItemsInSelection =	253					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	SDARS2	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station6
…						
0x00FE	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station30

DAB Station List

ListServerID =	Generic Radio 1 (0x05)					
ActiveListID =	Radio DAB (0x000B)					
ParentListID =	Radio Root (0x0000)					
NbrItemsInSelection =	253					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	SDARS2	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station6
…						
0x00FE	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station30

SDARS Station List

ListServerID =	Generic Radio 1 (0x05)					
ActiveListID =	Radio SDARS (0x000C)					
ParentListID =	Radio Root (0x0000)					
NbrItemsInSelection =	253					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	SDARS2	Invalid	Invalid
0x0001	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station1
0x0002	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station2
0x0003	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station3
0x0004	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station4
0x0005	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station5
0x0006	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station6
…						
0x00FE	Radio Station (0xA0)	Supported (0x1)	Entry Object (0x1)	{RadioBand}{IndexNumber}{Frequency}{StationIcon}{StationName}	Invalid	Activate Station30

2.11.1.10 LBP-REQ-132690/B-List Server RadioDataService1 - EPG List Structure for Centerstack HMI

Basic EPG List Root						
ListServerID =	Radio Data Service1 (0x07)					
ActiveListID =	Basic EPG Root (0x0000)					
ParentListID =	Basic EPG Root (0x0000)					
NbrItemsInSelection =	2					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	EPG	Invalid	Invalid
0x0001	Radio EPG Data (0xA1)	Not Supported (0x0)	Entry Object (0x1)	{Icon}{NULL}{NULL}{ProgramName}	Invalid	Invalid
0x0002	Radio EPG Data (0xA1)	Not Supported (0x0)	Entry Object (0x1)	{NULL}{Hour}{Minute}{ProgramName}	Invalid	Invalid

2.11.1.11 LBP-REQ-132691/B-List Server RadioDataService2 - Journaline List Structure for Centerstack HMI

Radio Data Service2 Root						
ListServerID =	Radio Data Service2 (0x08)					
ActiveListID =	Journaline (0x0000)					
ParentListID =	Journaline (0x0000)					
NbrItemsInSelection =	51					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x00	Radio Journaline Data (0xA2)	Not Supported (0x0)	List Label (0x0)	Journaline	Invalid	Invalid
0x01	Radio Journaline Data (0xA2)	Supported (0x1) || Not Supported (0x0)	Entry Object (0x1) ||List Object (0x2)	{JournalineListEntry}	refer to HMI specification for list object behavior && enter child list	refer to HMI specification for list entry behavior
…						
0x32	Radio Journaline Data (0xA2)	Supported (0x1) || Not Supported (0x0)	Entry Object (0x1) ||List Object (0x2)	{JournalineListEntry}	refer to HMI specification for list object behavior && enter child list	refer to HMI specification for list entry behavior

The server structure (child list hirachy) for Journaline shall be build up according to the data transmitted by the broadcaster. Following structure is used as an example only.

Radio Data Service2 Root						
ListServerID =	Radio Data Service2 (0x08)					
ActiveListID =	Journaline (0x0000)					
ParentListID =	Journaline (0x0000)					
NbrItemsInSelection =	4					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Radio Journaline Data (0xA2)	Not Supported (0x0)	List Label (0x0)	Deutschlandradio Informationen	Invalid	Invalid
0x0001	Radio Journaline Data (0xA2)	Not Supported (0x0)	List Object (0x2)	News	Goto ActiveListID 0x0001	Invalid
0x0002	Radio Journaline Data (0xA2)	Not Supported (0x0)	List Object (0x2)	Traffic	Goto ActiveListID 0x0002	Invalid
0x0003	Radio Journaline Data (0xA2)	Not Supported (0x0)	List Object (0x2)	Weather	Goto ActiveListID 0x0003	Invalid

Radio Data Service2 Nachrichten						
ListServerID =	Radio Data Service2 (0x08)					
ActiveListID =	Journaline Root_Item1 (0x0001)					
ParentListID =	Journaline (0x0000)					
NbrItemsInSelection =	1					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Radio Journaline Data (0xA2)	Not Supported (0x0)	List Label (0x0)	News	Invalid	Invalid
0x0001	Radio Journaline Data (0xA2)	Not Supported (0x0)	List Object (0x2)	Deutschlandfunk News	Goto ActiveListID 0x0004 or 0x0005	Invalid

Radio Data Service2 Verkehr						
ListServerID =	Radio Data Service2 (0x08)					
ActiveListID =	Journaline Root_Item2 (0x0002)					
ParentListID =	Journaline (0x0000)					
NbrItemsInSelection =	1					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Radio Journaline Data (0xA2)	Not Supported (0x0)	List Label (0x0)	Traffic	Invalid	Invalid
0x0001	Radio Journaline Data (0xA2)	Not Supported (0x0)	List Object (0x2)	Current Traffic Jam Information	Goto ActiveListID 0x0006 or 0x0005	Invalid

Radio Data Service2 Wetter						
ListServerID =	Radio Data Service2 (0x08)					
ActiveListID =	Journaline Root_Item3 (0x0003)					
ParentListID =	Journaline (0x0000)					
NbrItemsInSelection =	1					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Radio Journaline Data (0xA2)	Not Supported (0x0)	List Label (0x0)	Weather	Invalid	Invalid
0x0001	Radio Journaline Data (0xA2)	Not Supported (0x0)	List Object (0x2)	Weather in Germany	Goto ActiveListID 0x0007 or 0x0006	Invalid

Radio Data Service2 Deutschlandfunk Nachrichten						
ListServerID =	Radio Data Service2 (0x08)					
ActiveListID =	Journaline Child1_Item1 (0x0004)					
ParentListID =	Journaline Root_Item1 (0x0001)					
NbrItemsInSelection =	1					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Radio Journaline Data (0xA2)	Not Supported (0x0)	List Label (0x0)	Deutschlandfunk News	Invalid	Invalid
0x0001	Radio Journaline Data (0xA2)	Not Supported (0x0)	Entry Object (0x1)	Arrival of Merkel in Tokio	Invalid	Transmit Journaline Text message

Empty						
ListServerID =	Radio Data Service2 (0x08)					
ActiveListID =	Empty (0x0005)					
ParentListID =	Parent List (e.g. Journaline Root_Item2 (0x0002))					
NbrItemsInSelection =	1					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(ItemIndex) Behavior
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	{List Label} empty	Invalid	Invalid
0x0001	Generic Text (0x02)	Not Supported (0x0)	Entry Object (0x1)	OK	Invalid	Invalid

2.11.1.12 LBP-REQ-192091/A-List Server RadioDataService3 - Advanced EPG List Structure for Centerstack HMI

Advanced EPG List Root						
ListServerID =	Radio Data Service3 (0x09)					
ActiveListID =	Advanced EPG Root (0x0000)					
ParentListID =	Advanced EPG Root (0x0000)					
NbrItemsInSelection =	96					
ItemIndex	DataType	ActivationEvent	ObjectType	ItemDescriptor	getItem(ItemIndex) Behavior	setItem(I
0x0000	Generic Text (0x02)	Not Supported (0x0)	List Label (0x0)	EPG	Invalid	Invalid
0x0001	Radio EPG Data (0xA1)	Not Supported (0x0)	Entry Object (0x1)	{NULL}{Hour}{Minute}{ProgramName}	Invalid	Invalid
0x0002	Radio EPG Data (0xA1)	Not Supported (0x0)	Entry Object (0x1)	{NULL}{Hour}{Minute}{ProgramName}	Invalid	Invalid
0x0003	Radio EPG Data (0xA1)	Not Supported (0x0)	Entry Object (0x1)	{NULL}{Hour}{Minute}{ProgramName}	Invalid	Invalid
0x0004	Radio EPG Data (0xA1)	Not Supported (0x0)	Entry Object (0x1)	{NULL}{Hour}{Minute}{ProgramName}	Invalid	Invalid
0x0005	Radio EPG Data (0xA1)	Not Supported (0x0)	Entry Object (0x1)	{NULL}{Hour}{Minute}{ProgramName}	Invalid	Invalid
0x0006	Radio EPG Data (0xA1)	Not Supported (0x0)	Entry Object (0x1)	{NULL}{Hour}{Minute}{ProgramName}	Invalid	Invalid
…						
0x0060	Radio EPG Data (0xA1)	Not Supported (0x0)	Entry Object (0x1)	{NULL}{Hour}{Minute}{ProgramName}	Invalid	Invalid

Future protection for C519

2.12 LBP-FUN-REQ-132987/A-New device connected

2.12.1 Use Cases

2.12.1.1 LBP-UC-REQ-132986/A-New Device Connected

Actors	User
Pre-conditions	Device is initially inserted / connected
Scenario Description	The list server shall build up the lists from the initially inserted / connected device. The ListBrowseServer shall indicate the initializing status to the ListBrowseClient
Post-conditions	Initializing status of the ListBrowseServer is indicated to the ListBrowseClient.
List of Exception Use Cases	E1-List Server Error : If the server is not able to build up the list structure due to any error the ListBrowseServer shall indicate this to the ListBrowseClient.
Interfaces	G-HMI, Vehicle System Interface

2.12.2 White Box View

2.12.2.1 White Box Scenarios

2.12.2.1.1 LBP-SD-REQ-132996/A-New devide connected

Scenarios

Normal Usage

The list server builds up the list structure of the newly connected device.

Constraints

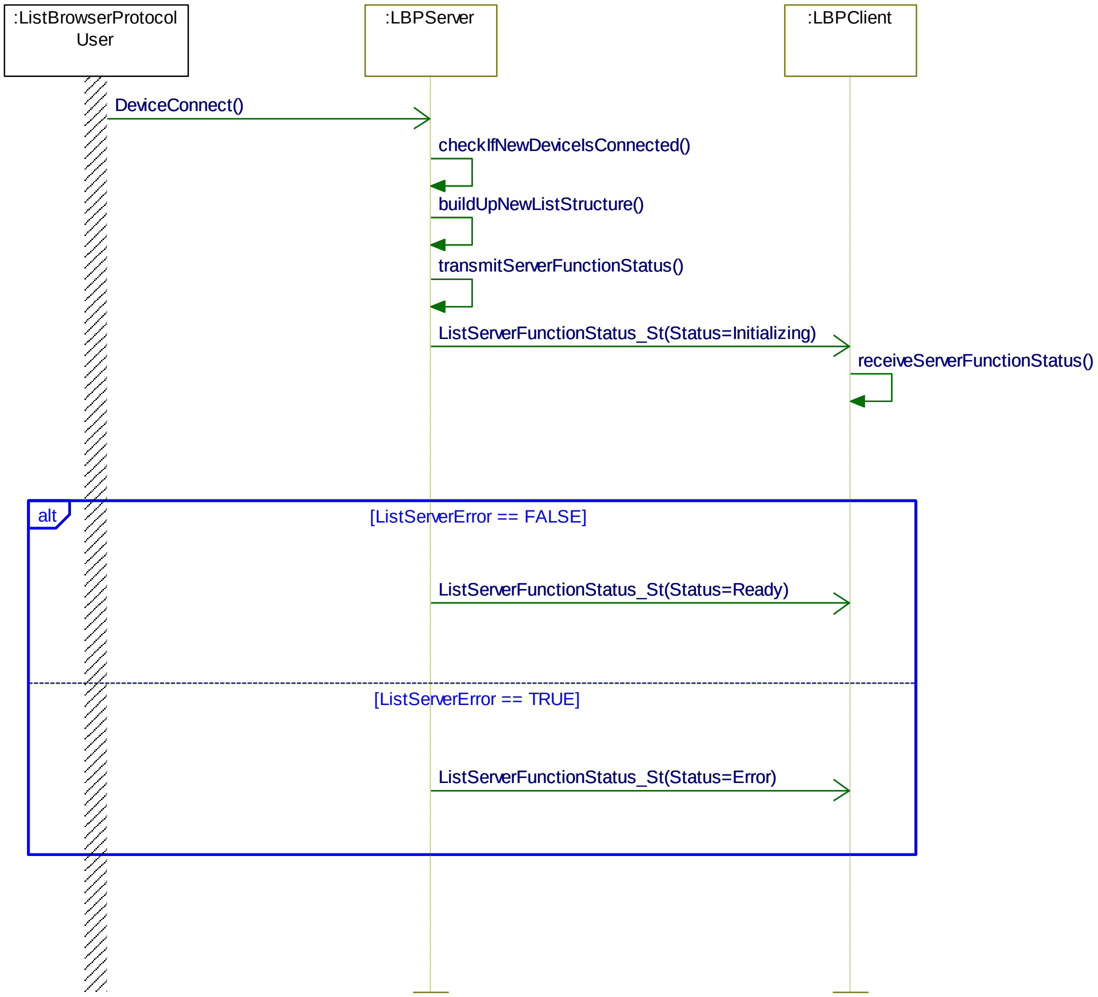
Pre-condition

New device is connected.

Post-condition

The list server function status is transmitted to the client.

Sequence Diagram


:ListBrowserProtocol User
:LBPServer
:LBPClient
DeviceConnect()
checkIfNewDeviceIsConnected()
buildUpNewListStructure()
transmitServerFunctionStatus()
ListServerFunctionStatus_St(Status=Initializing)
receiveServerFunctionStatus()
alt
[ListServerError == FALSE]
ListServerFunctionStatus_St(Status=Ready)
[ListServerError == TRUE]
ListServerFunctionStatus_St(Status=Error)

2.13 LBP-FUN-REQ-130789/A-Server list update

2.13.1 Use Cases

2.13.1.1 LBP-UC-REQ-129267/A-Indicate Server List Update

Actors	System
Pre-conditions	Infotainment Network is active.
Scenario Description	A server list gets updated with new data.
Post-conditions	Update of server list is indicated to the client.
List of Exception Use Cases	Server list is empty: If the server list is empty the list server will indicated the status to the client.
Interfaces	G-HMI, Vehicle System Interface

2.13.2 White Box View

2.13.2.1 White Box Scenarios

2.13.2.1.1 LBP-SD-REQ-130402/A-Indicate server list update

Scenarios

Normal Usage

A server list is getting updated.

Constraints

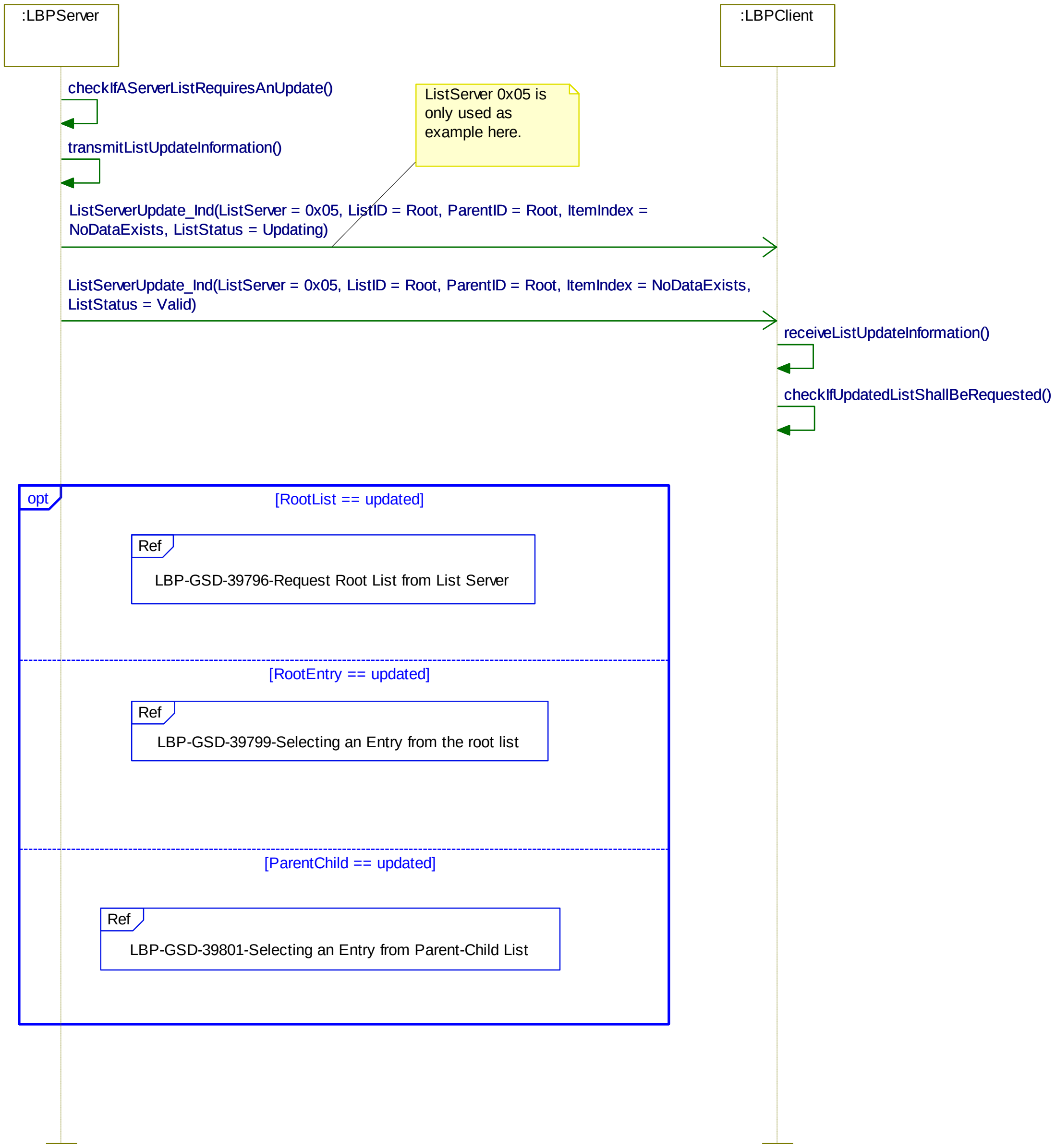
Pre-condition

Network is active.

Post-condition

Server list update information is indicated to the client.

Sequence Diagram


:LBPServer
:LBPClient
checkIfAServerListRequiresAnUpdate()
ListServer 0x05 is only used as example here.
transmitListUpdateInformation()
ListServerUpdate_Ind(ListServer = 0x05, ListID = Root, ParentID = Root, ItemIndex = NoDataExists, ListStatus = Updating)
ListServerUpdate_Ind(ListServer = 0x05, ListID = Root, ParentID = Root, ItemIndex = NoDataExists, ListStatus = Valid)
receiveListUpdateInformation()
checkIfUpdatedListShallBeRequested()
opt
[RootList == updated]
Ref
LBP-GSD-39796-Request Root List from List Server
[RootEntry == updated]
Ref
LBP-GSD-39799-Selecting an Entry from the root list
[ParentChild == updated]
Ref
LBP-GSD-39801-Selecting an Entry from Parent-Child List

3 Appendix: Reference Documents

Reference #	Document Title
1	
2	
3	
4	
5	