VDV Die Verkehrsunternehmen

VDV-Schrift 301-2-3

08/2019

IBIS-IP Beschreibung der Dienste / Service description

CustomerInformationService - V 2.2

Gesamtbearbeitung
Ausschuss für Telematik und Informationssysteme (ATI)

Gefördert durch:

Bundesministerium
für Wirtschaft
und Technologie

aufgrund eines Beschlusses
des Deutschen Bundestages

VDV-Schrift 301-2-3 08/2019

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CustomerInformationService - V 2.2

Sachbearbeitung
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Vorwort

Diese VDV-Schrift wurde aus der VDV-301-2 separiert, um Anpassungen an einzelnen IBIS-IP-Diensten unabhängig von anderen IBIS-IP-Diensten vornehmen zu können.

In der VDV-301-2 werden die technischen Grundlagen IBIS-IP-Systems beschrieben. In dieser VDV-Schrift 301-2-3 sind der CustomerInformationService und seine spezifischen Datenstrukturen beschrieben.

Diese VDV-Schrift wird zweisprachig veröffentlicht. Dabei ist zu beachten, dass Erläuterungen in Deutsch und Englisch verfasst sind, während die technischen Operationen und zugehörigen Datenstrukturen, die sich an Softwareentwickler richten, nur in Englisch beschrieben sind.

Foreword

This VDV-requirement document has been separated from the VDV-301-2 in order to make adjustments to individual IBIS IP services independent from other IBIS IP services.

The technical basics of the IBIS-IP systems are described in the VDV-301-2. The VDV 301-2-3 describes the PassengerInformationService and its specific data structures.

This VDV publication is published in two languages. It should be noted that explanations are written in German and English, while the technical operations and data structures related to software developers are described in English only.

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Abkürzungen / Abbreviations

CIS	Kunden Informations Dienst	Customer Information Service
IBIS	Integriertes Bordinformationssystem	Integrated Board Information System
IBIS-IP	Internetprotokoll basiertes IBIS	Internet protocol based IBIS
HTTP	Hypertext-Übertragungsprotokoll	Hypertext Transfer Protocol

1 Dienst CustomerInformationService

1.1 Aufgaben des Dienstes und die Nutzung

Der *CustomerInformationService* repräsentiert als Dienst die Fachkomponente FahrgastInformationsErmittlung. Hauptaufgabe des *CustomerInformationService* ist die Bereitstellung aller inhaltlichen Informationen, die für die Fahrgastinformation im und am Fahrzeug erforderlich sind. Insbesondere soll es für keine Fahrgastinformationskomponente im Fahrzeug (z.B. TFT-Monitore, Ansagegeräte, Frontanzeigen etc.) erforderlich sein, inhaltliche Informationen bei anderen Diensten im Fahrzeugnetzwerk abzurufen bzw. zusammenzusuchen. Der *CustomerInformationService* spielt sozusagen die Rolle des Pressesprechers bzgl. der Fahrgastinformation. Konzeptioneller Hintergrund dieser Architektur ist der Wunsch nach Konsistenz, der anderenfalls, beim Nutzen verschiedener Informationsquellen von verschiedenen Dienstanbietern, verloren ginge.

Informationen zum Layout bzw. zur Darstellung der Informationen liefert der *CustomerInformationService* nicht. Diese Informationen müssen entweder im darstellenden Gerät hinterlegt sein oder man nutzt den *HTMLDisplayService* bzw. den *MatrixDisplayService*, die inhaltlich beide auf dem *CustomerInformationService* aufbauen, aber zusätzliche Layoutinformationen zur Verfügung stellen.

Die Informationen des Dienstes stammen teils aus Plandaten, teils aus Echtzeitdaten und aus Echtzeitdaten zu Fahrzeugzuständen. Dazu zählen u.a. textuelle (ggf. mehrsprachige) und teils akustische Informationen, z. B. zu Zielanzeigen, Liniennummern, Fahrwegverläufe mit Haltestellennamen und Ankunfts-/Abfahrtszeiten, aktuelle/nächste Haltestelle, planmäßige Umsteigemöglichkeiten, Echtzeitinformationen zu Anschlussbeziehungen an (nachfolgenden) Haltestellen, Türstatus oder Haltewunsch.

Der *CustomerInformationService* wird in IBIS-IP als HTTP-Dienst zur Verfügung gestellt

1 Tasks of the Service and its Usage

The *CustomerInformationService* represents the functional component Customer Information Determination. The main task of *CustomerInformationService* is the provision of all content information required for passenger information in and on the vehicle. In particular, it should not be necessary for any passenger information component in the vehicle (e.g. TFT monitors, announcement devices, front displays, etc.) to retrieve or compile content information from other services in the vehicle network. The *CustomerInformationService* plays, so to speak, the role of the press spokesman for passenger information. The conceptual background of this architecture is the higher consistency, which would be spoiled if information were retrieved from different service providers.

The *CustomerInformationService* does not provide information about the layout or the presentation of the information. This information must either be stored in the display device itself or must be requested from the *HTMLDisplayService* or the *MatrixDisplayService*, both of which are based on the *CustomerInformationService* but provide additional layout information.

The information of the service comes partly from planned data, partly from real-time data as well as from real-time data on vehicle status, all of which could be of interest for passengers inside the vehicle. These include, among others, textual (possibly multi-lingual) and partly acoustic information, e.g.about the destination, the line number, the course of the route with the stop names, the arrival / departure times, the current / the next stop, the scheduled connection possibilities, the real-time information on the connections at (subsequent) stops, the door status or the holding request.

The *CustomerInformationService* is in IBIS-IP provided as an HTTP service.

1.2 Operations of the CustomerInformationService

The CustomerInformationService uses the GetAllData/SubscribeAllData operations to provide all the information the CustomerInformationService has at the time of the request. This ensures the best possible consistency of the information. In many cases, the provision of this one operation is sufficient to supply all devices in the vehicle. However, a fairly large XML structure has to be parsed in order to determine small changes originating from the movement of the vehicle along the road. The CustomerInformationService therefore also offers some operations to make partial amounts of the data available and, in particular, to allow low-performing devices to determine the relevant data more easily.

Subsequently the functional purpose of the operations of the Customer Infromationservice are shortly described. Subscribe-operations and Unsubscribe-operations are not explicetely mentioned, but only the Get-operation related to the same data structure.

Operation	**Functional purpose**
GetAllData	Provides ALL information the Customer Information Service has at the moment of the request.
GetCurrentAnnouncement	Provides information on the current passenger announcement (acoustic)
GetCurrentConnectionInformation	Provides information on current connections (planned or based on real-time imformation) at a stop

Operation	Functional purpose
GetCurrentDisplayContent	Provides information primarily for low performing displays, in particular it does not provide information about the route of a journey
GetCurrentStopPoint	Provides information on the current stop point only
GetCurrentStopIndex	Provides information on the index of the current stop point with respect to the route
GetTripData	Provides information on the route, the current position along the route and the deviation with respect to the timetable
GetVehicleData	Provides vehicle related information like the door status and a passengers stop request
RetrievePartialStopSequence	*Provides information on a part of the route, depending on the request parameters*

In the following all operations of the CustomerInformationService and their relations to the datatypes/datastructures are listed. Thereafter follows a detailed technical description of the operations and the datatypes/data structures used.

Operation	Request/ Response	Used Datatype, Datastructure
GetAllData	Req.	-
	Resp.	CustomerInformationService. GetAllDataResponseStructure
SubscribeAllData	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeAllData	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetCurrentAnnouncement	Req.	-
	Resp.	CustomerInformationService. GetCurrentAnnouncementResponseStructure
SubscribeCurrentAnnouncement	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeCurrentAnnouncement	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetCurrentConnectionInformation	Req.	-

Operation	Request/ Response	Used Datatype, Datastructure
	Resp.	CustomerInformationService. GetCurrentConnectionInformationResponseStructure
SubscribeCurrentConnectionInformation	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeCurrentConnectionInformation	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetCurrentDisplayContent	Req.	-
	Resp.	CustomerInformationService. GetCurrentDisplayContentResponseStructure
SubscribeCurrentDisplayContent	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeCurrentDisplayContent	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetCurrentStopPoint	Req.	-
	Resp.	CustomerInformationService. GetCurrentStopPointResponseStructure
SubscribeCurrentStopPoint	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeCurrentStopPoint	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetCurrentStopIndex	Req.	-
	Resp.	CustomerInformationService. GetCurrentStopIndexResponseStructure
SubscribeCurrentStopIndex	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeCurrentStopIndex	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetTripData	Req.	-
	Resp.	CustomerInformationService. GetTripDataResponseStructure

Operation	Request/ Response	Used Datatype, Datastructure
SubscribeTripData	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeTripData	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetVehicleData	Req.	-
	Resp.	CustomerInformationService. GetVehicleDataResponseStructure
SubscribeVehicleData	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeVehicleData	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
RetrievePartialStopSequence	Req.	CustomerInformationService. RetrievePartialStopSequenceRequestStructure
	Resp.	CustomerInformationService. RetrievePartialStopSequenceResponseStructure

Table 1: Description of CustomerInformationService Operations

1.3 Reading Guideline for the Tables

To understand the below mentioned tables please refer to the general explanation in “VDV 301-2 Base Services”, section 6.

1.4 Meaning of Current Stop Index in Root

Main process when current stop index has to be changed.

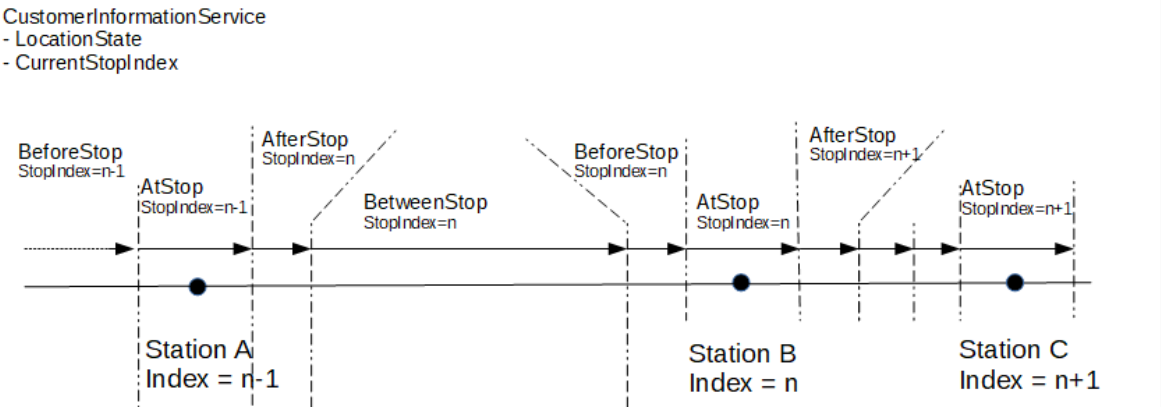

Figure 1

The table shows the different changes on different datafields when the current stop Index has changed.

All different entries with "Current" are dependent on the current Stop index.

Position Fahrzeug	Display content (expectation)		CustomerInformationService (CIS) Parameter						ELA (expectation)	Entwerter	Validation Service Parameter
Stop (Index)	Perlschnur Startpunkt	connection Info	Location State	Current Stop Index	Current Display Content	Current Stop Point	Current Connection Information	Current Annoucement	Ansage	Validater Zone	Current Stop Point
A (n-1)	A	from A /non	AtStop	n-1	A	A	A	A	from A /non	A	A
↓	A	non	AfterStop	n	B	B	B	B	non	A	A
↓	A	non	BetweenStop	n	B	B	B	B	non	A	A
↓	A	from B	BeforeStop	n	B	B	B	B	from B	A	A
B (n)	B	from B / non	AtStop	n	B	B	B	B	from B / non	B	B
↓	B	non	AfterStop	n+1	C	C	C	C	non	B	B
↓	B	non	BetweenStop	n+1	C	C	C	C	non	B	B
↓	B	from C	BeforeStop	n+1	C	C	C	C	from C	B	B
C (n+1)	C	from C /non	AtStop	n+1	C	C	C	C	from C /non	C	C

1.5 Data Structure of GetAllData Operation

1.5.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.5.2 Response

CustomerInformationService. GetAllDataResponse				*+Structure*	**Response structure for the GetAllData request**
				choice	One of the following structures
	a	***AllData***	**–1:1**	*+CustomerInformationService. AllData*	Detailed response (cf. table below)
	b	***OperationErrorMessage***		*IBIS-IP.string*	Error message

Table 2: Description of CustomerInformationService.GetAllDataResponse

CustomerInformationService.AllData			*+Structure*	**Response structure for all data of the CustomerInformationService**
	TimeStamp	**1:1**	*IBIS-IP.dateTime*	Response time stamp
	VehicleRef	**1:1**	*IBIS-IP.NMTOKEN*	Reference to the vehicle-ID
	DefaultLanguage	**1:1**	*IBIS-IP.language*	Definition of the default language
	GlobalDisplayContent	**0:***	*+DisplayContentStructure*	Trip Independent display content, slected by TripState (cf. also VDV 301-2-1 DisplayContent)
	TripInformation	**0:2**	*+TripInformation*	Trip information (cf. also VDV 301-2-1, "tripInformation")
	CurrentStopIndex	1:1	*IBIS-IP.int*	Index of the current stop
VehicleInformationGroup	***RouteDeviation***	1:1	*RouteDeviationEnumeration*	Information, if there exists a deviation of the planned route (cf. also VDV 301-2-1, "RouteDeviationEnumeration").
	DoorState	0:1	*DoorOpenStateEnumeration*	Information about the door state (cf. also VDV 301-2-1, „DoorOpenStateEnumeration")
	InPanic	0:1	*IBIS-IP.boolean*	Information about the panic button state
	VehicleStopRequested	0:1	*IBIS-IP.boolean*	Stop request status information
	ExitSide	0:1	*ExitSideEnumeration*	Exit side information (cf. also VDV 301-2-1, „ExitSide")
	MovingDirectionForward	0:1	*IBIS-IP.boolean*	Information about the moving direction
	VehicleMode	0:1	*VehicleModeEnumeration*	Vehicle mode information (cf. also VDV 301-2-1, „VehicleModeEnumeration") Should not be used from V2.2 on, please use MyOwnVehicleMode instead (see the line below)
	MyOwnVehicleMode	0:1	*NetexMode*	Vehicle mode and submode information an the vehicle I am in (cf. also VDV 301-2-1, „NetexMode")
	SpeakerActive	0:1	*IBIS-IP.boolean*	Information, wether an acoustic passenger announcement is active right now
	StopInformationActive	0:1	*IBIS-IP.boolean*	Used to switch on/off the passenger information intentionally (e.g. in case the planned route is left)
	TripState	0:1	*TripStateEnumeration*	Different states of the trip, to select which DisplayContent should be used, GlobalDisplayContent or TripInformation. cf. also VDV 301-2-1, „TripStateEnumeration")

Table 3: Description ofCustomerInformationService.AllData

1.6 Data Structures of SubscribeAllData Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "SubscribeRequest" and "SubscribeResponse" ibid.).

1.7 Data Structures of UnsubscribeAllData Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "UnsubscribeRequest" and "UnsubscribeResponse" ibid.).

1.8 Data Structure of GetCurrentAnnouncement Operation

1.8.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.8.2 Response

CustomerInformationService. GetCurrentAnnouncementResponse				*+Structure*	**Response structure for the current announcement request**
				Choice	One of the following structures
	a	***CurrentAnnouncement Data***	**–1:1**	*+CustomerInformationService.CurrentAnnouncementData*	Detailed response structure (cf. below)
	b	***OperationErrorMessage***		*IBIS-IP.string*	Error message

Table 4: Description of CustomerInformationService.GetCurrentAnnouncementResponse

CustomerInformationService. CurrentAnnouncementData			*+Structure*	**Detailed Response structure for the current announcement request**
	TimeStamp	**1:1**	*IBIS-IP.dateTime*	Response time stamp
	CurrentAnnouncement	**1:1**	*+Announcement*	Announcement information (cf. VDV 301-2-1, “Announcement”)

Table 5: Description of CustomerInformationService.CurrentAnnouncementData

1.9 Data Structure of SubscribeCurrentAnnouncement Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “SubscribeRequest” and “SubscribeResponse” ibid.).

1.10 Data Structure of UnsubscribeCurrentAnnouncement Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “UnsubscribeRequest” and “UnsubscribeResponse” ibid.).

1.11 Data Structure of GetCurrentConnectionInformation Operation

1.11.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.11.2 Response

CustomerInformationService. GetCurrentConnectionResponse				*+Structure*	**Response structure for information at current connection**
				Choice	One of the structures below
	a	***CurrentConnectionData***	**–1:1**	*+CustomerInformationService.CurrentConnectionData*	Detailed response structure (cf. below)
	b	***OperationErrorMessage***		*IBIS-IP.string*	Error message

Table 6: Description von CustomerInformationService.GetCurrentConnectionResponse

CustomerInformationService. CurrentConnectionData			*+Structure*	**Response structure for the request of the current connection**
	TimeStamp	**1:1**	*IBIS-IP.dateTime*	Response time stamp
	CurrentConnection	**0:***	*+Connection*	Information about the connection (cf. VDV 301-2-1„"Connection")

Table 7: Description of CustomerInformationService.CurrentConnectionData

1.12 Data Structure of SubscribeCurrentConnectionInformation Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "SubscribeRequest" and "SubscribeResponse" ibid.).

1.13 Data Structure of UnsubscribeCurrentConnectionInformation Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "UnsubscribeRequest" and "UnsubscribeResponse" ibid.).

1.14 Data Structure of GetCurrentDisplayContent Operation

1.14.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.14.2 Response

CustomerInformationService. GetCurrentDisplayContentResponse				*+Structure*	**Structure with the response with the current display content**
				Choice	One of the structures below
	a	***CurrentDisplayContentData***	**–1:1**	*+CustomerInformationService.CurrentDisplayContentData*	detailed response structure (cf. below)
	b	***OperationErrorMessage***		*IBIS-IP.string*	Error message

Table 8: Description of CustomerInformationService.GetCurrentDisplayContentResponse

CustomerInformationService. CurrentDisplayContentData			*+Structure*	**Response structure with the current data content for displays**
	TimeStamp	**1:1**	*IBIS-IP.dateTime*	Response time stamp
	CurrentDisplayContent	**1:***	*+DisplayContent*	Data content structure for displays (cf. VDV 301-2-1, “DisplayContent”)

Table 9: Description of CustomerInformationService.CurrentDisplayContentData

1.15 Data Structure of SubscribeCurrentDisplayContent Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “SubscribeRequest” and “SubscribeResponse” ibid.).

1.16 Data Structure of UnsubscribeCurrentDisplayContent Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “UnsubscribeRequest” and “UnsubscribeResponse” ibid.).

1.17 Data Structure of GetCurrentStopPoint Operation

1.17.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.17.2 Response

CustomerInformationService. GetCurrentStopPointResponse				*+Structure*	**Response structure with information about the current stop point**
				Choice	One of the structures below
	a	***CurrentStopPointData***	**–1:1**	*+CustomerInformationService.CurrentStopPointData*	detailed response structure (cf. below)
	b	***OperationErrorMessage***		*IBIS-IP.string*	Error message

Table 10: Description of CustomerInformationService.GetCurrentStopPointResponse

CustomerInformationService. CurrentStopPointData			*+Structure*	**Response structure which describes the current stop point data**
	TimeStamp	**1:1**	*IBIS-IP.dateTime*	Response time stamp
	CurrentStopPoint	**1:1**	*+StopInformation*	Information to the current stop point (cf. VDV 301-2-1, “StopInformation”)

Table 11: Description of CustomerInformationService.CurrentStopPointData

1.18 Data Structure of SubscribeCurrentStopPoint Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “SubscribeRequest” and “SubscribeResponse” ibid.).

1.19 Data Structure of UnsubscribeCurrentStopPoint Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “UnsubscribeRequest” and “UnsubscribeResponse” ibid.).

1.20 Data Structure of GetCurrentStopIndex Operation

1.20.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.20.2 Response

CustomerInformationService. GetCurrentStopIndexResponse				*+Structure*	**Response structure for the current stop point index**
				Choice	One of the structures below
	a	***CurrentStopIndexData***	**–1:1**	*+CustomerInformationService.CurrentStopIndexData*	detailed response structure (cf. below)
	b	***OperationErrorMessage***		*IBIS-IP.string*	Error message

Table 12: Description of CustomerInformationService.GetCurrentStopIndexResponse

CustomerInformationService. CurrentStopIndexData			*+Structure*	**Response structure with the data content of the current stop index**
	TimeStamp	**1:1**	*IBIS-IP.dateTime*	Response time stamp
	CurrentStopIndex	**1:1**	*IBIS-IP.int*	Stop index information

Table 13: Description of CustomerInformationService.CurrentStopIndexData

1.21 Data Structure of SubscribeCurrentStopIndex Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “SubscribeRequest” and “SubscribeResponse” ibid.).

1.22 Data Structure of UnsubscribeCurrentStopIndex Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “UnsubscribeRequest” and “UnsubscribeResponse” ibid.).

1.23 Data Structure of GetTripData Operation

1.23.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.23.2 Response

CustomerInformationService. GetTripDataResponse				*+Structure*	**Response Structure with the current trip data**
				Choice	One of the structures below
	a	***TripData***	**–1:1**	*+CustomerInformationService.TripData*	detailed response structure (cf. below)
	b	***OperationErrorMessage***		*IBIS-IP.string*	Error message

Table 14: Description of CustomerInformationService.GetTripDataResponse

CustomerInformationService.TripData			*+Structure*	**Response structure with trip data content**
	TimeStamp	**1:1**	*IBIS-IP.dateTime*	Response time stamp
	VehicleRef	**1:1**	*IBIS-IP.NMTOKEN*	Reference at vehicle ID
	DefaultLanguage	**1:1**	*IBIS-IP.language*	Information about the default language
	TripInformation	**1:1**	*+TripInformation*	Trip information (cf. VDV 301-2-1, „TripInformation“)
	CurrentStopIndex	**1:1**	*IBIS-IP.int*	Information for the current stop index

Table 15: Description of CustomerInformationService.TripData

1.24 Data Structure of SubscribeTripData Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “SubscribeRequest” and “SubscribeResponse” ibid.).

1.25 Data Structure of UnsubscribeTripData Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “UnsubscribeRequest” and “UnsubscribeResponse” ibid.).

1.26 Data Structure of GetVehicleData Operation

1.26.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.26.2 Response

CustomerInformationService. GetVehicleDataResponse				*+Structure*	**Response structure with vehicle data**
				Choice	One of the structures below
	a	***VehicleData***	**–1:1**	*+CustomerInformationService. VehicleData*	detailed response structure (cf. below)
	b	***OperationErrorMessage***		*IBIS-IP.string*	Error message

Table 16: Description of CustomerInformationService.GetVehicleDataResponse

CustomerInformationService.VehicleData			*+Structure*	**Structure with vehicle data content**
	TimeStamp	**1:1**	*IBIS-IP.dateTime*	Response time stamp
	VehicleRef	**1:1**	*IBIS-IP.NMTOKEN*	Reference at a specific vehicle-ID
VehicleInformationGroup	***RouteDeviation***	1:1	*RouteDeviationEnumeration*	Information, if there is a route deviation (cf. VDV 301-2-1, „RouteDeviationInformation“)
	DoorState	0:1	*DoorOpenStateEnumeration*	Information about the door state (cf. VDV 301-2-1, “DoorStateEnumeration”)
	InPanic	0:1	*IBIS-IP.boolean*	Information about the panic button state
	VehicleStopRequested	0:1	*IBIS-IP.boolean*	Stop request status information
	ExitSide	0:1	*ExitSideEnumeration*	Exit side information (cf. VDV 301-2-1, „ExitSideEnumeration“)
	MovingDirectionForward	0:1	*IBIS-IP.boolean*	Information about the moving direction
	VehicleMode	0:1	*VehicleModeEnumeration*	Information about the vehicle mode (cf. VDV 301-2-1, „VehicleModeEnumeration“) Should not be used from V2.2 on, please use my own vehicle mode
	MyOwnVehicleMode	0:1	*PtModesEnumeration*	Vehicle mode information for different subtypes Vehicle mode information for different subtypes (cf. also VDV 301-2-1, „PtModesEnumeration“)
	SpeakerActive	0:1	*IBIS-IP.boolean*	Information, wether an acoustic passenger announcement is active right now
	StopInformationActive	0:1	*IBIS-IP.boolean*	Used to switch on/off the passenger information intentionally (e.g. in case the planned route is left)
	TripState	0:1	*TripStateEnumeration*	Different states of the trip, to select which DisplayContent should be used, GlobalDisplayContent or TripInformation

Table 17: Description of CustomerInformationService.VehicleData

1.27 Data Structure of SubscribeVehicleData Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “SubscribeRequest” and “SubscribeResponse” ibid.).

1.28 Data Structure of UnsubscribeVehicleData Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “UnsubscribeRequest” and “UnsubscribeResponse” ibid.).

1.29 Data Structure of RetrievePartialStopSequence Operation

1.29.1 Request

CustomerInformationService.RetrievePartialStopRequest			*+Structure*	**Request structure for an defined part of the stop point sequence**
	StartingStopIndex	**1:1**	*IBIS-IP.int*	First stop index of the index queue
	NumberOfStopPoints	**1:1**	*IBIS-IP.int*	Requested number of stop points

Table 18: Description of CustomerInformationService.RetrievePartialStopRequest

1.29.2 Response

CustomerInformationService.RetrievePartialStopSequenceResponse				*+Structure*	**Response structure for a partial stop point sequence request**
				Choice	One of the structures below
	a	***PartialStopSequenceData***	**–1:1**	*+CustomerInformationService.PartialStopSequenceData*	detailed response structure (cf. below)
	b	***OperationErrorMessage***		*IBIS-IP.string*	Error message

Table 19: Description of CustomerInformationService.RetrievePartialStopSequenceResponse

CustomerInformationService.PartialStopSequenceData			*+Structure*	**Response structure with the detailed data content for a partial stop index request**
	TimeStamp	**1:1**	*IBIS-IP.dateTime*	Response time stamp
	StopSequence	**1:1**	*+StopSequence*	Information for a defined stop sequence (cf. VDV 301-2-1, „StopSequence“)

Table 20: Description of CustomerInformationService.PartialStopSequenceData

2 Versionshistorie/Version history

2.1 Version 2.0

2.1.1 Funktionale Erweiterungen
Functional Upgrade

Keine/none

2.1.2 Technische Ergänzungen/Korrekturen
Technical Upgrade/Corrections

— *CurrentDisplayContentData* Struktur aktualisiert: *CurrentDisplayContent*: maxOccurs=”unbounded” (vgl. 1.14)
CurrentDisplayContentData structure updated: *CurrentDisplayContent*: maxOccurs=”unbounded” (cf. 1.14)

— *CurrentConnectionInformation* structure aktualisiert: *CurrentConnection:* minOccurs=”0” maxOccurs=”unbounded” (vgl. 1.11)
CurrentConnectionInformation structure updated: *CurrentConnection:* minOccurs=”0” maxOccurs=”unbounded” (cf. 1.11)

2.1.3 Textliche Korrekturen
Textual Corrections

— Abschnitt 1.3 ergänzt
section 1.3 added

— Tippfehler in der Tabelle in Abschnitt 1.2 korrigiert
typos in the table in section 1.2 corrected

2.2 Version 2.2

2.2.1 Funktionale Erweiterungen
Functional Upgrade

— GlobalDisplayContent hinzugefügt/added (1.5.2)

— TripState hinzugefügt/added (1.5.2; 1.26.2)

— Myownvehicle added in GetAllData and GetVehicleData (1.5.2; 1.26.2)

2.2.2 Technische Ergänzungen/Korrekturen
Technical Upgrade/Corrections

- Prozess der Haltestellenfortschaltung genau beschriebven
  Process of current stop index in detail decribed

- TripInformation geändert von 1:2 nach 0:2 (1.5.2)
  TripInformation changed from 1:2 to 0:2 (1.5.2)

- Info bei VehicleMode um stattdessen MyOwnVehicle zu verwenden.
  Info at VehicleMode to use MyOwnVehicle instead.

Regelwerke – Normen und Empfehlungen / Rules and regulations - standards and recommendations

(1)	CEN/TS 13149-7	Öffentlicher Verkehr - Planungs- und Steuerungssysteme für Straßenfahrzeuge - Teil 7: System- und Netzwerkarchitektur; Englische Fassung CEN/TS 13149-7:2015 / Public transport - Road vehicle scheduling and control systems - Part 7: System and Network Architecture
(2)	CEN/TS 13149-8	Öffentlicher Verkehr - Planungs- und Steuerungssysteme für Straßenfahrzeuge - Teil 8: Physikalische Schicht für IP-Kommunikation; Englische Fassung CEN/TS 13149-8:2013 / Public transport - Road vehicle scheduling and control systems - Part 8: Physical layer for IP communication
(3)	VDV 301-1	Internetprotokoll basiertes integriertes Bordinformationssystem IBIS-IP - Teil 1: Systemarchitektur / VDV 301-1: IBIS-IP, Part 1: System architecture
(4)	VDV 301-2	Internetprotokoll basiertes integriertes Bordinformationssystem IBIS-IP - Teil 2: Schnitstellenspezifikation / VDV 301-2: IBIS-IP, Part 2: Interface Specification V1.0
(5)	VDV 301-2-1	IBIS-IP Beschreibung der Dienste - Gemeinsame Datenstrukturen und Aufzählungstypen / IBIS-IP Description of Services – Common Data Structures and Enumerations

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