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**VDV-Schrift**

**301-2-1**

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**IBIS-IP Beschreibung der Dienste /  
Service description**

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**Gemeinsame Datenstrukturen und Aufzählungstypen/  
Common data structures and enumerations**

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**Gesamtbearbeitung**

Ausschuss für Telematik und Informationssysteme (ATI)

Gefördert durch:



aufgrund eines Beschlusses  
des Deutschen Bundestages



# IBIS-IP Beschreibung der Dienste / Service description

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Gemeinsame Datenstrukturen und Aufzählungstypen/  
Common data structures and enumerations

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**Gesamtbearbeitung**

Unterausschuss für Telematik (UA-Telematik)

**Autorenverzeichnis**

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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 wie auch die Basisdienste, welche die Grundlagen eines IBIS-IP-Systems bilden, beschrieben.

Die VDV-Schrift 301-2-1 beschreibt die gemeinsamen Datenstrukturen und Aufzählungstypen.

### **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 as well as the basic services of the IBIS-IP systems are described in the VDV-301-2.

The VDV 301-2-1 describes the common data structures and enumerations.

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# 1 Gemeinsam genutzte Daten-Strukturen

## Common data structure

### 1.1 AdditionalAnnouncement

<b>AdditionalAnnouncement</b>			<b>+Structure</b>	<b>Structure which describes the additional information for an announcement</b>
	<b>AnnouncementRef</b>	1:1	<i>IBIS-IP.NMOKEN</i>	announcement reference
	<i>AnnouncementText</i>	0:*	<i>+InternationalTextType</i>	Announcement text
	<i>AnnouncementTTSText</i>	0:*	<i>+InternationalTextType</i>	Announcement text for text to speech engines
			<i>choice</i>	One of the choices below
a	<b>ImmediateInformation</b>	-1:1	<i>IBIS-IP.boolean</i>	Immediate sending of the additional announcement
b	<b>PeriodicalInformation</b>		<i>IBIS-IP.duration</i>	Periodical sending of the additional announcement
c	<b>InformationAtSpecificPoint</b>		<i>+SpecificPoint</i>	Sending of an announcement at a specific (trip) point (point information cf. 1.34)

Table 1 Description of AdditionalAnnouncement

### 1.2 Announcement

<b>Announcement</b>			<b>+Structure</b>	<b>Structure with information which is needed for an announcement</b>
	<b>AnnouncementRef</b>	1:1	<i>IBIS-IP.NMOKEN</i>	announcement reference
	<i>AnnouncementText</i>	0:*	<i>+InternationalTextType</i>	Announcement text
	<i>AnnouncementTTSText</i>	0:*	<i>+InternationalTextType</i>	Announcement text for text to speech engines

Table 2 Description of Announcement

### 1.3 BayArea

<b>BayArea</b>			<b>+Structure</b>	<b>Structure which describes the bay area (in relation to the stop sign)</b>
	<i>BeforeBay</i>	0:1	<i>IBIS-IP.double</i>	Bay begin, distance to the stop sign in meters in moving direction
	<i>BehindBay</i>	0:1	<i>IBIS-IP.double</i>	Bay ending, distance after the stop sign in meters in moving direction

Table 3 Description of BayArea

## 1.4 BeaconPoint

<b>BeaconPoint</b>			<b>+Structure</b>	<b>Structure which describes a beacon point</b>
	<i>PointRef</i>	0:1	<i>IBIS-IP.NMOKEN</i>	Reference at a point
	<b>BeaconCode</b>	1:1	<i>IBIS-IP.NMOKEN</i>	Beacon code
	<i>ShortName</i>	0:*	<i>+International TextType</i>	Beacon short name
	<i>Description</i>	0:*	<i>+International TextType</i>	Description of the beacon

Table 4 Description of BeaconPoint

## 1.5 CardApplInformation

<b>CardApplInformations</b>			<b>+Structure</b>	<b>Structure for information of applications of a read card</b>
	<b>CardApplInformationLength</b>	1:1	<i>IBIS-IP.unsignedInt</i>	Length of the byte array from <i>CardApplInformationData</i>
	<b>CardApplInformationData</b>	1:*	<i>IBIS-IP.byte</i>	Data array for application data

Table 5 Description of CardApplInformation

## 1.6 CardTicketData

<b>CardTicketData</b>			<b>+Structure</b>	<b>information of tariff data on card</b>
	<b>CardTicketDataID</b>	1:1	<i>IBIS-IP.unsigned-Long</i>	Card ID
	<b>CardTicketDataLength</b>	1:1	<i>IBIS-IP.unsignedInt</i>	Length of ticket data
	<b>CardTicketData</b>	1:*	<i>IBIS-IP.byte</i>	Data array for ticket information

Table 6 Description of CardTicketData

## 1.7 CardType

<b>CardType</b>			<b>+Structure</b>	<b>Structure to describe a card type (ticket)</b>
	<b>CardSerialNumber</b>	1:1	<i>IBIS-IP.NMOKEN</i>	Serial number of the card
	<b>CardTypeID</b>	1:1	<i>IBIS-IP.NMOKEN</i>	Type ID of the card
	<i>CardTypeText</i>	0:*	<i>+International TextType</i>	Type ID of the card as string/text

Table 7 Description of CardType



## 1.8 Connection

<i>Connection</i>			+Structure	Structure which describes a connection
	<b>StopRef</b>	1:1	<i>IBIS-IP.NMTOKEN</i>	Reference at a stop point which the connection is concerning on
	<b>ConnectionRef</b>	1:1	<i>IBIS-IP.NMTOKEN</i>	Reference at the connection
	<b>ConnectionType</b>	1:1	<i>ConnectionTypeEnumeration</i>	Type of connection (cf. 2.2)
	<b>DisplayContent</b>	0:1	+ <i>DisplayContent</i>	Display content of the distributor (cf. 1.19)
	<b>Platform</b>	0:1	<i>IBIS-IP.string</i>	Information about the platform for the interchange
	<b>ConnectionState</b>	0:1	<i>ConnectionStateEnumeration</i>	Description of the connection state in case of a ordered connection (cf. 2.1)
	<b>TransportMode</b>	0:1	+ <i>Vehicle</i>	Information about the transport mode for the connection (cf.1.59)
	<b>ExpectedDepartureTime</b>	0:1	<i>IBIS-IP.dateTime</i>	Information on the expected departure
	<b>ScheduledDepartureTime</b>	0:1	<i>IBIS-IP.dateTime</i>	Information on the planned departure

Table 8 Description of Connection

## 1.9 DataAcceptedResponse

<i>DataAcceptedResponse</i>			+Structure	Struktur eines Dienstes zur Beantwortung einer Operation, welche Daten dem Dienst zur Verfügung stellt
	<b>DataAcceptedResponseData</b>	1:1	+ <i>DataAcceptedResponseDataStructure</i>	Ausführliche Antwortstruktur (siehe 1.10)
	<b>OperationErrorMessage</b>	1:1	<i>IBIS-IP.string</i>	Fehlermeldung

Table 9 Description of DataAcceptedResponse

## 1.10 DataAcceptedResponseData

<i>DataAcceptedResponseData</i>			+Structure	Detailed response structure including data
	<b>TimeStamp</b>	1:1	<i>IBIS-IP.dateTime</i>	Time stamp of the response
	<b>DataAccepted</b>	1:1	<i>IBIS-IP.boolean</i>	Data acknowledge
	<b>ErrorCode</b>	0:1	<i>ErrorCodeEnumeration</i>	Descriptive value for an error (cf. 2.9)
	<b>ErrorInformation</b>	0:1	<i>IBIS-IP.string</i>	Error code information (free text)

Table 10 Description of DataAcceptedResponseData

## 1.11 DataVersion

With the data version different versions of this XML-Scheme are possible in one system.

<b>DataVersion</b>			+Structure	<b>Structure with information of the data version</b>
	<b>DataType</b>	1:1	<i>IBIS-IP.string</i>	Free text description of the data type
	<b>VersionRef</b>	1:1	<i>IBIS-IP.NMOKEN</i>	Version information

Table 11 Description of DataVersion

## 1.12 DataVersionList

<b>DataVersionList</b>			+Structure	<b>Structure with which several data versions can be listed</b>
	<b>DataVersion</b>	1:*	+DataVersion	Data Structure for the description of data types (cf. 1.11)

Table 12 Description of DataVersionList

## 1.13 Destination

<b>Destination</b>			+Structure	<b>Structure with information about the destination</b>
	<b>DestinationRef</b>	1:1	<i>IBIS-IP.NMOKEN</i>	Reference at the display destination text
	<b>DestinationName</b>	0:*	+International TextType	Text which is published at the display
	<b>DestinationShortName</b>	0:*	+International TextType	Short text which is published at the display

Table 13 Description of Destination

## 1.14 DeviceInformation

<b>DeviceInformation</b>			+Structure	<b>Structure with non changeable device configuration data</b>
<i>DeviceInformationGroup</i>	<b>DeviceName</b>	1:1	<i>IBIS-IP.string</i>	Device name
	<b>Manufacturer</b>	1:1	<i>IBIS-IP.string</i>	Manufacturer of the device
	<b>SerialNumber</b>	1:1	<i>IBIS-IP.NMOKEN</i>	Serial number of the device
	<b>DeviceClass</b>	1:1	+DeviceClass Enumeration	One of the possible device class (cf. 2.3)
	<b>DataVersionList</b>	0:1	+DataVersion List	List with the data versions (cf. 1.12)
	<b>WebInterfaceAddress</b>	0:1	<i>IBIS-IP.anyURI</i>	URI for a optional web interface for maintenance

Table 14 Description of DeviceInformation

## 1.15 DeviceSpecification

<i>DeviceSpecification</i>			<i>+Structure</i>	<b>Structure which describes a device</b>
	<b><i>DeviceClass</i></b>	1:1	<i>DeviceClassE</i> <i>numeration</i>	One of the available device <b>classes</b> (cf. 2.3)
	<b><i>DeviceID</i></b>	1:1	<i>IBIS-</i> <i>IP.NMTOKEN</i>	Device-ID

Table 15 Description of DeviceSpecification

## 1.16 DeviceSpecificationList

<i>DeviceSpecificationList</i>			<i>+Structure</i>	<b>Structure with the device specification list</b>
	<b><i>DeviceSpecification</i></b>	1:*	<i>+DeviceSpecif</i> <i>ication</i>	Device information (cf. 1.15)

Table 16 Description of DeviceSpecificationList

## 1.17 DeviceSpecificationWithState

<i>DeviceSpecificationWithState</i>			<i>+Structure</i>	<b>Structure with the device specification including the current working states</b>
	<b><i>DeviceSpecification</i></b>	1:1	<i>+DeviceSpecif</i> <i>ication</i>	Structure which describes a device (cf. 1.15)
	<b><i>DeviceState</i></b>	1:1	<i>DeviceStateE</i> <i>numeration</i>	possible states of the device (cf. 2.4)

Table 17 Description of DeviceSpecificationWithState

## 1.18 DeviceSpecificationWithStateList

<i>DeviceSpecificationWithStateList</i>			<i>+Structure</i>	<b>List of objects of with device specifications and their states</b>
	<b><i>DeviceSpecificationWithState</i></b>	1:*	<i>+DeviceSpecif</i> <i>icationWithState</i>	Structure with the device specification including the current working states

Table 18 Description of DeviceSpecificationWithStateList

## 1.19 DisplayContent

<i>DisplayContent</i>			+Structure	Structure with the complete display content
	<i>DisplayContentRef</i>	0:1	<i>IBIS-IP.NMOKEN</i>	Reference at the display content
	<b>LineInformation</b>	1:1	+ <i>LineInformation</i>	information about the line, which has to be displayed (cf. 1.31)
	<b>Destination</b>	1:1	+ <i>Destination</i>	Information about the destination, which has to be displayed (cf. 1.13)
	<i>ViaPoint</i>	0:*	+ <i>ViaPoint</i>	Information about the via points, which has to be displayed (cf. 1.60)
	<i>AdditionalInformation</i>	0:*	+ <i>InternationalTextType</i>	Information about the additional information like express bus, additional bus etc. , which has to be displayed
<i>Display Policy</i>	<i>Priority</i>	0:1	<i>IBIS-IP.nonNegativeInteger</i>	Information about the display priority
	<i>PeriodDuration</i>	0:1	<i>IBIS-IP.duration</i>	Information about the period duration
	<i>Duration</i>	0:1	<i>IBIS-IP.duration</i>	Duration of a display turn

Table 19 Description of DisplayContent

## 1.20 DoorCounting

<i>DoorCounting</i>			+Structure	Counting data of a door
	<b>ObjectClass</b>	1:1	<i>DoorCountingObjectClassEnumeration</i>	Value with the detailed description of the counted object (cf. chapter 2.5)
	<b>In</b>	1:1	+ <i>IBIS-IP.int</i>	Number of boarded passengers
	<b>Out</b>	1:1	+ <i>IBIS-IP.int</i>	Number of escaped passengers
	<i>CountQuality</i>	0:1	<i>DoorCountingQualityEnumeration</i>	Textstring with information on the quality of counting (cf. 2.6)

Table 20 Description of DoorCounting

## 1.21 DoorCountingList

<i>DoorCountingList</i>			+Structure	Structure for a list of door with for which values are set
	<b>DoorID</b>	1:1	<i>IBIS-IP.NMOKEN</i>	ID for identification of the door
	<b>CountSet</b>	1:*	+ <i>DoorCounting</i>	Structure with counting values (cf. chapter 1.20)

Table 21 Description of DoorCountingList

## 1.22 DoorInformation

<i>DoorInformation</i>			<i>+Structure</i>	<b>Structure with information about the counting at a specific door</b>
	<b>DoorID</b>	1:1	<i>IBIS-IP.NMOKEN</i>	ID for identification of the door
	<b>Count</b>	1:*	<i>+DoorCounting</i>	structure for the counting data (cf. 1.20)
	<b>State</b>	0:1	<i>+DoorState</i>	Structure with door states (cf. 1.25)

Table 22 Description of DoorInformation

## 1.23 DoorOpenState

<i>DoorOpenState</i>			<i>+Structure</i>	<b>Door state</b>
	<b>Value</b>	1:1	<i>DoorOpenStateEnumeration</i>	Description value of the opening state of a door (cf. 2.7)
	<b>ErrorCode</b>	0:1	<i>ErrorCodeEnumeration</i>	Descriptive value for an error (cf. 2.9)

Table 23 Description of DoorOpenState

## 1.24 DoorOperationState

<i>DoorOperationState</i>			<i>+Structure</i>	<b>Door operation state</b>
	<b>Value</b>	1:1	<i>DoorOperationStateEnumeration</i>	Description value of the operation state (cf. chapter 2.8)
	<b>ErrorCode</b>	0:1	<i>ErrorCodeEnumeration</i>	Descriptive value for an error (cf. chapter 2.9)

Table 24 Description of DoorOperationState

## 1.25 DoorState

<i>DoorState</i>			<i>+Structure</i>	<b>Structure for description of the door state</b>
	<b>OpenState</b>	1:1	<i>+DoorOpenState</i>	Structure for description of door opening state (cf. 1.23)
	<b>OperationState</b>	0:1	<i>+DoorOperationState</i>	Structure for description of the door operation state (cf. 1.24)

Table 25 Description of DoorState

## 1.26 FareZoneInformation

<b>FareZoneInformation</b>			<i>+Structure</i>	<b>Structure for the description of information for tariffs and fare zones</b>
<i>Fare-Zone-Information</i>	<b>FarezoneID</b>	1:1	<i>IBIS-IP.NMTOKEN</i>	Index of a fare zone
	<i>FarezoneType</i>	0:1	<i>+ZoneType</i>	Information about the fare zone type (cf. 1.61)
	<i>FarezoneLongName</i>	0:*	<i>+InternationalTextType</i>	Fare zone long name
	<i>FarezoneShortName</i>	0:*	<i>+InternationalTextType</i>	Fare zone short name

Table 26 Description of FareZoneInformation

## 1.27 GlobalCardStatus

<b>GlobalCardStatus</b>			<i>+Structure</i>	<b>Global card status</b>
	<b>GlobalCardStatusID</b>	1:1	<i>IBIS-IP.unsignedInt</i>	ID of Card status based on the EN 1545
	<i>GlobalCardStatusText</i>	0:*	<i>IBIS-IP.string</i>	Text of global card status based on the EN 1545

Table 27 Description of GlobalCardStatus

## 1.28 GNSSPoint

<b>GNSSPoint</b>			<i>+Structure</i>	<b>Structure which describes a point where coordinates are used for locating the point</b>
	<i>PointRef</i>	0:1	<i>IBIS-IP.NMTOKEN</i>	Reference at a GNSS point
	<b>Longitude</b>	1:1	<i>+GNSSCoordinate</i>	Structure for geographical longitude (cf. 1.29)
	<b>Latitude</b>	1:1	<i>+GNSSCoordinate</i>	Structure for geographical latitude (cf. 1.29)
	<i>Altitude</i>	0:1	<i>IBIS-IP.double</i>	Geographical Altitude

Table 28 Description of GNSSPoint

## 1.29 GNSSCoordinate

<b>GNSSCoordinate</b>			<i>+Structure</i>	<b>Structure for describing coordinates on the surface</b>
	<b>Degree</b>	1:1	<i>IBIS-IP.double</i>	Coordinate in degree
	<b>Direction</b>	1:1	<i>IBIS-IP.string</i>	geographical direction

Table 29 Description of GNSSCoordinate

### 1.30 JourneyStopInformation

<i>JourneyStopInformation</i>			<i>+Structure</i>	<b>Structure to describe a stop point by the Journey Information Determination</b>
	<b>StopRef</b>	1:1	<i>IBIS-IP.NMOKEN</i>	Reference at the stop point
	<b>StopName</b>	1:*	<i>+International TextType</i>	Name of stop point
	<i>StopAlternativeName</i>	0:*	<i>+International TextType</i>	Alternative name of stop point
	<i>Platform</i>	0:1	<i>IBIS-IP.string</i>	Name of the platform
	<b>DisplayContent</b>	1:*	<i>+DisplayContent</i>	Information about display content (cf. 1.19)
	<i>Announcement</i>	0:*	<i>+Announcement</i>	Information for announcement (cf. 1.2)
	<i>ArrivalScheduled</i>	0:1	<i>IBIS-IP.dateTime</i>	Scheduled arrival
	<i>DepartureScheduled</i>	0:1	<i>IBIS-IP.dateTime</i>	Scheduled departure
	<i>Connection</i>	0:*	<i>+Connection</i>	Information about the connections (cf. 1.8)
	<i>BayArea</i>	0:1	<i>+BayArea</i>	Information about the size of the Bay Area (cf. 1.3)
	<i>GNSSPoint</i>	0:1	<i>+GNSSPoint</i>	Information for the Geo-Coordinates of the stop point (cf. 1.28)
	<i>FareZone</i>	0:*	<i>IBIS-IP.NMOKEN</i>	Valid fare zone at the current stop point

Table 30 Description of JourneyStopInformation

### 1.31 LineInformation

<i>LineInformation</i>			<i>+Structure</i>	<b>Structure for description of the line information</b>
	<b>LineRef</b>	1:1	<i>IBIS-IP.NMOKEN</i>	Reference at the line
	<i>LineName</i>	0:*	<i>+International TextType</i>	name of line
	<i>LineShortName</i>	0:*	<i>+International TextType</i>	short name of line
	<i>LineNumber</i>	0:1	<i>IBIS-IP.int</i>	number of line

Table 31 Description of LineInformation

### 1.32 LogMessage

<i>LogMessage</i>			<i>+Structure</i>	<b>Structure for logging message</b>
	<b>MessageProvider</b>	1:1	<i>+DeviceSpecification</i>	Message provider (cf. 1.15)
	<b>MessageBody</b>	1:1	<i>+Message</i>	Message content (cf. 1.33)

Table 32 Description of LogMessage

### 1.33 Message

<i>Message</i>			<i>+Structure</i>	<b>Structure for describing a message</b>
	<i>Message-ID</i>	1:1	<i>IBIS-IP.int</i>	index of message
	<i>TimeStamp</i>	1:1	<i>IBIS-IP.dateTime</i>	time stamp, when the message was created
	<i>MessageType</i>	1:1	<i>MessageType Enumeration</i>	kind of message (cf. chapter 2.17)
	<i>MessageText</i>	1:1	<i>IBIS-IP.string</i>	Message text

Table 33 Description of Message

### 1.34 Point

<i>Point</i>			<i>+Structure</i>	<b>Structure with (logical) point description</b>
	<i>PointIndex</i>	1:1	<i>IBIS-IP.int</i>	Point index
	<i>PointType</i>	1:1	<i>+PointType</i>	Type of the point (cf. chapter 1.36)
	<i>DistanceToPreviousPoint</i>	1:1	<i>IBIS-IP.int</i>	Distance to the previous point in [m]

Table 34 Description of Point

### 1.35 PointSequence

<i>PointSequence</i>			<i>+Structure</i>	<b>Structure for describing a sequence of points</b>
	<i>Point</i>	2:*	<i>+Point</i>	Description of points (cf. 1.34)

Table 35 Description of PointSequence

### 1.36 PointType

<i>PointType</i>			<i>+Structure</i>	<b>Structure for choosing a specific point type</b>
			<i>choice</i>	One of the structures below
a	<i>StopPoint</i>	-1:1	<i>+JourneyStopInformation</i>	Stop point (cf. chapter 1.30)
b	<i>BeaconPoint</i>		<i>+BeaconPoint</i>	Beacon point (cf. chapter 1.4)
c	<i>GNSSLocationPoint</i>		<i>+GNSSPoint</i>	Point, location described in coordinates (cf. chapter 1.28)
d	<i>TimingPoint</i>		<i>+TimingPoint</i>	Point where a schedule comparison should take place (cf. chapter 1.53)
e	<i>TSPPoint</i>		<i>+TSPPoint</i>	Point for traffic light prioritisation (cf. chapter 1.56)

Table 36 Description of PointType

### 1.37 ServiceIdentification

The ServiceIdentification structure allows identifying a service in the system. Contrary to the ServiceSpecification (cf. 1.42) this structure is additionally including the information about the device where the service is running.



<b>ServiceIdentification</b>			+Structure	<b>Structure for the unique identification of a service in the system</b>
	<b>ServiceName</b>	1:1	+ServiceSpecification	Structure for the service description
	<b>Device</b>	1:1	+DeviceSpecification	Structure for device description

Table 37 Description of ServiceIdentification

### 1.38 ServiceIdentificationWithState

<b>ServiceIdentificationWithState</b>			+Structure	<b>Structure for unique identification of a service in the whole system including its state</b>
	<b>ServiceIdentification</b>	1:1	+ServiceIdentification	Structure for unique identification of a service in the whole system (cf. 1.37)
	<b>ServiceState</b>	1:1	ServiceStateEnumeration	Information about the state of the service

Table 38 Description of ServiceIdentificationWithState

### 1.39 ServiceIdentificationWithStateList

<b>ServiceIdentificationWithStateList</b>			+Structure	<b>Structure with a list of all unique services and their state in the system</b>
	<b>ServiceIdentificationWithState</b>	1:*	+ServiceIdentificationWithState	Structure for the unique identification of a service including its state (cf. 1.43)

Table 39 Description of ServiceIdentificationWithStateList

### 1.40 ServiceInformation

<b>ServiceInformation</b>			+Structure	<b>Structure for description of the services which are available on a device</b>
	<b>Service</b>	1:1	+ServiceSpecification	Structure for description of a service (cf. 1.42)
	<b>Autostart</b>	1:1	IBIS-IP.boolean	Information whether a service has to be started automatically by the DeviceManagement (and not by the SystemManagementService), especially relevant for the vehicle operation functionalities

Table 40 Description of ServiceInformation

### 1.41 ServiceInformationList

<b>ServiceInformationList</b>			+Structure	<b>Structure for describing a list of services which are available on a device</b>
	<b>ServiceInformation</b>	1:*	+ServiceInformation	Structure for describing available services (cf. 1.40)

Table 41 Description of ServiceInformationList

## 1.42 ServiceSpecification

Die ServiceSpecification beschreibt einen Dienst geräteweit eindeutig durch Angabe des ServiceNamens und der IBIS-IP-Version. Eine systemweit eindeutige Identifikation erfordert zusätzlich die Kenntnis des Gerätes, auf dem ein Dienst läuft. Die entsprechende Datenstruktur ist die Servicelentifikation (vgl. 1.37)

<b>ServiceSpecification</b>			+Structure	<b>Structure for the unique service identification on a device</b>
	<b>ServiceName</b>	1:1	<i>ServiceName Enumeration</i>	A possible service (cf. 0)
	<b>IBIS-IP-Version</b>	1:1	<i>IBIS-IP.NMOKEN</i>	Version information of the used protocol (this is especially necessary for the SystemManagementService to know which service (version) has to be started)

Table 42 Description of ServiceSpecification

## 1.43 ServiceSpecificationWithState

<b>ServiceSpecificationWithState</b>			+Structure	<b>Structure for the unique identification of a service at the device including its status</b>
	<b>ServiceSpecification</b>	1:1	<i>+ServiceSpecification</i>	Structure which describes a service (cf. 1.42)
	<b>ServiceState</b>	1:1	<i>ServiceState Enumeration</i>	Information about the operation state of the service

Table 43 Description of ServiceSpecificationWithState

## 1.44 ServiceSpecificationWithStateList

<b>ServiceSpecificationWithStateList</b>			+Structure	<b>Structure with a list of the service specifications including the operation states</b>
	<b>ServiceSpecificationWithState</b>	1:*	<i>+ServiceSpecificationWithState</i>	Description structure of a service including the operation state (cf 1.43)

Table 44 Description of ServiceSpecificationWithStateList

## 1.45 ServiceStartList

<b>ServiceStartList</b>			+Structure	<b>Structure with services that are available at one device</b>
	<b>Servicelentification</b>	1:*	<i>+Servicelentification</i>	Structure with all available services (cf. 1.37)

Table 45 Description of ServiceStartList

## 1.46 ShortTripStopList

<b>ShortTripStopList</b>			+Structure	<b>Structure with a list of all possible short trips</b>
	<b>ShortTripStopList</b>	1:*	<i>+StopPointTariffInformation</i>	Structure which describes one short trip (cf. 1.49)

Table 46 Description of ShortTripStopList

## 1.47 SpecificPoint

<b>SpecificPoint</b>			<b>+Structure</b>	<b>Structure with a specific point</b>
	<b>PointRef</b>	1:1	<i>IBIS-IP.NMTOKEN</i>	Reference at a point
	<b>DistanceToPreviousPoint</b>	1:1	<i>IBIS-IP.double</i>	Distance to the previous point in [m]

Table 47 Description of SpecificPoint

## 1.48 StopInformation

<b>StopInformation</b>			<b>+Structure</b>	<b>Structure for description of a stop point</b>
	<b>StopIndex</b>	1:1	<i>IBIS-IP.int</i>	Index of this stop point in a list of stop point
	<b>StopRef</b>	1:1	<i>IBIS-IP.NMTOKEN</i>	Reference at a stop point
	<b>StopName</b>	1:*	<i>+InternationalTextType</i>	name of stop point
	<b>StopAlternativeName</b>	0:*	<i>+InternationalTextType</i>	alternative name of stop point
	<b>Platform</b>	0:1	<i>IBIS-IP.string</i>	Name of the platform
	<b>DisplayContent</b>	1:*	<i>+DisplayContent</i>	Information about the display content (cf. chapter 1.19)
	<b>StopAnnouncement</b>	0:*	<i>+Announcement</i>	Information about the announcement (cf. chapter 1.2)
	<b>ArrivalScheduled</b>	0:1	<i>IBIS-IP.dateTime</i>	Scheduled arrival
	<b>DepartureScheduled</b>	0:1	<i>IBIS-IP.dateTime</i>	Scheduled departure
	<b>RecordedArrivalTime</b>	0:1	<i>IBIS-IP.dateTime</i>	Recorded arrival time
	<b>DistanceToNextStop</b>	0:1	<i>IBIS-IP.int</i>	Distance to the next stop point
	<b>Connection</b>	0:*	<i>+Connection</i>	Information about the connections (cf. chapter 1.8)
	<b>FareZone</b>	0:*	<i>IBIS-IP.NMTOKEN</i>	Valid fare zone at this stop point

Table 48 Description of StopInformation

## 1.49 StopPointTariffInformation

<b>StopPointTariffInformationStructure</b>			<b>+Structure</b>	<b>Structure with tariff information for a stop point</b>
<i>Stop-Point-Tariff-Information</i>	<b>JourneyStopInformation</b>	1:1	<i>+Journey-StopInformationStructure</i>	Information about the requested stop point (cf. 1.30)
	<b>FareZoneInformation</b>	1:1	<i>+FareZone-Information-Structure</i>	Information about the fare zone for this stop point (cf. 1.26)

Table 49 Description of StopInformation

## 1.50 StopSequence

<b>StopSequence</b>			<b>+Structure</b>	<b>Structure for describing a sequence of stop points</b>
	<b>StopPoint</b>	<b>2:*</b>	<b>+StopInformation</b>	Stop point information (cf. 1.48)

Table 50 Description of StopSequence

## 1.51 SubscribeRequest

<b>SubscribeRequest</b>			<b>+Structure</b>	<b>Structure with a subscription request</b>
	<b>Client-IP-Address</b>	<b>1:1</b>	<b>IBIS-IP.string</b>	IP address of the client for which subscription
	<b>ReplyPort</b>	<b>0:1</b>	<b>IBIS-IP.int</b>	Reply port for the subscription
	<b>Reply-Path</b>	<b>0:1</b>	<b>IBIS-IP.string</b>	Reply path for the subscriptions

Table 51 Description of SubscribeRequest

## 1.52 SubscribeResponse

<b>SubscribeResponse</b>			<b>+Structure</b>	<b>Structure for the subscription response</b>
			<b>Choice</b>	One of the structures below
a	<b>Active</b>	<b>-1:1</b>	<b>IBIS-IP.boolean</b>	Information about the subscription acknowledgement
b	<b>OperationErrorMessage</b>		<b>IBIS-IP.string</b>	Error message

Table 52 Description of SubscribeResponse

## 1.53 TimingPoint

<b>TimingPoint</b>			<b>+Structure</b>	<b>Structure for describing a point, where a schedule comparison should take place</b>
	<b>TimingPointRef</b>	<b>0:1</b>	<b>IBIS-IP.NMTOKEN</b>	Reference at a point
	<b>ScheduleTime</b>	<b>1:1</b>	<b>IBIS-IP.dateTime</b>	Scheduled departure time
	<b>GNSSPoint</b>	<b>1:1</b>	<b>+GNSSPoint</b>	GNSS information (cf. 1.28)

Table 53 Description of TimingPoint

## 1.54 TripInformation

<i>TripInformation</i>			+Structure	Structure with trip information
	<b>TripRef</b>	1:1	<i>IBIS-IP.NMOKEN</i>	Reference at the trip ID
	<b>StopSequence</b>	1:1	+ <i>StopSequence</i>	Description of a stop sequence (cf. 1.50)
	<b>LocationState</b>	0:1	<i>LocationState Enumeration</i>	Rough information for the current position between two stop point (cf. 2.16)
	<i>TimetableDelay</i>	0:1	<i>IBIS-IP.int</i>	Timetable delay in [min]
	<b>AdditionalTextMessage</b>	0:*	+ <i>International TextType</i>	Additional text information (possibly multilingual)
	<b>AdditionalAnnouncement</b>	0:*	+ <i>AdditionalAnnouncement</i>	Additional announcement (cf. 1.1)
	<i>RouteDirection</i>	0:1	+ <i>RouteDirectionEnumeration</i>	Information on the direction a route is served (cf. 2.19)

Table 54 Description of TripInformation

## 1.55 TripSequence

<i>TripSequence</i>			+Structure	Structure with a trip sequence
	<b>TripRef</b>	1:1	<i>IBIS-IP.NMOKEN</i>	Reference at the trip ID
	<i>TripIndex</i>	0:1	<i>IBIS-IP.int</i>	Index at the current trip
	<i>TripStart</i>	0:1	<i>IBIS-IP.time</i>	Scheduled trip start
	<i>CurrentStopIndex</i>	0:1	<i>IBIS-IP.int</i>	Information about the index of the current stop point
	<i>JourneyMode</i>	0:1	<i>JourneyMode Enumeration</i>	Information about the mode of the journey (cf. chapter 0)
	<b>PointSequence</b>	1:1	+ <i>PointSequence</i>	Description of a sequence of points (cf. chapter 1.35)

Table 55 Description of TripSequence

## 1.56 TSPPoint

<i>TSPPoint</i>			+Structure	Structure with description of a point for traffic light prioritisation
	<i>TSPPointRef</i>	0:1	<i>IBIS-IP.NMOKEN</i>	Reference at a TSP point
	<b>TSPCode</b>	1:1	<i>IBIS-IP.NMOKEN</i>	TSP content
	<i>ShortName</i>	0:*	+ <i>International TextType</i>	TSP short name
	<i>Description</i>	0:*	+ <i>International TextType</i>	TSP description

Table 56 Description of TSPPoint

## 1.57 UnsubscribeRequest

<i>UnsubscribeRequest</i>			+Structure	Structure for the request of termination of a subscription
	<b>Client-IP-Address</b>	1:1	<i>IBIS-IP.string</i>	Information about the IP address where the subscription has to be terminated
	<i>ReplyPort</i>	0:1	<i>IBIS-IP.int</i>	Information about the reply port where the subscription has to be terminated
	<i>Reply-Path</i>	0:1	<i>IBIS-IP.string</i>	Information about the reply path where the subscription has to be terminated

Table 57 Description of UnsubscribeRequest

## 1.58 UnsubscribeResponse

<i>UnsubscribeResponse</i>			+Structure	Structure for the response to a request of termination of a subscription
			<i>Choice</i>	One of the structures below
a	<b>Active</b>	-1:1	<i>IBIS-IP.boolean</i>	Information about the termination
b	<b>OperationErrorMessage</b>		<i>IBIS-IP.string</i>	Error message

Table 58 Description of UnsubscribeResponse

## 1.59 Vehicle

<i>Vehicle</i>			+Structure	Structure with information about the vehicle
	<b>VehicleTypeRef</b>	1:1	<i>IBIS-IP.NMTOKEN</i>	Reference at a vehicle type
	<i>Name</i>	0:*	<i>+InternationalTextType</i>	Vehicle name

Table 59 Description of Vehicle

## 1.60 ViaPoint

<i>ViaPoint</i>			+Structure	Structure which describes a via point
	<b>ViaPointRef</b>	1:1	<i>IBIS-IP.NMTOKEN</i>	Reference at a via stop point
	<i>PlaceRef</i>	0:1	<i>IBIS-IP.NMTOKEN</i>	Reference at the associated stop place
	<i>PlaceName</i>	0:*	<i>+InternationalTextType</i>	name of the via point
	<i>PlaceShortName</i>	0:*	<i>+InternationalTextType</i>	short name of the via point
	<i>ViaPointDisplayPriority</i>	0:1	<i>IBIS-IP.int</i>	Information about the display priority of the via point

Table 60 Description of ViaPoint

## 1.61 ZoneType

<b>ZoneType</b>			<i>+Structure</i>	<b>Structure for description of a zone type</b>
	<b><i>FarezoneTypeID</i></b>	1:1	<i>IBIS- IP.NMTOKEN</i>	Index at the fare zone type
	<b><i>FarezoneTypeName</i></b>	0:*	<i>+International TextType</i>	Fare zone type name

Table 61 Description of ZoneType

---

## 2 Gemeinsam genutzte Aufzählungstypen

Das Nachfolgende Kapitel beschreibt die in IBIS-IP verwendeten Aufzählungstypen, die abhängig vom Kontext im Datenaustausch gesetzt werden müssen.

### Common enumerations

The following chapter describes the enumerations used in IBIS-IP, which must be applied depending on the context in data exchange.

#### 2.1 ConnectionStateEnumeration

Enumeration Name	Possible Values	Description
ConnectionStateEnumeration	ConnectionBroken ConnectionOK NoInformationAvailable	Information about the status of the connection

Table 62 Description of ConnectionStateEnumeration

#### 2.2 ConnectionTypeEnumeration

Enumeration Name	Possible Values	Description
ConnectionTypeEnumeration	Interchange ProtectedConnection	Information about the type of the connection

Table 63 Description of ConnectionTypeEnumeration

#### 2.3 DeviceClassEnumeration

Enumeration Name	Possible Values	Description
DeviceClassEnumeration	OnBoardUnit SideDisplay FrontDisplay InteriorDisplay Validator TicketVendingMachine AnnouncementSystem MMI VideoSystem APC MobileInterface Other TestDevice	Information about the device class according to VDV 301-2

Table 64 Description of DeviceClassEnumeration



## 2.4 DeviceStateEnumeration

Enumeration Name	Possible Values	Description
DeviceStateEnumeration	defective notavailable running	Information about the device state

Table 65 Description of DeviceStateEnumeration

## 2.5 DoorCountingObjectClassEnumeration

Enumeration Name	Possible Values	Description
DoorCountingObjectClassEnumeration	Adult Bike Child Pram Wheelchair Unidentified Others	Information about the counted objects at the counting of passengers

Table 66 Description of DoorCountingObjectClassEnumeration

## 2.6 DoorCountingQualityEnumeration

Enumeration Name	Possible Values	Description
DoorCountingQualityEnumeration	Defect Other Regular Sabotage	Information about the counting quality

Table 67 Description of DoorCountingQualityEnumeration

## 2.7 DoorOpenStateEnumeration

Enumeration Name	Possible Values	Description
DoorOpenStateEnumeration	DoorsOpen AllDoorsClosed SingleDoorOpen SingleDoorClosed	Information about the opening state of a door

Table 68 Description of DoorOpenStateEnumeration

## 2.8 DoorOperationStateEnumeration

Enumeration Name	Possible Values	Description
DoorOperationStateEnumeration	Locked Normal EmergencyRelease	Information about the dorr operation state of a door

Table 69 Description of DoorOperationStateEnumeration

## 2.9 ErrorCodeEnumeration

Enumeration Name	Possible Values	Description
ErrorCodeEnumeration	DataEstimated FaultData NoScheduleDataAvailable DeviceMissing NoServiceResponse ImportantDataNotAvailable DataNotValid	Descriptive Information about the error reason

Table 70 Description of ErrorCodeEnumeration

## 2.10 ExitSideEnumeration

Enumeration Name	Possible Values	Description
ExitSideEnumeration	both left right unknown	Information about the exit side

Table 71 Description of ExitSideEnumeration

## 2.11 GNSSCoordinateSystemEnumeration

Enumeration Name	Possible Values	Description
GNSSCoordinateSystemsEnumeration	CH1903 ETSR89 IERS NAD27 NAD83 WGS84 WGS72 SGS85 P90	Information about the coordinate system used by the GNSS system

Table 72 Description of GNSSCoordinateSystemsEnumeration

## 2.12 GNSSQualityEnumeration

Enumeration Name	Possible Values	Description
GNSSQualityEnumeration	dGPS Estimated GPS NotValid Unknown	Information about the GNSS quality

Table 73 Description of GNSSQualityEnumeration

## 2.13 GNSSTypeEnumeration

Enumeration Name	Possible Values	Description
GNSSTypeEnumeration	GPS Glonass Galileo Beidou IRNSS Other DeadReckoning MixedGNSSTypes	Information about the GNSS type

Table 74 Description of GNSSTypeEnumeration

## 2.14 IBIS-IP-VersionEnumeration

Enumeration Name	Possible Values	Description
IBIS-IP-VersionEnumeration	1.0	Version of IBIS-IP

Table 75 Description of IBIS-IP-VersionEnumeration

## 2.15 JourneyModeEnumeration

Enumeration Name	Possible Values	Description of
JourneyModeEnumeration	NoTrip AdditionalTrip ServiceTrip	Information about the journey mode

Table 76 Description of JourneyModeEnumeration

## 2.16 LocationStateEnumeration

Enumeration Name	Possible Values	Description
LocationStateEnumeration	AfterStop AtStop BetweenStop BeforeStop	Information about the location state relative to the subsequent stop point

Table 77 Description of LocationStateEnumeration

## 2.17 MessageTypeEnumeration

Enumeration Name	Possible Values	Description
MessageTypeEnumeration	Status Warning Error	Information about a message type

Table 78 Description of MessageTypeEnumeration

## 2.18 RouteDeviationEnumeration

Enumeration Name	Possible Values	Description
RouteDeviationEnumeration	onroute offroute unknown	Information about the route deviation

Table 79 Description of RouteDeviationEnumeration

## 2.19 RouteDirectionEnumeration

Enumeration Name	Possible Values	Description
RouteDirectionEnumeration	Forward Backward Clockwise Counterclockwise Other	Information about the driving direction

Table 80 Description of RouteDirectionEnumeration

## 2.20 ServiceNameEnumeration

Enumeration Name	Possible Values	Description
ServiceNameEnumeration	BeaconLocationService CustomerInformationService DeviceManagementService DistanceLocationService GNSSLocationService JourneyInformationService NetworkLocationService PassengerCountingService SystemDocumentationService SystemManagementService TicketingService TimeService TestService	Information about the service names in VDV 301-2

Table 81 Description of ServiceNameEnumeration

## 2.21 ServiceStateEnumeration

Enumeration Name	Possible Values	Description
ServiceStateEnumeration	defective notrunning running starting standby	Information about the service status

Table 82 Description of ServiceStateEnumeration

## 2.22 SystemDocumentationInformationEnumeration

Enumeration Name	Possible Values	Description
SystemDocumentationInformationEnumeration	ErrorMessage StatusMessage WarningMessage All	Information about the message type

Table 83 Description of SystemDocumentationInformationEnumeration

## 2.23 TicketRazziaInformationEnumeration

Enumeration Name	Possible Values	Description
TicketRazziaInformationEnumeration	razzia norazzia	Information whether a razzia takes place

Table 84 Description of TicketRazziaInformationEnumeration

## 2.24 TicketValidationEnumeration

Enumeration Name	Possible Values	Description
TicketValidationEnumeration	Valid notvalid NoCard	Validation result

Table 85 Description of TicketValidationEnumeration

## 2.25 VehicleModeEnumeration

Enumeration Name	Possible Values	Description
VehicleModeEnumeration	Air bus coach ferry metro rail tram underground	Vehicle mode information

Table 86 Description of VehicleModeEnumeration

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## 3 Versionshistorie / Version History

### 3.1 Version 1.1

- *Connection*-Struktur, neues Element *ScheduledDepartureTime* ergänzt, Min:Max-Angaben korrigiert
- *DeviceSpecification*: typo korrigiert
- *TripInformation*: Typ der *AdditionalTextMessage* von IBIS-IP.string auf +InternationalTextType geändert, neues Element *RouteDirection* ergänzt
- Neue Enumeration *RouteDirectionEnumeration* ergänzt

### Version 1.1

- *Connection*-Structure, new element *ScheduledDepartureTime* ergänzt, Min:Max-Information corrected
- *DeviceSpecification*: typo corrected
- *TripInformation*: Typ of *AdditionalTextMessage* of IBIS-IP.string changed to +InternationalTextType, new element *RouteDirection* added
- New enumeration *RouteDirectionEnumeration* added

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## Regelwerke – Normen und Empfehlungen / References

- (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: Schnittstellenspezifikation /  
  
VDV 301-2: IBIS-IP, Part 2: Interface Specification V1.0

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