

LinkServer (Verwijsindex)

Interface description



August 30, 2018

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Versions

v20120805	Version 1 (in Dutch)
V20131031	Translated in English
V20140102	Additions and Changes
V20140522	Additions to the new functionality and messages
V20150619	New fields to existing messages
V20151023	Minor update
V20160725	New function and messages: CancelAuthorisation
V20160902	Included URL's of the test environment
V20170110	Minor updates
V20170608	Added: - the support of the NPR protocol with add-ons - the triggering of the authorisation and payment process by the Provider □ implementations checklists Rewritten/ reorganized some parts
V20170620	Minor update, added some fields to some of the new messages
V20171116	Minor update, updates on some new messages
V20180131	New Production URL
V20180830	New Production URL

1 Introduction

This document is the interface description of the LinkServer –in Dutch the Verwijsindex–.

It describes the process and interfaces for the VRN-based automatic authorisation of Parking facility/area admittance. The interfaces of both Parking facility systems and Provider systems are described

2 LinkServer (Verwijsindex)

The LinkServer enables the external access and departure authorisation and payments at Parking facilities. Authorisation can be provided by a payment service provider or a permit or subscription provider. The LinkServer dispatches the authorisation requests and the clearing data to the right system.

The LinkServer enables that when a vehicle enters a parking facility, a payment request or authorisation request is sent to the right Provider (e.g. provider system, permit system, webshop or ticket shop) in order to get authorisation. The LinkServer selects the Provider to be consulted and routes the messages.

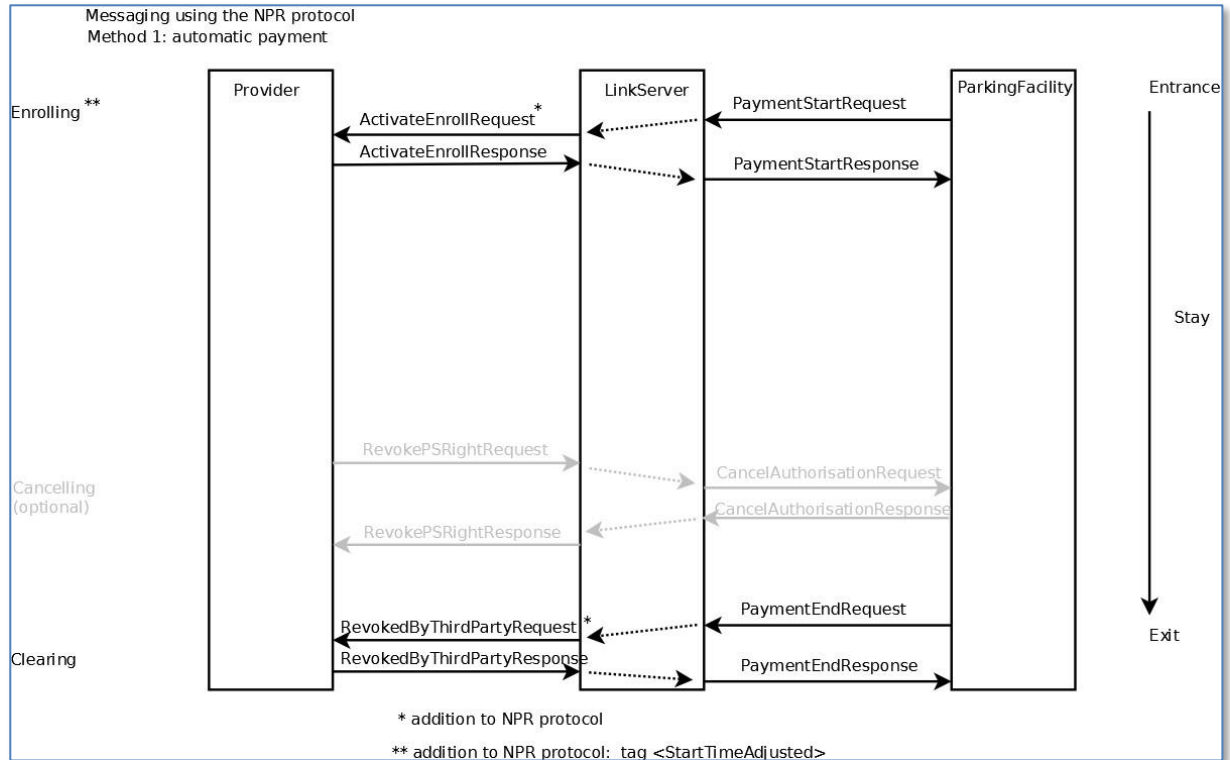
The way of work is that the LinkServer identifies based on the vehicle identification – preferably the VRN (vehicle registration number, license plate)– by which Provider(s) the request will be handled. The LinkServer sends the time of arrival and the amount to be authorized (arrival) or to be payed (departure) from the Parking facility to the appropriate Provider. When the vehicle departs the Parking facility sends the time of departure and the amount due to the Provider. The way the settlement of payments is organized is up to the owner of the parking facility: bilateral or via the National Parking register of SHPV.

In addition to the authorisation triggered by the entrance of a vehicle, the authorisation and payment triggered by a Provider is supported.

In addition to the LinkServer protocol the NPR protocol is supported with a few addons specific for the off street use.

3 Program Flows

A schematic flow of the various messages. Can be found in the attached document 'Off street parking using the NPR protocol'. Example for automatic entrance and exit:



4 Implementation

4.1 Checklist for a Parking facility

Implement the following messages

- ☐ PaymentStart
- ☐ PaymentEnd

Optional

- ☐ PaymentCheck

Implement a webservice, which is capable of accepting the following messages

- ☐ ActivateAuthorisation
- ☐ CancelAuthorisation

4.2 Checklist for a Provider using LinkServer protocol (automatic payment)

Implement the following messages

- ☐ LinkRegistration
- ☐ LinkRegistrationBatch (optional)
- ☐ CancelAuthorisation

Implement a webservice, which is capable of accepting the following messages

- ☐ PaymentStart
- ☐ PaymentEnd
- ☐ PaymentCheck

4.3 Checklist for a Provider using NPR+ protocol (automatic payment)

Implement the following messages

- ☐ RevokePSRight

Implement a webservice, which is capable of accepting the following messages

- ☐ ActivateEnroll
- ☐ RevokedByThirdParty

4.4 Checklist for a Provider using NPR protocol (manual payment)

Implement the following messages

- ☐ EnrollPSRight
- ☐ RevokePSRight

Implement a webservice, which is capable of accepting the following messages ☐

- ☐ RevokedByThirdParty

Link server, interface description

4.5 WebService overview

4.5.1 LinkService

The **production** environment of the service can be found at <https://verwijsindex.shpv.nl/servicev4/201808/VerwijsIndexService.svc> The **test** environment is located at <https://www.52dn.nl/Service/VerwijsIndexService.svc>

It implements the following messages

- PaymentStart
- PaymentEnd
- PaymentCheck
- ServiceStatus

Communication with the webservice is done in the WSHttpBinding formatting which uses *application/soap+xml* as ContentType

4.5.2 ProviderService

The **production** environment of the service can be found at <https://verwijsindex.shpv.nl/servicev4/201808/ProviderService.svc> The **test** environment is located at <https://www.52dn.nl/Service/ProviderService.svc> It implements the

following messages

- LinkRegistration
- LinkRegistrationBatch
- CancelAuthorisation

4.5.3 RegistrationsService

The **production** environment of the service can be found at <https://verwijsindex.shpv.nl/servicev4/201808/registration.svc>

The **test** environment of the service can be found at <https://www.52dn.nl/Service/registration.svc>

It implements the following messages

- EnrollPSRight
- RevokePSRight
- StatusRequest

ContentType for communication with the webservice is *text/xml*

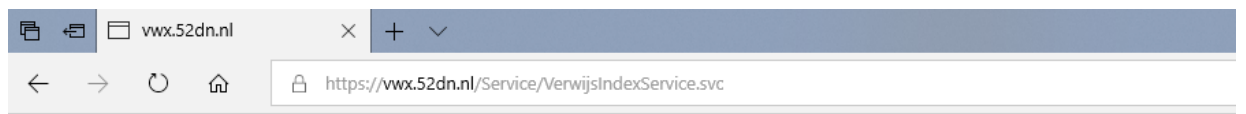
Link server, interface description

One difference from the RDW webservice is that a client certificate is not necessary for communication.

4.6 Development

By navigating to the URL of the webservice using a Web Browser or thru a HTTP GET request the message definition can be obtained in the WebService Definition Language (WSDL) format. Most of the modern programming languages are equipped with some tool to import these kinds of WSDL files, some of them directly from the Integrated Development Environment. These will generate most of the classes and some of them wrappers and clients.

A WSDL looks like the capture below



```
<?xml version="1.0" encoding="ISO-8859-1"?>
- <wsdl:definitions xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/" xmlns:wsaw="http://www.w3.org/2003/05/addressing/metadata" xmlns:wsam="http://www.w3.org/2007/05/addressing/metadata" xmlns:wsa="http://schemas.xmlsoap.org/ws/2003/05/addressing/metadata" xmlns:wsap="http://schemas.xmlsoap.org/ws/2004/08/addressing/policy" xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/mex" xmlns:i0="https://vwx.52dn.nl/Service/" xmlns:wsx="http://schemas.xmlsoap.org/ws/2004/09/mex" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:import location="https://vwx.52dn.nl/Service/VerwijsIndexService.svc?wsdl=wsdl0" namespace="https://vwx.52dn.nl/Service/">
  <wsdl:types>
    <xsd:schema targetNamespace="https://verwijsindex.shpv.nl/service/Imports">
      <xsd:import namespace="https://verwijsindex.shpv.nl/service/" schemaLocation="https://vwx.52dn.nl/Service/VerwijsIndexService.svc?wsdl=wsdl0" schemaLocation="https://vwx.52dn.nl/Service/VerwijsIndexService.svc?wsdl=wsdl0"/>
      <xsd:import namespace="http://schemas.microsoft.com/2003/10/Serialization/" schemaLocation="https://vwx.52dn.nl/Service/VerwijsIndexService.svc?wsdl=wsdl0" schemaLocation="https://vwx.52dn.nl/Service/VerwijsIndexService.svc?wsdl=wsdl0"/>
      <xsd:import namespace="https://verwijsindex.shpv.nl/messages/" schemaLocation="https://vwx.52dn.nl/Service/VerwijsIndexService.svc?wsdl=wsdl0" schemaLocation="https://vwx.52dn.nl/Service/VerwijsIndexService.svc?wsdl=wsdl0"/>
    </xsd:schema>
  </wsdl:types>
```

5 Message description

In the formal description is pointed out which fields are mandatory or which are optional.

In the following paragraphs examples are shown.

5.1 Access

The PaymentStartRequest message is used by the Parking System to ask the Provider via the LinkServer an authorisation for automated payment for a vehicle. The Provider answers via the PaymentStartResponse message. In case of an authorisation the Provider responds with an own unique authorisation code. Optional the response can contain a maximum amount and a maximum datetime for the authorisation. In case no authorisation is given the response does not contain an authorisation code and the Remark field will contain additional information (see also section "Error handling").

Both Parking facility and Provider can optional send a token identification. The usage depends on the method used to give pedestrians access to the facility when they return to their vehicle.

In the case no Provider is detected or no authorisation is given, the LinkServer reports the result to the Parking System. Access must then be arranged in another way or refused.

The following set of fields of the PaymentStartRequest have been marked as required:

1. AreaManagerId
2. Areald
3. VehicleId
4. StartDateTime

Link server, interface description

Image 1 PaymentStartRequest

```
<?xml version="1.0"?>
- <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <a:Action s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/VerwijsIndex/PaymentStart</a:Action>
    <a:MessageID>string</a:MessageID>
    - <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo>
  </s:Header>
  - <s:Body>
    - <PaymentStart xmlns="https://verwijsindex.shpv.nl/service/">
      - <PaymentStartRequest xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:d4p1="https://verwijsindex.shpv.nl/messages/">
        <d4p1:AreaManagerId>string</d4p1:AreaManagerId>
        <d4p1:AreaId>string</d4p1:AreaId>
        <d4p1:VehicleId>string</d4p1:VehicleId>
        <d4p1:CountryCode>string</d4p1:CountryCode>
        <d4p1:AccessId>string</d4p1:AccessId>
        <d4p1:StartDateTime>datetime</d4p1:StartDateTime>
        <d4p1:EndDateTime>datetime</d4p1:EndDateTime>
        <d4p1:Amount>double</d4p1:Amount>
        <d4p1:VAT>double</d4p1:VAT>
        <d4p1:Token>string</d4p1:Token>
        <d4p1:VehicleIdType>string</d4p1:VehicleIdType>
        <d4p1:TokenType>string</d4p1:TokenType>
      </PaymentStartRequest>
    </PaymentStart>
  </s:Body>
</s:Envelope>
```

Image 2 PaymentStartResponse

```
<?xml version="1.0"?>
- <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <a:Action s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/VerwijsIndex/PaymentStartResponse</a:Action>
    <a:RelatesTo>string</a:RelatesTo>
  </s:Header>
  - <s:Body>
    - <PaymentStartResponse xmlns="https://verwijsindex.shpv.nl/service/">
      - <PaymentStartResult xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:b="https://verwijsindex.shpv.nl/messages/">
        <b:ProviderId>string</b:ProviderId>
        <b:PaymentAuthorisationId>string</b:PaymentAuthorisationId>
        <b:AuthorisationMaxAmount>double</b:AuthorisationMaxAmount>
        <b:AuthorisationValidUntil>datetime</b:AuthorisationValidUntil>
        <b:RemarkId>string</b:RemarkId>
        <b:Remark>string</b:Remark>
        <b:Token>string</b:Token>
        <b:TokenType>string</b:TokenType>
      </PaymentStartResult>
    </PaymentStartResponse>
  </s:Body>
</s:Envelope>
```

5.2 Departure

If the vehicle leaves the parking, the Parking System sends an invoice (PaymentEndRequest) with the amount due via the LinkServer. The Provider confirms this message with the PaymentEndResponse.

In case of an error (e.g. no matching authorisation could be found), the remark fields will contain additional information (see also section "Error handling").

The following set of fields of the PaymentEndRequest have been marked as required:

1. ProviderId
2. PaymentAuthorisationId
3. VehicleId
4. EndDateTime

Image 3 PaymentEndRequest

```

<?xml version="1.0"?>
- <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <a:Action s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/VerwijsIndex/PaymentEnd</a:Action>
    <a:MessageID>string</a:MessageID>
    <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo>
  </s:Header>
  - <s:Body>
    - <PaymentEnd xmlns="https://verwijsindex.shpv.nl/service/">
      - <PaymentEndRequest xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:d4p1="https://verwijsindex.shpv.nl/messages/">
        <d4p1:ProviderId>string</d4p1:ProviderId>
        <d4p1:PaymentAuthorisationId>string</d4p1:PaymentAuthorisationId>
        <d4p1:VehicleId>string</d4p1:VehicleId>
        <d4p1:CountryCode>string</d4p1:CountryCode>
        <d4p1:EndDateTime>datetime</d4p1:EndDateTime>
        <d4p1:Amount>double</d4p1:Amount>
        <d4p1:VAT>double</d4p1:VAT>
        <d4p1:VehicleIdType>string</d4p1:VehicleIdType>
      </PaymentEndRequest>
    </PaymentEnd>
  </s:Body>
</s:Envelope>

```

Image 4 PaymentEndResponse

```

<?xml version="1.0"?>
- <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <a:Action s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/VerwijsIndex/PaymentEndResponse</a:Action>
    <a:RelatesTo>string</a:RelatesTo>
  </s:Header>
  - <s:Body>
    - <PaymentEndResponse xmlns="https://verwijsindex.shpv.nl/service/">
      - <PaymentEndResult xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:b="https://verwijsindex.shpv.nl/messages/">
        <b:PaymentAuthorisationId>string</b:PaymentAuthorisationId>
        <b:RemarkId>string</b:RemarkId>
        <b:Remark>string</b:Remark>
      </PaymentEndResult>
    </PaymentEndResponse>
  </s:Body>
</s:Envelope>

```

5.3 Check

The PaymentCheckRequest is used to check access authorisation for a vehicle without further exchange of entrance and exit data. The answer (PaymentCheckResponse) holds information whether or not the vehicle should be granted access and to which Area.

Although the Areald field is marked as optional in the service definition, it's required for a proper functionality.

It is also possible to check a single Provider. When the field is specified it will check the vehicle at the given provider.

In case of an error (e.g. no PaymentServiceProvider for this vehicle), the remark fields will contain additional information (see also section "Error handling").

The following set of fields of the PaymentCheckRequest have been marked as required:

1. AreaManagerId
2. Areald
3. VehicleId
4. CheckDateTime

Image 5 PaymentCheckRequest

```

<?xml version="1.0"?>
- <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <a:Action s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/VerwijsIndex/PaymentCheck</a:Action>
    <a:MessageID>string</a:MessageID>
    - <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo>
  </s:Header>
  - <s:Body>
    - <PaymentCheck xmlns="https://verwijsindex.shpv.nl/service/">
      - <PaymentCheckRequest xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:d4p1="https://verwijsindex.shpv.nl/messages/">
        <d4p1:AreaManagerId>string</d4p1:AreaManagerId>
        <d4p1:AreaId>string</d4p1:AreaId>
        <d4p1:VehicleId>string</d4p1:VehicleId>
        <d4p1:CountryCode>string</d4p1:CountryCode>
        <d4p1:CheckDateTime>datetime</d4p1:CheckDateTime>
        <d4p1:Provider>string</d4p1:Provider>
        <d4p1:VehicleIdType>string</d4p1:VehicleIdType>
      </PaymentCheckRequest>
    </PaymentCheck>
  </s:Body>
</s:Envelope>

```

Image 6 PaymentCheckResponse

```

<?xml version="1.0"?>
- <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <a:Action
      s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/VerwijsIndex/PaymentCheckResponse</a:Action>
    <a:RelatesTo>string</a:RelatesTo>
  </s:Header>
  - <s:Body>
    - <PaymentCheckResponse xmlns="https://verwijsindex.shpv.nl/service/">
      - <PaymentCheckResult xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:b="https://verwijsindex.shpv.nl/messages/">
        <b:Granted>bool</b:Granted>
        <b:AreaId>string</b:AreaId>
        <b:RemarkId>string</b:RemarkId>
        <b:Remark>string</b:Remark>
        <b:ProviderId>string</b:ProviderId>
      </PaymentCheckResult>
    </PaymentCheckResponse>
  </s:Body>
</s:Envelope>

```

5.4 Activation by Provider

During the stay in a parking facility the Provider can make a request to the parking facility to take over the payment for a vehicle.

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```
<?xml version="1.0"?>
- <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <a:Action s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/Consumer/ActivateAuthorisation</a:Action>
    <a:MessageID>string</a:MessageID>
    - <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo>
    <a:To s:mustUnderstand="1">https://verwijsindex.azurewebsites.net/Consumer/ConsumerService.svc</a:To>
  </s:Header>
  - <s:Body>
    - <ActivateAuthorisation xmlns="https://verwijsindex.shpv.nl/service/">
      - <ActivateAuthorisationRequest xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:b="https://verwijsindex.shpv.nl/messages/">
        <b:ProviderId>string</b:ProviderId>
        <b:PaymentAuthorisationId>string</b:PaymentAuthorisationId>
        <b:VehicleId>string</b:VehicleId>
        <b:CountryCode>string</b:CountryCode>
        <b:VehicleIdType>string</b:VehicleIdType>
        <b:AreaManagerId>string</b:AreaManagerId>
        <b:AreaId>string</b:AreaId>
        <b:EndDateTime>datetime</b:EndDateTime>
      </ActivateAuthorisationRequest>
    </ActivateAuthorisation>
  </s:Body>
</s:Envelope>
```

And the response to the ActivateAuthorisation

```
<?xml version="1.0"?>
- <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope" xmlns:a="http://www.w3.org/2005/08/addressing">
  - <s:Header>
    <a:Action
      s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/Consumer/ActivateAuthorisationResponse</a:Action>
    <a:RelatesTo>string</a:RelatesTo>
  </s:Header>
  - <s:Body>
    - <ActivateAuthorisationResponse xmlns="https://verwijsindex.shpv.nl/service/">
      - <ActivateAuthorisationResult xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:d4p1="https://verwijsindex.shpv.nl/messages/">
        <d4p1:ProviderId>string</d4p1:ProviderId>
        <d4p1:PaymentAuthorisationId>string</d4p1:PaymentAuthorisationId>
        <d4p1:Granted>bool</d4p1:Granted>
        <d4p1:EndDateTime>datetime</d4p1:EndDateTime>
        <d4p1:RemarkId>string</d4p1:RemarkId>
        <d4p1:Remark>string</d4p1:Remark>
        <d4p1:Amount>double</d4p1:Amount>
        <d4p1:VAT>double</d4p1:VAT>
        <d4p1:StartDateTimeAdjusted>datetime</d4p1:StartDateTimeAdjusted>
      </ActivateAuthorisationResult>
    </ActivateAuthorisationResponse>
  </s:Body>
</s:Envelope>
```

5.5 LinkRegistration

For finding the Provider for a vehicle identification the LinkServer has two methods:

1. Implicit linking: authorisation requests are sent to the Provider without a preregistered link in the LinkServer.
Payment requests will be sent for every vehicle.
2. Explicit linking on the initiative of the Provider: the Provider sends links to the LinkServer. These are terminated by submitting a new version of the link with a new enddate. Generally, submitting a link replaces end any existing link on the start date of the new link.
Payment requests will be sent only if a valid link is registered.

The links submitted by the Provider can be sent separate or combined in a batch.

The following set of fields of the LinkRegistrationRequest have been marked as required:

1. ProviderId
2. LinkId

Link server, interface description

3. VehicleId
4. ValidFrom
5. ValidUntil

Image 7 LinkRegistrationRequest

```
<?xml version="1.0"?>
- <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing">
  - <s:Header>
    <a:Action s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/Provider/Registration</a:Action>
    <a:MessageID>string</a:MessageID>
    - <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo>
  </s:Header>
  - <s:Body>
    - <Registration xmlns="https://verwijsindex.shpv.nl/service/"
      - <req xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:d4p1="https://verwijsindex.shpv.nl/messages/">
        <d4p1:ProviderId>string</d4p1:ProviderId>
        <d4p1:LinkId>string</d4p1:LinkId>
        <d4p1:VehicleId>string</d4p1:VehicleId>
        <d4p1:CountryCode>string</d4p1:CountryCode>
        <d4p1:ValidFrom>datetime</d4p1:ValidFrom>
        <d4p1:ValidUntil>datetime</d4p1:ValidUntil>
        <d4p1:AreaId>string</d4p1:AreaId>
        <d4p1:VehicleIdType>string</d4p1:VehicleIdType>
      </req>
    </Registration>
  </s:Body>
</s:Envelope>
```

Image 8 LinkRegistrationResponse

```
<?xml version="1.0"?>
- <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing">
  - <s:Header>
    <a:Action
      s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/Provider/RegistrationResponse</a:Action>
    <a:RelatesTo>string</a:RelatesTo>
  </s:Header>
  - <s:Body>
    - <RegistrationResponse xmlns="https://verwijsindex.shpv.nl/service/"
      - <RegistrationResult xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:b="https://verwijsindex.shpv.nl/messages/">
        <b:RemarkId>string</b:RemarkId>
        <b:Remark>string</b:Remark>
      </RegistrationResult>
    </RegistrationResponse>
  </s:Body>
</s:Envelope>
```

Example of the batch message sent by het Provider

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Image 9 LinkRegistrationBatchRequest

```

<?xml version="1.0"?>
- <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing">
  - <s:Header>
    <a:Action s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/Provider/BatchRegistration</a:Action>
    <a:MessageID>string</a:MessageID>
    - <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo>
  </s:Header>
  - <s:Body>
    - <BatchRegistration xmlns="https://verwijsindex.shpv.nl/service/">
      - <req xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:d4p1="https://verwijsindex.shpv.nl/messages/">
        - <d4p1:Batch>
          - <d4p1:LinkRegistrationRequest>
            <d4p1:ProviderId>string</d4p1:ProviderId>
            <d4p1:LinkId>string</d4p1:LinkId>
            <d4p1:VehicleId>string</d4p1:VehicleId>
            <d4p1:CountryCode>string</d4p1:CountryCode>
            <d4p1:ValidFrom>datetime</d4p1:ValidFrom>
            <d4p1:ValidUntil>datetime</d4p1:ValidUntil>
            <d4p1:AreaId>string</d4p1:AreaId>
            <d4p1:VehicleIdType>string</d4p1:VehicleIdType>
          </d4p1:LinkRegistrationRequest>
          - <d4p1:LinkRegistrationRequest>
            <d4p1:ProviderId>string</d4p1:ProviderId>
            <d4p1:LinkId>string</d4p1:LinkId>
            <d4p1:VehicleId>string</d4p1:VehicleId>
            <d4p1:CountryCode>string</d4p1:CountryCode>
            <d4p1:ValidFrom>datetime</d4p1:ValidFrom>
            <d4p1:ValidUntil>datetime</d4p1:ValidUntil>
            <d4p1:AreaId>string</d4p1:AreaId>
            <d4p1:VehicleIdType>string</d4p1:VehicleIdType>
          </d4p1:LinkRegistrationRequest>
        </d4p1:Batch>
      </req>
    </BatchRegistration>
  </s:Body>
</s:Envelope>

```

Image 10 LinkRegistrationBatchResponse

```

<?xml version="1.0"?>
- <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://www.w3.org/2005/08/addressing">
  - <s:Header>
    <a:Action
      s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/Provider/BatchRegistrationResponse</a:Action>
    <a:RelatesTo>string</a:RelatesTo>
  </s:Header>
  - <s:Body>
    - <BatchRegistrationResponse xmlns="https://verwijsindex.shpv.nl/service/">
      - <BatchRegistrationResult xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:b="https://verwijsindex.shpv.nl/messages/">
        - <b:Batch>
          - <b:LinkRegistrationResponse>
            <b:RemarkId>string</b:RemarkId>
            <b:Remark>string</b:Remark>
          </b:LinkRegistrationResponse>
          - <b:LinkRegistrationResponse>
            <b:RemarkId>string</b:RemarkId>
            <b:Remark>string</b:Remark>
          </b:LinkRegistrationResponse>
        </b:Batch>
      </BatchRegistrationResult>
    </BatchRegistrationResponse>
  </s:Body>
</s:Envelope>

```

5.6 Canceling

The Provider is able to revoke or abort the current payment transaction. To do so, the Provider has to send the CancelAuthorisationRequest.

The request consists of the following fields:

- **ProviderId***, this identifies the payment provider,
- **PaymentAuthorisationId*** is the identifier for the current transaction.
- The fields **VehicleId***, **CountryCode*** and **VehicleIdType*** are used to identify the vehicle.
- The fields **AreaManagerId*** and **AreaId*** are being used to identify the parking facility
- **CancelDateTime** controls the kind of request
 - o An empty value which is a request for a complete cancelation of the parking,
 - o A date time value is supplied, this will result in a partial cancelation.

* All these fields have been exchanged with the PaymentStart function.

The consuming service (the parkingfacility) is able to grant or to refuse the complete parking or just partly. This is reflected in the response message, it consists of the following members

- The **ProviderId** and **PaymentAuthorisationId**, are being used to identify the provider and the transaction at the provider,
- The fields **Granted**, **CanceledDateTime**, **RemarkId** and **Remark**
 - o CanceledDateTime is empty and Granted = true, for a complete cancelation,
 - o A date time value and granted = true, for a partial cancelation,
 - o The amount due and the VAT are returned in case of a partial cancelation
 - o Granted = false, combined with a reason in the remark field.

There are several possible reasons for refusal e.g. the vehicle has already left the parking area.

In order to support CancelAuthorisation messages the Parking facility has to implement a compatible webservice and publish it on an internet facing host. An example of the CancelAuthorisation conversation

Image 11 CancelAuthorisationRequest

```
<?xml version="1.0"?>
- <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <a:Action
      s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/Provider/CancelAuthorisation</a:Action>
    <a:MessageID>string</a:MessageID>
    - <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo>
    <a:To s:mustUnderstand="1">http://verwijsindex.shpv.nl/Service/ProviderService.svc</a:To>
  </s:Header>
  - <s:Body>
    - <CancelAuthorisation xmlns="https://verwijsindex.shpv.nl/service/">
      - <CancelAuthorisationRequest xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:b="https://verwijsindex.shpv.nl/messages/">
        <b:ProviderId>string</b:ProviderId>
        <b:PaymentAuthorisationId>string</b:PaymentAuthorisationId>
        <b:VehicleId>string</b:VehicleId>
        <b:CountryCode>string</b:CountryCode>
        <b:VehicleIdType>string</b:VehicleIdType>
        <b:AreaManagerId>string</b:AreaManagerId>
        <b:AreaId>string</b:AreaId>
        <b:CancelDateTime>datetime</b:CancelDateTime>
      </CancelAuthorisationRequest>
    </CancelAuthorisation>
  </s:Body>
</s:Envelope>
```

Image 12 CancelAuthorisationResponse

```
<?xml version="1.0"?>
- <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope" xmlns:a="http://www.w3.org/2005/08/addressing">
  - <s:Header>
    <a:Action
      s:mustUnderstand="1">https://verwijsindex.shpv.nl/service/Provider/CancelAuthorisationResponse</a:Action>
    <a:RelatesTo>string</a:RelatesTo>
  </s:Header>
  - <s:Body>
    - <CancelAuthorisationResponse xmlns="https://verwijsindex.shpv.nl/service/">
      - <CancelAuthorisationResult xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:d4p1="https://verwijsindex.shpv.nl/messages/">
        <d4p1:ProviderId>string</d4p1:ProviderId>
        <d4p1:PaymentAuthorisationId>string</d4p1:PaymentAuthorisationId>
        <d4p1:Granted>bool?</d4p1:Granted>
        <d4p1:RemarkId>string</d4p1:RemarkId>
        <d4p1:Remark>string</d4p1:Remark>
        <d4p1:Amount>double?</d4p1:Amount>
        <d4p1:VAT>double?</d4p1:VAT>
        <d4p1:StartTimeAdjusted>datetime?</d4p1:StartTimeAdjusted>
        <d4p1:EndTimeAdjusted>datetime?</d4p1:EndTimeAdjusted>
      </CancelAuthorisationResult>
    </CancelAuthorisationResponse>
  </s:Body>
</s:Envelope>
```

6 Using the NPR protocol

Besides the LinkServer messages the LinkServer also supports some of the NPR messages.

The following messages of the RPV webservice have been implemented

1. EnrollPSRight ○ Which is similar to the PaymentStart function
2. RevokePSRight ○ Which is similar to the CancelAuthorisation function
3. StatusRequest ○ For testing the connection

4. ActivateEnroll (add-on to the NPR protocol)
 - Which is similar to the PaymentStart function
5. RevokedByThridParty (add-on to the NPR protocol)
 - Which is similar to the PaymentEnd function

The other functions of the NPR interface are also visible on the WSDL, but have not been implemented and calling them will always return a ResponseError with ErrorCode 140 "NotImplemented". A full explanation of these messages can be found in the main Interface Description of the NPR which can be retrieved from

https://nationaalparkeerregister.nl/uploads/media/Interface_Description_v7.0.pdf

This document we will be focusing on the deviations.

6.1 Enroll request

When the Provider wants to take over the payment for a (certain) duration. Please note that the VehicleIdType and ProviderId fields have been added. The PSRightWindowList is not supported.

```
<?xml version="1.0"?>
- <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing" xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  - <s:Header>
    <a:Action s:mustUnderstand="1">http://rdw.nl/rpv/1.0/IRegistration/EnrollPSRight</a:Action>
    <h:PIN xmlns="http://rdw.nl/rpv/1.0" xmlns:h="http://rdw.nl/rpv/1.0">string</h:PIN>
    <a:MessageID>string</a:MessageID>
  - <a:ReplyTo>
    <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
  </a:ReplyTo>
    <a:To s:mustUnderstand="1">https://verwijsindex.shpv.nl/Service/201705/registration.svc</a:To>
  </s:Header>
  - <s:Body xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    - <PSRightEnrollRequest xmlns="http://rdw.nl/rpv/1.0">
      - <PSRightEnrollRequestData>
        <VehicleId>string</VehicleId>
        <CountryCodeVehicle>string</CountryCodeVehicle>
        <AreaManagerId>string</AreaManagerId>
        <AreaId>string</AreaId>
      - <LocationPSRight>
        <Latitude>decimal</Latitude>
        <Longitude>decimal</Longitude>
      </LocationPSRight>
        <SellingPointId>string</SellingPointId>
        <UsageId>string</UsageId>
        <StartTimePSRight>datetime</StartTimePSRight>
        <EndTimePSRight>datetime</EndTimePSRight>
      - <PSRightWindowList>
        - <PSRightWindowData>
          <StartTimePSRightDayWindow>string</StartTimePSRightDayWindow>
          <EndTimePSRightDayWindow>string</EndTimePSRightDayWindow>
          <StartTimePSRightWindow>string</StartTimePSRightWindow>
          <EndTimePSRightWindow>string</EndTimePSRightWindow>
        </PSRightWindowData>
      </PSRightWindowList>
        <AmountPSRight>decimal</AmountPSRight>
        <VATPSRight>decimal</VATPSRight>
        <ReferencePSRight>string</ReferencePSRight>
        <VehicleIdType>string</VehicleIdType>
        <ProviderId>string</ProviderId>
      </PSRightEnrollRequestData>
    </PSRightEnrollRequest>
  </s:Body>
</s:Envelope>
```

And the response to the Enroll Request. Please note that the StartTimeAdjusted/ EndTimeAdjusted, Amount and VAT fields have been added. The fields SpecifCalcAmountList and PSRightRemarkList are not in use.

```

<?xml version="1.0"?>
- <s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/" xmlns:a="http://www.w3.org/2005/08/addressing">
  - <s:Header>
    <a:Action s:mustUnderstand="1">http://rdw.nl/rpv/1.0/IRegistration/EnrollPSRightResponse</a:Action>
    <a:RelatesTo>string</a:RelatesTo>
  </s:Header>
  - <s:Body xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    - <PSRightEnrollResponse xmlns="http://rdw.nl/rpv/1.0">
      - <PSRightEnrollResponseData>
        <PSRightId>string</PSRightId>
        <AreaManagerId>string</AreaManagerId>
        <AreaId>string</AreaId>
        <SellingPointId>string</SellingPointId>
        <EndTimePSRightAdjusted>datetime</EndTimePSRightAdjusted>
        <AmountPSRightCalculated>decimal?</AmountPSRightCalculated>
        <VATPSRightCalculated>decimal?</VATPSRightCalculated>
        - <SpecifCalcAmountList>
          <SpecifCalcAmountData/>
        </SpecifCalcAmountList>
        - <PSRightRemarkList>
          <PSRightRemarkData/>
        </PSRightRemarkList>
        <StartTimeAdjusted>datetime</StartTimeAdjusted>
        <EndTimePSRight>datetime?</EndTimePSRight>
        <AmountPSRight>decimal</AmountPSRight>
        <VATPSRight>decimal</VATPSRight>
      </PSRightEnrollResponseData>
    </PSRightEnrollResponse>
  </s:Body>
</s:Envelope>

```

6.2 Revoke request

```

<?xml version="1.0"?>
- <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing" xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  - <s:Header>
    <a:Action s:mustUnderstand="1">http://rdw.nl/rpv/1.0/IRegistration/RevokePSRight</a:Action>
    <h:PIN xmlns="http://rdw.nl/rpv/1.0" xmlns:h="http://rdw.nl/rpv/1.0">string</h:PIN>
    <a:MessageID>string</a:MessageID>
    - <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo>
    <a:To s:mustUnderstand="1">https://verwijsindex.shpv.nl/Service/201705/registration.svc</a:To>
  </s:Header>
  - <s:Body xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    - <PSRightRevokeRequest xmlns="http://rdw.nl/rpv/1.0">
      - <PSRightRevokeRequestData>
        <PSRightId>string</PSRightId>
        <EndTimePSRight>datetime</EndTimePSRight>
      </PSRightRevokeRequestData>
    </PSRightRevokeRequest>
  </s:Body>
</s:Envelope>

```

And the response message to the revoke request. Please note that the StartTimePSRightAdjusted has been added. The fields SpecifCalcAmountList and PSRightRemarkList are not in use.

```

<?xml version="1.0"?>
- <s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/" xmlns:a="http://www.w3.org/2005/08/addressing">
  - <s:Header>
    <a:Action s:mustUnderstand="1">http://rdw.nl/rpv/1.0/IRegistration/RevokePSRightResponse</a:Action>
    <a:RelatesTo>string</a:RelatesTo>
  </s:Header>
  - <s:Body xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    - <PSRightRevokeResponse xmlns="http://rdw.nl/rpv/1.0">
      - <PSRightRevokeResponseData>
        <EndTimePSRightAdjusted>datetime?</EndTimePSRightAdjusted>
        <AmountPSRightCalculated>double?</AmountPSRightCalculated>
        <VATPSRightCalculated>double?</VATPSRightCalculated>
        - <SpecifCalcAmountList>
          <SpecifCalcAmountData/>
        </SpecifCalcAmountList>
        - <PSRightRemarkList>
          <PSRightRemarkData/>
        </PSRightRemarkList>
        <StartTimePSRightAdjusted>datetime?</StartTimePSRightAdjusted>
      </PSRightRevokeResponseData>
    </PSRightRevokeResponse>
  </s:Body>
</s:Envelope>

```

Link server, interface description

6.3 Status request

For testing the connection

```
<?xml version="1.0"?>
- <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing" xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  - <s:Header>
    <a:Action s:mustUnderstand="1">http://rdw.nl/rpv/1.0/IRegistration/StatusRequest</a:Action>
    <h:PIN xmlns="http://rdw.nl/rpv/1.0" xmlns:h="http://rdw.nl/rpv/1.0">string</h:PIN>
    <a:MessageID>string</a:MessageID>
    - <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo>
    <a:To s:mustUnderstand="1">https://verwijsindex.shpv.nl/Service/201705/registration.svc</a:To>
  </s:Header>
  - <s:Body xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    - <StatusRequestRequest xmlns="http://rdw.nl/rpv/1.0">
      - <StatusRequestRequestData>
        <StatusTime>datetime</StatusTime>
        <StatusReference>string</StatusReference>
      </StatusRequestRequestData>
    </StatusRequestRequest>
  </s:Body>
</s:Envelope>
```

And the response message to the status request

```
<?xml version="1.0"?>
- <s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/" xmlns:a="http://www.w3.org/2005/08/addressing">
  - <s:Header>
    <a:Action s:mustUnderstand="1">http://rdw.nl/rpv/1.0/IRegistration/StatusRequestResponse</a:Action>
    <a:RelatesTo>string</a:RelatesTo>
  </s:Header>
  - <s:Body xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    - <StatusRequestResponse xmlns="http://rdw.nl/rpv/1.0">
      - <StatusRequestResponseData>
        <StatusTime>datetime</StatusTime>
        <StatusRPV>string</StatusRPV>
        <StatusReference>string</StatusReference>
      </StatusRequestResponseData>
    </StatusRequestResponse>
  </s:Body>
</s:Envelope>
```

6.4 ActivateEnroll

```
<?xml version="1.0"?>
- <s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/" xmlns:a="http://www.w3.org/2005/08/addressing">
  - <s:Header>
    <a:Action s:mustUnderstand="1">http://rdw.nl/rpv/1.0/IRegistration/ActivateEnroll</a:Action>
    <h:PIN xmlns="http://rdw.nl/rpv/1.0" xmlns:h="http://rdw.nl/rpv/1.0">string</h:PIN>
    <a:MessageID>string</a:MessageID>
    - <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo>
    <a:To s:mustUnderstand="1">https://verwijsindex.shpv.nl/Service/201705/registration.svc</a:To>
  </s:Header>
  - <s:Body xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    - <ActivateEnrollRequestRequest xmlns="http://rdw.nl/rpv/1.0">
      - <ActivateEnrollRequestRequestData>
        <AreaManagerId>string</AreaManagerId>
        <AreaId>string</AreaId>
        <VehicleId>string</VehicleId>
        <CountryCode>string</CountryCode>
        <AccessId>string</AccessId>
        <StartDateTime>datetime</StartDateTime>
        <EndDateTime>datetime</EndDateTime>
        <Amount>double</Amount>
        <VAT>double</VAT>
        <Token>string</Token>
        <VehicleIdType>string</VehicleIdType>
        <TokenType>string</TokenType>
      </ActivateEnrollRequestRequestData>
    </ActivateEnrollRequestRequest>
  </s:Body>
</s:Envelope>
```

And the response message to the ActivateEnroll request

Link server, interface description

```
<?xml version="1.0"?>
- <s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/" xmlns:a="http://www.w3.org/2005/08/addressing">
  - <s:Header>
    <a:Action s:mustUnderstand="1">http://rdw.nl/rpv/1.0/IRegistration/ActivateEnrollResponse</a:Action>
    <a:RelatesTo>string</a:RelatesTo>
  </s:Header>
  - <s:Body xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    - <ActivateEnrollRequestResponse xmlns="http://rdw.nl/rpv/1.0">
      - <ActivateEnrollRequestResponseData>
        <ProviderId>string</ProviderId>
        <PaymentAuthorisationId>string</PaymentAuthorisationId>
        <AuthorisationMaxAmount>double</AuthorisationMaxAmount>
        <AuthorisationValidUntil>datetime</AuthorisationValidUntil>
        <RemarkId>string</RemarkId>
        <Remark>string</Remark>
        <Token>string</Token>
        <TokenType>string</TokenType>
      </ActivateEnrollRequestResponseData>
    </ActivateEnrollRequestResponse>
  </s:Body>
</s:Envelope>
```

6.5 RevokedByThirdParty

When the vehicle leaves the parking facility, a revoked message will be sent to the paymentprovider.

```
<?xml version="1.0"?>
- <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing" xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  - <s:Header>
    <a:Action s:mustUnderstand="1">http://rdw.nl/rpv/1.0/IRegistration/RevokedByThirdParty</a:Action>
    <h:PIN xmlns="http://rdw.nl/rpv/1.0" xmlns:h="http://rdw.nl/rpv/1.0"/>
    <a:MessageID>string</a:MessageID>
    - <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo>
    <a:To s:mustUnderstand="1">https://verwijsindex.shpv.nl/Service/201705/registration.svc</a:To>
  </s:Header>
  - <s:Body xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    - <RevokedByThirdPartyRequestRequest xmlns="http://rdw.nl/rpv/1.0">
      - <RevokedByThirdPartyRequestRequestData>
        <ProviderId>string</ProviderId>
        <PaymentAuthorisationId>string</PaymentAuthorisationId>
        <VehicleId>string</VehicleId>
        <CountryCode>string</CountryCode>
        <EndDateTime>datetime</EndDateTime>
        <Amount>double</Amount>
        <VAT>double</VAT>
        <VehicleIdType>string</VehicleIdType>
      </RevokedByThirdPartyRequestRequestData>
    </RevokedByThirdPartyRequestRequest>
  </s:Body>
</s:Envelope>
```

The response message the links server expect to receive on the RevokedByThirdParty request.

```
<?xml version="1.0"?>
- <s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/" xmlns:a="http://www.w3.org/2005/08/addressing">
  - <s:Header>
    <a:Action s:mustUnderstand="1">http://rdw.nl/rpv/1.0/IRegistration/RevokedByThirdPartyResponse</a:Action>
    <a:RelatesTo>string</a:RelatesTo>
  </s:Header>
  - <s:Body xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    - <RevokedByThirdPartyRequestResponse xmlns="http://rdw.nl/rpv/1.0">
      - <RevokedByThirdPartyRequestResponseData>
        <PaymentAuthorisationId>string</PaymentAuthorisationId>
        <RemarkId>string</RemarkId>
        <Remark>string</Remark>
      </RevokedByThirdPartyRequestResponseData>
    </RevokedByThirdPartyRequestResponse>
  </s:Body>
</s:Envelope>
```

7 Priority in links

In situations where the LinkServer has registered more than one link for a vehicle the priority specified by the owner of the parking facility is leading. In cases of equal priority the selection is random i.e. the order is determined by drawing of lots.

8 The matching of VRNs by the LinkServer

The LinkServer compares VRNs without regard to hyphens and diacritics. In the relaying of messages the original specification is used.

The use of the country code is optional and must be handled with care: the sending of a wrong country code might result in a mismatch, that is that no link can be found and the payment request will not be relayed.

9 Encrypted LinkRegistrations [under construction]

The Provider has the option to register link encrypted in the LinkServer. In that case the Provider has to provide the public key to SHPV. The public key is used to encrypt vehicle-id's sent by the Parking facility for the matching.

10 Mandate

The Provider has the option to mandate the LinkServer by specifying a maximum amount in the link to be registered. In that case the LinkServer handles link requests on behalf of the Provider. It is to be configured whether the Provider wants to receive copies of the messages or not. A mandate can be withdrawn or changed by the Provider by sending a new link without an authorisation amount or another amount.

11 Type values

The VehicleId and Token fields have a corresponding optional descriptor field, VehicleIdType and TokenType. This extra field can be used to identify the value of these specific fields. The current list of allowed types is:

- BARCODE
- HASH
- LICENSE_PLATE
- RFID
- PINCODE
- MAGNET

By request this list can be extended, other non-empty values will be rejected.

12 Error handling

In the case of an interruption of the service including a timeout it is impossible to determine which Provider authorises the payment request. Automated admission then has to be refused or arranged in another procedure.

In the case a Provider gave authorisation (positive PaymentStartResponse) and the Parking System does for some reason does not make use of the authorisation, the Parking System has to send an annulation by sending a PaymentEndRequest with an endtime that is equal to the starttime and an amount of €0,00. Possible reasons for this situation:

- The car owner decides to pay on a different way e.g. by using the payment terminal of the parking facility.
- The authorisation was received by the Parking System too late. Either the Parking System or the LinkServer sends the PaymentEndRequest, depending where the time-out was detected.

In the case of a disruption sending the PaymentEndRequest, the Parking System has to resend the request. The sending and resending of the PaymentEndRequest are not time critical. There is no need to let the vehicle wait for departure until the message was sent and acknowledged.

The table lists the error messages and remark messages that are in use:

Code	Error description	Type
10	No PaymentServiceProvider for this VehicleId	Remark
15	Remote party (PaymentServiceProvider/ ParkingFacility) does not respond	Error
20	No authorisation for payment	Remark
40	Internal error	Error
60	Required field 'xxx' null or empty	Error
65	EndTime before StartTime	Error
70	Internal error	Error
85	PaymentStop does not affect the permit	Remark
95	No matching authorisation could be found	Error
100	Internal error	Error
105	Value in the specified type field is not a valid value	Error
110	Authorisation already settled	Remark
115	No contract available	Error
120	Problem with NPR registration	Error
125	Problem with LinkRegistration, see remark for details	Error
130	ProviderId invalid or expired	Error
131 to 138	Temporary, LinkRegistration information, see remark for details	Remark/ Error
140	Function not implemented	Error
145	Location information incomplete, valid combinations are AreaManagerId + AreaId or SellingPointId or Latitude + Longitude	Error
150	VehicleId not found at ParkingFacility	Remark
155	Authorisation was not found in the system	Remark

13 Definition

13.1 Glossary

Word	Description
Facility owner	The organisation that owns or manages one or more Parking facilities
Link	The relation between a vehicle identification (e.q. vehicle registration number, vrn) and the Provider. With the Link the Provider states that it is willing to handle (payment) authorisation requests.
Parking facility	The parking garage or parking area or an area where the entrance of vehicles is regulated.
Parking system	The system of a parking facility that manages the admittance and departure of vehicles.
Provider	The service provider who authorises payment request and registers links in the LinkServer. Examples: system of a parking payment provider, permit system, white list.

13.2 Data definitions

Item	Description
AccessId	The reference used by the Parking system to identify the payment request. It is up to the Areamanager to use generic of unique access ids
Amount	The amount to be authorised resp. the amount due. The amount is VAT inclusive)
Areald	The identification of the Parking facility
AreamanagerId	The identification of the owner of one or more parking facilities
AuthorisationMaxAmount	The maximum amount authorised by the Provider
AuthorisationValidUntil	The enddate of the authorisation
CountryCode	The country code of the vehicle, specified according http://www.unece.org/trans/conventn/Distsigns.pdf
EndTime	The time of departure of the vehicle
PaymentAuthorisationId	The unique reference/identification for the authorisation by Provider.
ProviderId	The identification of the Provider

Item	Description
Remark	The explanation of a remark in a messages
RemarkId	The type/code of a remark in a message
StartDateTime	The time of arrival of a vehicle at the Parking facility
Token	The identification of a token that can be used for allowing pedestrians to enter the parking facility e.g. in order to return to their vehicle
TokenType	The type descriptor of the Token value
VAT	The value added tax part of the amount
VehicleId	The identification of the vehicle e.g. the vehicle registration number (vrn) or license plate but other identifications can be used
VehicleIdType	The type descriptor of the VehicleId value