GENIVI NavigationCore API

Release 3.0.2
Status: Approved

30 June 2014

Accepted for release by:
This document has been accepted for the GENIVI Gemini Release by the Expert Group Location Based Services (EG-LBS)

Abstract:
This document describes the API of the NavigationCore Abstract Component.

Keywords:
NavigationAPIs, NavigationCore.

Table of contents

1 Change History

Version	Date	Author	Change
0.1	27 Feb 2012	Marco Residori (XS Embedded)	Document Created.
0.2	19 Mar 2012	Marco Residori (XS Embedded)	Updated sequence diagrams. Updated *Interfaces* chapter.
0.3	21 Mar 2012	Marco Residori (XS Embedded)	Updated *Interfaces* chapter.
1.0	22 Mar 2012	Marco Residori (XS Embedded)	System Architecture Team (SAT) approval.
2.0 (beta)	07 Jun 2013	Marco Residori (XS Embedded)	Updated API description. API Version 2.0.
2.0	17 Jun 2013	Marco Residori (XS Embedded)	Updated API description. API fixes: GT-2691, GT-2689, GT-2651. API Version 2.0 (*gemini-final* tag)
3.0.0	21 Jan 2014	Marco Residori (XS Embedded)	Updated API description. API Version 3.0.0
3.0.1	22 May 2014	Marco Residori (XS Embedded)	Updated copyright notes.
3.0.2	30 June 2014	Marco Residori (XS Embedded)	Updated contributors list.

2 Introduction

This document describes the NavigationCore API.

3 Terminology

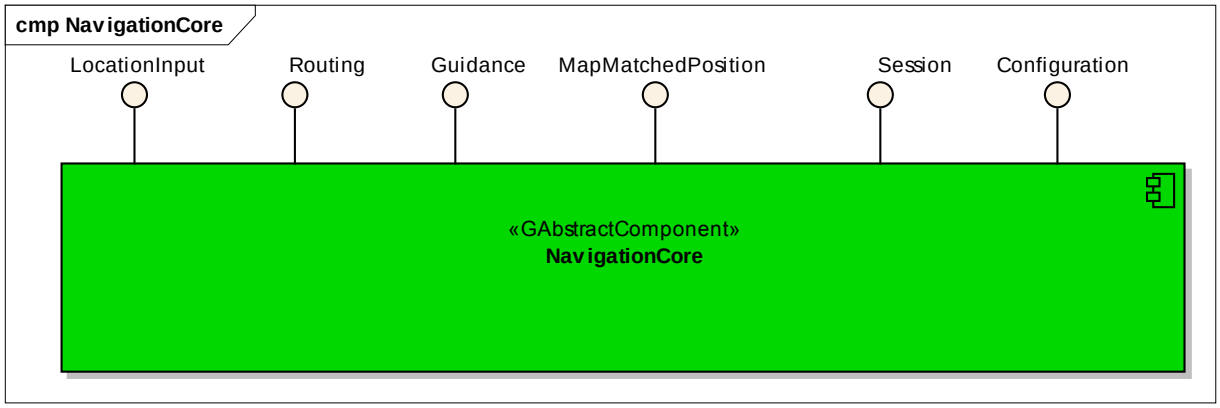
Term	***Description***
Link-ID	Identifier of a route segment in a database

4 Requirements

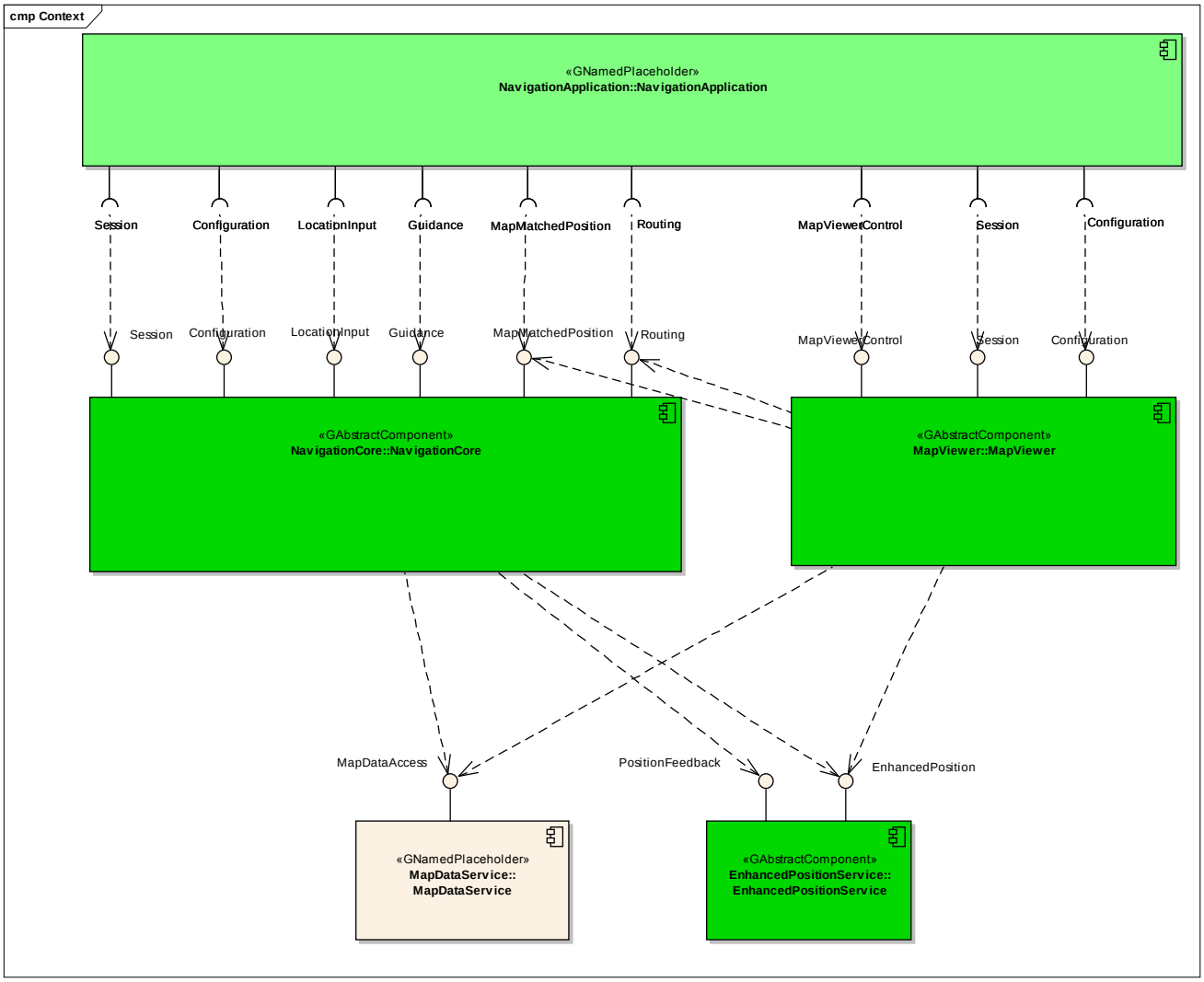
- Ease of Development
- Extensibility
- Multi-client Behavior
- Simplicity

5 Architecture

5.1 Interfaces



5.2 Interaction with other Components



6 API

6.1 D-Bus

The NavigationCore interfaces are D-Bus interfaces. They are defined using the D-Bus introspection data format, which is nothing but an IDL expressed in XML format.

For more information about the D-Bus data types please refer to the following website:
http://dbus.freedesktop.org/doc/dbus-specification.html#message-protocol-signatures

For more information about the D-Bus introspection data format, please refer to the following website:
http://dbus.freedesktop.org/doc/dbus-specification.html#introspection-format

6.2 Git Repository

The NavigationCore interfaces can be found in the GENIVI Git repository at:
https://git.genivi.org/git/gitweb.cgi?p=navigation;a=tree;f=NavigationCore/api

6.3 Naming Conventions

Element	Description	Example
Interface File	genivi.<component name in lowercase character>.<interface name in lowercase characters>	genivi.navigationcore.routing.xml
Methods/Signal/Properties	Camel case naming convention First letter uppercase	CalculateRoute
Arguments	Camel case naming convention First letter lowercase	routeHandle

6.4 Data Types Convention

D-bus types code are used. Please refer to the following webpage for more information:

http://dbus.freedesktop.org/doc/dbus-specification.html

Element	D-Bus Data Type Code	Example
Enumerators	q (uint16)	
Handles	y (uint8)	
Maps	a{qv}	Dictionary of tuples (key, value) The key is expressed as an enumerator

6.5 Errors

Error Type	Description	Example	Error Documentation	Note
User Error	Error caused by user actions	The user tries to start route guidance, although guidance is already running	Application specific error string documented in the XML file	Can occur in final product
Hardware Error	Error related to hardware/database related problems	No map data	Application specific error string documented in the XML file	Can occur in final product
Protocol Error	Error caused by wrong sequence of commands	Wrong sequence of commands to enter destination	Standard D-Bus error string	Should not occur in final product
Bus Error	D-Bus communication error	Bus busy	Standard D-Bus error string	Can occur in final product
Programming Error	Programming Error	Invalid parameters	Standard D-Bus error string and debug messages	Should not occur in production code

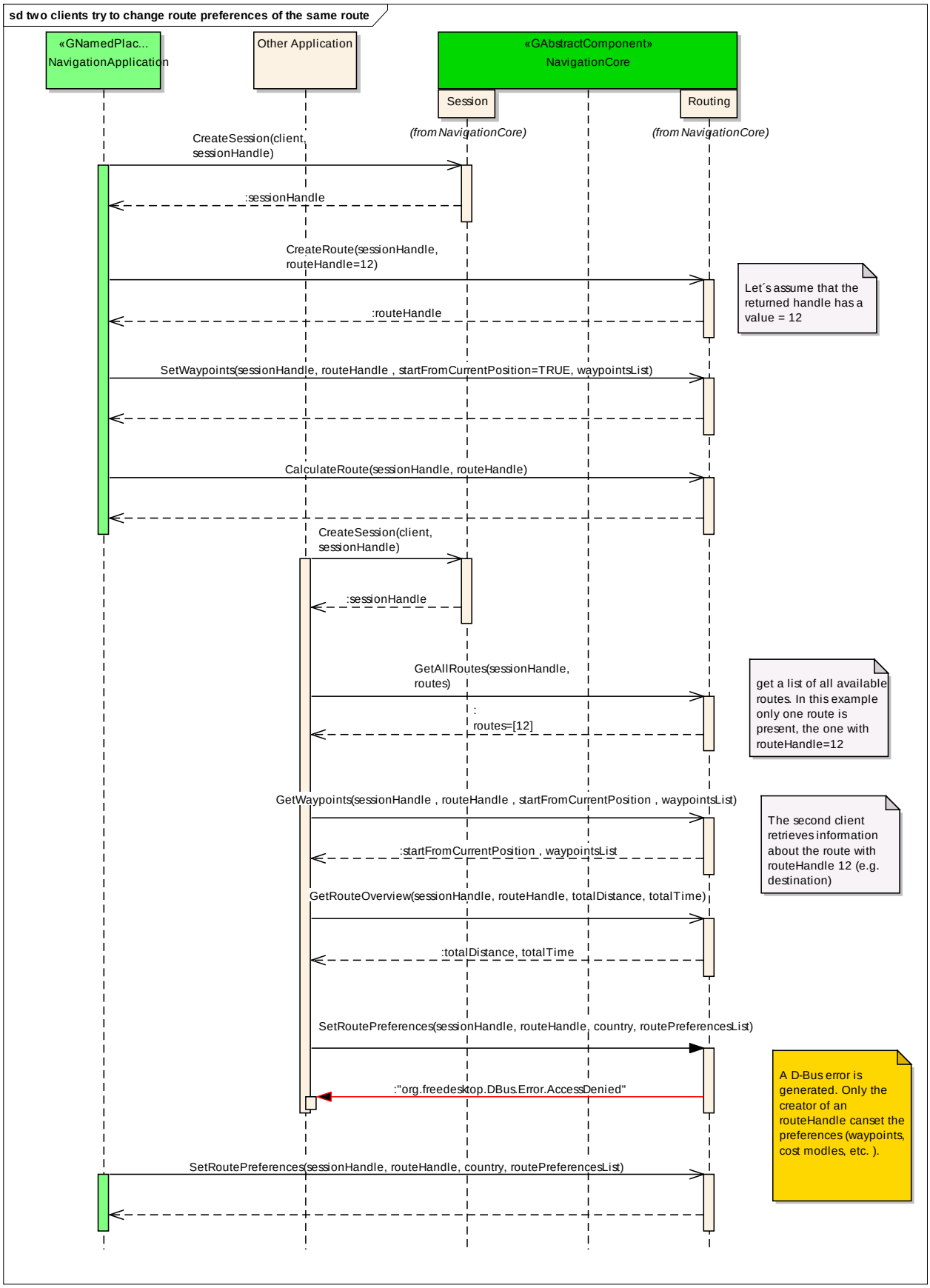
Only application-specific errors are documented directly in the interfaces (XML files). For all other errors, standard D-Bus strings are used. These kinds of strings are not documented in the interfaces. It is implicitly assumed that every method may return a standard D-Bus error string.

6.6 Sessions

A session-id identifies a requester. In a multi-client context only the requester that created an instance may be allowed to execute operations on that instance.

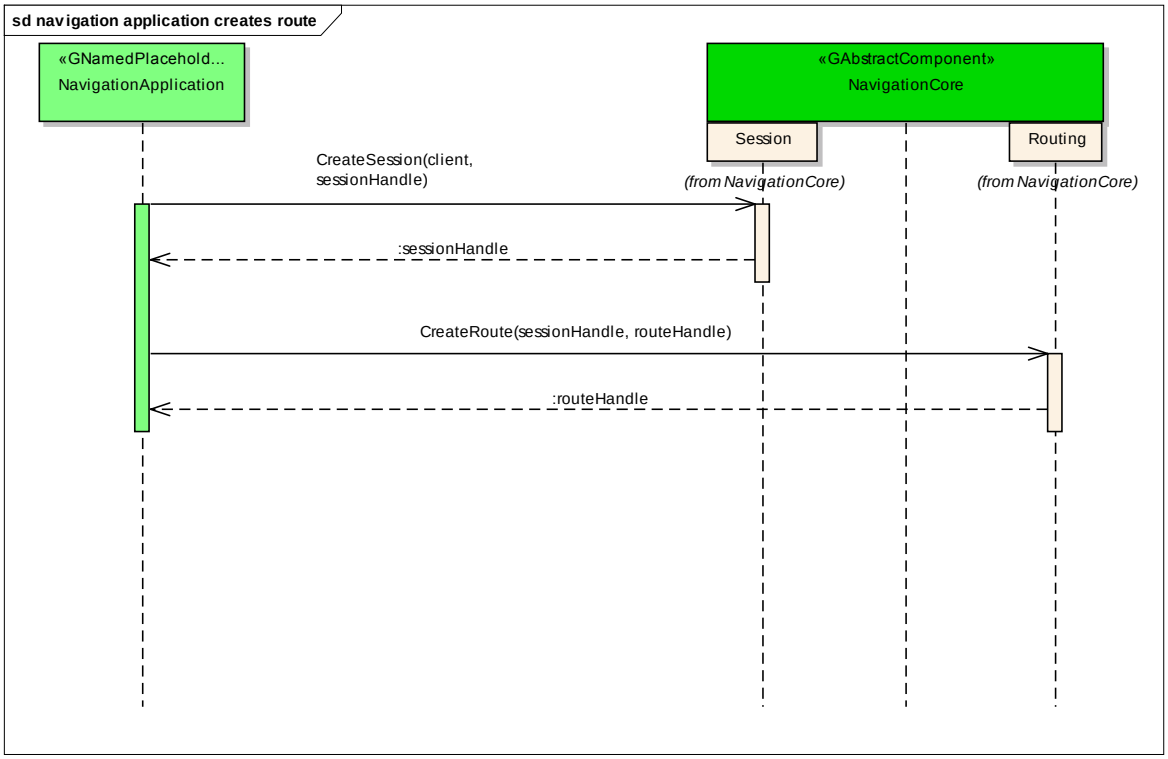
Other requesters may operate on the same handle (e.g. route handle, location input handle) with limited rights. For example, only the creator of a route handle can start/stop a route calculation on that handle. Other clients may simply be allowed to retrieve the total distance to the destination.

The following diagram shows an example of how session handles can be used:

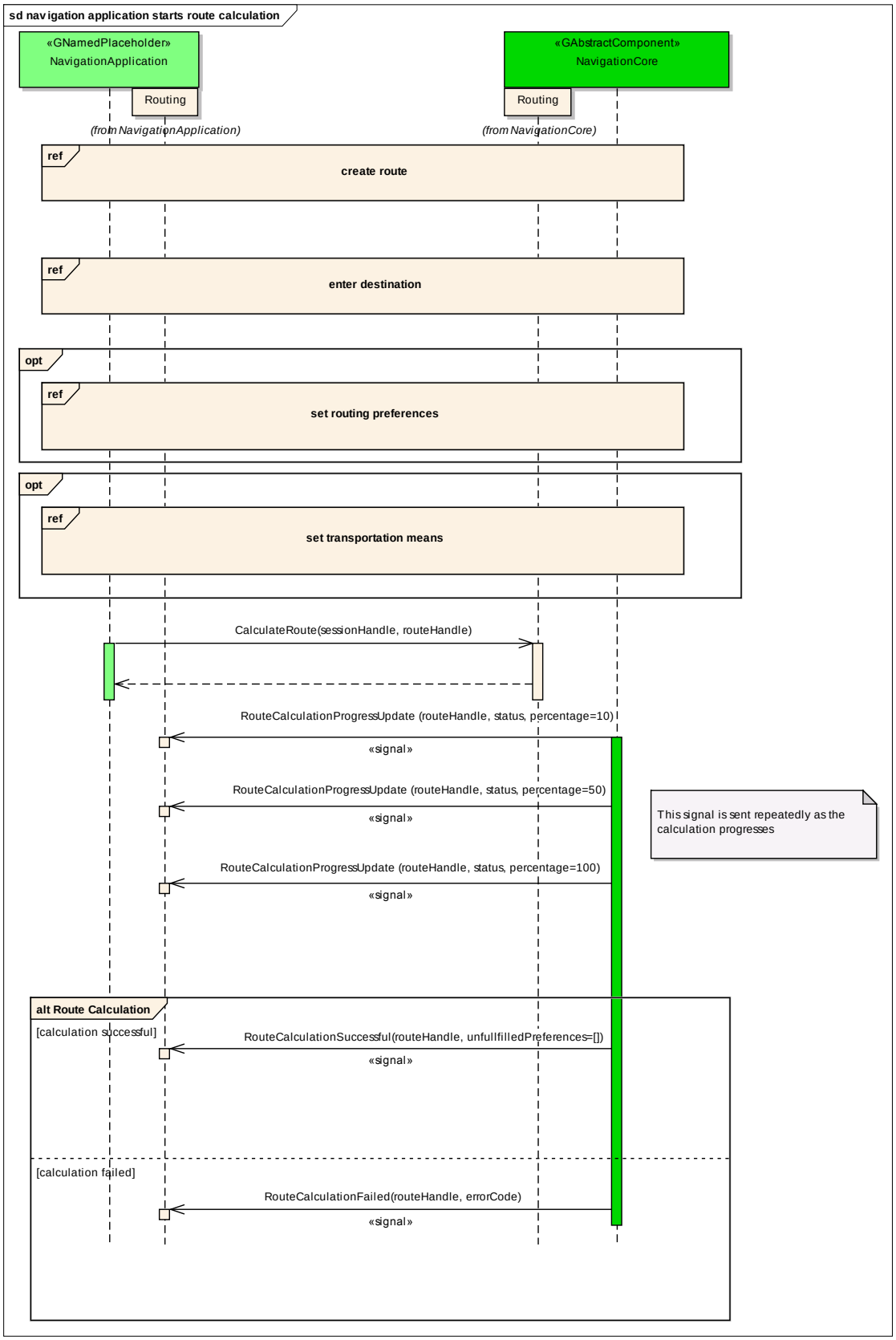


6.7 Sequence Diagrams

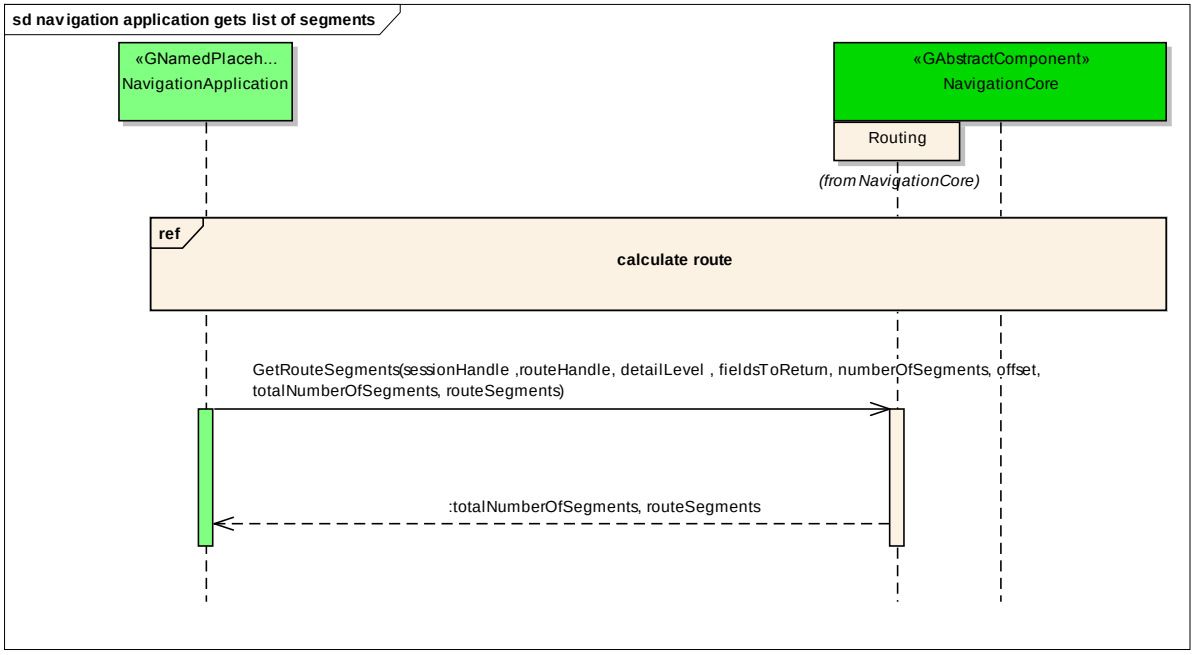
6.7.1 navigation application creates route



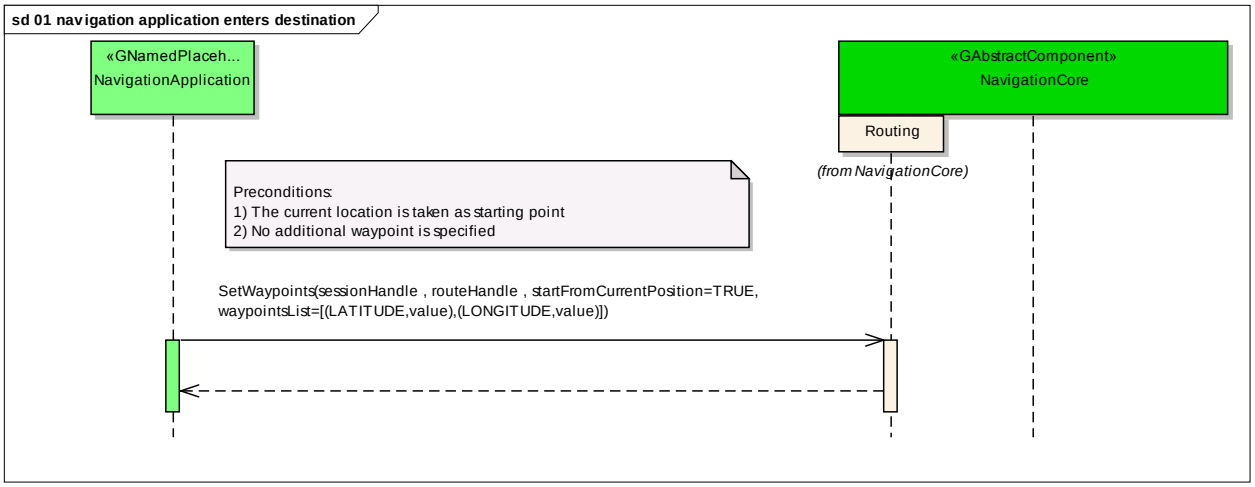
6.7.2 navigation application starts route calculation



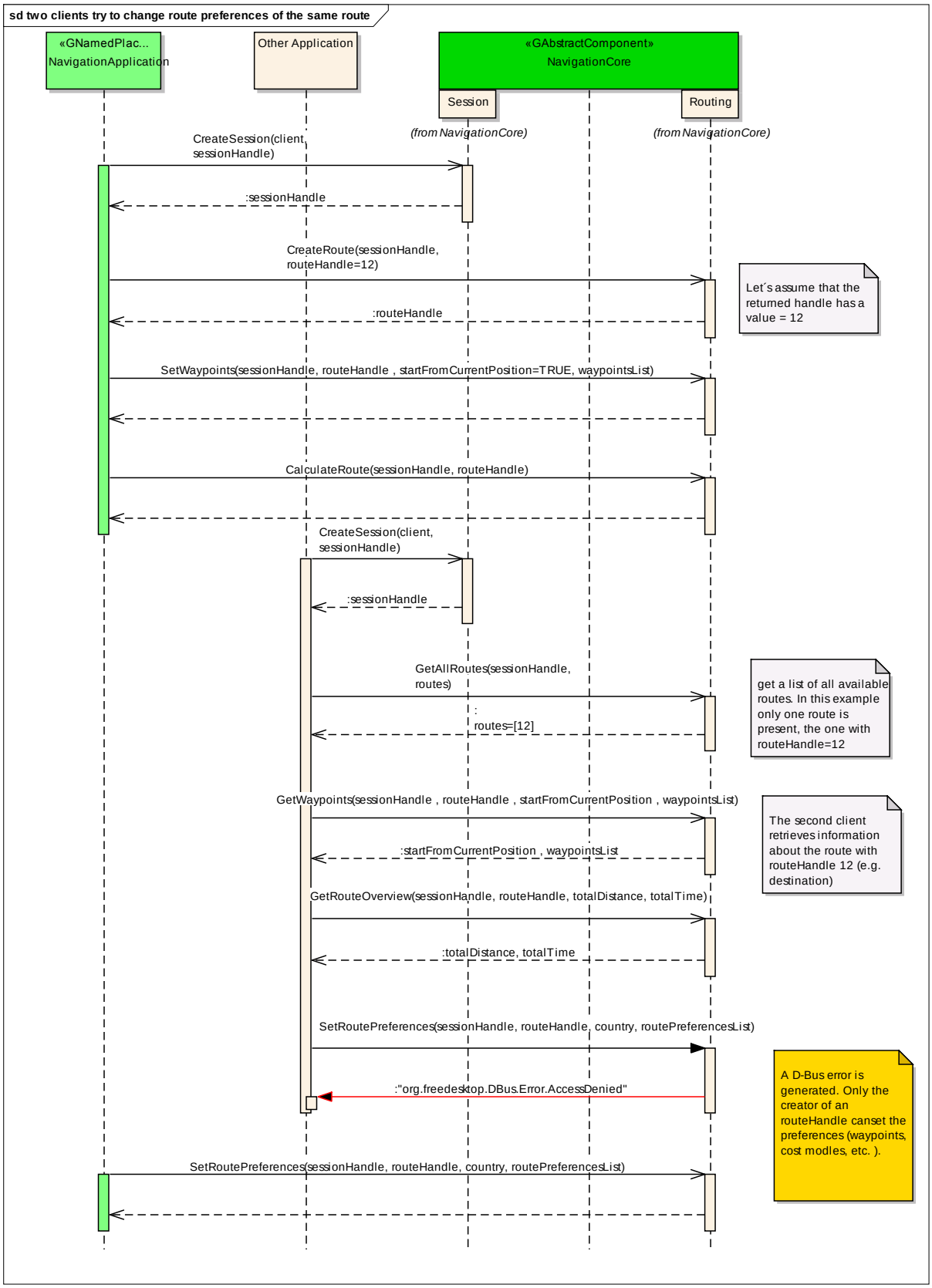
6.7.3 navigation application gets list of segments



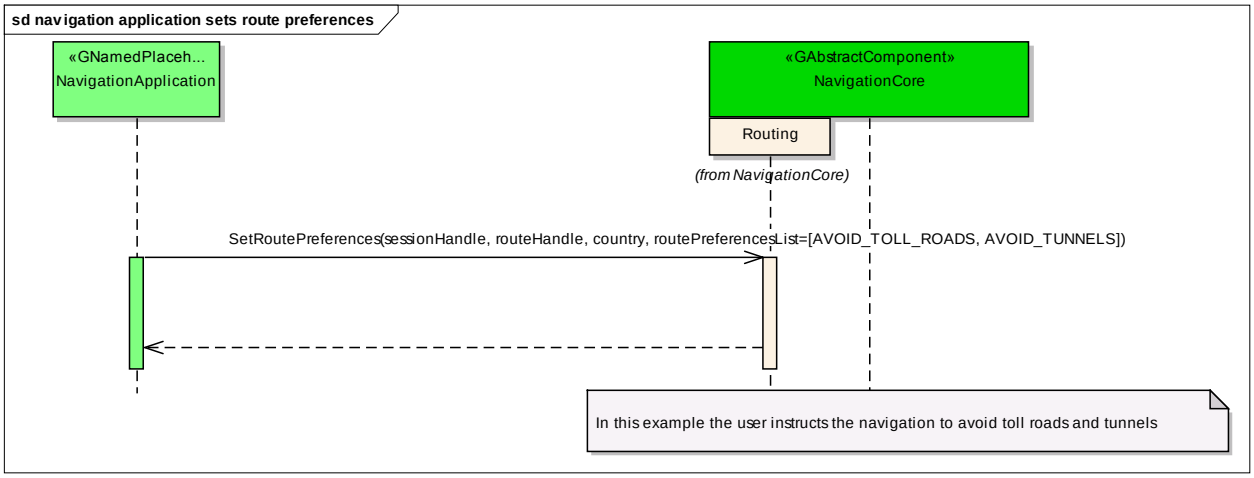
6.7.4 navigation application enters destination



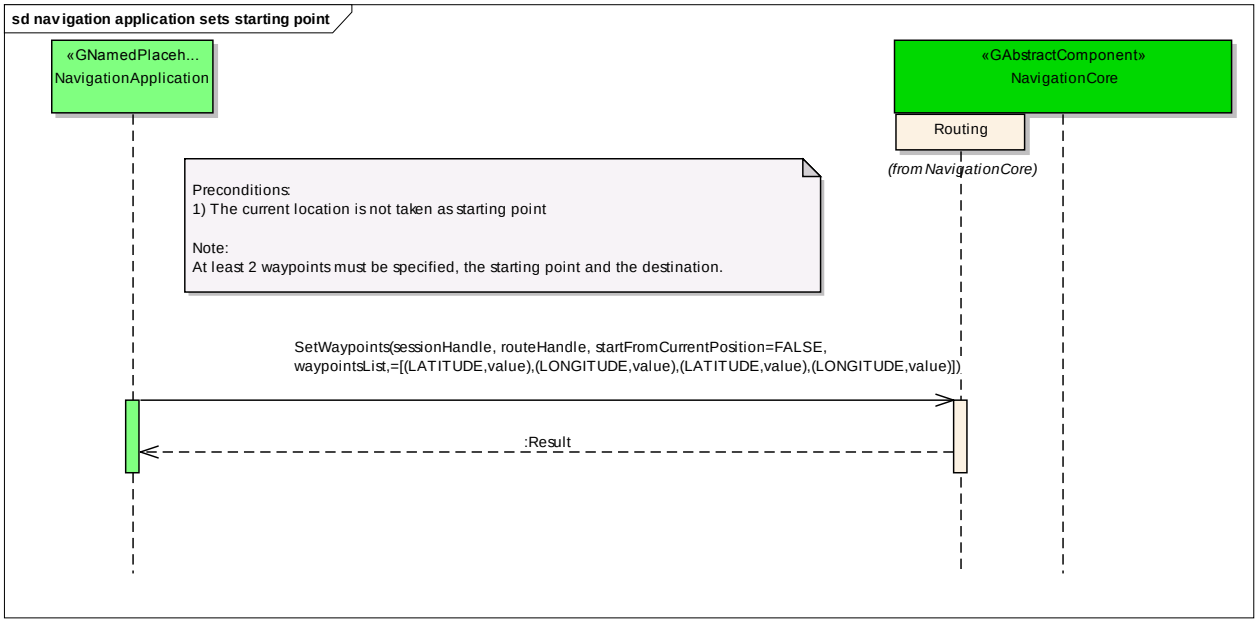
6.7.5 two clients try to change route preferences of the same route



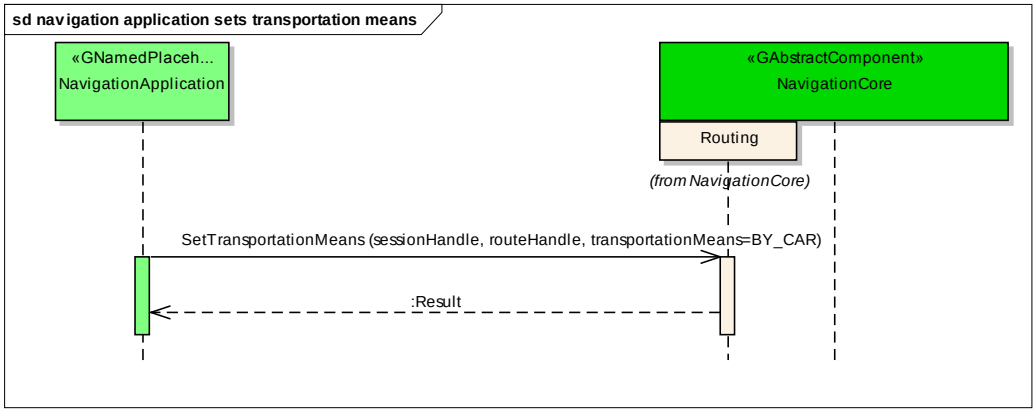
6.7.6 navigation application sets route preferences



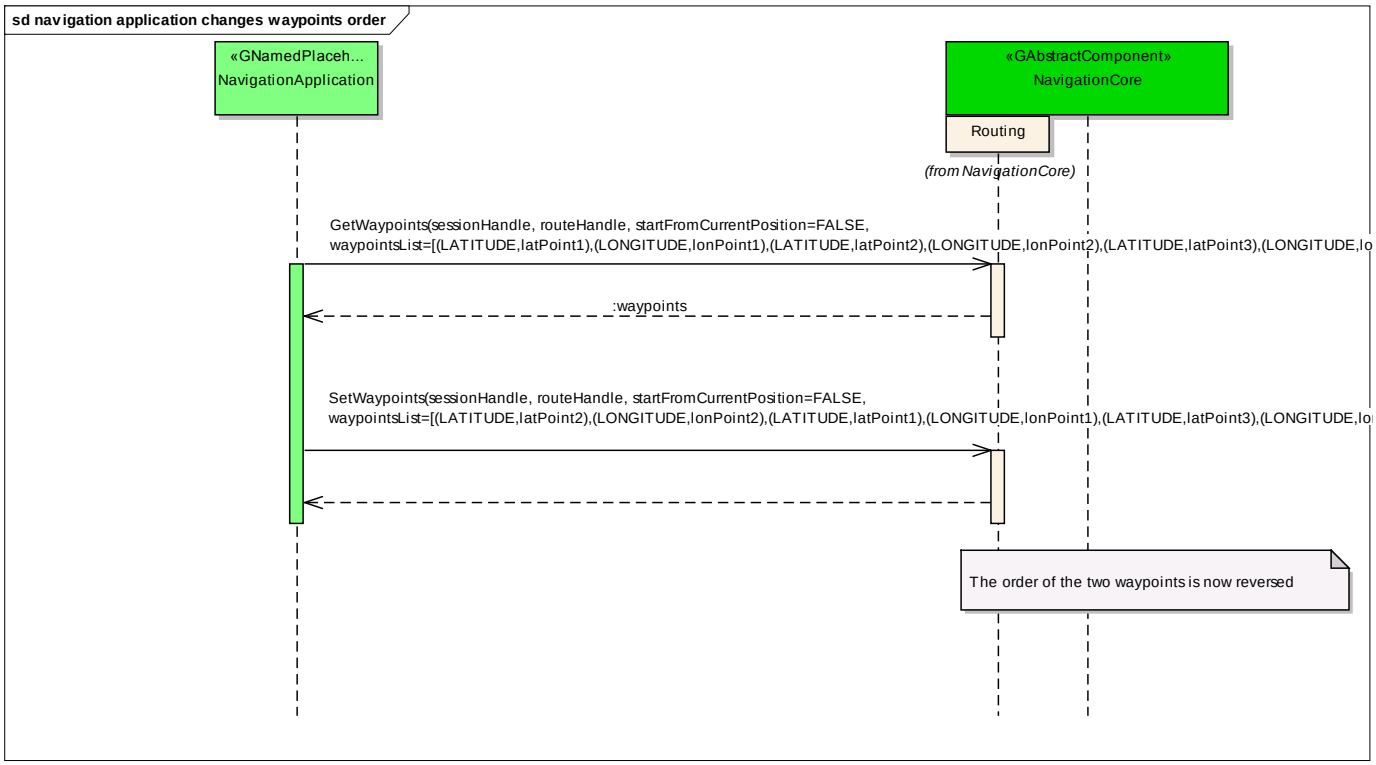
6.7.7 navigation application sets starting point



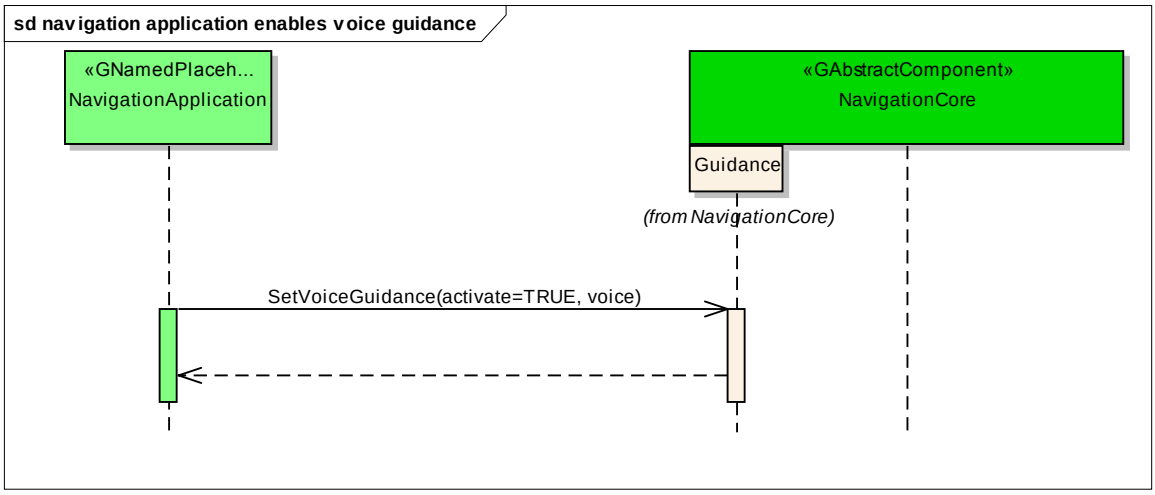
6.7.8 navigation application sets transportation means



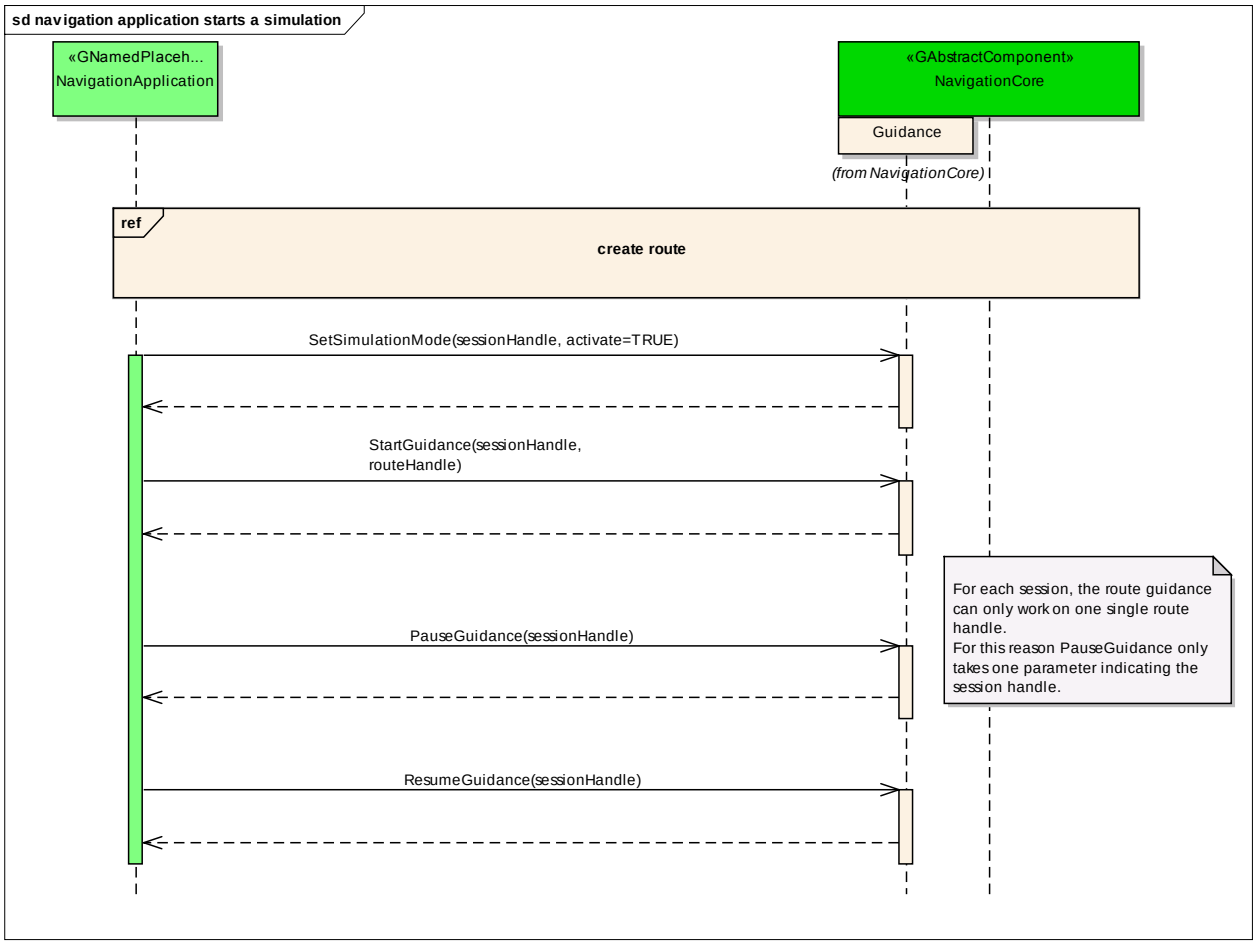
6.7.9 navigation application changes waypoints order



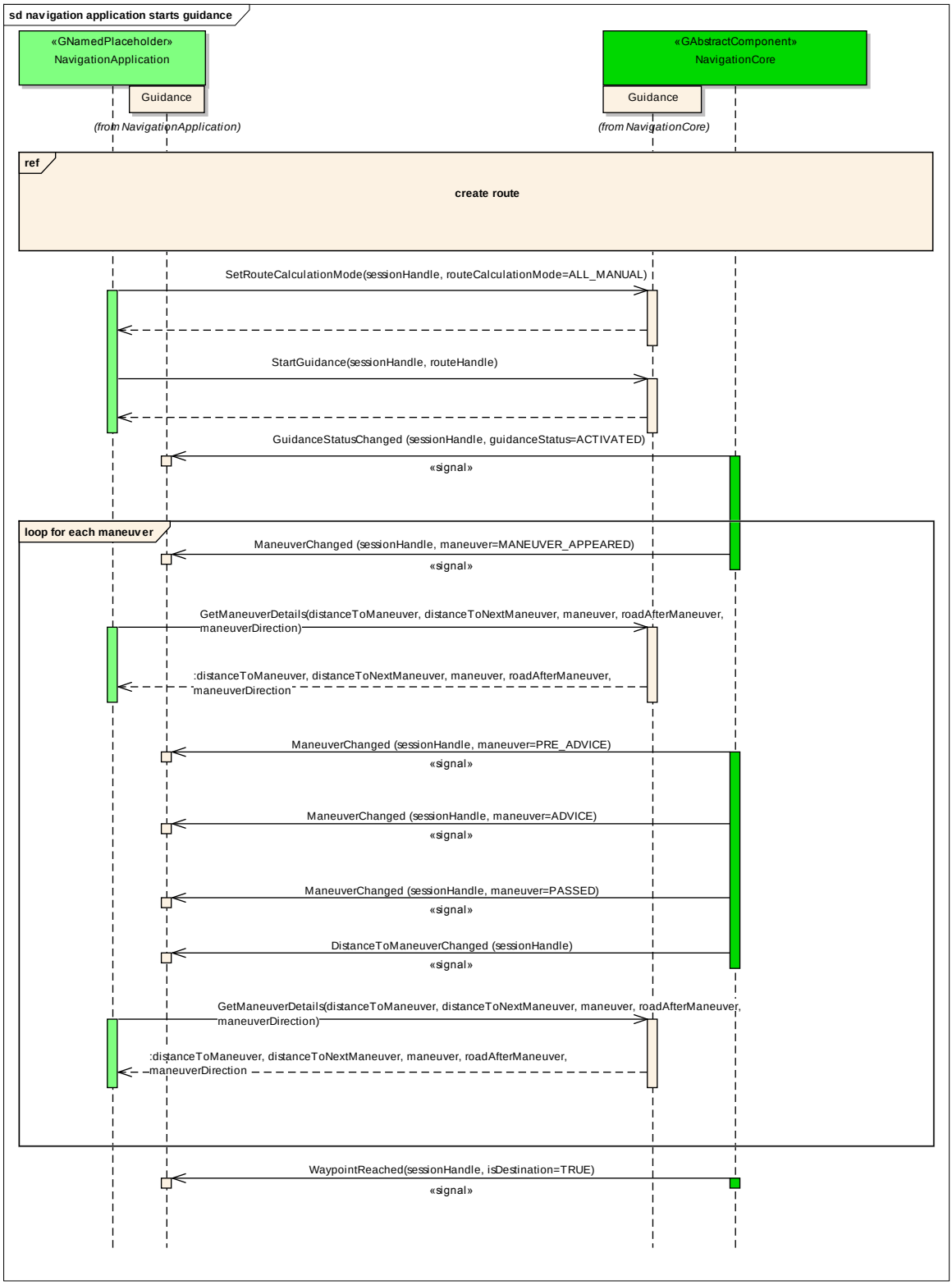
6.7.10 navigation application enables voice guidance



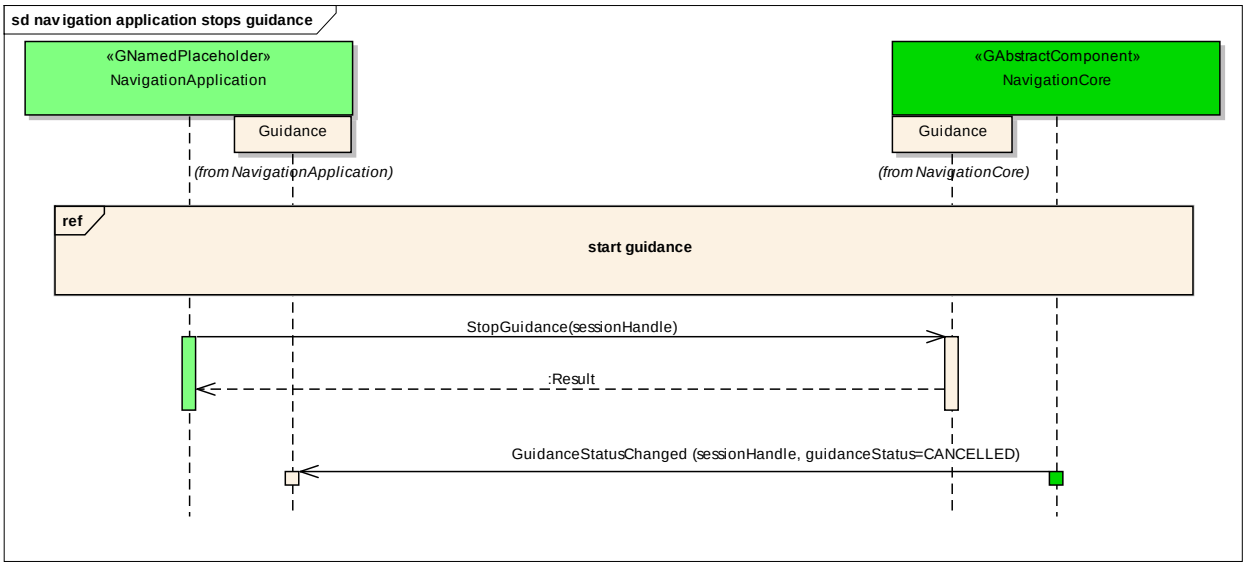
6.7.11 navigation application starts a simulation



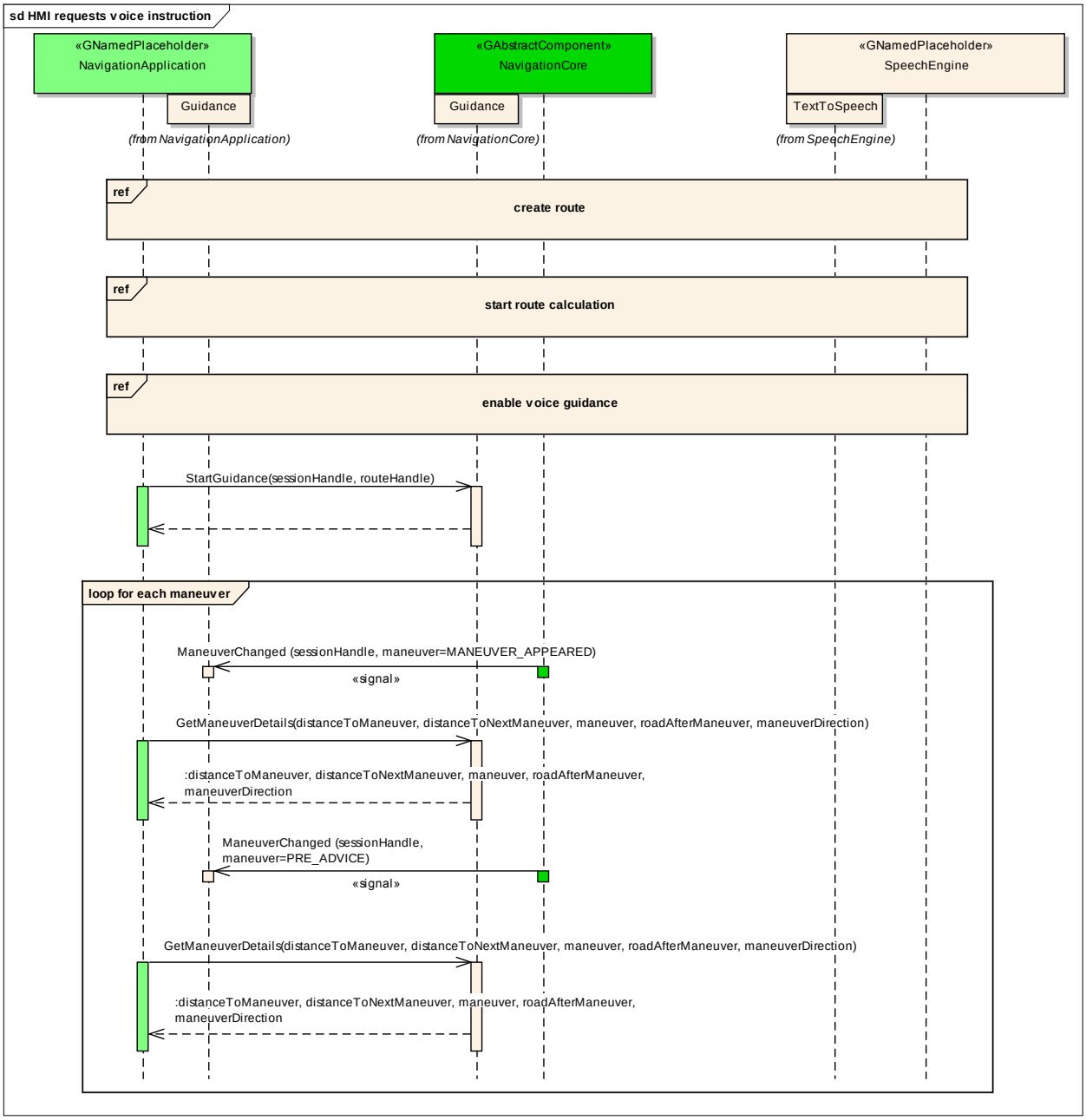
6.7.12 navigation application starts guidance



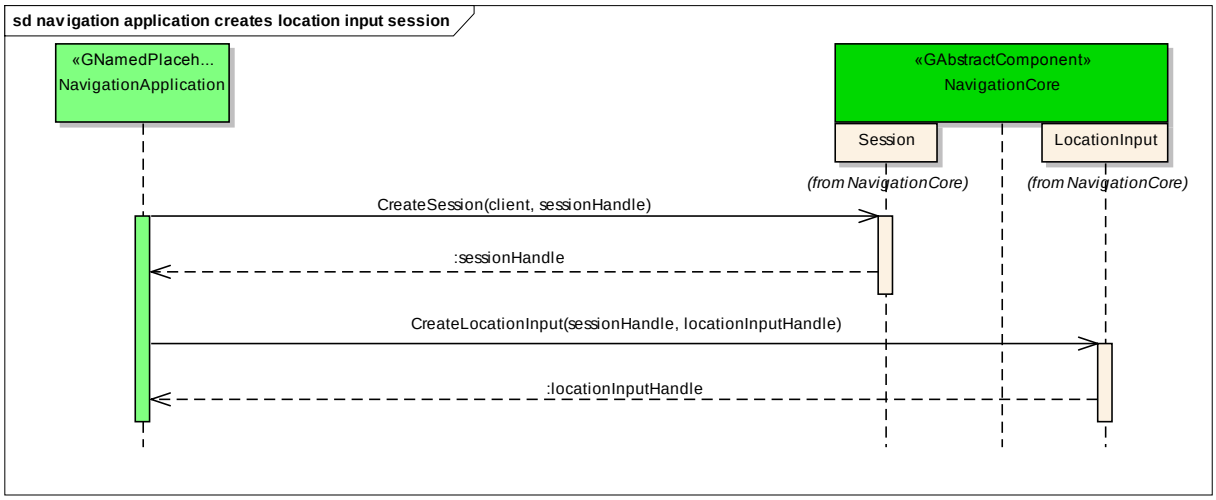
6.7.13 navigation application stops guidance



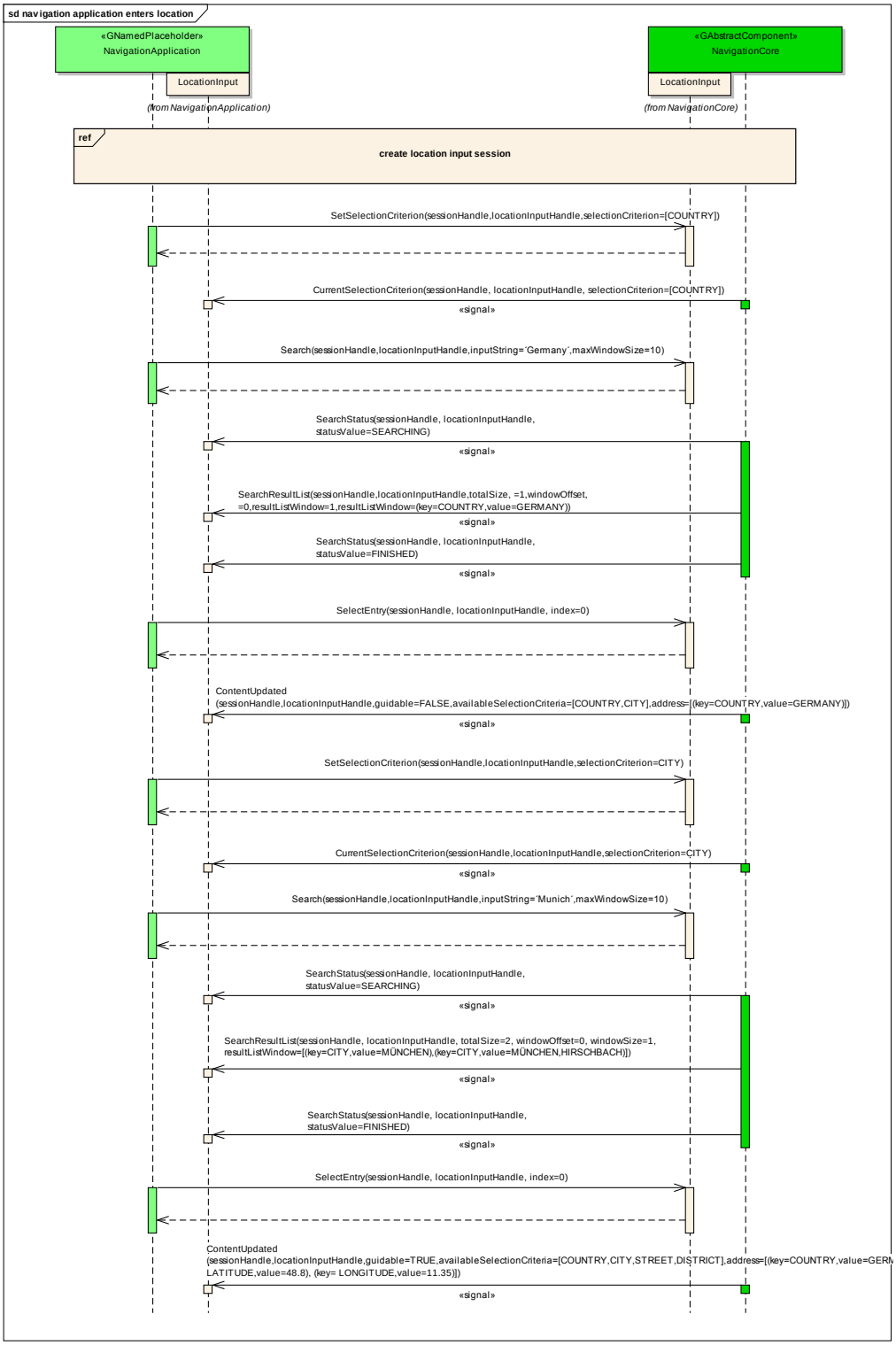
6.7.14 HMI requests voice instruction



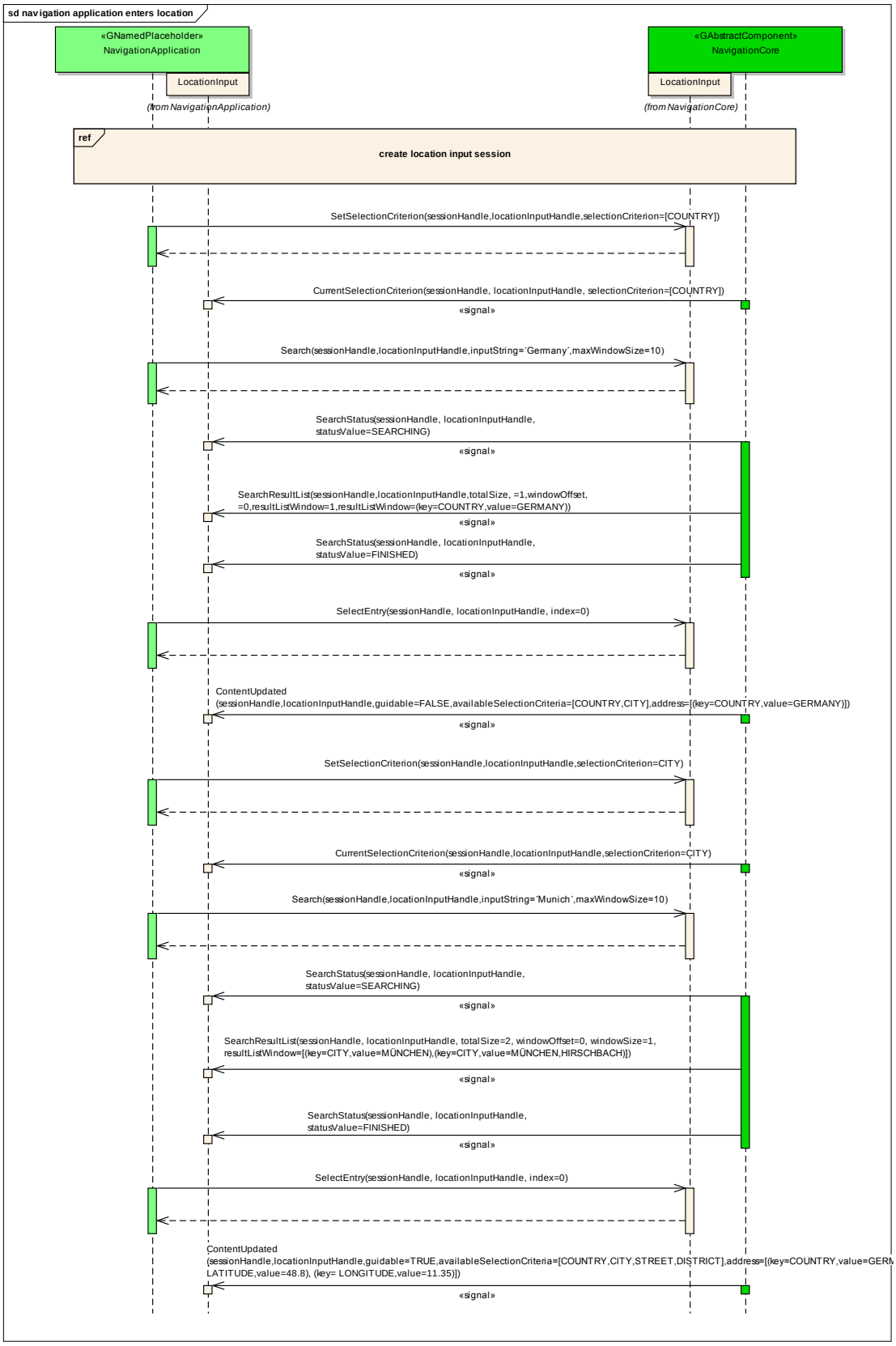
6.7.15 navigation application creates location input session



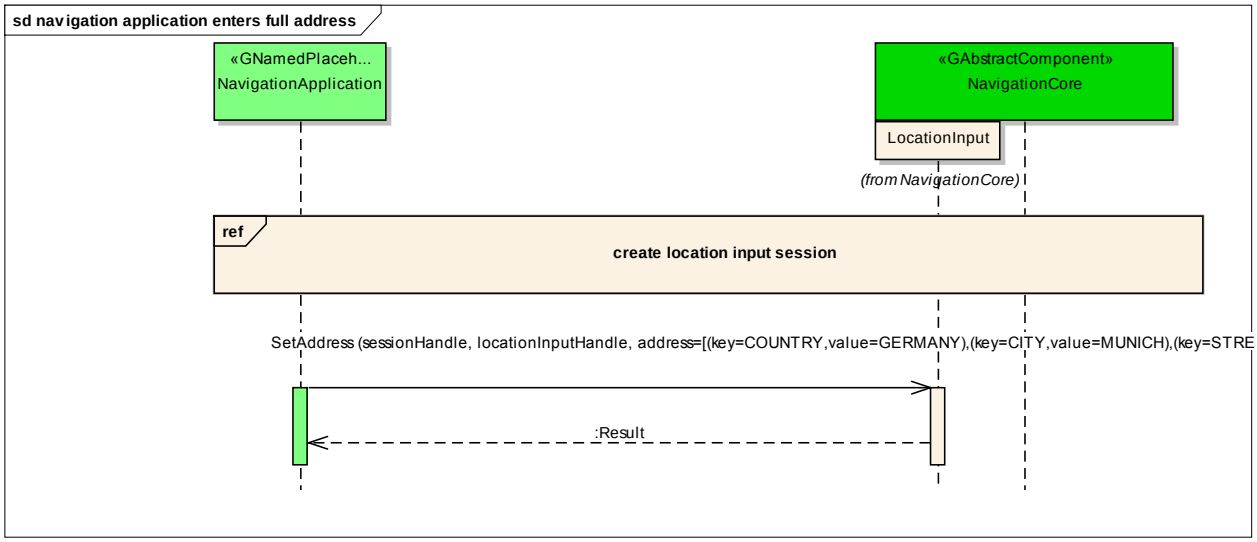
6.7.16 navigation application enters location



6.7.17 navigation application enters location using speller



6.7.18 navigation application enters full address



6.8 Interfaces

interface
org.genivi.navigationcore.Routing
version 3.0.0 (22-01-2014)

Routing = This interface offers functions that implement the routing functionality of a navigation system

---

GetVersion = This method returns the API version implemented by the server application
method `GetVersion`

version = struct(major,minor,micro,date)
major = when the major changes, then backward compatibility with previous releases is not granted
minor = when the minor changes, then backward compatibility with previous releases is granted, but something changed in the implementation of the API (e.g. new methods may have been added)
micro = when the micro changes, then backward compatibility with previous releases is granted (bug fixes or documentation modifications)
date = release date (e.g. 21-06-2011)
out **(qqqs)** `version`

CreateRoute = This method creates a route
method `CreateRoute`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `routeHandle`

This error is generated if no more routing handles are available
error `org.genivi.navigationcore.Routing.Error.NoMoreRouteHandles`

DeleteRoute = This method deletes a route and its associated resources
method `DeleteRoute`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

This error is generated if an application tries to delete a route handle that is not available
error `org.genivi.navigationcore.Routing.Error.RouteNotAvailable`

This error is generated if an application tries to delete a route which is not created manually (e.g. an alternative route calculated in the background)
error `org.genivi.navigationcore.Routing.Error.OperationNotAllowed`

RouteDeleted = This signal is emitted to inform clients that the current route has been deleted
signal `RouteDeleted`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `routeHandle`

SetCostModel = This method sets the cost model
method `SetCostModel`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

costModel =
enum(INVALID,FASTEST,SHORTEST,ECOLOGICAL,SCENIC,EASY,OFF_ROAD,BALANCED,CHEAPEST, ...)
FASTEST = least time to reach the destination
SHORTEST = shortest distance to destination
ECOLOGICAL = least fuel or electric charge to destination
SCENIC = most scenic route to destination
EASY = least number of turns to reach the destination
OFF_ROAD = a distance-optimised route between points that are not covered by road mappings
BALANCED = trade-off between FASTEST and SHORTEST (e.g. 50% FASTEST and 50% SHORTEST)
CHEAPEST = least fuel or electric charge to destination taking pricing into account
in **q** `costModel`

This error is generated if an application tries to set a cost model for a route which is not created manually (e.g. an alternative route calculated in the background)
error `org.genivi.navigationcore.Routing.Error.OperationNotAllowed`

GetCostModel = This method retrieves the selected cost model
method `GetCostModel`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

costModel =
enum(INVALID,FASTEST,SHORTEST,ECOLOGICAL,SCENIC,EASY,OFF_ROAD,BALANCED,CHEAPEST, ...)
FASTEST = least time to reach the destination
SHORTEST = shortest distance to destination
ECOLOGICAL = least fuel or electric charge to destination
SCENIC = most scenic route to destination
EASY = least number of turns to reach the destination
OFF_ROAD = a distance-optimised route between points that are not covered by road mappings
BALANCED = trade-off between FASTEST and SHORTEST (e.g. 50% FASTEST and 50% SHORTEST)
CHEAPEST = least fuel or electric charge to destination taking pricing into account
out **q** `costModel`

GetSupportedCostModels = This method retrieves a list of supported cost models
method `GetSupportedCostModels`

costModelsList = array[costModel]
costModel =
enum(INVALID,FASTEST,SHORTEST,ECOLOGICAL,SCENIC,EASY,OFF_ROAD,BALANCED,CHEAPEST, ...)
FASTEST = least time to reach the destination

SHORTEST = shortest distance to destination
ECOLOGICAL = least fuel or electric charge to destination
SCENIC = most scenic route to destination
EASY = least number of turns to reach the destination
OFF_ROAD = a distance-optimised route between points that are not covered by road mappings
BALANCED = trade-off between FASTEST and SHORTEST (e.g. 50% FASTEST and 50% SHORTEST)
CHEAPEST = least fuel or electric charge to destination taking pricing into account
out **aq** `costModelsList`

SetRoutePreferences = This method sets a list of route preferences
method `SetRoutePreferences`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

countryCode = ISO 3166-1 alpha 3 country code (upper case)
If this argument is an empty string, it means that the preferences apply to all countries
in **s** `countryCode`

roadPreferenceList = array[preference]
preference = struct(preferenceMode,preferenceSource)
preferenceMode = enum(PROHIBIT,AVOID,USE,PREFER)
preferenceMode = PROHIBIT. Routing module must not calculate a planned route including sections matching given avoidance source.
preferenceMode = AVOID. Routing module should not calculate a planned route including sections matching given avoidance source.
preferenceMode = USE. Routing module should calculate a planned route including sections matching given avoidance source.
preferenceMode = PREFER. Routing module should calculate a planned route including as much as possible sections matching given avoidance source.
preferenceSource =
enum(FERRY,TOLL_ROADS,TUNNELS,HIGHWAYS_MOTORWAYS,VEHICLE_SIZE_LIMIT,CRIME_AREAS)
in **a(qq)** `roadPreferenceList`

conditionPreferenceList = array[preference]
preference = struct(preferenceMode,preferenceSource)
preferenceMode = enum(USE,IGNORE)
preferenceSource = enum(TRAFFIC_REALTIME, ...)
in **a(qq)** `conditionPreferenceList`

This error is generated if an application tries to set route preferences for a route which is not created manually (e.g. an alternative route calculated in the background)
error `org.genivi.navigationcore.Routing.Error.OperationNotAllowed`

This error is generated if an application tries to set a route preference which is not supported (e.g. (USE,CRIME_AREA)). The preferences which are not supported are product dependent.
error `org.genivi.navigationcore.Routing.Error.RoutePreferenceNotSupported`

GetRoutePreferences = This method retrieves a list of selected route preferences
method `GetRoutePreferences`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

countryCode = ISO 3166-1 alpha 3 country code (upper case)
If this argument is an empty string, it means that the preferences apply to all countries
in **s** `countryCode`

roadPreferenceList = array[preference]
preference = struct(preferenceMode,preferenceSource)
preferenceMode = enum(PROHIBIT,AVOID,USE,PREFER)
preferenceMode = PROHIBIT. Routing module must not calculate a planned route including sections matching given avoidance source.
preferenceMode = AVOID. Routing module should not calculate a planned route including sections matching given avoidance source.
preferenceMode = USE. Routing module should calculate a planned route including sections matching given avoidance source.
preferenceMode = PREFER. Routing module should calculate a planned route including as much as possible sections matching given avoidance source.
preferenceSource = enum(FERRY,TOLL_ROADS,TUNNELS,HIGHWAYS_MOTORWAYS,VEHICLE_SIZE_LIMIT,CRIME_AREAS)
out **a(qq)** `roadPreferenceList`

conditionPreferenceList = array[preference]
preference = struct(preferenceMode,preferenceSource)
preferenceMode = enum(USE,IGNORE)
preferenceSource = enum(TRAFFIC_REALTIME, ...)
out **a(qq)** `conditionPreferenceList`

GetSupportedRoutePreferences = This method retrieves a list of supported route preferences
method `GetSupportedRoutePreferences`

routePreferencesList = array[preference]
preference = struct(preferenceMode,preferenceSource)
preferenceMode = enum(PROHIBIT,AVOID,USE,PREFER)
preferenceMode = PROHIBIT. Routing module must not calculate a planned route including sections matching given avoidance source.
preferenceMode = AVOID. Routing module should not calculate a planned route including sections matching given avoidance source.
preferenceMode = USE. Routing module should calculate a planned route including sections matching given avoidance source.
preferenceMode = PREFER. Routing module should calculate a planned route including as much as possible sections matching given avoidance source.
preferenceSource = enum(FERRY,TOLL_ROADS,TUNNELS,HIGHWAYS_MOTORWAYS,VEHICLE_SIZE_LIMIT,CRIME_AREAS)
out **a(qq)** `routePreferencesList`

conditionPreferenceList = array[preference]
preference = struct(preferenceMode,preferenceSource)
preferenceMode = enum(USE,IGNORE)
preferenceSource = enum(TRAFFIC_REALTIME, ...)
out **a(qq)** `conditionPreferenceList`

SetRouteSchedule = This method sets the time schedule for the route to be calculated
method `SetRouteSchedule`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

routeSchedule = array[detail]
detail = dictionary[key,value]
dictionary = array of tuples (key,value)
key = enum(ARRIVAL_TIME, ARRIVAL_DATE,DEPARTURE_TIME, DEPARTURE_DATE)
key = ARRIVAL_TIME, value of type 'u', that represents the arrival time is expressed in seconds since mid-night (UTC)
key = ARRIVAL_DATE, value of type 'u', that represents the arrival date is either a calendar date (the number of days since 1 Jan 2000) or a weekday indication. For weekday indication the values 0 till 6 are used (0 = Saturday, 1 = Sunday, 2 = Monday, ..., 6 = Friday)
key = DEPARTURE_TIME, value of type 'u', that represents the departure time is expressed in seconds since mid-night (UTC)
key = DEPARTURE_DATE, value of type 'u', that represents the departure date is either a calendar date (the number of days since 1 Jan 2000) or a weekday indication. For weekday indication the values 0 till 6 are used (0 = Saturday, 1 = Sunday, 2 = Monday, ..., 6 = Friday)
in **a{qu}** `routeSchedule`

GetRouteSchedule = This method gets the time schedule for the route to be calculated
method `GetRouteSchedule`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

valuesToReturn= array[value]
value= enum(ARRIVAL_TIME, ARRIVAL_DATE,DEPARTURE_TIME, DEPARTURE_DATE)
in **aq** `valuesToReturn`

routeSchedule = array[detail]
detail = dictionary[key,value]
dictionary = array of tuples (key,value)
key = enum(ARRIVAL_TIME, ARRIVAL_DATE,DEPARTURE_TIME, DEPARTURE_DATE)
key = ARRIVAL_TIME, value of type 'u', that represents the arrival time is expressed in seconds since mid-night (UTC)
key = ARRIVAL_DATE, value of type 'u', that represents the arrival date is either a calendar date (the number of days since 1 Jan 2000) or a weekday indication. For weekday indication the values 0 till 6 are used (0 = Saturday, 1 = Sunday, 2 = Monday, ..., 6 = Friday)
key = DEPARTURE_TIME, value of type 'u', that represents the departure time is expressed in seconds since mid-night (UTC)
key = DEPARTURE_DATE, value of type 'u', that represents the departure date is either a calendar date (the number of days since 1 Jan 2000) or a weekday indication. For weekday indication the values 0 till 6 are used (0 = Saturday, 1 = Sunday, 2 = Monday, ..., 6 = Friday)
out **a{qu}** `routeSchedule`

SetTransportationMeans = This method sets a list of means of transportation that must be considered when calculating a route
method `SetTransportationMeans`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

transportationMeansList = array[transportationMeans]

transportationMeans = enum(INVALID,BY_CAR,ON_FOOT,LONG_RANGE_TRAINS,PUBLIC_TRANSPORTATION,BY_BICYCLE,BY_TRUCK, ...)

in **aq** `transportationMeansList`

This error is generated if an application tries to set transportation means for a route which is not created manually (e.g. an alternative route calculated in the background)

error `org.genivi.navigationcore.Routing.Error.OperationNotAllowed`

GetTransportationMeans = This method retrieves the selected means of transportation

method `GetTransportationMeans`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value

in **u** `routeHandle`

transportationMeansList = array[transportationMeans]
transportationMeans = enum(INVALID,BY_CAR,ON_FOOT,LONG_RANGE_TRAINS,PUBLIC_TRANSPORTATION,BY_BICYCLE,BY_TRUCK, ...)

out **aq** `transportationMeansList`

GetSupportedTransportationMeans = This method retrieves a list of supported means of transportation

method `GetSupportedTransportationMeans`

transportationMeansList = array[transportationMeans]
transportationMeans = enum(INVALID,BY_CAR,ON_FOOT,LONG_RANGE_TRAINS,PUBLIC_TRANSPORTATION,BY_BICYCLE,BY_TRUCK, ...)

out **aq** `transportationMeansList`

SetExcludedAreas = This method sets the areas to be excluded when calculating a route

method `SetExcludedAreas`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value

in **u** `sessionHandle`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value

in **u** `routeHandle`

excludedAreas = array[array(lat,lon)]
excludedAreas = array[convexPolygon]
convexPolygon = array[lat,lon]
lat = latitude of a vertex of the polygon in format %3.6f. Range [-90:+90]. Example: 48.053250
lon = longitude of a vertex of the polygon in format %3.6f. Range [-180:+180]. Example: 48.053250
Note: a polygon must have at least 3 vertexes

in **aa(dd)** `excludedAreas`

This error is generated if an application tries to set excluded areas for a route which is not created manually (e.g. an alternative route calculated in the background)

error `org.genivi.navigationcore.Routing.Error.OperationNotAllowed`

GetExcludedAreas = This method retrieves the areas to be excluded when calculating a route

method `GetExcludedAreas`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

excludedAreas = array[array(lat,lon)]
excludedAreas = array[convexPolygon]
convexPolygon = array[lat,lon]
lat = latitude of a vertex of the polygon in format %3.6f. Range [-90:+90]. Example: 48.053250
lon = longitude of a vertex of the polygon in format %3.6f. Range [-180:+180]. Example: 48.053250
Note: pass an empty array to remove previously selected excluded areas
out **aa(dd)** `excludedAreas`

SetWaypoints = This method sets a list of waypoints
method `SetWaypoints`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

startFromCurrentPosition = flag indicating if the current position is used as starting point
in **b** `startFromCurrentPosition`

waypointsList = array[waypoint]
waypoint = tuple (key,value)
key = enum(INVALID,WAYPOINT_TYPE,LOCATION_INPUT,LATITUDE,LONGITUDE,ALTITUDE, ...)
key = WAYPOINT_TYPE, value = value of type 'q', that represents an enum(INVALID,SOFT_POINT,HARD_POINT, ...)
key = LOCATION_INPUT, value = value of type 'ay'. This is a byte array whose interpretation is left to the navigation core
key = LATITUDE, value = value of type 'd', that expresses the latitude of the starting point in format %3.6f. Range [-90:+90]. Example: 48.053250
key = LONGITUDE, value = value of type 'd', that expresses the longitude of the starting point in format %3.6f. Range [-180:+180]. Example: 8.324500
key = ALTITUDE, value = value of type 'i', that expresses the altitude of the starting point in meters
Note: if the flag StartFromCurrentPosition=true, then at least one waypoint must be provided (destination)
Note: if the flag StartFromCurrentPosition=false, then at least two waypoints must be provided (starting point and destination)
in **aa{qv}** `waypointsList`

This error is sent when a client application tries to change the waypoints while the route guidance is active
error `org.genivi.navigationcore.Routing.Error.WaypointCannotBeChanged`

This error is sent when a client application tries to set a number of waypoints that exceeds the system capabilities
error `org.genivi.navigationcore.Routing.Error.TooManyWaypoints`

This error is generated if an application tries to set waypoints for a route which is not created manually (e.g. an alternative route calculated in the background)
error `org.genivi.navigationcore.Routing.Error.OperationNotAllowed`

GetWaypoints = This method retrieves a list of waypoints
method `GetWaypoints`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

startFromCurrentPosition = flag indicating if the current position is used as starting point
out **b** `startFromCurrentPosition`

waypointsList = array[waypoint]
waypoint = tuple (key,value)
key = enum(INVALID,WAYPOINT_TYPE,LOCATION_INPUT,LATITUDE,LONGITUDE,ALTITUDE, ...)
key = WAYPOINT_TYPE, value = value of type 'q', that represents an enum(INVALID,SOFT_POINT,HARD_POINT, ...)
key = LOCATION_INPUT, value = value of type 'ay'. This is a byte array whose interpretation is left to the navigation core
key = LATITUDE, value = value of type 'd', that expresses the latitude of the starting point in format %3.6f. Range [-90:+90]. Example: 48.053250
key = LONGITUDE, value = value of type 'd', that expresses the longitude of the starting point in format %3.6f. Range [-180:+180]. Example: 8.324500
key = ALTITUDE, value = value of type 'i', that expresses the altitude of the starting point in meters
out **aa{qv}** `waypointsList`

CalculateRoute = This method starts a route calculation
method `CalculateRoute`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

This error is generated if an application tries to calculate a route which is not created manually (e.g. an alternative route calculated in the background)
error `org.genivi.navigationcore.Routing.Error.OperationNotAllowed`

CancelRouteCalculation = This method cancels a route calculation
method `CancelRouteCalculation`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

RouteCalculationCancelled = This signal informs a client that a route calculation was cancelled
signal `RouteCalculationCancelled`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `routeHandle`

RouteCalculationSuccessful = This signal informs a client that a route calculation was successful
signal `RouteCalculationSuccessful`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value

out **u** `routeHandle`

unfullfilledPreferences = array[preference]
preference = tuple(preferenceMode,preferenceSource)
preferenceMode = enum(PROHIBIT,AVOID,USE,PREFER)
preferenceMode = PROHIBIT. Routing module must not calculate a planned route including sections matching given avoidance source.
preferenceMode = AVOID. Routing module should not calculate a planned route including sections matching given avoidance source.
preferenceMode = USE. Routing module should calculate a planned route including sections matching given avoidance source.
preferenceMode = PREFER. Routing module should calculate a planned route including as much as possible sections matching given avoidance source.
preferenceSource = enum(FERRY,TOLL_ROADS,TUNNELS,HIGHWAYS_MOTORWAYS,VEHICLE_SIZE_LIMIT,CRIME_AREAS)
out **a{qq}** `unfullfilledPreferences`

RouteCalculationFailed = This signal informs a client that a route calculation failed
signal `RouteCalculationFailed`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `routeHandle`

errorCode = enum(INVALID,UNMATCHED_POSITION,UNREACHABLE_DESTINATION,UNFULFILLED_PREFERENCE_MODE, ...)
errorCode = UNFULFILLED_PREFERENCE_MODE. Refer to unfullfilledPreferences to see which routing preferences could not be met causing routing calculation to fail; for any other value the argument unfulfilledPreferences should be ignored.
out **q** `errorCode`

unfullfilledPreferences = array[preference]
preference = tuple(preferenceMode,preferenceSource)
preferenceMode = enum(PROHIBIT,AVOID,USE,PREFER)
preferenceMode = PROHIBIT. Routing module must not calculate a planned route including sections matching given avoidance source.
preferenceMode = AVOID. Routing module should not calculate a planned route including sections matching given avoidance source.
preferenceMode = USE. Routing module should calculate a planned route including sections matching given avoidance source.
preferenceMode = PREFER. Routing module should calculate a planned route including as much as possible sections matching given avoidance source.
preferenceSource = enum(FERRY,TOLL_ROADS,TUNNELS,HIGHWAYS_MOTORWAYS,VEHICLE_SIZE_LIMIT,CRIME_AREAS)
out **a{qq}** `unfullfilledPreferences`

RouteCalculationProgressUpdate = This signal informs a client about a route calculation progress
signal `RouteCalculationProgressUpdate`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `routeHandle`

status = enum(INVALID,CALCULATION_OK,NO_POSITION, ...)
out **q** `status`

percentage = progress status. Range [0:100]

out **y** `percentage`

CalculateRoutes = This method allows a client to calculate alternative routes that differs from a list of already calculated routes

method `CalculateRoutes`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value

in **u** `sessionHandle`

calculatedRoutesList = array[calculatedRoute]
calculatedRoute = Handle identifying an already calculated route. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value

in **au** `calculatedRoutesList`

alternativeRoutesList = array[alternativeRoute]
alternativeRoute = Handle identifying an alternative route. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value

out **au** `alternativeRoutesList`

This error is generated if an application tries to calculate an alternative to a route which is not created manually (e.g. an alternative route calculated in the background)

error `org.genivi.navigationcore.Routing.Error.OperationNotAllowed`

GetRouteSegments = This method retrieves a list of segments for a given route starting from the one closest to the current position to the one closest to the destination

method `GetRouteSegments`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value

in **u** `routeHandle`

detailLevel = detail level

in **n** `detailLevel`

valuesToReturn= array[key]
key = enum(INVALID,LINK-ID,INTERMEDIATE_POINTS,START_LATITUDE,START_LONGITUDE,START_ALTITUDE, END_LATITUDE,END_LONGITUDE,END_ALTITUDE,ROAD_NAME,ROAD_NUMBER,DISTANCE,TIME,MANEUVER,INSTRUCTION, BORDER_CROSSING,TIME_ZONE,DAYLIGHT_SAVING_TIME,ADDITIONAL_INFORMATION,HIGHWAY_EXIT, ... , ALL)

in **aq** `valuesToReturn`

numberOfSegments = number of segments to be retrieved

in **u** `numberOfSegments`

offset = offset from the beginning of the list

in **u** `offset`

totalNumberOfSegments = total number of segments

out **u** `totalNumberOfSegments`

routeSegments = array[segment]
segment = tuple(key,value)
Note: a segment is the shortest navigable stretch of a route (e.g. the stretch between two adjacent junctions)
key = enum(INVALID,LINK-ID,INTERMEDIATE_POINTS,START_LATITUDE,START_LONGITUDE,START_ALTITUDE, END_LATITUDE,END_LONGITUDE,END_ALTITUDE,ROAD_NAME,ROAD_NUMBER,DISTANCE,TIME,MANEUVER,INSTRUCTION,

BORDER_CROSSING,TIME_ZONE,DAYLIGHT_SAVING_TIME,ADDITIONAL_INFORMATION,HIGHWAY_EXIT, ...)
key = LINK-ID, value = value of type 'ay', that represents a link-ID in a format whose interpretation is left to the navigationcore
key = START_LATITUDE, value = value of type 'd', that expresses the latitude of the starting point in format %3.6f. Range [-90:+90]. Example: 48.053250
key = END_LATITUDE, value = value of type 'd', that expresses the latitude of the ending point in format %3.6f. Range [-90:+90]. Example: 48.053250
Note: END_LATITUDE can be omitted, if it coincides with the latitude of the start point of the next segment
key = START_LONGITUDE, value = value of type 'd', that expresses the longitude of the starting point in format %3.6f. Range [-180:+180]. Example: 8.321000
key = END_LONGITUDE, value = value of type 'd', that expresses the longitude of the ending point in format %3.6f. Range [-180:+180]. Example: 8.321000
Note: END_LONGITUDE can be omitted, if it coincides with the longitude of the start point of the next segment
key = START_ALTITUDE, value = value of type 'i', that expresses the altitude relative to the ground of the starting point in meters
key = END_ALTITUDE, value = value of type 'i', that expresses the altitude relative to the ground of the ending point in meters
Note: END_ALTITUDE can be omitted, if it coincides with the altitude of the start point of the next segment
key = INTERMEDIATE_POINTS, value = value of type 'a(qddd)', that expresses an array of intermediate points
Note: an intermedate point is expressed as a struct(type,latitude,longitude,altitude), where type = enum(INVALID,HARD_POINT,SOFT_POINT, ...)
key = ROAD_NUMBER, value = value of type 's', that expresses the road number
key = ROAD_NAME, value = value of type 's', that expresses the road name
key = DISTANCE, value = value of type 'u', that identifies distance to the next segment in meters
key = TIME, value = value of type 'u', that identifies time to travel to the next segment in seconds
key = MANEUVER, value = value of type 'a(qqaq)', that identifies a pictogram that describes the next maneuver (OPTIONAL)
key = INSTRUCTION, value = value of type 's', that identifies the instruction to the user
key = BORDER_CROSSING, value = value of type 's', that contains information about border crossings
key = TIME_ZONE, value = value of type 'n', that indicates the time zone of the current segment. It is expressed as the time difference from the UTC in minutes
key = DAYLIGHT_SAVING_TIME, value = value of type 'n', that indicates the daylight saving time of the current segment. It is expressed as the time difference from the UTC in minutes
key = ADDITIONAL_INFORMATION, value = value of type 's', that contains additional information to the user (toll cost, ...)
key = HIGHWAY_EXIT, value = value of type 's', that in case the road segment ends with a highway exit, it expresses the highway exit number
key = START_OFFSET, value = value of type 'u', that indicates the offset of the starting point in meters from the beginning of the route

out **aa{qv}** `routeSegments`

GetRouteOverview = This method retrieves general information about a given route

method `GetRouteOverview`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value

in **u** `routeHandle`

valuesToReturn = array[key]
key = enum(ARRIVAL_TIME,ARRIVAL_DATE,DEPARTURE_TIME,DEPARTURE_DATE,TOTAL_DISTANCE,TOTAL_TIME, ... ,ALL)

in **aq** `valuesToReturn`

routeOverview = array[detail]
detail = tuple(key,value)
key = enum(ARRIVAL_TIME,ARRIVAL_DATE,DEPARTURE_TIME,DEPARTURE_DATE,TOTAL_DISTANCE,TOTAL_TIME, ...)

key = ARRIVAL_TIME, value of type 'u', that represents the arrival time expressed in seconds since mid-night (UTC)
key = ARRIVAL_DATE, value of type 'u', that represents the arrival date expressed either as calendar date (the number of days since 1 Jan 2000) or as weekday. The weekday is expressed with values from 0 to 6 (0 = Saturday, 1 = Sunday, 2 = Monday, ..., 6 = Friday)
key = DEPARTURE_TIME, value of type 'u', that represents the departure time expressed in seconds since mid-night (UTC)
key = DEPARTURE_DATE, value of type 'u', that represents the departure date expressed either as calendar date (the number of days since 1 Jan 2000) or as weekday. The weekday is expressed with values from 0 to 6 (0 = Saturday, 1 = Sunday, 2 = Monday, ..., 6 = Friday)
key = TOTAL_DISTANCE, value of type 'u', that represents the total distance in m
key = TOTAL_TIME, value of type 'u', that represents the total time in seconds
out **a{qv}** `routeOverview`

GetRouteBoundingBox = This method retrieves the bounding box containing a calculated route
method `GetRouteBoundingBox`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

boundingBox = struct(top-left-corner,bottom-right-corner)
geocoordinates of the top-left-corner = struct(lat,lon)
geocoordinates of the bottom-right-corner = struct(lat,lon)
lat = latitude in format %3.6f. Range[-90:+90]. Example: 48.053250
lon = longitude in format %3.6f. Range[-180:+180]. Example: 8.321000
out **((dd)(dd))** `boundingBox`

GetAllRoutes = This method retrieves the handles of all created routes
method `GetAllRoutes`

routesList = array[route]
route = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **au** `routesList`

AlternativeRoutesAvailable = This signal is emitted when alternative routes have been computed in the background and are available for guidance.
signal `AlternativeRoutesAvailable`

routeHandlesList = array[routeHandle]
routeHandle = Handle identifying a computed alternative route. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **au** `routeHandlesList`

SetBlockedRouteStretches = This method sets blocked streches on a given route
method `SetBlockedRouteStretches`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

blockParameters = struct(offset,length)
offset = the offset in meters from the beginning of the route where the road block starts from
length = the length of the road block in meters
Note: pass an empty array to remove previously set blocked route stretches
in **a(uu)** `blockParameters`

GetBlockedRouteStretches = This method retrieves all blocked streches on a given route
method `GetBlockedRouteStretches`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

blockParameters = struct(offset,length)
offset = the offset in meters from the beginning of the route where the road block starts from
length = the length of the road block in meters
out **a(uu)** `blockParameters`

interface
org.genivi.navigationcore.Session
version 3.0.0 (22-01-2014)

Session = This interface offers functions to create and delete sessions

---

GetVersion = This method returns the API version implemented by the server application
method `GetVersion`

version = struct(major,minor,micro,date)
major = when the major changes, then backward compatibility with previous releases is not granted
minor = when the minor changes, then backward compatibility with previous releases is granted, but something changed in the implementation of the API (e.g. new methods may have been added)
micro = when the micro changes, then backward compatibility with previous releases is granted (bug fixes or documentation modifications)
date = release date (e.g. 21-06-2011)
out **(qqqs)** `version`

CreateSession = This method creates a new session
method `CreateSession`

client = name or identifier of the client application that requests a new session
The navigation core must internally associate this name to the returned session handle
This parameter can be used to identify the client application and determine if a given feature is enabled for it
in **s** `client`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `sessionHandle`

This error is generated if no more session handles are available
error `org.genivi.navigationcore.Session.Error.NoMoreSessionHandles`

DeleteSession = This method deletes a session and its associated resources
method `DeleteSession`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

This error is generated if an application tries to delete a session handle that is not available
error `org.genivi.navigationcore.Session.Error.SessionNotAvailable`

GetSessionStatus = This method returns whether a given session handle is available or not (for example because it was deleted)
method `GetSessionStatus`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

sessionStatus = enum(INVALID,AVAILABLE,NOT_AVAILABLE)
out **q** `sessionStatus`

GetAllSessions = This method returns a list of all available sessions
method `GetAllSessions`

sessionsList = array[struct(sessionHandle,client)]
sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
client = name or identifier of the client application that requested the sessionHandle
out **a(us)** `sessionsList`

SessionDeleted = This signal is emitted when a session is deleted
signal `SessionDeleted`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `sessionHandle`

interface
org.genivi.navigationcore.Configuration
version 3.0.0 (21-01-2014)

Configuration = This interface offers functions to set and retrieve configuration parameters

---

GetVersion = This method returns the API version implemented by the server application
method `GetVersion`

version = struct(major,minor,micro,date)
major = when the major changes, then backward compatibility with previous releases is not granted
minor = when the minor changes, then backward compatibility with previous releases is granted, but something changed in the implementation of the API (e.g. new methods may have been added)
micro = when the micro changes, then backward compatibility with previous releases is granted (bug fixes or documentation modifications)
date = release date (e.g. 21-06-2011)
out **(qqqs)** `version`

SetUnitsOfMeasurement = This method sets the units of measurement
method `SetUnitsOfMeasurement`

unitsOfMeasurementList = array[unitsOfMeasurement]
unitsOfMeasurement = tuple (key,value)
key = enum(INVALID,LENGTH, ...)
key = LENGTH, value = value of type 'q', that represents an enum(INVALID,METER,MILE, ...)
in **a{qv}** `unitsOfMeasurementList`

GetUnitsOfMeasurement = This method retrieves the units of measurement
method `GetUnitsOfMeasurement`

unitsOfMeasurementList = array[unitsOfMeasurement]
unitsOfMeasurement = tuple (key,value)
key = enum(INVALID,LENGTH, ...)
key = LENGTH, value = value of type 'q', that represents an enum(INVALID,METER,MILE, ...)
out **a{qv}** `unitsOfMeasurementList`

GetSupportedUnitsOfMeasurement = This method retrieves the supported units of measurement
method `GetSupportedUnitsOfMeasurement`

unitsOfMeasurementList = array[unitsOfMeasurement]
unitsOfMeasurement = dictionary[key,value]
dictionary = array of tuples (key,value)
key = enum(INVALID,LENGTH, ...)
key = LENGTH, value = value of type 'aq'; 'q' is an enum(INVALID,METER,MILE, ...)

out **a{qv}** `unitsOfMeasurementList`

SetTimeFormat = This method sets the time format

method `SetTimeFormat`

timeFormat = enum(INVALID,12H,24H, ...)

in **q** `timeFormat`

GetTimeFormat = This method retrieves the time format

method `GetTimeFormat`

timeFormat = enum(INVALID,12H,24H, ...)

out **q** `timeFormat`

GetSupportedTimeFormats = This method retrieves the supported time formats

method `GetSupportedTimeFormats`

timeFormatList = array[timeFormat]

timeFormat = enum(INVALID,12H,24H, ...)

out **aq** `timeFormatList`

SetCoordinatesFormat = This method sets the coordinates format

method `SetCoordinatesFormat`

coordinatesFormat = enum(INVALID,DEGREES,MINUTES,SECONDS, ...)

DEGREES format = d.dº

MINUTES format = dºm.m'

SECONDS format = dºm's"

in **q** `coordinatesFormat`

GetCoordinatesFormat = This method retrieves the coordinates format

method `GetCoordinatesFormat`

coordinatesFormat = enum(INVALID,DEGREES,MINUTES,SECONDS, ...)

DEGREES format = d.dº

MINUTES format = dºm.m'

SECONDS format = dºm's"

out **q** `coordinatesFormat`

GetSupportedCoordinatesFormats = This method retrieves the supported coordinates formats

method `GetSupportedCoordinatesFormats`

coordinatesFormatList = array[coordinatesFormat]

coordinatesFormat = enum(INVALID,DEGREES,MINUTES,SECONDS, ...)
DEGREES format = d.dº
MINUTES format = dºm.m'
SECONDS format = dºm's"
out **aq** `coordinatesFormatList`

SetLocale = This method sets the current language and country
method `SetLocale`

languageCode = ISO 639-3 language code (lower case)
in **s** `languageCode`

countryCode = ISO 3166-1 alpha 3 country code (upper case)
in **s** `countryCode`

GetLocale = This method retrieves the current language and country
method `GetLocale`

languageCode = ISO 639-3 language code (lower case)
out **s** `languageCode`

countryCode = ISO 3166-1 alpha 3 country code (upper case)
out **s** `countryCode`

GetSupportedLocales = This method retrieves the supported languages and countries
method `GetSupportedLocales`

localeList = array[struct(languageCode,countryCode)]
languageCode = ISO 639-3 language code (lower case)
countryCode = ISO 3166-1 alpha 3 country code (upper case)
out **a(ss)** `localeList`

ConfigurationChanged = This signal is sent to the clients when one or more configuration settings changes
signal `ConfigurationChanged`

changedSettings = array[setting]
setting = enum(INVALID,UNITS_OF_MEASUREMENT,LOCALE,TIME_FORMAT,COORDINATES_FORMAT, ...)
out **aq** `changedSettings`

interface
org.genivi.navigationcore.Guidance
version 3.1.0-alpha (03-03-2014)

Guidance = This interface offers functions that implement the route-guidance functionality of a navigation system

---

GetVersion = This method returns the API version implemented by the server application
method `GetVersion`

version = struct(major,minor,micro,date)
major = when the major changes, then backward compatibility with previous releases is not granted
minor = when the minor changes, then backward compatibility with previous releases is granted, but something changed in the implementation of the API (e.g. new methods may have been added)
micro = when the micro changes, then backward compatibility with previous releases is granted (bug fixes or documentation modifications)
date = release date (e.g. 21-06-2011)
out **(qqqs)** `version`

StartGuidance = This method starts the guidance for a given route
The guidanceStatus will change to ACTIVE
method `StartGuidance`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

routeHandle = Route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `routeHandle`

StopGuidance = This method stops the guidance
The guidanceStatus will change to INACTIVE
method `StopGuidance`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

SetVoiceGuidance = This method switch on/off the voice guidance
method `SetVoiceGuidance`

activation of the voice guidance
in **b** `activate`

kind of voice (to be defined)
in **s** `voice`

This error is generated if the voice generation is inactive
error `org.genivi.navigationcore.Guidance.Error.VoiceNotAllowed`

GetGuidanceDetails = This method retrieves guidance information
method `GetGuidanceDetails`

voiceGuidance = if TRUE voice guidance is active
out **b** `voiceGuidance`

vehicleOnTheRoad = if TRUE the vehicle is located on the road network
out **b** `vehicleOnTheRoad`

isDestinationReached = if TRUE the destination has been reached
out **b** `isDestinationReached`

maneuver = enum(INVALID,CRUISE,MANEUVER_APPEARED,PRE_ADVICE,ADVICE,PASSED, ...)
out **q** `maneuver`

PlayVoiceManeuver = This method plays or repeats the last voice guidance
method `PlayVoiceManeuver`

This error is generated if the voice generation is inactive
error `org.genivi.navigationcore.Guidance.Error.VoiceNotAllowed`

GetWaypointInformation = This method retrieves the information on the remaining way points of the route. A point can be the final destination as well as a stage defined by the user. The returned waypoints are ordered by their 'number'.
method `GetWaypointInformation`

requestedNumberOfWaypoints = the number of requested waypoints. If 0, all waypoints will be returned.
in **q** `requestedNumberOfWaypoints`

numberOfWaypoints = the number of retrieved waypoints(NOTE: the number corresponds to the number of elements in the array)
out **q** `numberOfWaypoints`

array[struct(waypointOffset,travelTime,direction,side,timeZone,daylightSavingTime,isDestination,number)]
waypointOffset = the offset of the way point in meters from the beginning of the route
travelTime = time to reach the way point in seconds
direction = direction of the way point in degree relatively to the North. Range [0:360]
side = enum(LEFT,RIGHT,NOT_AVAILABLE)
timeZone = time zone of the way point. It is expressed as the time difference from the UTC in minutes
daylightSavingTime = daylight saving time of the way point. It is expressed as the time difference from the UTC in minutes
isDestination = if TRUE the way point is the destination
number = number of the next waypoint (related to the waypoint list, first way point index is 0)
out **a(uuiqnnbq)** `waypointsList`

This method retrieves the information on the final destination
method `GetDestinationInformation`

offset = offset of the destination in meter from the beginning of the route
out **u** `offset`

travelTime = time to reach the destination in second
out **u** `travelTime`

direction = direction of the destination in degree relatively to the North. Range [0:360]
out **i** `direction`

side = enum(LEFT,RIGHT,NOT_AVAILABLE)
out **q** `side`

timeZone = time zone of the destination. It is expressed as the time difference from the UTC in minutes
out **n** `timeZone`

daylightSavingTime = daylight saving time of the destination. It is expressed as the time difference from the UTC in minutes
out **n** `daylightSavingTime`

VehicleLeftTheRoadNetwork = This signal is emitted when the vehicle exits from the road network
signal `VehicleLeftTheRoadNetwork`

GuidanceStatusChanged = This signal is emitted when the guidance status changes
signal `GuidanceStatusChanged`

guidanceStatus = enum(INVALID,ACTIVE,INACTIVE)
ACTIVE means that NavigationCore is providing guidance information
INACTIVE means that NavigationCore is not providing guidance information
out **q** `guidanceStatus`

routeHandle = Active route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value. Should be ignored when guidanceStatus=INACTIVE.
out **u** `routeHandle`

WaypointReached = This signal is emitted when the destination is reached
signal `WaypointReached`

isDestination = flag. TRUE means that the way point is the destination
out **b** `isDestination`

This signal is emitted each time a maneuver event is going
signal `ManeuverChanged`

maneuver = enum(INVALID,CRUISE,MANEUVER_APPEARED,PRE_ADVICE,ADVICE,PASSED, ...)
out **q** `maneuver`

PositionOnRouteChanged = This signal is emitted when the position on the route changes
signal `PositionOnRouteChanged`

offsetOnRoute = the current offset on the route in meters from the beginning of the route
out **u** `offsetOnRoute`

GetManeuversList = This method retrieves the list of next maneuvers
method `GetManeuversList`

requestedNumberOfManeuvers = the number of requested maneuvers
in **q** `requestedNumberOfManeuvers`

maneuverOffset = the offset of the first maneuver to retrieve
in **u** `maneuverOffset`

numberOfManeuvers = the number of retrieved maneuvers
Note: the number corresponds to the number of elements in the array
out **q** `numberOfManeuvers`

maneuversList =
array[struct(roadNumberAfterManeuver,roadNameAfterManeuver,roadPropertyAfterManeuver,drivingSide,offsetOfNextManeuver,maneuverDetails)]
roadNumberAfterManeuver = the number of the road after the maneuver (if a road has multiple road numbers,
they will be separated by slashes ('/') and combined into one string)
roadNameAfterManeuver = the name of the road after the maneuver
roadPropertyAfterManeuver = enum(TOLL_ROADS, ... ,DEFAULT)
drivingSide = enum(LEFT,RIGHT)
offsetOfNextManeuver = the offset of the next maneuver in meters from the beginning of the route (next
maneuver is the second maneuver on the route ahead)
maneuverDetails = array[struct(offsetOfManeuver,travelTime,direction,maneuver,maneuverData)]
offsetOfManeuver = the offset of the current maneuver in meters from the beginning of the route (current
maneuver is the first maneuver on the route ahead)
travelTime = travel time to the basic maneuver in seconds
direction = direction of the maneuver in degree relatively to the North. Range [0:360]
maneuver =
enum(INVALID,STRAIGHT_ON,TURN,CROSSROAD,ROUNDABOUT,HIGHWAY_ENTER,HIGHWAY_EXIT,BIFURCATION,FOLLOW_SPECIFIC_LANE,DESTINATION,WAYPOINT,ROAD_FORM_CHANGE)
maneuverData = array[struct(key, value)]
key =
enum(LENGTH,DIRECTION,EXIT_NUMBER,ROAD_FORM,LANE_INFO,LATITUDE,LONGITUDE,ALTITUDE)
key = LENGTH, value of type 'q', when maneuver=ROUNDABOUT, expresses the length of the route segment
between the entry to and the exit from the roundabout
key = DIRECTION, value of type 'q',
enum(INVALID,STRAIGHT_ON,LEFT,SLIGHT_LEFT,HARD_LEFT,RIGHT,SLIGHT_RIGHT,HARD_RIGHT,UTURN_RIGHT,UTURN_LEFT)
key = EXIT_NUMBER, when maneuver=ROUNDABOUT, value of type 'q' that expresses the roundabout exit
number
when maneuver=HIGHWAY_EXIT, value of type 's' that expresses the highway exit number
key = ROAD_FORM, value of type 'q',
enum(INVALID,ROAD_REGULAR,ROAD_HIGHWAY_MOTORWAY,ROAD_FERRY)
key = LANE_INFO, value of type 'a(uuuq)', array[struct(laneIndex,laneDirections,directionToFollow,divider)]
laneIndex = number of the individual lane. Counting starts from zero, beginning at the left-most lane in the
direction of travel (independent of the driving side)
laneDirections = bitfield where each bit corresponds to a certain direction. A 1-bit indicates that the
corresponding part of the lane arrow is drawn in the lane information on the street (see the lane info bitmasks)
directionToFollow = bitfield where each bit corresponds to a certain direction. A 1-bit indicates that the
corresponding part of the lane arrow matches the direction of the corresponding maneuver (see the lane info
bitmasks). At most one bit of this bitmask will be set.
The bitmasks are:
LANE_INFO_BITMASK_STRAIGHT,LANE_INFO_BITMASK_SLIGHTRIGHT,LANE_INFO_BITMASK_RIGHT,LANE_INFO_BITMASK_SHARPRIGHT,LANE_INFO_BITMASK_RIGHTUTURN,LANE_INFO_BITMASK_SLIGHTLEFT,LANE_INFO_BITMASK_LEFT,LANE_INFO_BITMASK_SHARPLEFT,LANE_INFO_BITMASK_LEFTUTURN
divider = indicates the type of divider between the given lane and the next one to the right, in the direction of travel
enum(DIVIDER_UNDEFINED,DIVIDER_INTERRUPTEDLONG,DIVIDER_INTERRUPTEDSHORT,DIVIDER_SOLIDSINGLE,DIVIDER_SOLIDDOUBLE,DIVIDER_SOLIDINTERRUPTED,DIVIDER_INTERRUPTEDSOLID)
Note: To describe the divider on the left side of the left-most lane, use the following entry in LANE_INFO:
(laneIndex=0xffffffff,laneDirections=0x00000000,directionToFollow=0x00000000,divider=type)
key = LATITUDE, value = value of type 'd', that expresses the latitude of the starting point in format %3.6f. Range
[-90:+90]. Example: 48.053250
key = LONGITUDE, value = value of type 'd', that expresses the longitude of the starting point in format %3.6f.
Range [-180:+180]. Example: 8.324500
key = ALTITUDE, value = value of type 'i', that expresses the altitude of the starting point in meters
out **a(ssqqua(uuiqa(qv)))** `maneuversList`

This error is generated in case there's no maneuver until the destination
error `org.genivi.navigationcore.Guidance.Error.NoManeuver`

VehicleLeftTheRoute = This signal is emitted when the vehicle has left the route
signal `VehicleLeftTheRoute`

SetRouteCalculationMode = This method configures the way the navigation application wants the navigation core to behave of reroute trigger
method `SetRouteCalculationMode`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

routeCalculationMode =
enum(INVALID,ALL_MANUAL,ALL_AUTOMATIC,TRAFFIC_MANUAL,OFF_ROUTE_MANUAL)
in **q** `routeCalculationMode`

SkipNextManeuver = This method allows to jump behind the current maneuver
method `SkipNextManeuver`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

This error is generated in case there's no maneuver until the destination
error `org.genivi.navigationcore.Guidance.Error.NoManeuver`

GetGuidanceStatus = This method retrieves the guidance status
method `GetGuidanceStatus`

guidanceStatus = enum(INVALID,ACTIVE,INACTIVE)
ACTIVE means that NavigationCore is providing guidance information
INACTIVE means that NavigationCore is not providing guidance information
out **q** `guidanceStatus`

routeHandle = Active route handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value. Should be ignored when guidanceStatus=INACTIVE
out **u** `routeHandle`

SetVoiceGuidanceSettings = This method sets the voice guidance settings
method `SetVoiceGuidanceSettings`

mode = enum(INVALID,DISABLED_PROMPT,AUTOMATIC_PROMPT,MANUAL_PROMPT, ...)
MANUAL_PROMPT means that a client application can ask the NavigationCore to play the voice prompts
AUTOMATIC_PROMPT means that the voice prompts will be requested by NavigationCore automatically
DISABLED_PROMPT means that the client application will the voice generator component directly to play the messages (bypassing the NavigationCore)
in **q** `promptMode`

GetVoiceGuidanceSettings = This method returns the used voice guidance settings
method `GetVoiceGuidanceSettings`

mode = enum(INVALID,DISABLED_PROMPT,AUTOMATIC_PROMPT,MANUAL_PROMPT, ...)
MANUAL_PROMPT means that a client application can ask the NavigationCore to play the voice prompts
AUTOMATIC_PROMPT means that the voice prompts will be requested by NavigationCore automatically
DISABLED_PROMPT means that the client application will the voice generator component directly to play the messages (bypassing the NavigationCore)
out **q** `promptMode`

PositionToRouteChanged = This signal is emitted when the vehicle is off-the-road network and either the heading or the distance (or both) to the closest point on the active route changes
signal `PositionToRouteChanged`

distance = distance in meters to the closest point on the active route
out **u** `distance`

direction = direction in degrees relatively to the closest point on the active route. Range [0:360]
out **i** `direction`

ActiveRouteChanged = This signal is emitted when the active route changes
signal `ActiveRouteChanged`

changeCause = enum(INVALID,TRAFFIC,OFF_ROUTE,MANUAL,...)
out **q** `changeCause`

interface
org.genivi.navigationcore.MapMatchedPosition
version 3.0.0 (21-01-2014)

MapMatchedPosition = This interface offers functions to retrieve the map matched position and to simulate positioning

If NavigationCore is not in Simulation Mode (Simulation Status is SIMULATION_STATUS_NO_SIMULATION), it is using the EnhancedPosition from the Positioning component.
In Simulation Mode it is not using this position, instead it uses FixedPosition or FollowActiveRoute to determine the position.
With FixedPosition (Simulation Status is SIMULATION_STATUS_FIXED_POSITION), the position is fixed, unless it is changed by a call to setPosition().
This supports use cases like: setting the current car position in a demo mode, or replay a position log file (where setPosition() is called for each logged location).
In Follow Active Route mode, NavigationCore is generating positions itself.
These positions follow the current active route. When the end of the route is reached, the position jumps back to the starting point of the route.
There are two sub states: Running (Simulation Status is SIMULATION_STATUS_RUNNING) and Paused (Simulation Status is SIMULATION_STATUS_PAUSED).
By default the 'driving speed' will be equal to the free flow speed of each road segment. However a speed factor can be set via the method SetSimulationSpeed.

GetVersion = This method returns the API version implemented by the server application
method `GetVersion`

version = struct(major,minor,micro,date)
major = when the major changes, then backward compatibility with previous releases is not granted
minor = when the minor changes, then backward compatibility with previous releases is granted, but something changed in the implementation of the API (e.g. new methods may have been added)
micro = when the micro changes, then backward compatibility with previous releases is granted (bug fixes or documentation modifications)
date = release date (e.g. 21-06-2011)
out **(qqqs)** `version`

SetSimulationMode = This method activates or deactivates the simulation mode
method `SetSimulationMode`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

activate = flag. TRUE means that the simulation mode is activated.
The simulation status will be SIMULATION_STATUS_FIXED_POSITION, with the position being the last known position in the NavigationCore.
FALSE means that the simulation mode is de-activated. The simulation status will be SIMULATION_STATUS_NO_SIMULATION
in **b** `activate`

GetSimulationStatus = This method retrieves the simulation status
method `GetSimulationStatus`

simulationStatus = enum(SIMULATION_STATUS_NO_SIMULATION, SIMULATION_STATUS_RUNNING, SIMULATION_STATUS_PAUSED, SIMULATION_STATUS_FIXED_POSITION)
SIMULATION_STATUS_NO_SIMULATION means that NavigationCore is using the EnhancedPosition
SIMULATION_STATUS_RUNNING means that positions are generated along the active route
SIMULATION_STATUS_PAUSED means that the generation of positions along the active route is paused
SIMULATION_STATUS_FIXED_POSITION means that the position is fixed.
out **q** `simulationStatus`

AddSimulationStatusListener = Add this node as a listener to Simulation Status changes.
Upon changes a SimulationStatusChanged signal will be received. NavigationCore will only send out a SimulationStatusChanged signal if there is at least one node listening to these changes.
method `AddSimulationStatusListener`

RemoveSimulationStatusListener = Remove this node as a listener to Simulation Status changes.
method `RemoveSimulationStatusListener`

SimulationStatusChanged = This signal is emitted when the Simulation Status has changed
signal `SimulationStatusChanged`

simulationStatus = enum(SIMULATION_STATUS_NO_SIMULATION, SIMULATION_STATUS_RUNNING, SIMULATION_STATUS_PAUSED, SIMULATION_STATUS_FIXED_POSITION)
SIMULATION_STATUS_NO_SIMULATION means that NavigationCore is using the EnhancedPosition
SIMULATION_STATUS_RUNNING means that positions are generated along the active route

SIMULATION_STATUS_PAUSED means that the generation of positions along the active route is paused
SIMULATION_STATUS_FIXED_POSITION means that the position is fixed.
out **q** `simulationStatus`

SetSimulationSpeed = This method sets the speed factor for the simulation mode
method `SetSimulationSpeed`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

speedFactor = speed factor
unit is x0.25. Normal speed x1 is 4
in **y** `speedFactor`

GetSimulationSpeed = returns the speed factor for the simulation mode
method `GetSimulationSpeed`

speedFactor = speed factor
unit is x0.25. Normal speed x1 is 4
out **y** `speedFactor`

AddSimulationSpeedListener = Add this node as a listener to simulation speed factor changes.
Upon changes a SimulationSpeedChanged signal will be received.
NavigationCore will only send out a SimulationSpeedChanged signal if there is at least one node listening to these changes
method `AddSimulationSpeedListener`

RemoveSimulationSpeedListener = Remove this node as a listener to simulation speed factor changes.
method `RemoveSimulationSpeedListener`

SimulationSpeedChanged = This signal is emitted when the simulation speed factor has changed
NavigationCore will only send out a SimulationSpeedChanged signal if there is at least one node listening to these changes
signal `SimulationSpeedChanged`

speedFactor = speed factor
unit is x0.25. Normal speed x1 is 4
out **y** `speedFactor`

StartSimulation = This method starts, or resumes, a Follow Active Route simulation
If the current Simulation Status is SIMULATION_STATUS_PAUSED, the simulation is resumed from the current location.
Otherwise the simulation is started from the starting point of the route. In both cases the new status will be SIMULATION_STATUS_RUNNING
method `StartSimulation`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

PauseSimulation = This method freezes the current location
The new status will be SIMULATION_STATUS_PAUSED
method `PauseSimulation`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

GetPosition = This method returns the current position
method `GetPosition`

valuesToReturn= array[key]
key =
enum(INVALID,TIMESTAMP,LATITUDE,LONGITUDE,ALTITUDE,HEADING,SPEED,CLIMB,GNSS_FIX_STATUS,DR_STATUS,MM_STATUS,SIMULATION_MODE, ... ,ALL)
in **aq** `valuesToReturn`

position = dictionary[key,value]
dictionary = array of tuples (key,value)
key =
enum(INVALID,TIMESTAMP,LATITUDE,LONGITUDE,ALTITUDE,HEADING,SPEED,CLIMB,GNSS_FIX_STATUS,DR_STATUS,MM_STATUS,SIMULATION_MODE, ...)
key = TIMESTAMP, value = value of type 't', that represents a timestamp in ms
key = LATITUDE, value = value of type 'd', that expresses the latitude of the current position in format %3.6f.
Range [-90,+90]. Example: 48.053250

key = LONGITUDE, value = value of type 'd', that expresses the longitude of the current position in format %3.6f. Range [-180,+180]. Example: 8.324500
key = ALTITUDE, value = value of type 'i', that expresses the altitude above the sea level of the current position in meters
key = HEADING, value = value of type 'u', that expresses the course angle in degree (0 = north, 90 = east, 180 = south, 270 = west, no negative values)
key = SPEED, value = value of type 'd', that expresses speed measured in m/s. A negative value indicates that the vehicle is moving backwards
key = CLIMB, value = value of type 'i', that expresses the inclination measured in degrees
key = GNSS_FIX_STATUS, value = value of type 'q', that represents an enum(INVALID,NO_FIX,TIME_FIX,2D_FIX,3D_FIX, ...)
key = DR_STATUS, value = value of type 'b', where TRUE means that a dead-reckoning algorithm has been used to calculate the current position
key = MM_STATUS, value = value of type 'b', where TRUE means that a map-matching algorithm has been used to calculate the current position
key = SIMULATION_MODE, value = value of type 'b', where TRUE means that the current position is simulated
out **a{qv}** `position`

This error is generated if no position is available
error `org.genivi.navigationcore.MapMatchedPosition.Error.NoPosition`

SetPosition = This method sets the position to a specific location
Independent of the current Simulation Status, the new status will be SIMULATION_STATUS_FIXED_POSITION.
This method can be used to replay a position log file (with positions obtained via calls to GetPosition()) by calling this method for each position in the log file.
It is of course also possible to call this method just once with e.g. a 'current location' entered by the user (via the HMI).
method `SetPosition`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

position = dictionary[key,value]
dictionary = array of tuples (key,value)
key = enum(INVALID,TIMESTAMP,LATITUDE,LONGITUDE,ALTITUDE,HEADING,SPEED,CLIMB,GNSS_FIX_STATUS,DR_STATUS,MM_STATUS, ...)
key = TIMESTAMP, value = value of type 't', that represents a timestamp in ms
key = LATITUDE, value = value of type 'd', that expresses the latitude of the current position in format %3.6f. Range [-90,+90]. Example: 48.053250
key = LONGITUDE, value = value of type 'd', that expresses the longitude of the current position in format %3.6f. Range [-180,+180]. Example: 8.324500
key = ALTITUDE, value = value of type 'i', that expresses the altitude above the sea level of the current position in meters
key = HEADING, value = value of type 'u', that expresses the course angle in degree (0 = north, 90 = east, 180 = south, 270 = west, no negative values)
key = SPEED, value = value of type 'd', that expresses speed measured in m/s. A negative value indicates that the vehicle is moving backwards
key = CLIMB, value = value of type 'i', that expresses the inclination measured in degrees
key = GNSS_FIX_STATUS, value = value of type 'q', that represents an enum(INVALID,NO_FIX,TIME_FIX,2D_FIX,3D_FIX, ...)
key = DR_STATUS, value = value of type 'b', where TRUE means that a dead-reckoning algorithm has been used to calculate the current position
key = MM_STATUS, value = value of type 'b', where TRUE means that a map-matching algorithm has been used to calculate the current position
Note that the key SIMULATION_MODE is not allowed here, as it will be true by definition.
in **a{qv}** `position`

PositionUpdate = This signal is called to notify a client application of a position change. The update frequency is implementation specific. The maximal allowed frequency is 10Hz
signal `PositionUpdate`

changedValues = array[value]
value = enum(INVALID,TIMESTAMP,LATITUDE,LONGITUDE,ALTITUDE,HEADING,SPEED,CLIMB,GNSS_FIX_STATUS,DR_STATUS,MM_STATUS,SIMULATION_MODE, ...)
out **aq** `changedValues`

GetAddress = This method returns the current address
method `GetAddress`

valuesToReturn= array[fieldType]
key = enum(INVALID,TIMESTAMP,COUNTRY,COUNTRYCODE,CITY,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,TIMEZONE_OFFSET,DAYLIGHT_OFFSET,MATCH_TYPE, ... ,ALL)
in **aq** `valuesToReturn`

address = dictionary[key,value]
dictionary = array of tuples (key,value)
key = enum(INVALID,TIMESTAMP,COUNTRY,COUNTRYCODE,CITY,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,TIMEZONE_OFFSET,DAYLIGHT_OFFSET,MATCH_TYPE, ...)
key = TIMESTAMP, value = value of type 't', that represents a timestamp in ms
key = COUNTRY, value = value of type 's', that identifies the country name

key = COUNTRYCODE, value = value of type 's', ISO 3166-1 alpha 3 country code (upper case)
key = CITY, value = value of type 's', that identifies the city name
key = STREET, value = value of type 's', that identifies the street name
key = ROAD_NUMBER, value = value of type ´s´, that identifies the road number
key = HOUSENUMBER, value = value of type 's', that identifies the house number
key = HOUSENAME, value = value of type ´s´, that identifies the house name
key = CROSSING, value = value of type 's', that identifies the crossing
key = DISTRICT, value = value of type 's', that identifies the district name
key = TIMEZONE_OFFSET, value = value of type 'n', that identifies the timezone offset at the current address
key = DAYLIGHT_OFFSET, value = value of type 'n', that identifies the daylight offset at the current address
key = MATCH_TYPE, value = value of type 'q', that identifies an enum(INVALID,ON_ROAD,OFF_ROAD,ON_FERRY,IN_TUNNEL,ON_CARPARK, ...)
out **a{qv}** `address`

This error is generated if no map is available
error `org.genivi.navigationcore.MapMatchedPosition.Error.NoMap`

This error is generated if the vehicle is located in a position outside of the known map
error `org.genivi.navigationcore.MapMatchedPosition.Error.OutOfKnownMap`

AddressUpdate = This signal is called to notify a client application that the current address changed
signal `AddressUpdate`

changedValues = array[value]
value = enum(INVALID,TIMESTAMP,COUNTRY,COUNTRYCODE,CITY,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,TIMEZONE_OFFSET,DAYLIGHT_OFFSET,MATCH_TYPE, ...)
out **aq** `changedValues`

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positionOnSegment = This method returns the vehicle position on a route segment
method `GetPositionOnSegment`

valuesToReturn= array[fieldType]
key = enum(INVALID,TIMESTAMP,SEGMENT_ID,DIRECTION_ON_SEGMENT,DISTANCE_ON_SEGMENT, ... ,ALL)
in **aq** `valuesToReturn`

positionOnSegment = dictionary[key,value]
dictionary = array of tuples (key,value)
key = enum(INVALID,TIMESTAMP,SEGMENT_ID,DIRECTION_ON_SEGMENT,DISTANCE_ON_SEGMENT, ...)
key = TIMESTAMP, value = value of type 't', that represents a timestamp in ms
key = SEGMENT_ID, value = value = value of type 'ay', that represents a link-ID in a format whose interpretation is left to the navigationcore
key = DIRECTION_ON_SEGMENT, value = value of type 'b', where TRUE means forward and FALSE means backward
key = DISTANCE_ON_SEGMENT, value = value of type 'd', that indicates the distance in meter on the segment
out **a{qv}** `positionOnSegment`

PositionOnSegmentUpdate = This signal is called to notify the client that the vehicle position on the route segment changed
signal `PositionOnSegmentUpdate`

changedValues = array[value]
value = enum(INVALID,TIMESTAMP,SEGMENT_ID,DIRECTION_ON_SEGMENT,DISTANCE_ON_SEGMENT, ...)
out **aq** `changedValues`

GetStatus = This method returns the current status
method `GetStatus`

valuesToReturn = array[fieldType]
key = enum(INVALID,TIMESTAMP,GNSS_FIX_STATUS,DR_STATUS,MM_STATUS,SIMULATION_MODE, ... ,ALL)
in **aq** `valuesToReturn`

status = dictionary[key,value]
dictionary = array of tuples (key,value)
key = enum(INVALID,TIMESTAMP,GNSS_FIX_STATUS,DR_STATUS,MM_STATUS,SIMULATION_MODE, ...)
key = TIMESTAMP, value = value of type 't', that represents a timestamp in ms
key = GNSS_FIX_STATUS, value = value of type 'q', that represents an enum(INVALID,NO_FIX,TIME_FIX,2D_FIX,3D_FIX, ...)
key = DR_STATUS, value = value of type 'b', where TRUE means that a dead-reckoning algorithm has been used to calculate the current position
key = MM_STATUS, value = value of type 'b', where TRUE means that a map-matching algorithm has been used to calculate the current position
key = SIMULATION_MODE, value = value of type 'b', where TRUE means that the current position is simulated
out **a{qv}** `status`

StatusUpdate = This signal is emitted to notifiy a client application that the current status changed
signal `StatusUpdate`

changedValues = array[value]
value = enum(INVALID,TIMESTAMP,GNSS_FIX_STATUS,DR_STATUS,MM_STATUS,SIMULATION_MODE, ...)
out **aq** `changedValues`

OffroadPositionChanged = This signal is emitted when the heading and the distance to the closest point on the road network changes
signal `OffRoadPositionChanged`

distance = distance in meters to the closest point on the road network
out **u** `distance`

direction = direction in degrees relatively to the closest point on the road network. Range [0:360]
out **i** `direction`

interface
org.genivi.navigationcore.LocationInput
version 3.0.0 (21-01-2014)

LocationInput = This interface offers functions that implement the location-input functionality of a navigation system

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GetVersion = This method returns the API version implemented by the server application
method `GetVersion`

version = struct(major,minor,micro,date)
major = when the major version changes, then backward compatibility with previous releases is not granted
minor = when the minor version changes, then backward compatibility with previous releases is granted, but something changed in the implementation of the API (e.g. new methods may have been added)
micro = when the micro version changes, then backward compatibility with previous releases is granted (bug fixes or documentation modifications)
date = release date (e.g. 21-06-2011)
out **(qqqs)** `version`

CreateLocationInput = This method creates a new location input and retrieves a handle
method `CreateLocationInput`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `locationInputHandle`

This error is generated if no more location input handles are available
error `org.genivi.navigationcore.LocationInput.Error.NoMoreLocationInputHandles`

DeleteLocationInput = This method deletes a location input and its associated resources
method `DeleteLocationInput`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `locationInputHandle`

This error is generated if an application tries to delete a location input handle that is not available
error `org.genivi.navigationcore.LocationInput.Error.LocationInputNotAvailable`

GetSupportedAddressAttributes = This method retrieves the supported address attributes
method `GetSupportedAddressAttributes`

addressAttributesList = array[attribute]
attribute =
enum(INVALID,LATITUDE,LONGITUDE,ALTITUDE,FULL_ADDRESS,COUNTRY,STATE,CITY,ZIPCODE,STREET,HOUSENUMBER,CROSSING,DISTRICT,PHONENUMBER,POINAME,TOWNCENTER, ...)
out **aq** `addressAttributesList`

SetAddress = This method sets the address to start with for the LocationInput identified by the given handle
method `SetAddress`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `locationInputHandle`

address = array[attribute]
attribute = tuple(key,value)
key =
enum(INVALID,LATITUDE,LONGITUDE,ALTITUDE,FULL_ADDRESS,COUNTRY,COUNTRYCODE,STATE,CITY,ZIPCODE,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,PHONENUMBER,POINAME,TOWNCENTER, ...)
key = LATITUDE, value = value of type ´d´, that expresses the latitude in format %3.6f. Range[-90:+90]. Example: 48.70901
key = LONGITUDE, value = value of type ´d´, that expresses the longitude in format %3.6f. Range[-180:+180]. Example: 9.167898
key = ALTITUDE, value = value of type ´i´, that expresses the altitude in meters
key = COUNTRY, value = value of type ´s´, that identifies the country name
key = COUNTRYCODE, value = value of type ´s´, ISO 3166-1 alpha 3 country code (upper case)
key = CITY, value = value of type ´s´, that identifies the city name
key = STREET, value = value of type ´s´, that identifies the street name
key = ROAD_NUMBER, value = value of type ´s´, that identifies the road number
key = HOUSENUMBER, value = value of type ´s´, that identifies the house number
key = HOUSENAME, value = value of type ´s´, that identifies the house name
key = CROSSING, value = value of type ´s´, that identifies the crossing
key = DISTRICT, value = value of type ´s´, that identifies the district name
key = PHONENUMBER, value = value of type ´s´, that identifies a phone number
key = POINAME, value = value of type ´s´, that identifies a POI name
in **a{qv}** `address`

SetSelectionCriterion = This method sets the selection criterion for the current speller, search input and the corresponding result-lists for the current session
method `SetSelectionCriterion`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `locationInputHandle`

selectionCriterion = enum(INVALID,LATITUDE,LONGITUDE,ALTITUDE,FULL_ADDRESS,COUNTRY,COUNTRYCODE,STATE,CITY,ZIPCODE,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,PHONENUMBER,POINAME,TOWNCENTER, ...)
in **q** `selectionCriterion`

Spell = This method sends the next spell input for the current session
Note: when a spell is started the entries of the search are removed
method `Spell`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `locationInputHandle`

inputString = last input character (UTF-8) (0x08(Backspace) for delete last character, 0x0D(Carriage Return) for delete entire input)
in **s** `inputCharacter`

maxWindowSize = maximum number of elements that should be returned as result
in **q** `maxWindowSize`

Search = This method sends the search input for the current session
Note: when a search is started the entries of the spell input are removed
method `Search`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `locationInputHandle`

inputString = contains the String, that is searched
in **s** `inputString`

maxWindowSize = maximum number of elements that should be returned as result
in **q** `maxWindowSize`

CurrentSelectionCriterion = This signal notifies the SelectionCriterion for the current speller input or search.
Note: when no SelectionCriterion was set or an input was finished, the SelectionCriterion has the value INVALID
signal `CurrentSelectionCriterion`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `locationInputHandle`

selectionCriterion = enum(INVALID,LATITUDE,LONGITUDE,ALTITUDE,FULL_ADDRESS,COUNTRY,COUNTRYCODE,STATE,CITY,ZIPCODE,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,PHONENUMBER,POINAME,TOWNCENTER, ...)
out **q** `selectionCriterion`

SearchStatus = This signal updates the search status of the specified session
signal `SearchStatus`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `locationInputHandle`

statusValue = enum(INVALID,NOT_STARTED,SEARCHING,FINISHED, ...)
out **q** `statusValue`

SpellResult = This signal notifies the result of the previous Spell method
signal `SpellResult`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `locationInputHandle`

uniqueString = unique string derived from spell input (i.e. including auto-completion if applicable)
out **s** `uniqueString`

validCharacters = set of (UTF-8 encoded) characters valid for next input (unified in a single string). A Backspace(0x08) is returned if the input character passed to the Spell method was invalid
out **s** `validCharacters`

fullMatch = flag indicating whether the value in UniqueCharacters is already a full match for an existing list entry
out **b** `fullMatch`

RequestListUpdate = This method sends a request for more list elements for the current session
method `RequestListUpdate`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `locationInputHandle`

offset = starting offset of the newly requested list elements
in **q** `offset`

maxWindowSize = maximum number of elements that should be returned as result
in **q** `maxWindowSize`

SearchResultList = This signal updates the address result list (e.g. after a Search/Spell/Scroll call)
signal `SearchResultList`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `locationInputHandle`

totalSize = total size of the result list
out **q** `totalSize`

windowOffset = window offset within the complete list
out **q** `windowOffset`

windowSize = size of the provided window
out **q** `windowSize`

resultListWindow = array[address]
address = array[attribute]
attribute = tuple(key,value)
key =
enum(INVALID,LATITUDE,LONGITUDE,ALTITUDE,FULL_ADDRESS,COUNTRY,COUNTRYCODE,STATE,CITY,ZIPCODE,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,PHONENUMBER,POINAME,TOWNCENTER, ...)
key = LATITUDE, value = value of type ´d´, that expresses the latitude in format %3.6f. Range [-90:+90]. Example: 48.70901
key = LONGITUDE, value = value of type ´d´, that expresses the longitude in format %3.6f. Range [-180:+180]. Example: 9.167898
key = ALTITUDE, value = value of type ´i´, that expresses the altitude in meters
key = COUNTRY, value = value of type ´s´, that identifies the country name
key = COUNTRYCODE, value = value of type ´s´, ISO 3166-1 alpha 3 country code (upper case)
key = CITY, value = value of type ´s´, that identifies the city name
key = STREET, value = value of type ´s´, that identifies the street name
key = ROAD_NUMBER, value = value of type ´s´, that identifies the road number
key = HOUSENUMBER, value = value of type ´s´, that identifies the house number
key = HOUSENAME, value = value of type ´s´, that identifies the house name
key = CROSSING, value = value of type ´s´, that identifies the crossing
key = DISTRICT, value = value of type ´s´, that identifies the district name
key = PHONENUMBER, value = value of type ´s´, that identifies a phone number
key = POINAME, value = value of type ´s´, that identifies a POI name
out **aa{qv}** `resultListWindow`

SearchResultListSizeChanged = This signal updates the size of the address result list
signal `SearchResultListSizeChanged`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `locationInputHandle`

totalSize = total size of the result list
out **q** `totalSize`

SelectEntry = This method triggers selection of a result list entry by index
Note: the update of the input content will be notified in signal ContentUpdated
method `SelectEntry`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `locationInputHandle`

index = absolute list index of the entry to be selected
in **q** `index`

GetEntry = This method synchronously gets the address for the given result list entry
method `GetEntry`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `locationInputHandle`

index = list index of the entry to be returned
in **q** `index`

address = array[attribute]
attribute = tuple(key,value)
key =
enum(INVALID,LATITUDE,LONGITUDE,ALTITUDE,FULL_ADDRESS,COUNTRY,COUNTRYCODE,STATE,CITY,ZIPCODE,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,PHONENUMBER,POINAME,TOWNCENTER, ...)
key = LATITUDE, value = value of type ´d´, that expresses the latitude in format %3.6f. Range[-90:+90]. Example: 48.70901
key = LONGITUDE, value = value of type ´d´, that expresses the longitude in format %3.6f. Range[-180:+180]. Example: 9.167898
key = ALTITUDE, value = value of type ´i´, that expresses the altitude in meters
key = COUNTRY, value = value of type ´s´, that identifies the country name
key = COUNTRYCODE, value = value of type ´s´, ISO 3166-1 alpha 3 country code (upper case)
key = CITY, value = value of type ´s´, that identifies the city name
key = STREET, value = value of type ´s´, that identifies the street name
key = ROAD_NUMBER, value = value of type ´s´, that identifies the road number
key = HOUSENUMBER, value = value of type ´s´, that identifies the house number
key = HOUSENAME, value = value of type ´s´, that identifies the house name
key = CROSSING, value = value of type ´s´, that identifies the crossing
key = DISTRICT, value = value of type ´s´, that identifies the district name
key = PHONENUMBER, value = value of type ´s´, that identifies a phone number
key = POINAME, value = value of type ´s´, that identifies a POI name
out **a{qv}** `address`

ContentUpdated = This signal updates the input content data for the specified session
signal `ContentUpdated`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value

out **u** `locationInputHandle`

guidable = flag indicating whether the current address is guidable
out **b** `guidable`

availableSelectionCriteria = array of
enum(INVALID,LATITUDE,LONGITUDE,ALTITUDE,FULL_ADDRESS,COUNTRY,COUNTRYCODE,STATE,CITY,ZIPCODE,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,PHONENUMBER,POINAME,TOWNCENTER,
...)
Note: availableSelectionCriteria indicates the parts of the address that can be changed
out **aq** `availableSelectionCriteria`

address = array[attribute]
attribute = tuple(key,value)
key =
enum(INVALID,LATITUDE,LONGITUDE,ALTITUDE,FULL_ADDRESS,COUNTRY,COUNTRYCODE,STATE,CITY,ZIPCODE,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,PHONENUMBER,POINAME,TOWNCENTER,
...)
key = LATITUDE, value = value of type ´d´, that expresses the latitude in format %3.6f. Range[-90:+90]. Example:
48.70901
key = LONGITUDE, value = value of type ´d´, that expresses the longitude in format %3.6f. Range[-180:+180].
Example: 9.167898
key = ALTITUDE, value = value of type ´i´, that expresses the altitude in meters
key = COUNTRY, value = value of type ´s´, that identifies the country name
key = COUNTRYCODE, value = value of type ´s´, ISO 3166-1 alpha 3 country code (upper case)
key = CITY, value = value of type ´s´, that identifies the city name
key = STREET, value = value of type ´s´, that identifies the street name
key = ROAD_NUMBER, value = value of type ´s´, that identifies the road number
key = HOUSENUMBER, value = value of type ´s´, that identifies the house number
key = HOUSENAME, value = value of type ´s´, that identifies the house name
key = CROSSING, value = value of type ´s´, that identifies the crossing
key = DISTRICT, value = value of type ´s´, that identifies the district name
key = PHONENUMBER, value = value of type ´s´, that identifies a phone number
key = POINAME, value = value of type ´s´, that identifies a POI name
out **a{qv}** `address`

ValidateAddress = This method validates an address from different sources than Navigation
method `ValidateAddress`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `locationInputHandle`

inputAddress = array[attribute]
attribute = tuple(key,value)
key =
enum(INVALID,LATITUDE,LONGITUDE,ALTITUDE,FULL_ADDRESS,COUNTRY,COUNTRYCODE,STATE,CITY,ZIPCODE,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,PHONENUMBER,POINAME,TOWNCENTER,
...)
key = LATITUDE, value = value of type ´d´, that expresses the latitude in format %3.6f. Range[-90:+90]. Example:
48.70901
key = LONGITUDE, value = value of type ´d´, that expresses the longitude in format %3.6f. Range[-180,+180].
Example: 9.167898
key = ALTITUDE, value = value of type ´i´, that expresses the altitude in meters
key = COUNTRY, value = value of type ´s´, that identifies the country name
key = COUNTRYCODE, value = value of type ´s´, ISO 3166-1 alpha 3 country code (upper case)
key = CITY, value = value of type ´s´, that identifies the city name
key = STREET, value = value of type ´s´, that identifies the street name
key = ROAD_NUMBER, value = value of type ´s´, that identifies the road number
key = HOUSENUMBER, value = value of type ´s´, that identifies the house number
key = HOUSENAME, value = value of type ´s´, that identifies the house name
key = CROSSING, value = value of type ´s´, that identifies the crossing
key = DISTRICT, value = value of type ´s´, that identifies the district name
key = PHONENUMBER, value = value of type ´s´, that identifies a phone number
key = POINAME, value = value of type ´s´, that identifies a POI name
in **a{qv}** `inputAddress`

AddressValidationResult = This signal notifies the validation result of a former ValidateAddress call
signal `AddressValidationResult`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
out **u** `locationInputHandle`

validatedAddressList = array[validatedAddress]
validatedAddress = array[attribute]
attribute = tuple(key,value)
key =
enum(INVALID,LATITUDE,LONGITUDE,ALTITUDE,FULL_ADDRESS,COUNTRY,COUNTRYCODE,STATE,CITY,ZIPCODE,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,PHONENUMBER,POINAME,TOWNCENTER,
...)
key = LATITUDE, value = value of type ´d´, that expresses the latitude in format %3.6f. Range[-90:+90]. Example:
48.70901
key = LONGITUDE, value = value of type ´d´, that expresses the longitude in format %3.6f. Range[-180:+180].
Example: 9.167898
key = ALTITUDE, value = value of type ´i´, that expresses the altitude in meters
key = COUNTRY, value = value of type ´s´, that identifies the country name
key = COUNTRYCODE, value = value of type ´s´, ISO 3166-1 alpha 3 country code (upper case)
key = CITY, value = value of type ´s´, that identifies the city name
key = STREET, value = value of type ´s´, that identifies the street name
key = ROAD_NUMBER, value = value of type ´s´, that identifies the road number
key = HOUSENUMBER, value = value of type ´s´, that identifies the house number
key = HOUSENAME, value = value of type ´s´, that identifies the house name
key = CROSSING, value = value of type ´s´, that identifies the crossing
key = DISTRICT, value = value of type ´s´, that identifies the district name
key = PHONENUMBER, value = value of type ´s´, that identifies a phone number
key = POINAME, value = value of type ´s´, that identifies a POI name
out **aa{qv}** `validatedAddressList`

validationStatusList = array[validationStatus]
validationStatus = array[item]
item = tuple(key,value)
key =
enum(INVALID,LATITUDE,LONGITUDE,ALTITUDE,FULL_ADDRESS,COUNTRY,COUNTRYCODE,STATE,CITY,ZIPCODE,STREET,ROAD_NUMBER,HOUSENUMBER,HOUSENAME,CROSSING,DISTRICT,PHONENUMBER,POINAME,TOWNCENTER,
...)
value = enum(INVALID,OK,UNKNOWN,AMBIGUOUS,INCONSISTENT)

out **aa{qq}** `validationStatusList`

ReverseGeocode = This method transforms a geocoordinate into an address
Note: the update of the input content will be notified in signal ContentUpdated
method `ReverseGeocode`

sessionHandle = Session handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `sessionHandle`

locationInputHandle = Location input handle. Range[0x0:0x7fffffff]. 0x0 is reserved as an invalid handle value
in **u** `locationInputHandle`

coordinate = struct(lat,lon)
lat = latitude in format %3.6f. Range[-90:+90]. Example: 48.053250
lon = longitude in format %3.6f. Range[-180:+180]. Example: 8.321000
in **(dd)** `coordinate`

constants NavigationCore `version 3.0.0 (21-01-2014)`

- *This document defines the constants used in the NavigationCore APIs*

- *INVALID = 0x0000*

- *DEFAULT = 0xfffe*

- *ALL = 0xffff*

- *AVAILABLE = 0x0001*

- *NOT_AVAILABLE = 0x0002*

- *TIME_FORMAT = 0x0003*

- *12H = 0x0004*

- *24H = 0x0005*

- *COORDINATES_FORMAT = 0x0006*

- *DEGREES = 0x0007*

- *MINUTES = 0x0008*

- *SECONDS = 0x0009*

- *TIMESTAMP = 0x0010*

- *TIMEZONE_OFFSET = 0x0011*

- *DAYLIGHT_OFFSET = 0x0012*

- *LOCALE = 0x0025*

- *UNITS_OF_MEASUREMENT = 0x0030*

- *LENGTH = 0x0031*

- *METER = 0x0032*

- *MILE = 0x0033*

- *KM = 0x0034*

- *YARD = 0x0035*

- *FOOT = 0x0036*

- *DISABLED_PROMPT = 0x0041*

- *AUTOMATIC_PROMPT = 0x0042*
- *MANUAL_PROMPT = 0x0043*
- *CRUISE = 0x0050*
- *MANEUVER_APPEARED = 0x0051*
- *PRE_ADVICE = 0x0052*
- *ADVICE = 0x0053*
- *PASSED = 0x0054*
- *ACTIVE = 0x0060*
- *INACTIVE = 0x0061*
- *STRAIGHT_ON = 0x0070*
- *CROSSROAD = 0x0071*
- *ROUNDABOUT = 0x0072*
- *HIGHWAY_ENTER = 0x0073*
- *HIGHWAY_EXIT = 0x0074*
- *FOLLOW_SPECIFIC_LANE = 0x0075*
- *DESTINATION = 0x0076*
- *WAYPOINT = 0x0077*
- *TURN = 0x0078*
- *BIFURCATION = 0x0079*
- *LEFT = 0x0080*
- *SLIGHT_LEFT = 0x0081*
- *HARD_LEFT = 0x0082*
- *RIGHT = 0x0083*
- *SLIGHT_RIGHT = 0x0084*
- *HARD_RIGHT = 0x0085*
- *UTURN_RIGHT = 0x0086*
- *UTURN_LEFT = 0x0087*
- *ALL_MANUAL = 0x0090*

- *ALL_AUTOMATIC = 0x0091*
- *TRAFFIC_MANUAL = 0x0092*
- *OFF_ROUTE_MANUAL = 0x0093*
- *LATITUDE = 0x00a0*
- *LONGITUDE = 0x00a1*
- *ALTITUDE = 0x00a2*
- *HEADING = 0x00a3*
- *SPEED = 0x00a4*
- *CLIMB = 0x00a5*
- *COUNTRY = 0x00a6*
- *STATE = 0x00a7*
- *CITY = 0x00a8*
- *ZIPCODE = 0x00a9*
- *STREET = 0x00aa*
- *HOUSENUMBER = 0x00ab*
- *CROSSING = 0x00ac*
- *DISTRICT = 0x00ad*
- *PHONENUMBER = 0x00ae*
- *POINAME = 0x00af*
- *TOWNCENTER = 0x00b0*
- *LOCATION_INPUT = 0x00b1*
- *FULL_ADDRESS = 0x00b2*
- *COUNTRYCODE = 0x00b3*
- *HOUSENAME = 0x00b4*
- *NOT_STARTED = 0x0c0*
- *SEARCHING = 0x00c1*
- *FINISHED = 0x00c2*
- *OK = 0x00d0*

- *UNKNOWN = 0x00d1*
- *AMBIGUOUS = 0x00d2*
- *INCONSISTENT = 0x00d3*
- *GNSS_FIX_STATUS = 0x00e0*
- *DR_STATUS = 0x00e1*
- *MM_STATUS = 0x00e2*
- *SIMULATION_MODE = 0x00e3*
- *MATCH_TYPE = 0x00f0*
- *ON_ROAD = 0x00f1*
- *OFF_ROAD = 0x00f2*
- *ON_FERRY = 0x00f3*
- *IN_TUNNEL = 0x00f4*
- *ON_CARPARK = 0x00f5*
- *NO_FIX = 0x0100*
- *TIME_FIX = 0x0101*
- *2D_FIX = 0x0102*
- *3D_FIX = 0x0103*
- *SEGMENT_ID = 0x0110*
- *DIRECTION_ON_SEGMENT = 0x0112*
- *DISTANCE_ON_SEGMENT = 0x0113*
- *INTERMEDIATE_POINTS = 0x0120*
- *WAYPOINT_TYPE = 0x0121*
- *SOFT_POINT = 0x0122*
- *HARD_POINT = 0x0123*
- *CALCULATION_OK = 0x0130*
- *NO_POSITION = 0x0131*
- *UNMATCHED_POSITION = 0x0132*
- *UNREACHABLE_DESTINATION = 0x0133*

- *UNFULFILLED_PREFERENCE_MODE = 0x0134*
- *LINK-ID = 0x0140*
- *START_LATITUDE = 0x0141*
- *END_LATITUDE = 0x0142*
- *START_LONGITUDE = 0x0143*
- *END_LONGITUDE = 0x0144*
- *START_ALTITUDE = 0x0145*
- *END_ALTITUDE = 0x0146*
- *ROAD_NAME = 0x0147*
- *DISTANCE = 0x0148*
- *TIME = 0x0149*
- *MANEUVER = 0x014a*
- *INSTRUCTION = 0x014b*
- *BORDER_CROSSING = 0x014c*
- *ADDITIONAL_INFORMATION = 0x014d*
- *ROAD_NUMBER = 0x014e*
- *START_OFFSET = 0x014f*
- *FASTEST = 0x0160*
- *SHORTEST = 0x0161*
- *ECOLOGICAL = 0x0162*
- *SCENIC = 0x0163*
- *EASY = 0x0164*
- *BALANCED = 0x0166*
- *CHEAPEST = 0x0167*
- *FERRY = 0x0170*
- *TOLL_ROADS = 0x0171*
- *TUNNELS = 0x0172*
- *HIGHWAYS_MOTORWAYS = 0x0173*

- *VEHICLE_SIZE_LIMIT = 0x0174*
- *CRIME_AREAS = 0x0175*
- *BY_CAR = 0x0180*
- *ON_FOOT = 0x0181*
- *LONG_RANGE_TRAINS = 0x0182*
- *PUBLIC_TRANSPORTATION = 0x0183*
- *BY_BICYCLE = 0x0184*
- *BY_TRUCK = 0x0185*
- *ARRIVAL_TIME = 0x018a*
- *ARRIVAL_DATE = 0x018b*
- *DEPARTURE_TIME = 0x018c*
- *DEPARTURE_DATE = 0x018d*
- *TOTAL_TIME = 0x018e*
- *TOTAL_DISTANCE = 0x018f*
- *PROHIBIT = 0x0190*
- *AVOID = 0x0191*
- *USE = 0x0192*
- *PREFER = 0x0193*
- *IGNORE = 0x0194*
- *TRAFFIC_REALTIME = 0x0200*
- *TRAFFIC = 0x0210*
- *OFF_ROUTE = 0x0211*
- *MANUAL = 0x0212*
- *SIMULATION_STATUS_NO_SIMULATION = 0x0220*
- *SIMULATION_STATUS_RUNNING = 0x0221*
- *SIMULATION_STATUS_PAUSED = 0x0222*
- *SIMULATION_STATUS_FIXED_POSITION = 0x0223*
- *ROAD_FORM_CHANGE = 0x0230*

- *ROAD_REGULAR = 0x0231*
- *ROAD_HIGHWAY_MOTORWAY = 0x0232*
- *ROAD_FERRY = 0x0233*
- *DIRECTION = 0x0240*
- *EXIT_NUMBER = 0x0241*
- *ROAD_FORM = 0x0242*
- *LANE_INFO = 0x0243*
- *LANE_INFO_BITMASK_STRAIGHT = 0x0001*
- *LANE_INFO_BITMASK_SLIGHTRIGHT = 0x0002*
- *LANE_INFO_BITMASK_RIGHT = 0x0004*
- *LANE_INFO_BITMASK_SHARPRIGHT = 0x0008*
- *LANE_INFO_BITMASK_RIGHTUTURN = 0x0010*
- *LANE_INFO_BITMASK_SLIGHTLEFT = 0x0020*
- *LANE_INFO_BITMASK_LEFT = 0x0040*
- *LANE_INFO_BITMASK_SHARPLEFT = 0x0080*
- *LANE_INFO_BITMASK_LEFTUTURN = 0x0100*
- *DIVIDER_UNDEFINED = 0x0250*
- *DIVIDER_INTERRUPTEDLONG = 0x0251*
- *DIVIDER_INTERRUPTEDSHORT = 0x0252*
- *DIVIDER_SOLIDSINGLE = 0x0253*
- *DIVIDER_SOLIDDOUBLE = 0x0254*
- *DIVIDER_SOLIDINTERRUPTED = 0x0255*
- *DIVIDER_INTERRUPTEDSOLID = 0x0256*