![Nexus geographics logo]

MATRIX SOLVER USER MANUAL

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Index

1. Introduction

This document describes the calls and parameters provided by the RoutingReparto server.

The RoutingReparto server can be accessed using the URL

https://www.routingreparto.com/planificador/server?

Communication with the server is done via HTTP GET requests (if the parameters do not exceed 1024 bytes) or HTTP POST requests with enctype **multipart/form-data** or **application/x-www-form-urlencoded**.

The server always returns an XML response unless otherwise specified.

All requests to the server must include the Cercalia distributor code and optionally a client code. Prevent third parties from gaining access to your distributor code.

2. Route Matrix

2.1 Route Matrix Calculation Request

The request can be made by GET or POST indicating the following parameters:

cmd	It should always be **matrix.**
clientid	Dealer code or distribuidor code (ten digits key).
client	Client code. (Optional)
srs	Coordinate reference system. For example: EPSG:4326 or EPSG:3395
routeweight	Weight to minimize (time, distance, realtime*, timerimp*) *Only on networks that support it
maxcost	Maximum cost of the returned route over the minimized weight. If this cost is exceeded, they will be shown a -1. Default: No limit.
network	Network to be used (Depending on selected country)
origs	Coordinates Points of Origin [X0,Y0],[X1,Y1], ... [Xn,In]
dests	Coordinates Destination Points [X0,Y0],[X1,Y1], ... [Xn,In] If the **dests parameter is not specified**, it takes the same value as **origs** parameter.
avoidTolls	If it has a value **of true**, the use of toll roads will be avoided. Default false.
ignoreStopsNotSolved	If it is set to **false**, an error will be returned if there is a point (at the sources or destinations) with no network span nearby. Default. If it set to **true**, if there is a point (at the sources or destinations) with no network span nearby, the array will still be returned. In the column or row associated with this point, all values to -1 will appear.
direction	It determines the sense(s) through which one leaves or arrives at the origins or destinations. **DIRECTION_BOTH**: you can get there or leave in both directions (the optimum) **DIRECTION_UNRESOLVED**: you arrive or depart leaving the origin or destination on the right if possible. **DIRECTION_DEFAULT**: Default. If it is a street that is not very busy, both directions are chosen. If it is important, choose the one where the stop is on the right (whenever possible). Other values that should not be used: **DIRECTION_FORWARD**: It always comes in the same direction as the digitization of the section. **DIRECTION_BACKWARD**: You always arrive in the opposite direction to the digitization of the section.

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If the request is longer than 256 characters, it must be made by POST.

Sample Request:

cmd=matrix&clientid=cli&srs=EPSG:4326&routeweight=time&origs=[2.00854781, 41.31808218],[1.69725889,41.34549167]

2.2 Speed Profiles Route Matrix Calculation Request

For networks with Speed Profiles support, in addition to the parameters in section 2.1, the following can be specified:

speedProfiles	Default **false.** If true, travel times are calculated based on the departure time (departureTime).
departureTime	Date and time of departure in ISO 8601 format. Example for UTC time: 2007-04-05T14:30:12Z

Example call:

cmd=matrix&clientid=xxxxx&srs=EPSG%3A4326 &origs=%5B2.825253%2C+41.970376%5D&dests=%5B2.153909%2C+41.387005%5D&net work=ESP&routeweight=sptime&departuretime=2021-03-29T16%3A09%3A08.000Z

2.3 Request for Logistics Route Matrix Calculation

For logistics networks, in addition to the parameters in section 2.1, the following can be specified:

| vmaxvel	Maximum vehicle speed expressed in Km/h (Optional)
vweight	Vehicle weight expressed in tonnes. (Optional)
vaxleweight	Maximum weight of vehicle axles expressed in tonnes. (Optional)
vheight	Maximum height of the vehicle expressed in meters. (Optional)
vlength	Length of the vehicle expressed in meters. (Optional)
vwidth	Width of the vehicle expressed in meters. (Optional)
routeweight	You can specify one of the following: - time: Time - distance: Distance - timerimp: Time (route optimized for ADR vehicles)

RoutingReparto logistics networks end with the suffix "_logistics"

Example call:

```
cmd=matrix&clientid=xxxx&srs=EPSG%3A4326&origs=%5B2.825253%2C+41.970376%5D
&dests=%5B2.153909%2C+41.387005%5D&network=EUR_logistics&vweight=5
```

2.4 Route Matrix Calculation Response

The answer is an XML document with the following structure:
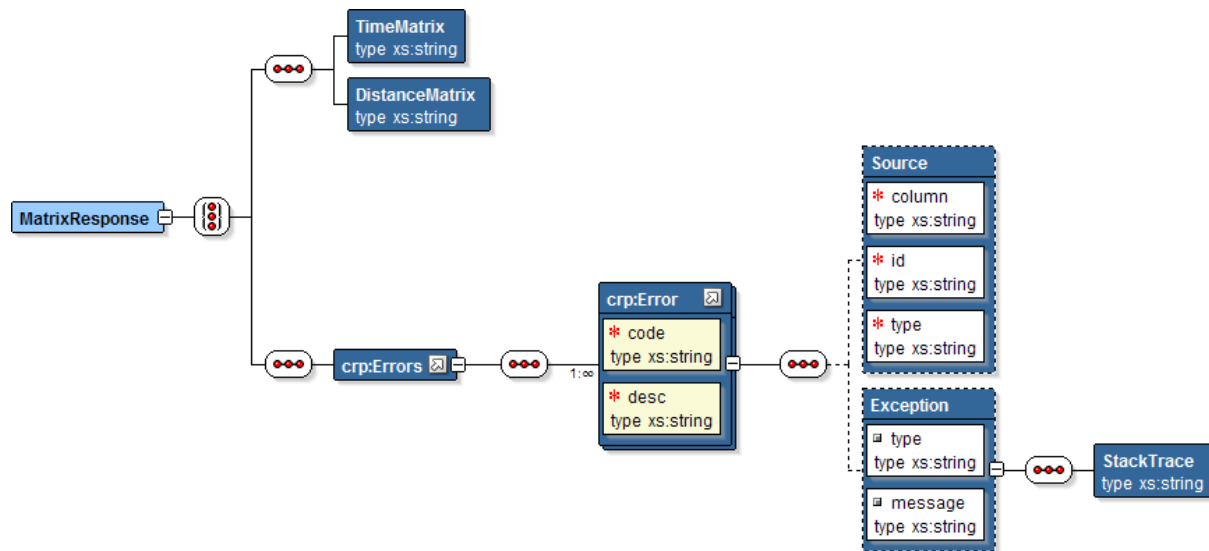
Examples:

```xml
<MatrixResponse>
      <TimeMatrix>0|232|321|0</TimeMatrix>
      <DistanceMatrix>0|5829227|5856304|0</DistanceMatrix>
</MatrixResponse>
```

or

```xml
<MatrixResponse>
      <Errors>
            <Error code="E10001" desc="Missing Distributor/Customer ID." />
      </Errors>
</MatrixResponse>
```

TimeMatrix contains all the times to go from one coordinate to another expressed in seconds.

To get the time it takes to go from the coordinate Pi to the coordinate Pj (where i and j indicate the order of the coordinate in the request) you need to read the (Pi * Number of coordinates + Pj) element.

The DistanceMatrix contains all the distances to go from one coordinate to another in meters.

To get the distance between the coordinate Pi and the coordinate Pj (where i and j indicate the order of the coordinate in the request) you need to read (Pi * Number of coordinates + Pj) element.

If errors occur, you will see the **Errors** tag instead **TimeMatrix** and **DistanceMatrix tags**.

2.5 Example

https://routingreparto.com/planificador/server?cmd=matrix&clientid=[XXXXXXX]&srs=EPSG%3A4326&direction=DIRECTION_BOTH&origs=%5B-4.745360706023661%2C41.64661688830424%5D%2C%5B-5.5771714219847%2C42.59709646216754%5D&dests=&network=EUR_logistics&routeweight=timerimp

Replace [XXXXXXX] with your clientid.

Annex 1: Error Codes

List of error codes:

Code	Description
E00000	No Error
E10001	Missing distributor/customer ID.
E10002	Unknown Reseller/Customer ID.
E20003	Insufficient points.
E20004	Non-contracted level.
E20005	Unauthorized mobile.
E30001	Server not reachable.
E30002	Internal server error.
E30003	Server busy.
E30004	Cercalia connection error.
E30005	Resource not available.
E30106	Error calculating matrix.
E40001	Map item not found.
E40002	There is no way.
E50001	Required parameter is missing.
E50002	Incorrect parameter value or out of range.
E50008	Incorrect request format.
E50009	XML validation failed.
E60001	There are no services to attend to.
E60002	There are no vehicles to serve.
E60003	There is no work with this identifier.