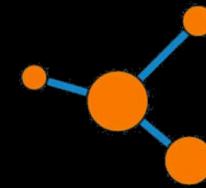# ATDI – HTZ WEB API

Mission Planning Automation

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HTZ WEB API – Mission Planning in your fingertips

- Advanced automation of network planning and optimisation in complex mission operations

- Restful WEBAPI to integrate with the 3rd party software solutions seamlessly

- Powerful back-end RF Engineering support from HTZ Warfare

- Support JSON and XML formats to structure data, ensuring the API responses are lightweight and easily readable.

- Real-time analysis to empower situational awareness; monitoring network performance ranges from power consumption, station status and more

- Support advanced customisation to tailor the project scenarios/workflows to fit the purpose of missions
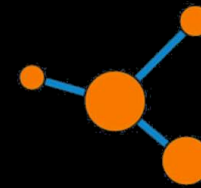
RESTFUL:API

HTZ Warfare

HTZ WEB API – Automated Planning without missing any keywords

- Cover frequency range from a few KHz up to 1 THZ

- User-defined radio equipment and antenna characteristics

- Support all core mission scenarios:

  - HF, VHF/UHF and other tactical radios

  - Microwave LOS (e.g. NATO bands III and IV)

  - Wireless networks and satellite communication (SATCOM)

  - Drone/Counter-Drone on-the-move missions

  - Mobile ad hoc networks (MANET) in the VHF and UHF ranges

  - Point-to-point links

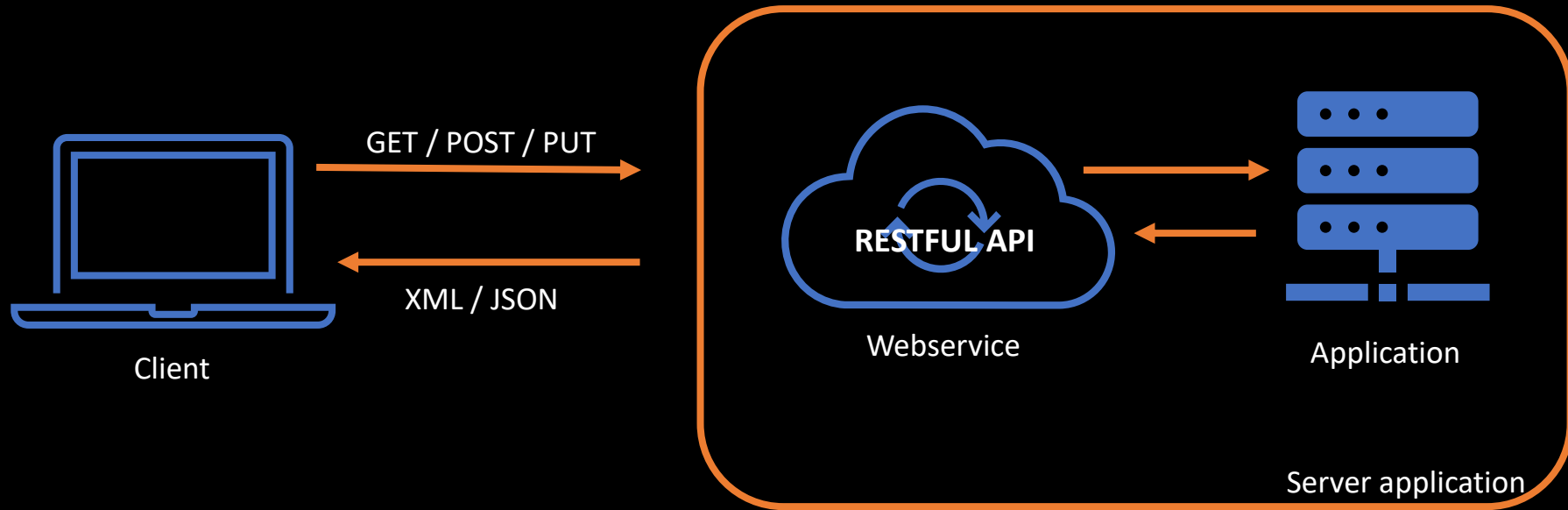 - Point-to-multipoint links in the LOS range

RESTFUL:API

HTZ Warfare

HTZ WEB API – Solution Architecture

GET / POST / PUT

XML / JSON

RESTFUL API

Client

Webservice

Application

Server application

HTZ WEB API – Automated Workflow

i. Client sends a request for a given queue; it is a script made of one or several actions.

ii. The client assigns an identifier to the request.

iii. On the server side, the web API receives the query and saves the task as a new job in the Queue; It then monitors the queue.

iv. If the calculation result is available within the timeout specified.

v. Check for the result availability of the corresponding script.

vi. The request script, as well as the calculation results, can be exchanged in XML or JSON format.

vii. JSON format will be translated to XML by the Web API service.
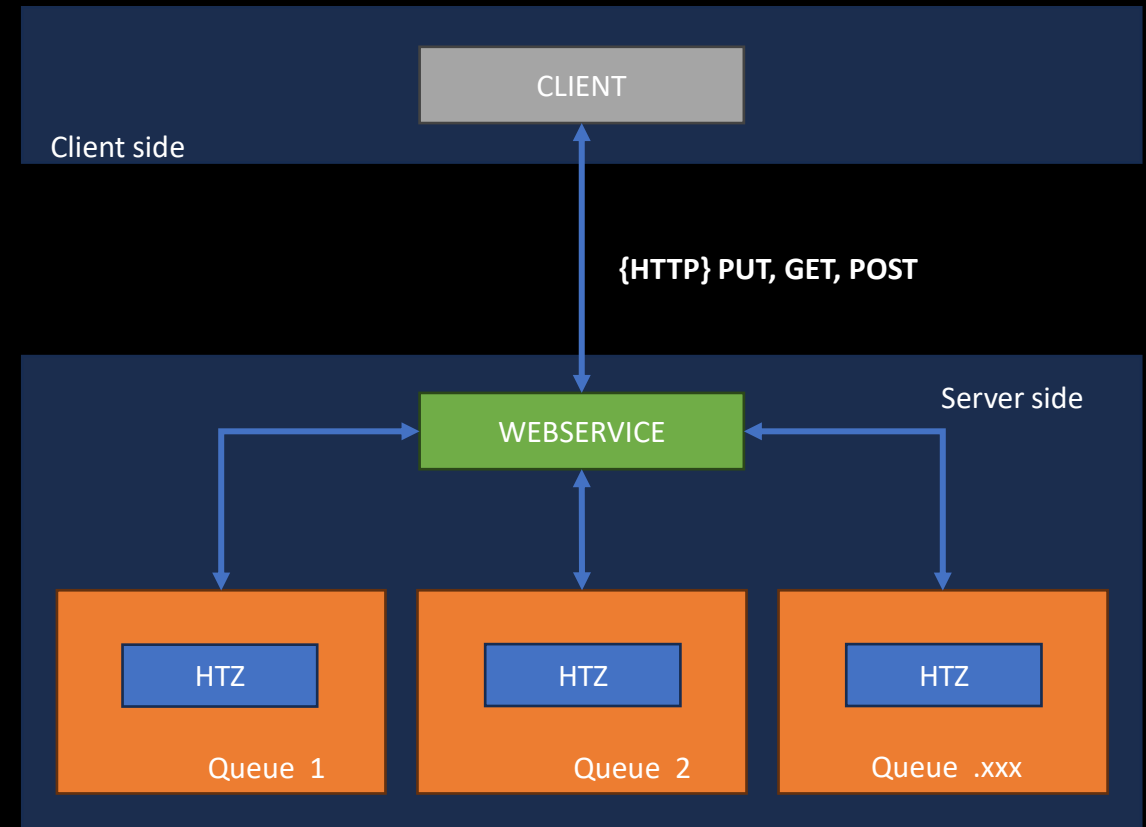
HTZ WEB API – Key Functions

Managing Projects

- **Load P11 :** Load a custom Palette

- **HTZ Version :** Retrieve Server Version in use

- **Load a Project :** Load a Given project embedded on the server side

- **Project information :** Retrieves information's such as : Altitude Min/Max, Number of stations, etc.

- **Load parameter file:** Handle to reload PRM to configure Protection ratio, Propagation models, etc.

- **Update project:** Save project embedded on the server side

- **Close HTZ:** Close HTZ on the server side

- **Creates Polygon (Well Known text – Format):** Handle to Draw polygon and add it into the vector layer

- **Delete Vector:** Admit to delete a given polygon into the vector layer.

HTZ WEB API – Key Functions

Services : Manage information and state returning by the Webservice

- Service State – Returns the list of Queues that have been configured on the server
- Queue State – Returns general and detailed information on a given Queue
- Queue Order – Ability to **START**, **STOP**, **PAUSE**, **RESUME** jobs in a given Queue

Submit Job: Send one or several orders to HTZ.

- Project Managing
- Object Managing
- Simulations – Coverage – P2P – Multipoint
- Frequency Assignment / Interferences

HTZ WEB API – Key Functions

Project Managing

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HTZ WEB API – Key Functions

Managing Stations

- **ADD STATION:** Put a station on map

- **MOVING STATION:** Move a station on a given coordinate

- **DELETE A GROUP OR A GIVEN STATION:** Delete a group or a given station

- **DELETE ALL STATIONS:** removing all the stations loads on the project

- **NETWORK ACTIVATION:** Activate stations belong to a given Network ID

- **ACTIVATE A GROUP OR A GIVEN STATION:** Active one or multiple stations on the map

- **GENERASTATIONS ON RANDOM COORDINATES:** Generates stations on a given polygon with Monte Carlo method

- **LINKING TWO STATIONS:** Link two stations (Unidirectional / Bidirectional)

HTZ WEB API – Key Functions

Simulations / Analysis

- **STATION COVERAGE:** Done a composite coverage and return the result in KML/GeoTIFF/TIFF

- **COMPOSITE COVERAGE MAP:** Retrieve a coverage already done by the users

- **C/N+I:** Retrieve the C/N+I map (Interferences)

- **BEST SERVER COVERAGE MAP:** Retrieve the best server coverage map in KML/TIFF.

- **OVERLAPING MAP:** Retrieve the overlapping on all the activated stations

HTZ WEB API – Key Functions

Simulations / Analysis

- **STATION COVERAGE:** Done a composite coverage and return the result in KML/GeoTIFF/TIFF

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- **BEST SERVER COVERAGE MAP:** Retrieve the best server coverage map in KML/TIFF.

- **OVERLAPING MAP:** Retrieve the overlapping on all the activated stations

- **GROUP COVERAGE MAP:** Retrieve the coverage map according to the Network ID

- **P2P CALCULATION:** Point-to-point calculation between two stations – Power Received, Margin, Profile

- **P2MP CALCULATION:** Point to multiple calculations – PR, FS, Azimuth, ToA, Distance.

- **SEARCH NODES:** Define the best location to add a relay between different networks

- **ADD RELAY:** Define the best location between two stations – cascade relay is available

- **SIMULATENEOUS COVERAGE MAP:** Simultaneous coverage map according to the Network ID

- **LOS COVERAGE:** Line Of Sight coverage – Displaying where you can communicate in LOS

HTZ WEB API – Key Functions

Frequency Assignment / Interferences:

- LOAD FREQUENCY LIST
- LOAD FREQUENCY BAND AND EXCLUDED FREQUENCIES
- ASSIGN FREQUENCIES IN COVERAGE MODE BAND
- ASSIGN FREQUENCIES IN P2P FAST BAND
- FREQUENCY LIST RETRIEVING ALL STATIONS
- FREQUENCY LIST RETRIEVING FOR A MULTIPLE OR MULTIPLE OR A GIVEN STATION
- THRESHOLD DEGRADATION BETWEEN STATIONS
- INTERFERENCE COVERAGE MAP

Support the following scenarios for VHF and UHF radio networks

Station Coverage – JSON Datagram example
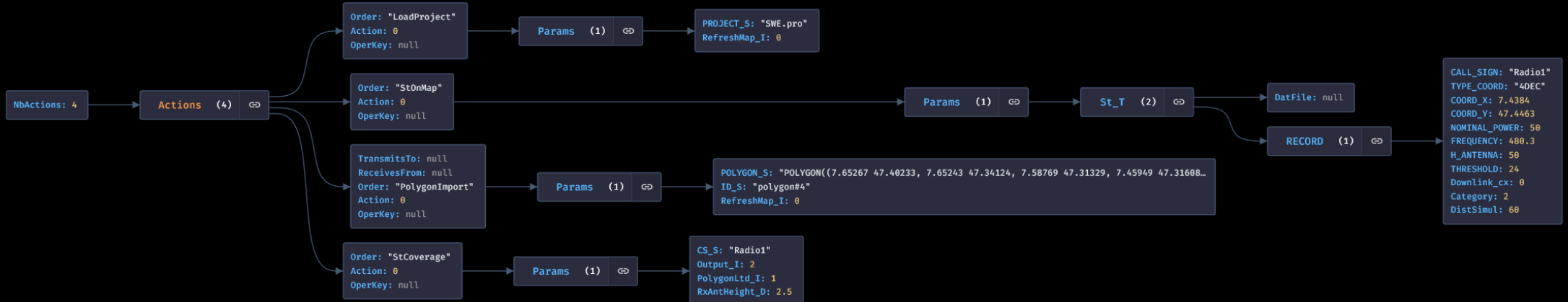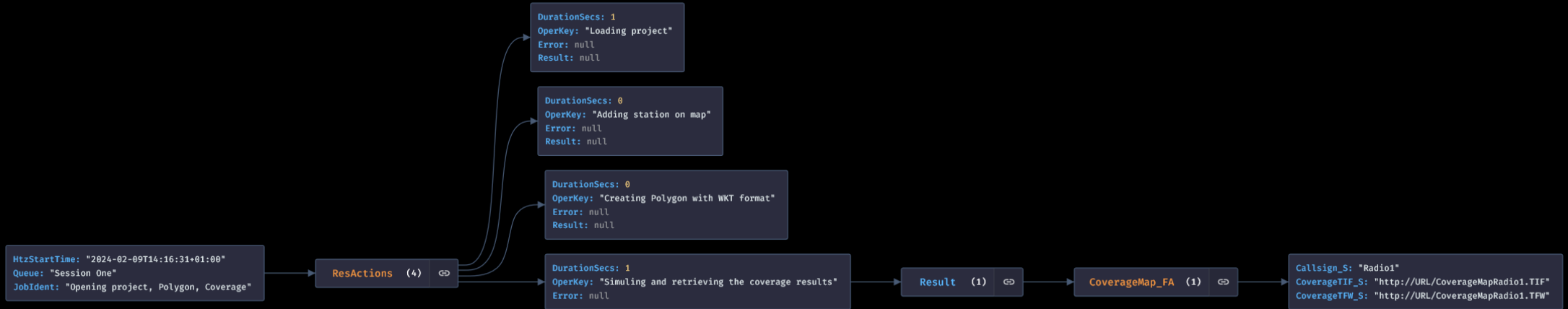
Connectivity analysis and network coverage analysis from a single point to an area

Output format : KML and GeoTIFF
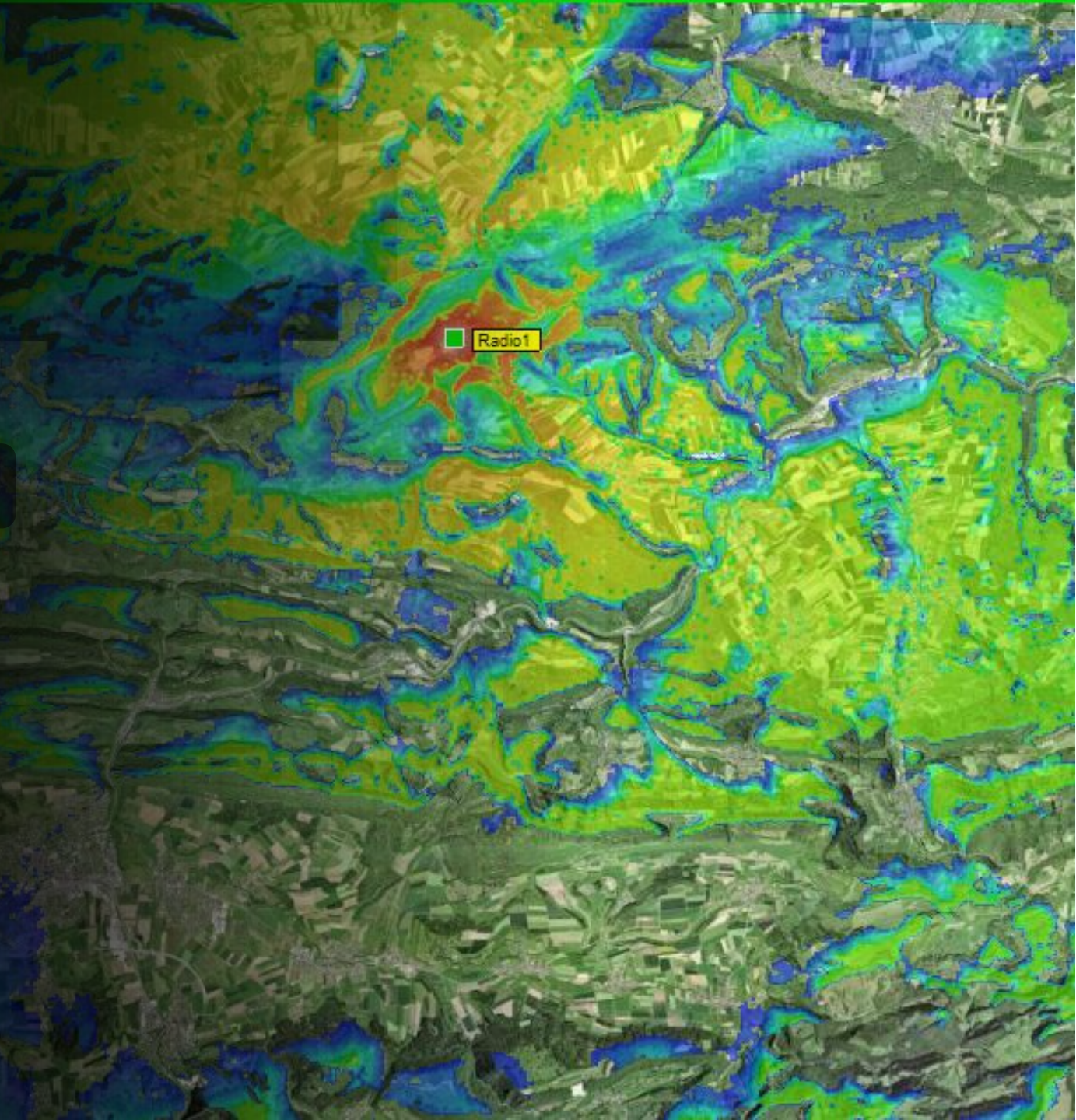
Connectivity analysis and network coverage analysis
between two points

Output format : XML, JSON

Power Received : -78.181152 dBm
Margin : 34.818848 dB

Radio1

Power Received : -88.181152 dBm
Margin : -4.818848 dB
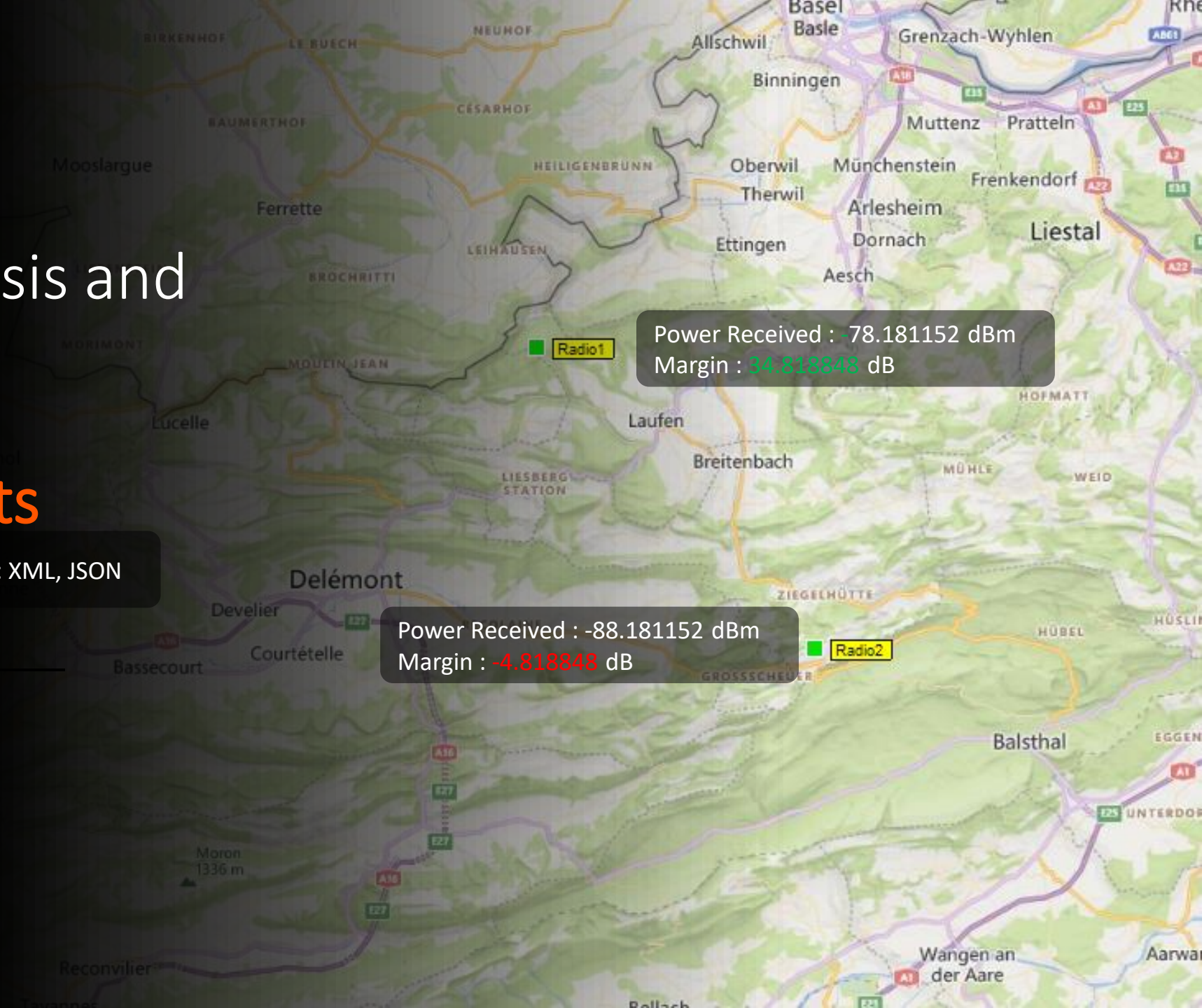
Radio2

Connectivity analysis and network coverage analysis **between multiple points of the same network** including connectivity matrix presentation
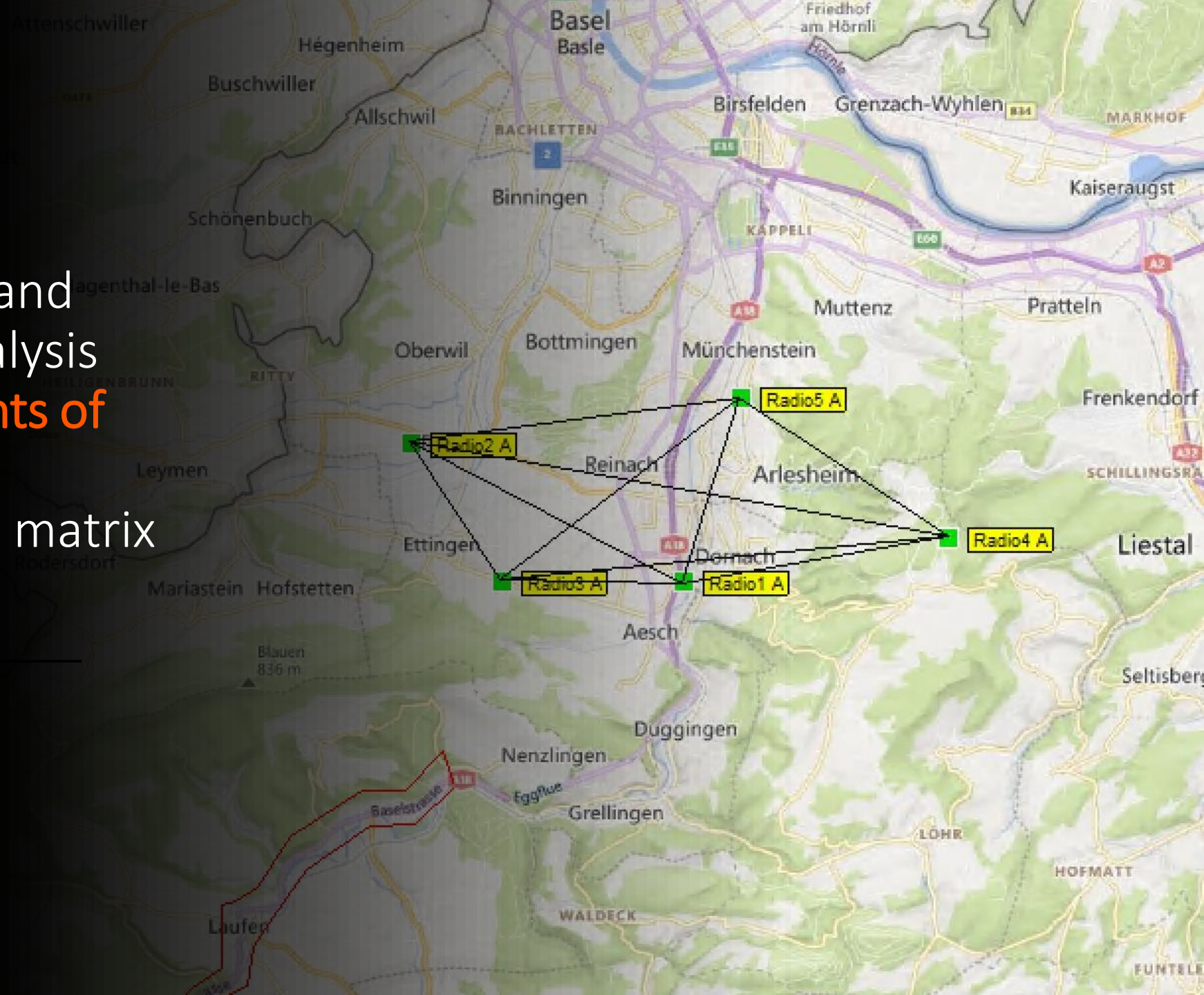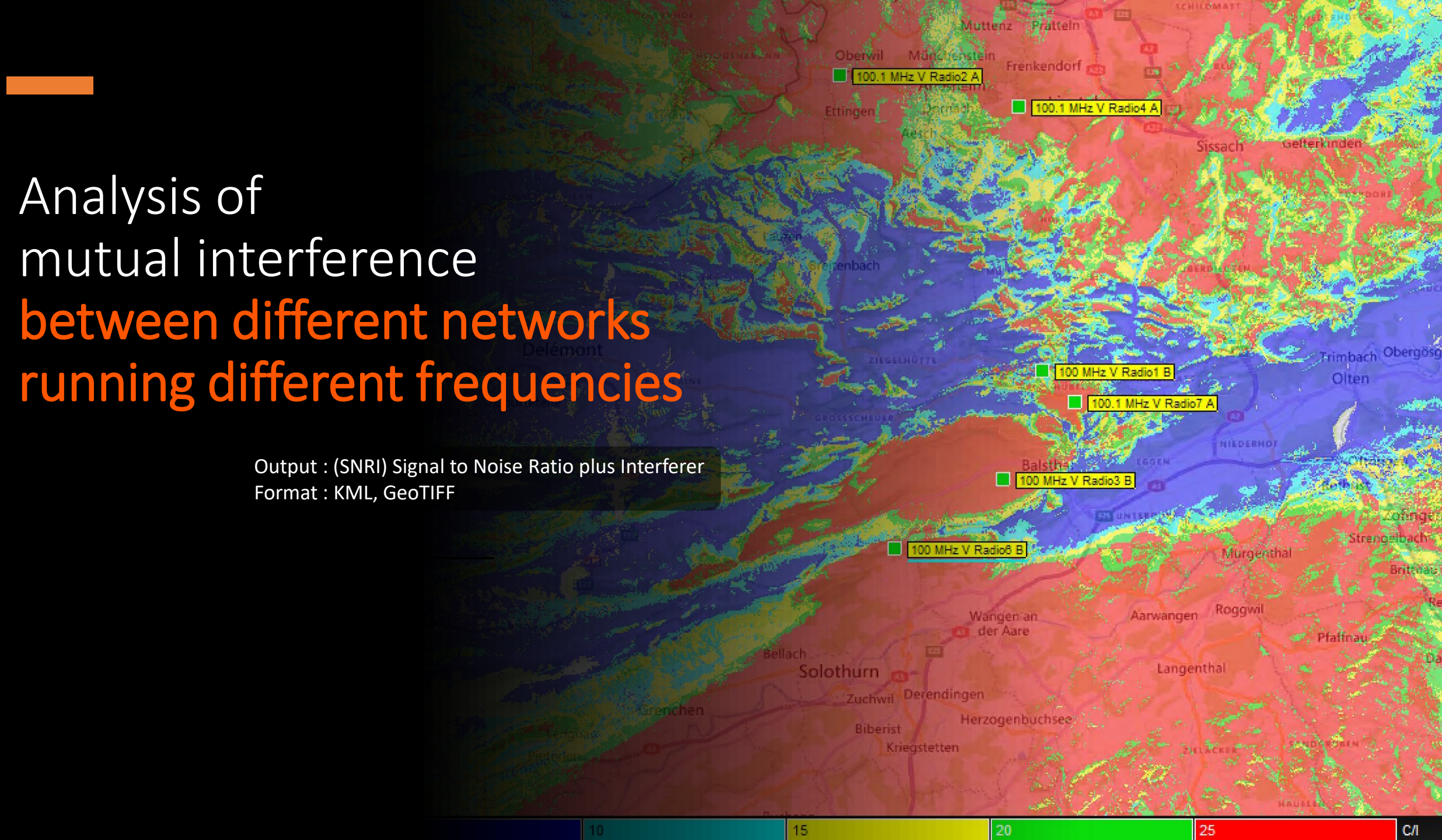
Connectivity analysis and network coverage analysis
between multiple points of the same network
including connectivity matrix presentation
e.g.: Power received (dBm)

P2MP - Matrix analysis
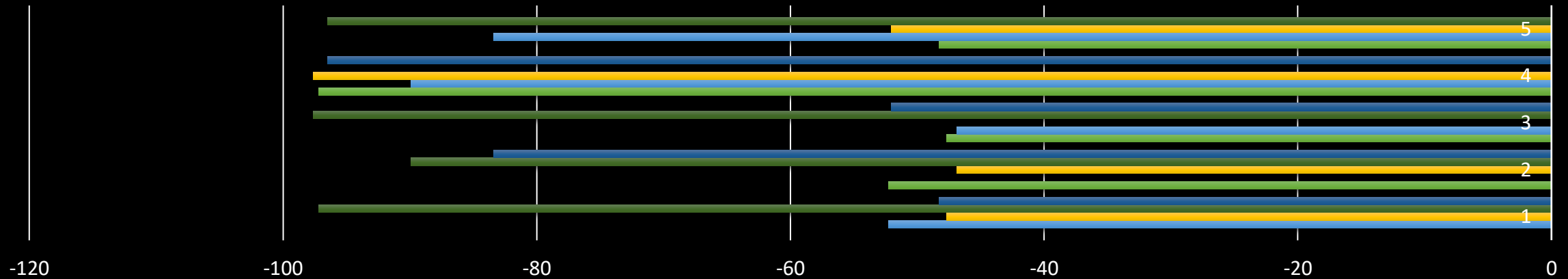
	1	2	3	4	5
5 - A	-48.27	-83.38	-52.07	-96.51	
4 - A	-97.2	-89.9	-97.63		-96.51
3 - A	-47.71	-46.88		-97.63	-52.07
2 - A	-52.27		-46.88	-89.9	-83.38
1 - A		-52.27	-47.71	-97.2	-48.27

Power Received from RADIO {1,2,...} dbm

Connectivity analysis and network coverage analysis
between multiple points of the same network
including connectivity matrix presentation:
e.g. Margin (dB)
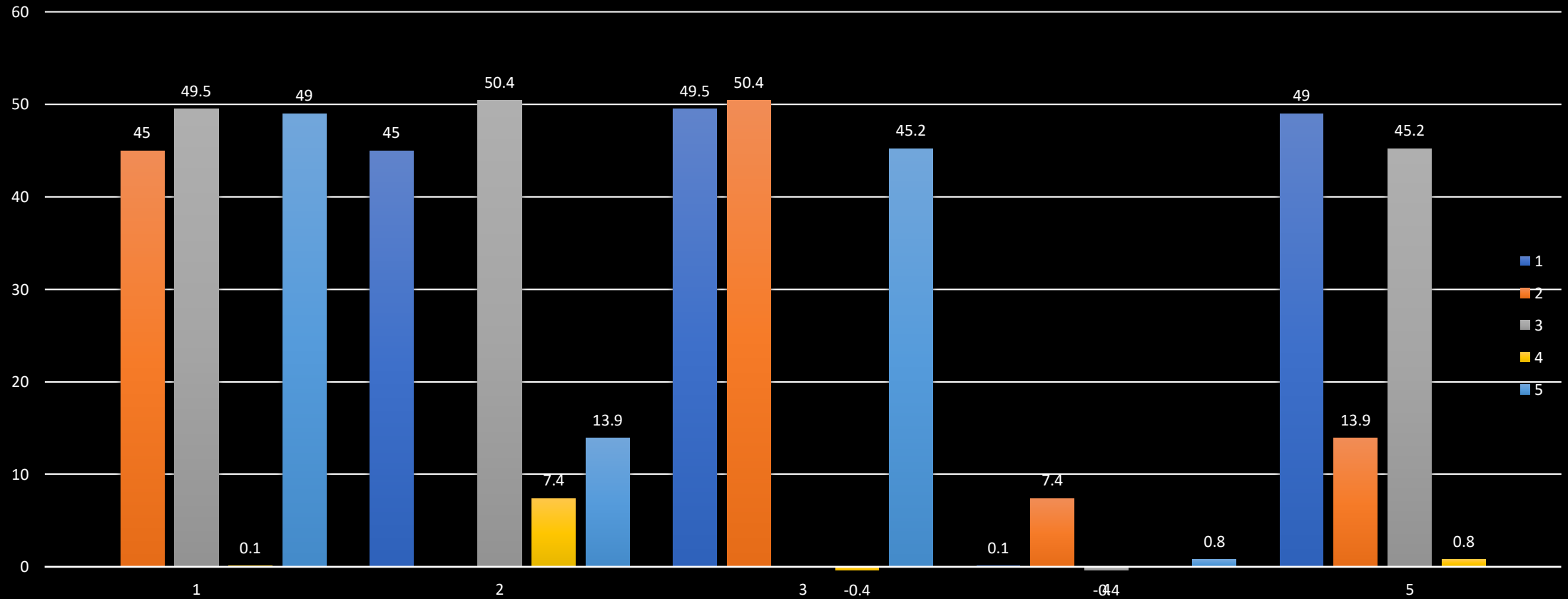
Connectivity analysis and network coverage analysis along a specified route

Output format : KML and GeoTIFF

Analysis of
mutual interference
between different networks
running different frequencies

100.1 MHz V Radio2 A
100.1 MHz V Radio4 A
100 MHz V Radio1 B
100.1 MHz V Radio7 A
100 MHz V Radio3 B
100 MHz V Radio6 B

Output : (SNRI) Signal to Noise Ratio plus Interferer
Format : KML, GeoTIFF

| 10 | 15 | 20 | 25 | C/I |

Frequency allocation - JSON Datagram example
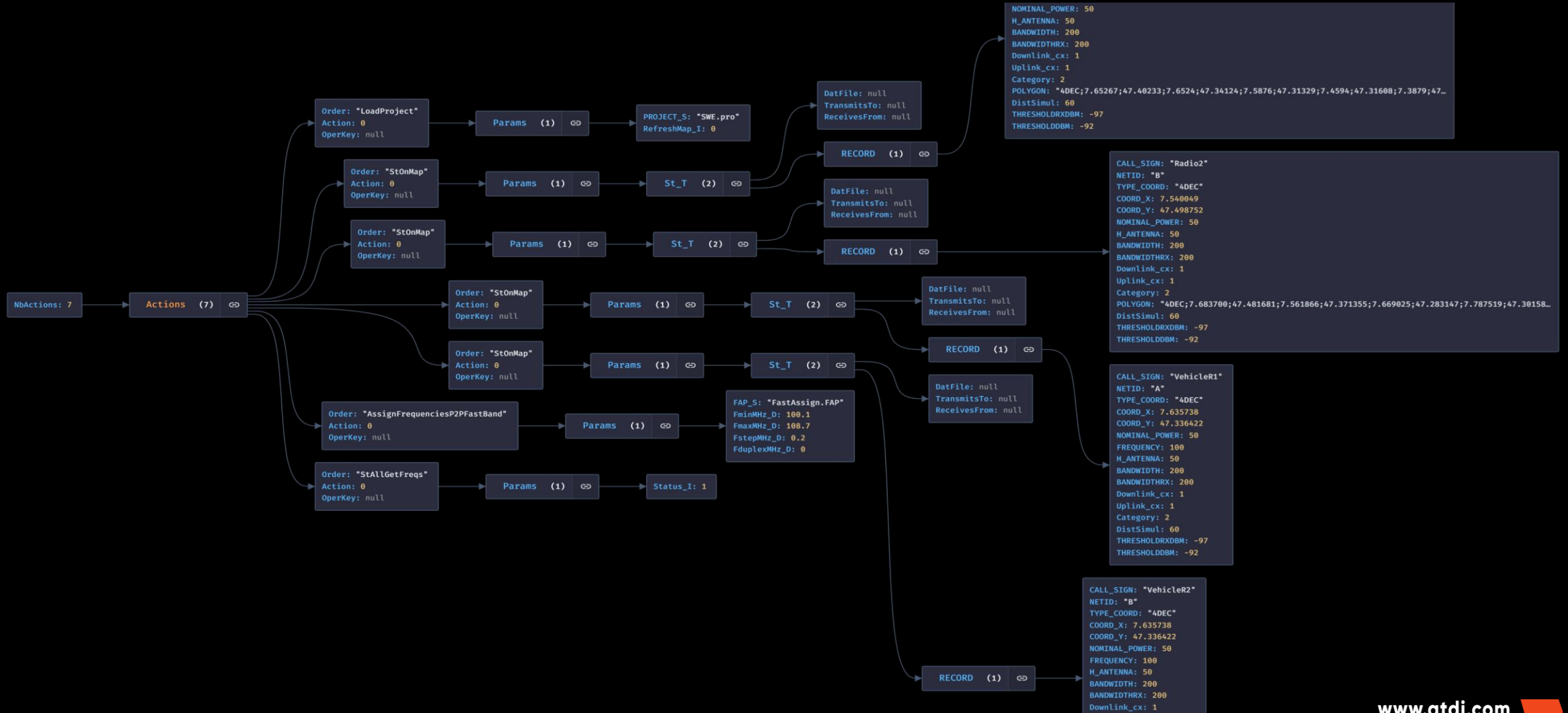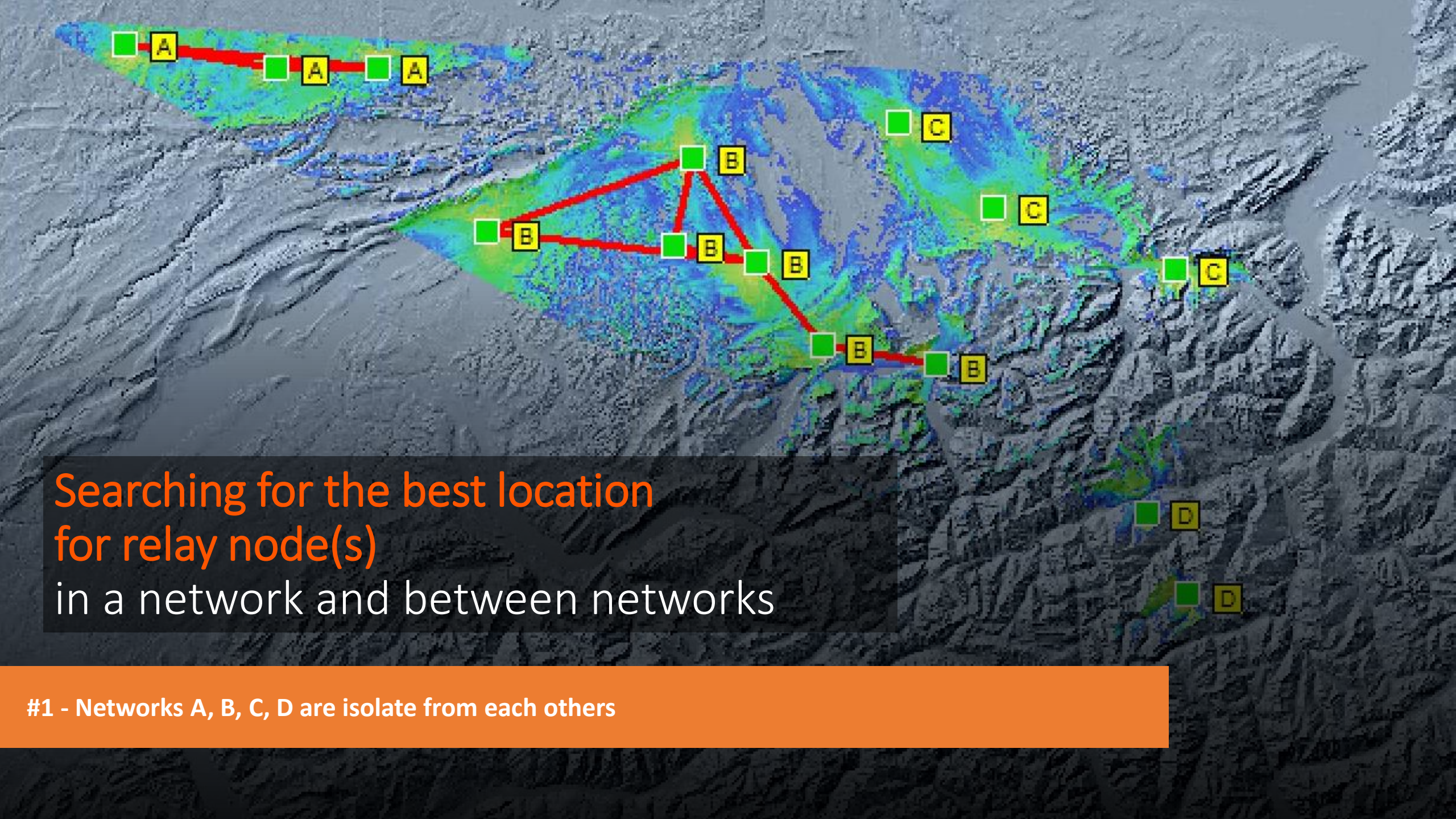
Analysis of
co-vehicle frequency allocation
in a single site connected to multiple
networks (2 radios in one car)
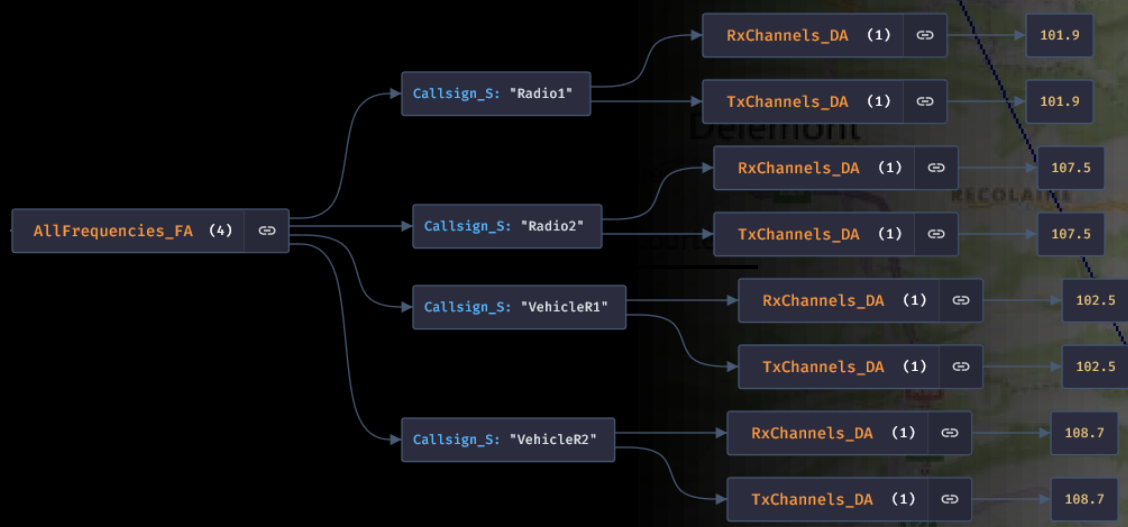
Analysis for
the Best Network received
in a target area
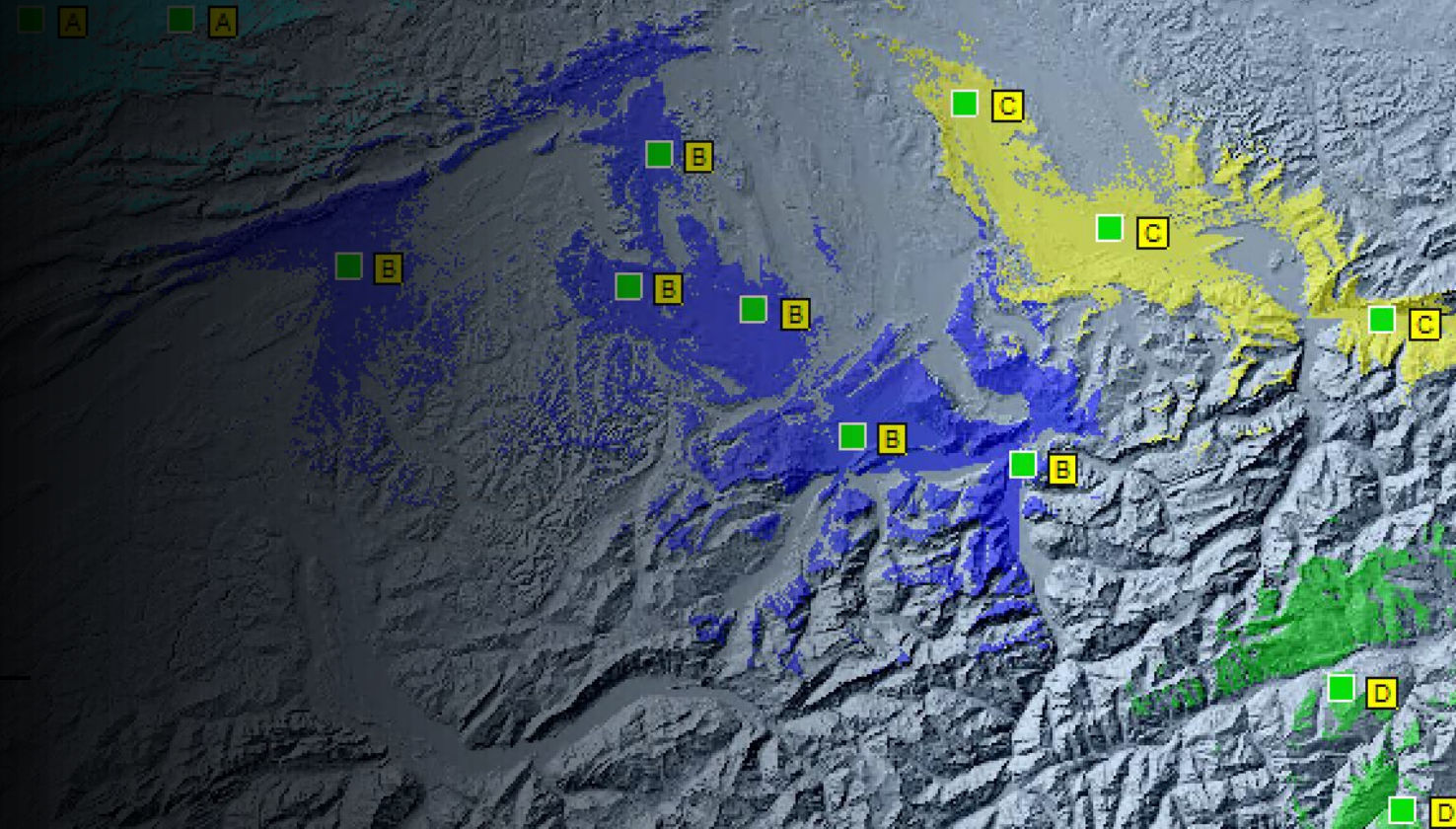
Searching for the best location for relay node(s)
in a network and between networks

#1 - Networks A, B, C, D are isolate from each others

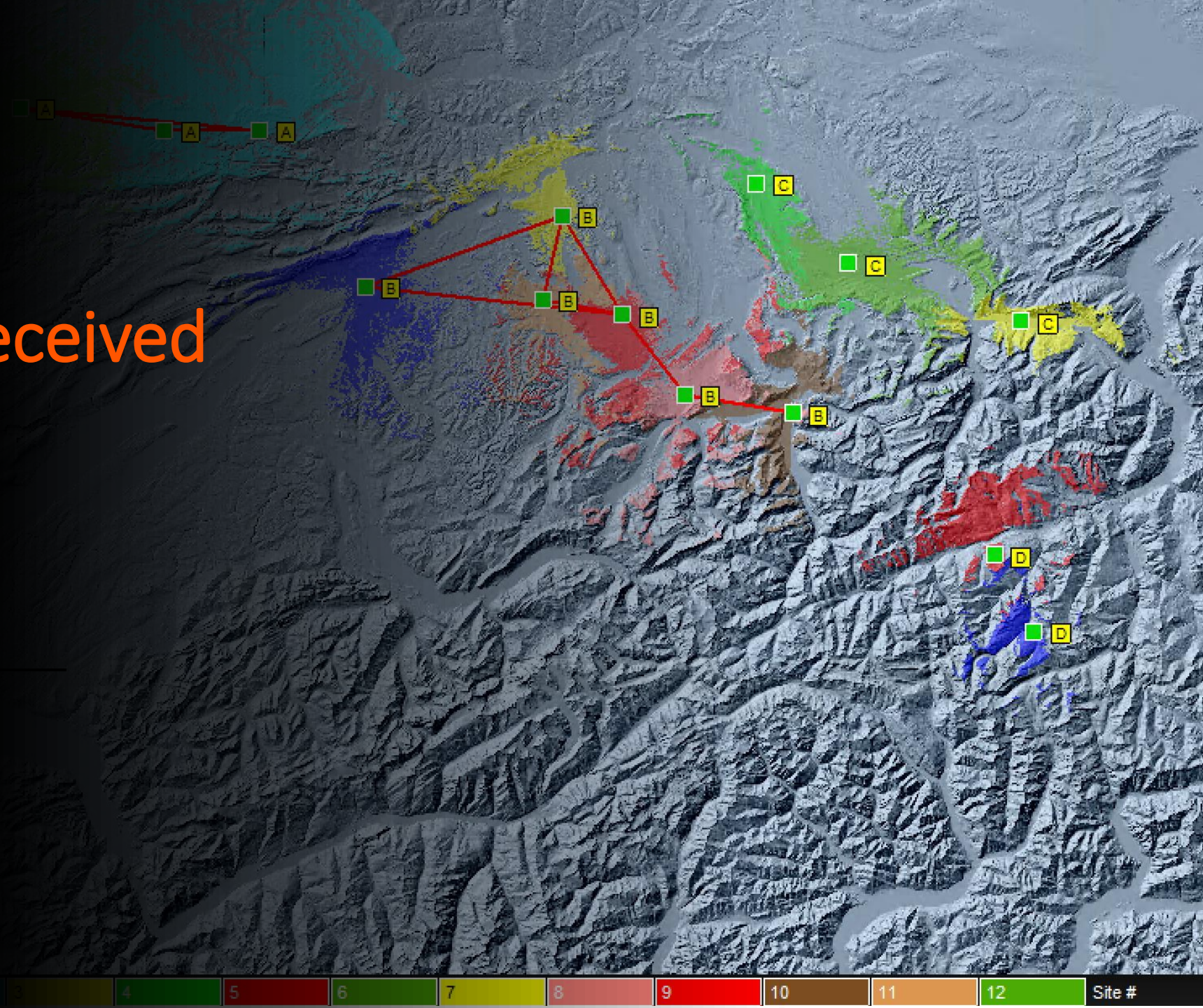Support recommendation for best location for relay placement in a network and between networks

Analysis for **overlapping between all networks**
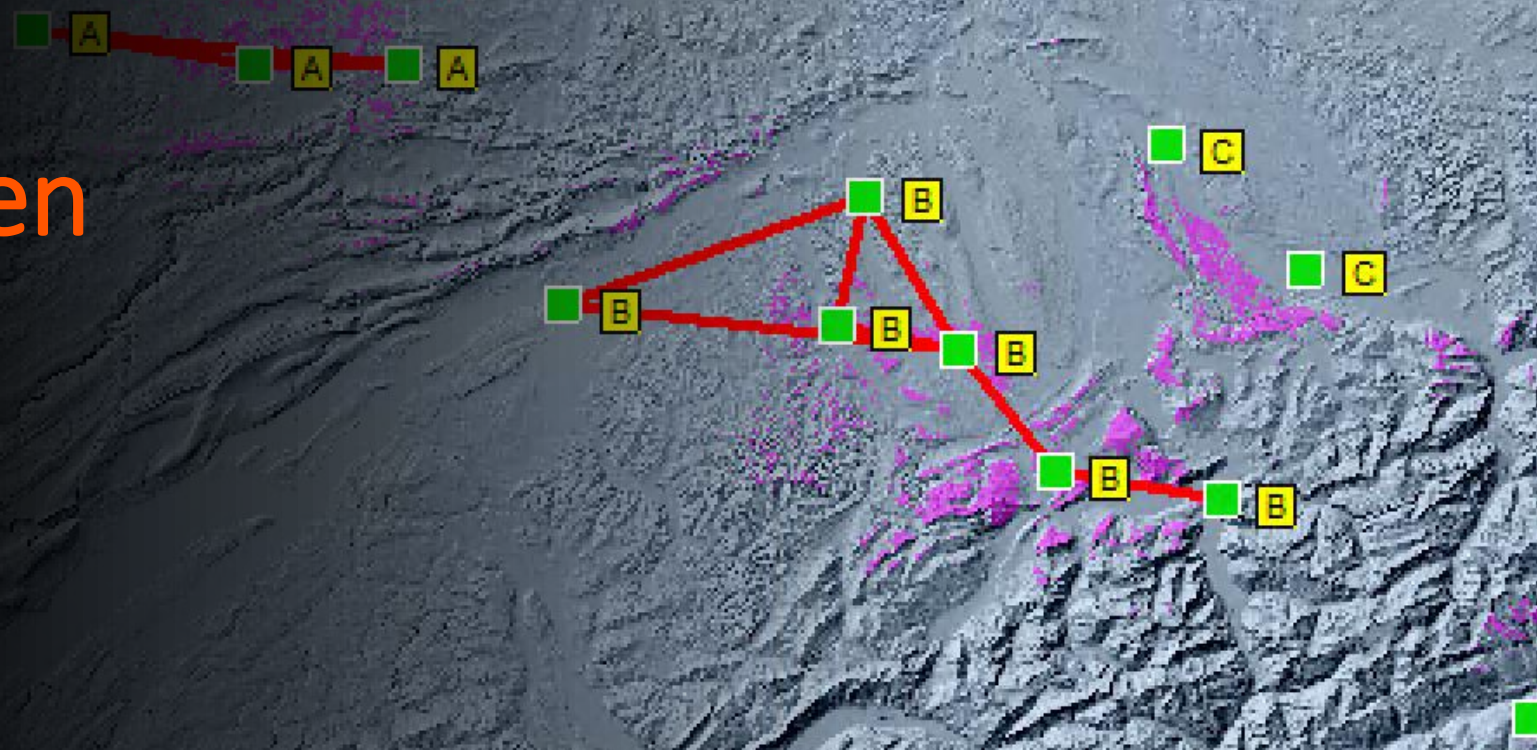
Site searching
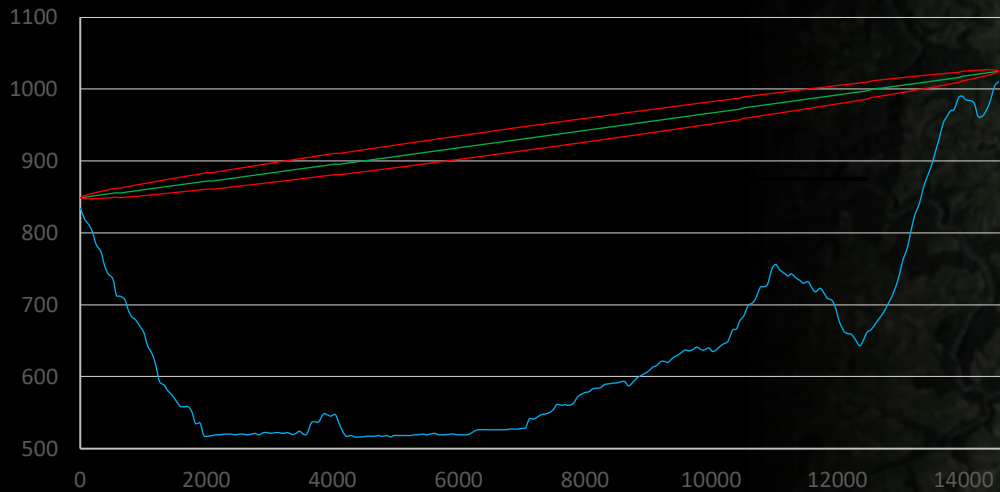for best server received
in a target area

Use case scenarios for Microwaves radio networks

Site searching
for best location in Line of Sight
in a target area
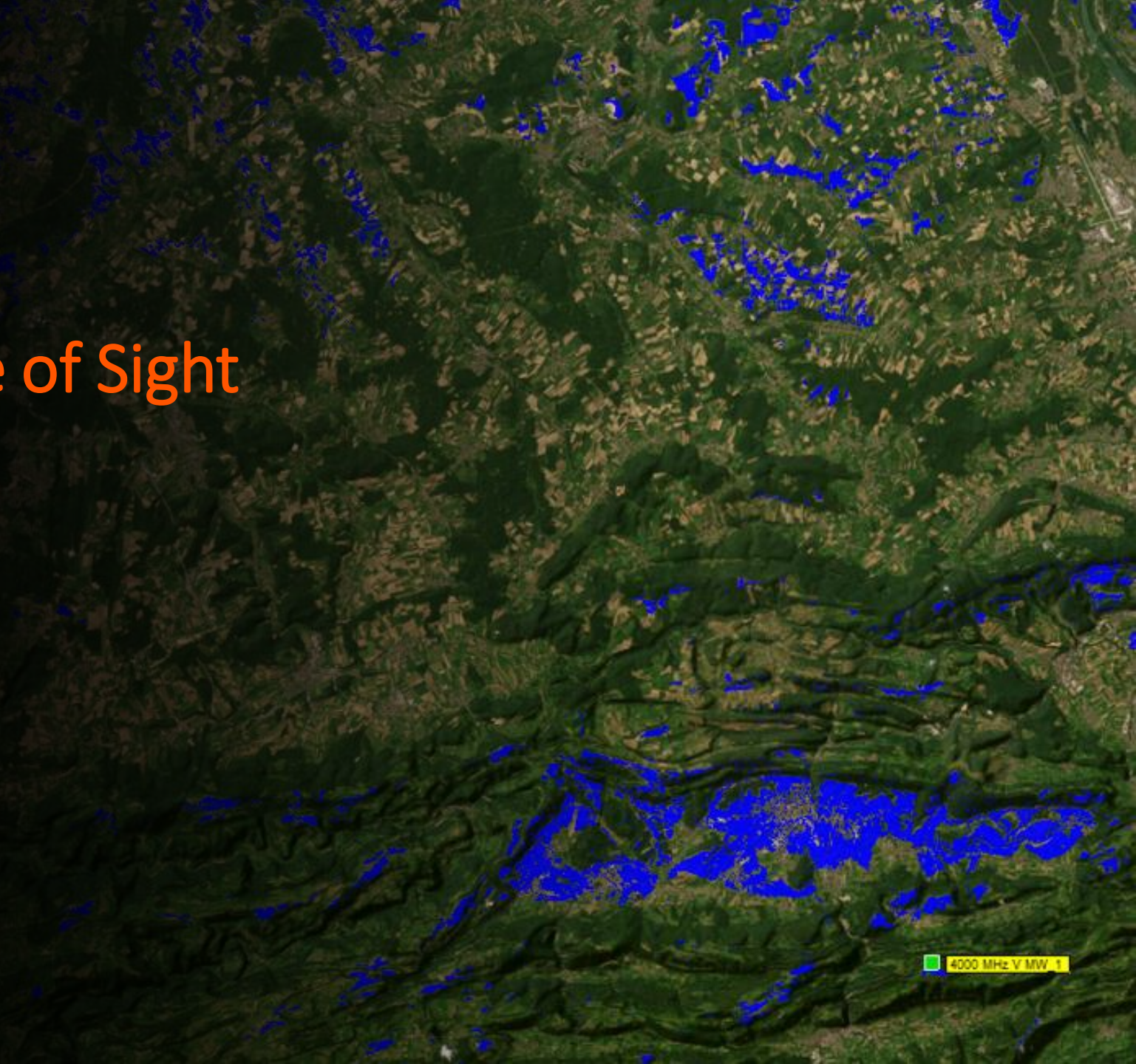
Connectivity and profile analysis for Line-of-sight radios
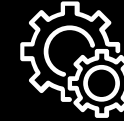
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System Customisation
Business analysis, system design, architecture, customisation, integration, and configuration.

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Provide professional consulting services in spectrum engineering and management to solve any spectrum issues.

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Medium to High resolution DTM and Clutter library.
Cloud base digital map image streaming and cache support.

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Support on Go-Live, Testing, and bug fixing.
On-going maintenance support with software updates.

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