LOG-a-TEC Portal Tutorial

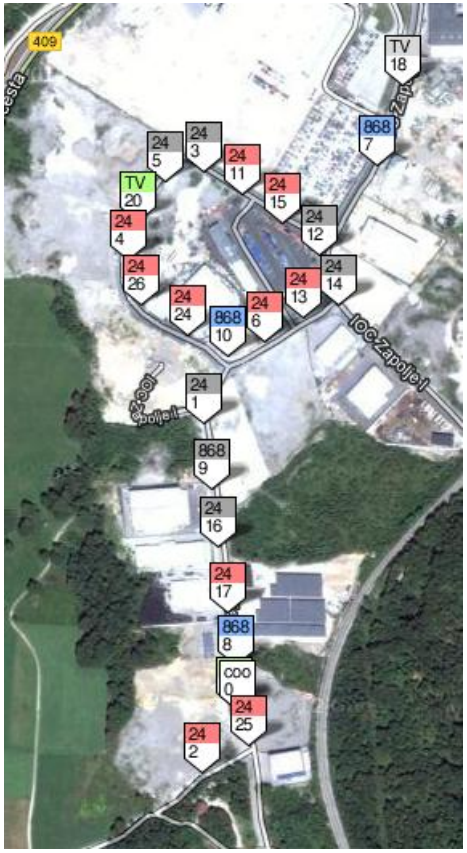
LOG-a-TEC is a wireless outoor testbed

- Meant for experimentation with
  - Spectrum sensing
  - Dynamic spectrum access
  - Cognitive radio
- Experimentation can be
  - Remote through the web portal
  - On site with additional equipment such as USRPs, TV band transmitters, etc.

LOG-a-TEC

- A total of 52 VESNA sensor nodes in two clusters

Industrial zone



City center

LOG-a-TEC Configuration

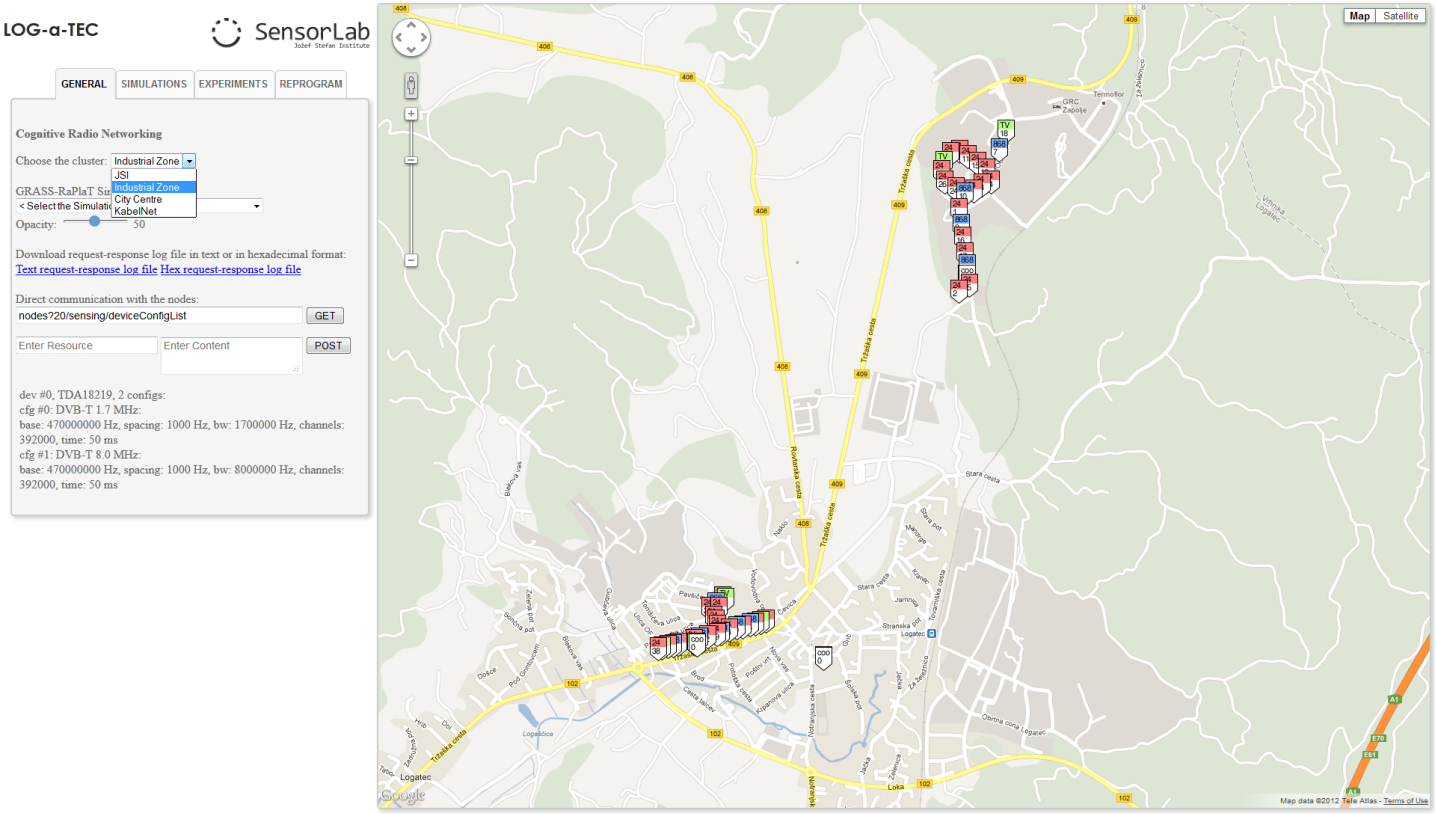
- 32 nodes with ISM 2.4 GHz transceivers
- 14 nodes with ISM 868 MHz transceivers
- 4 nodes with UHF receivers
- 2 coordinators

How to start working with LOG-a-TEC

- Contact us to get an account (or to make some other convenient arrangement)
- Using the account, log in the portal and request a slot for running your experiments
- Run your experiments in the granted slot
- Try first pre-defined simulations and experiments to get used to the environment
- Before running real experiments, use the GRASS-RaPlaT tool to check what results to expect!

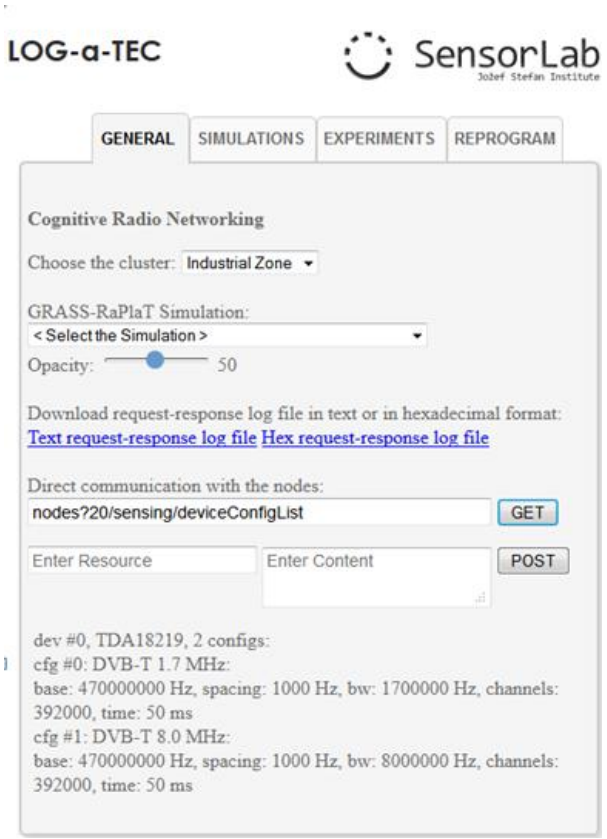
Step 1

- The web portal looks as depicted below
- Choose one of the two clusters to run your experiments



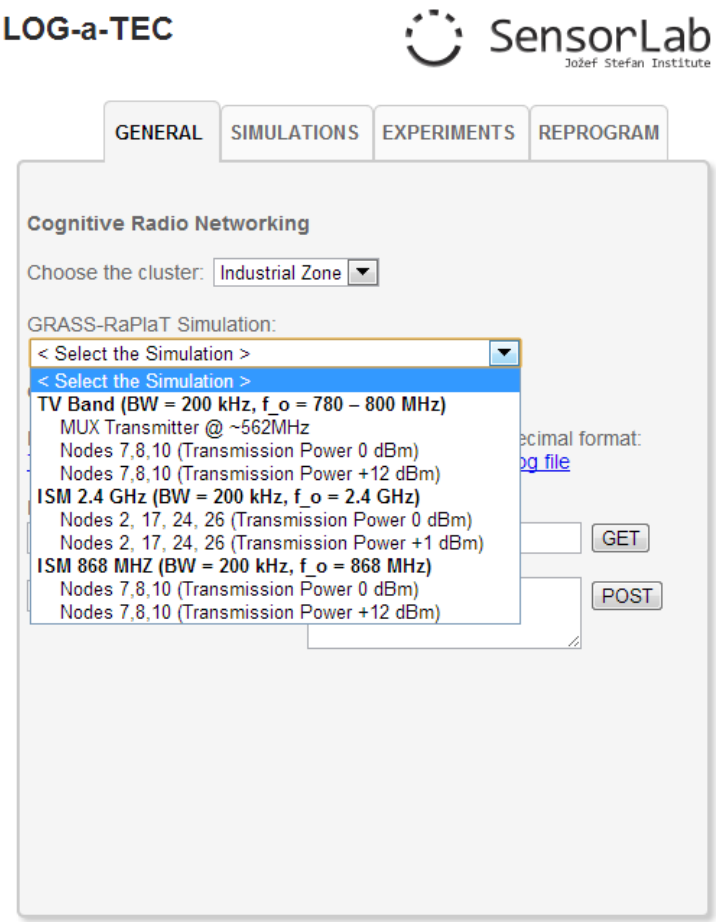
Step 2

- For each node in the cluster there are some pre-configured settings available
- You can directly communicate with the nodes to see what's available using GET and POST requests (see the General tab in the portal and the figure on the right)



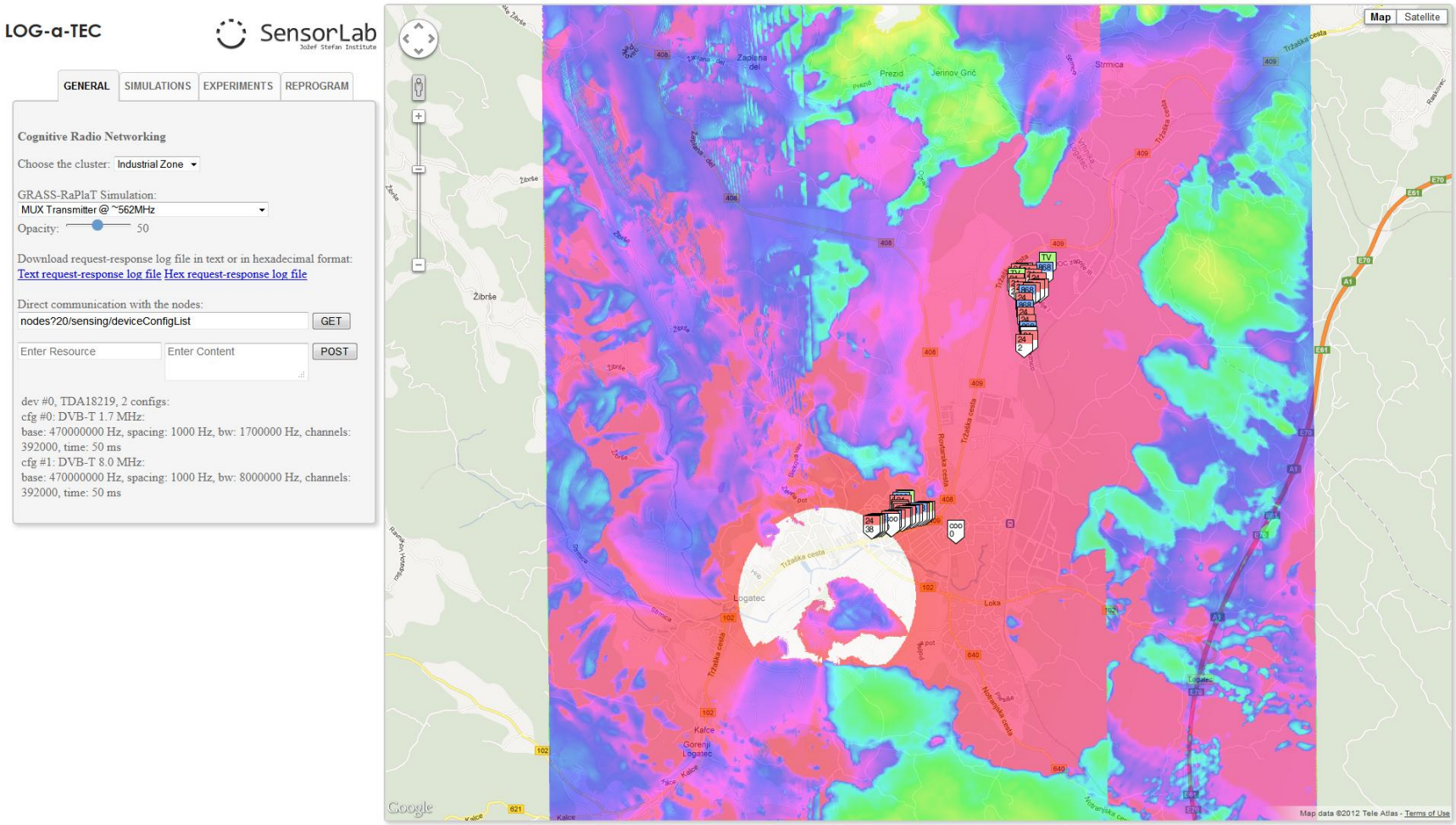
Step 3

- Predefined GRASS-RaPlaT simulations are available for
  - UHF,
  - ISM 2.4 GHz,
  - ISM 868 MHz
- The results for these simulations are pre-computed rather than generated on the fly



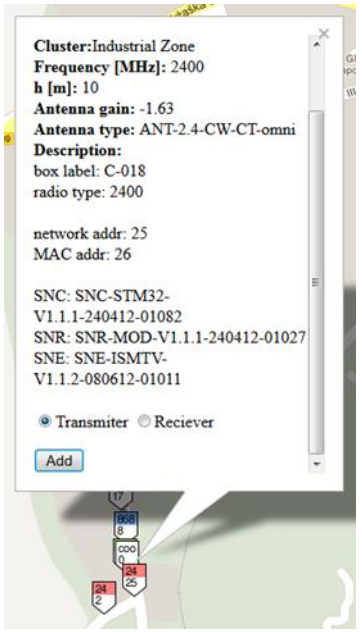
Example simulation result

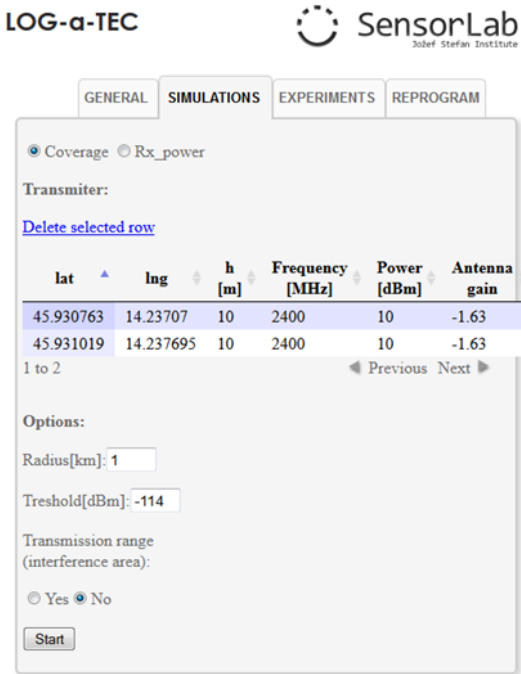
- For a multiplex transmitter on ~562 MHz



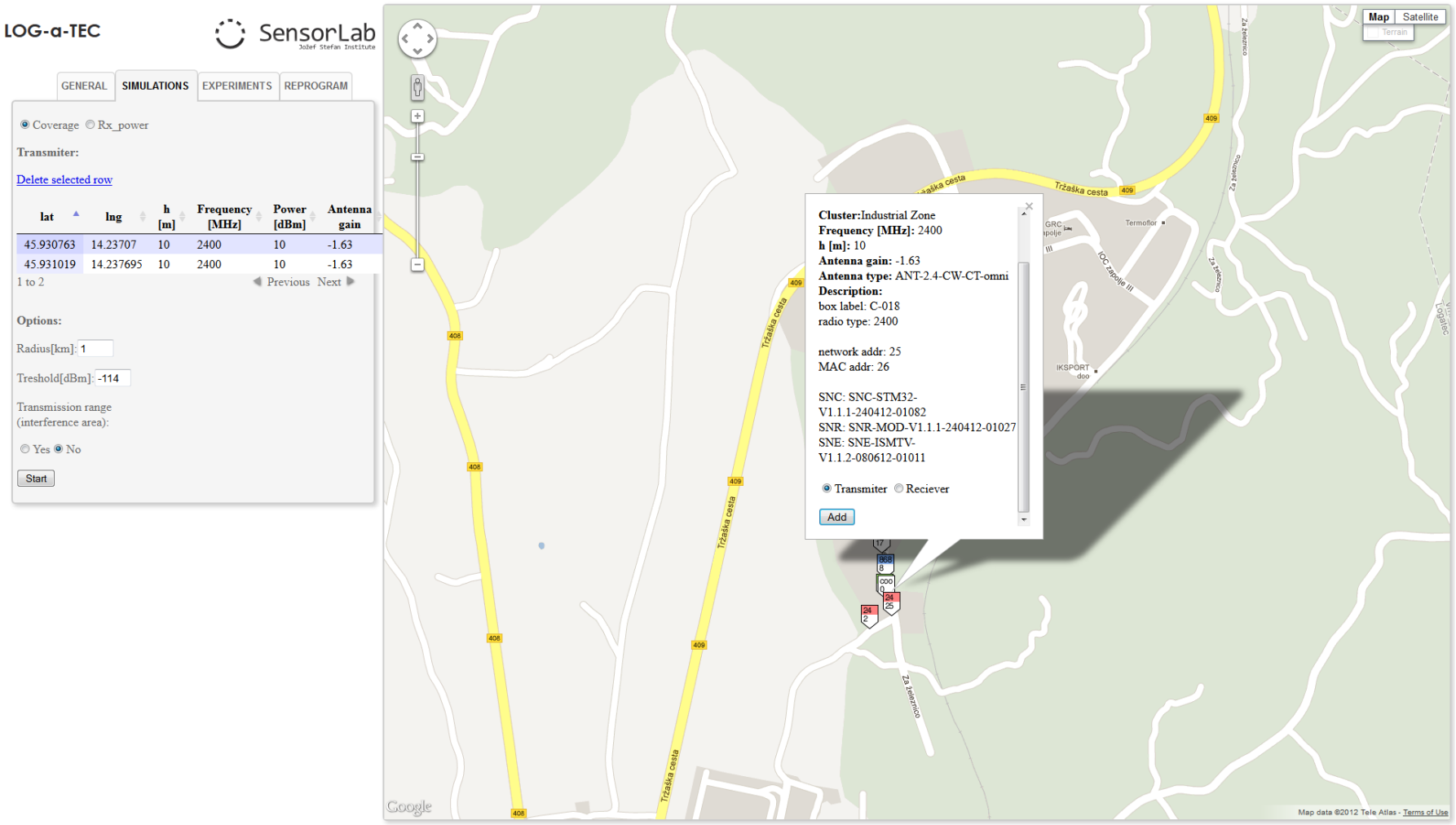
Step 4

- On the fly GRASS-RaPlaT simulations can also be requested
  - Select one by one the nodes you wish to add to the simulation
  - A pop-up will appear where you will be able to see all the configurations of the node (see top right figure)
  - Select whether you want the node to act a transmitter or receiver
  - Add the node to the simulation list (see a list of two nodes in the bottom right figure)
  - Select the type of simulation you wish: coverage or received power

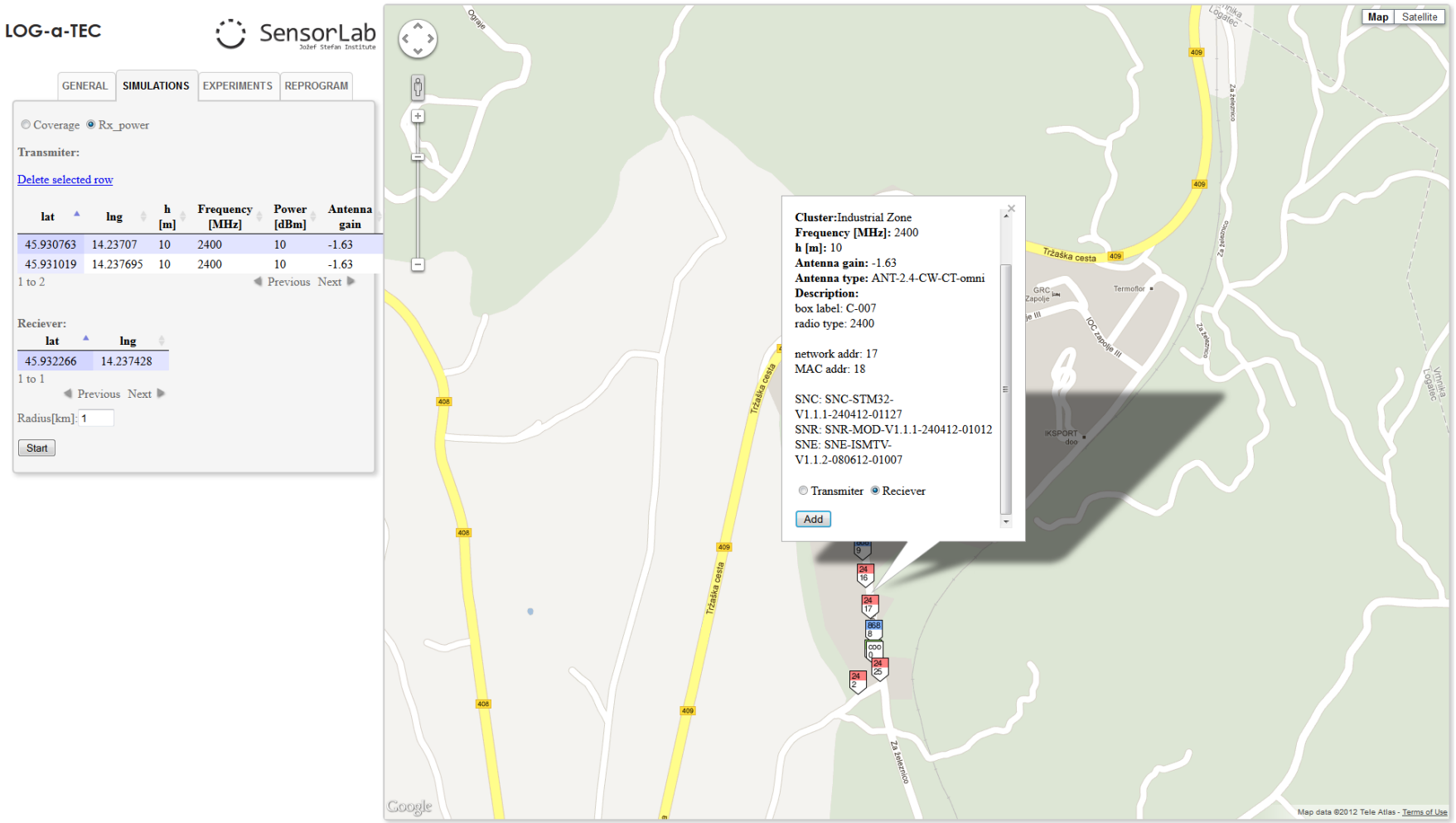




On the fly GRASS-RaPlaT simulation setup for *coverage* computation

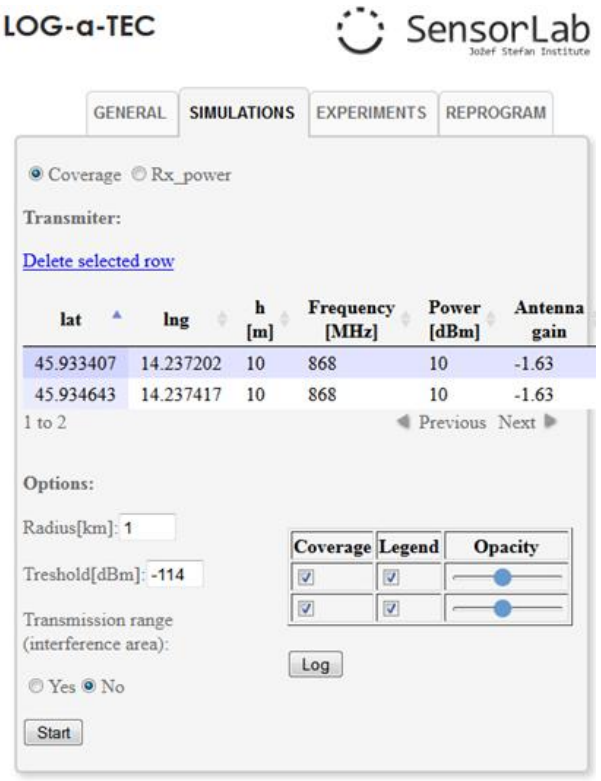


On the fly GRASS-RaPlaT simulation setup for *received power* computation

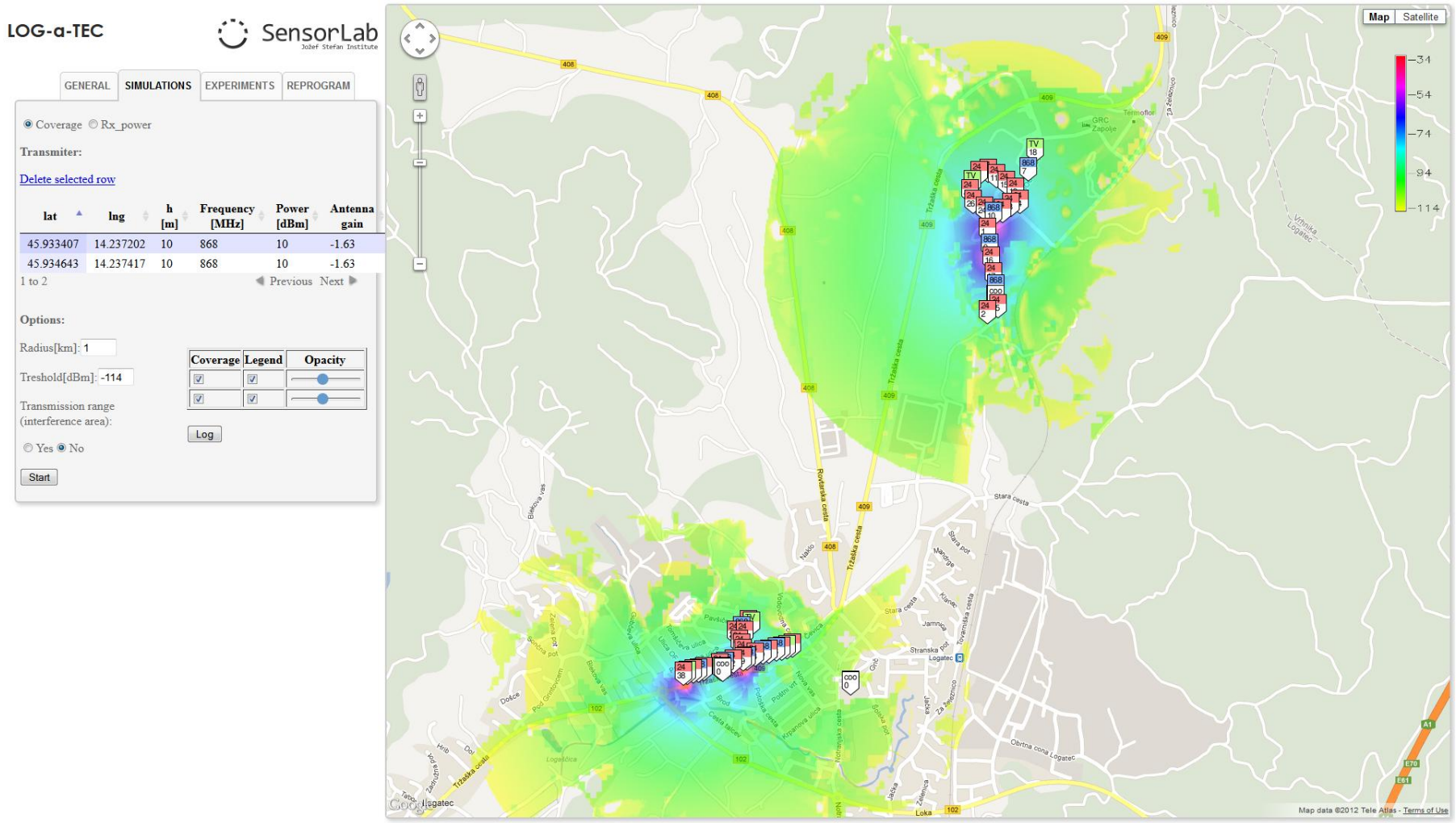


Step 5

- Visualize the simulation results
- For each node, select what you wish to see (coverage, legend) and how you wish to see it (opacity)

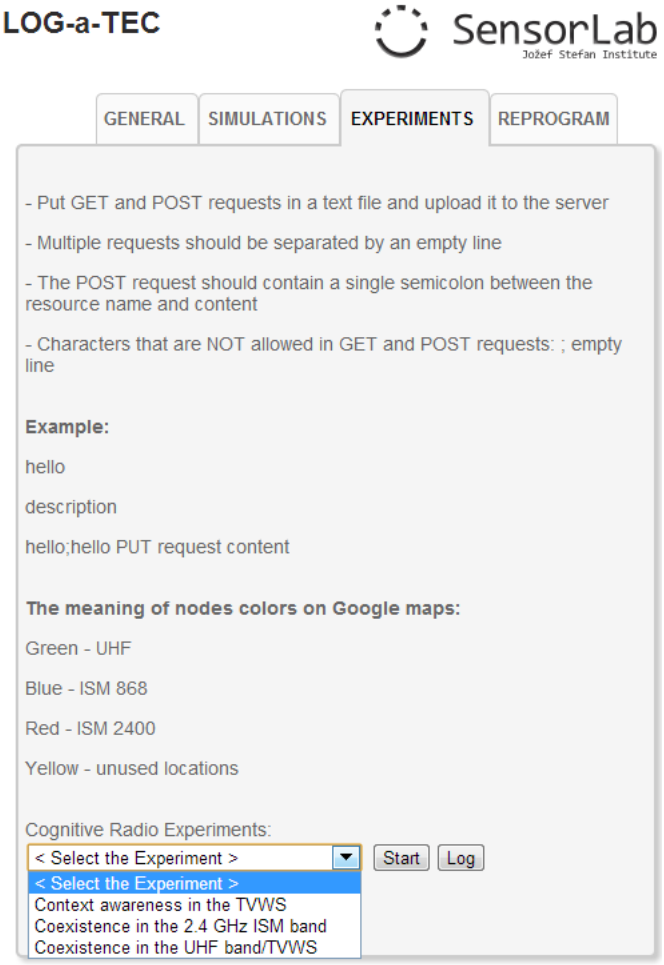


Example GRASS-RaPlaT visualization of the *coverage* result



Step 6

- Select and run one of the pre-defined cognitive radio experiments
- Currently three pre-defined cognitive radio experiments are available:
  - Context awareness in the TVWS
  - Coexistence in the 2.4 GHz ISM band
  - Coexistence in the UHF band/TVWS

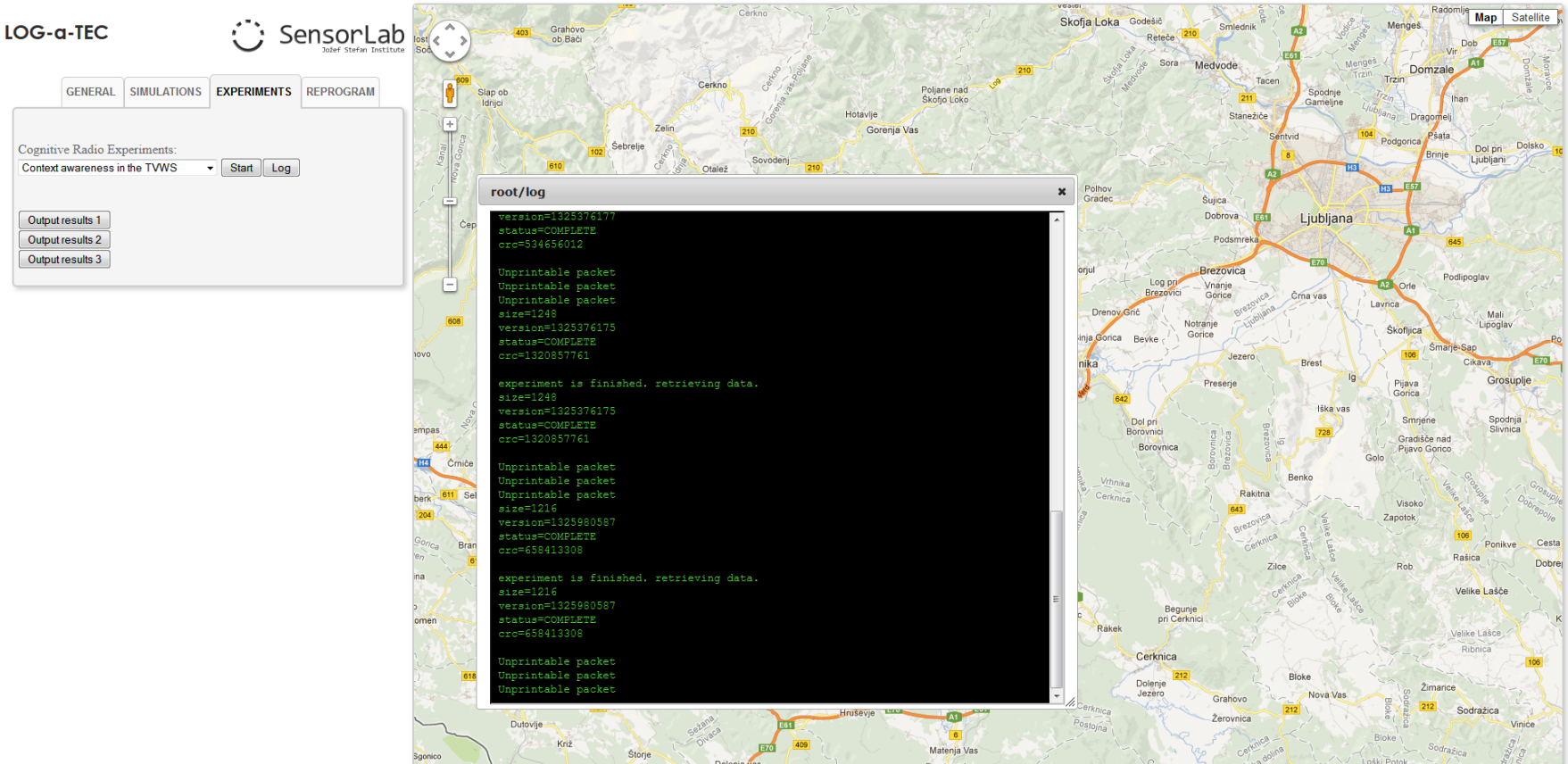


Example experiment

- A context awareness in TV white spaces is selected
- Three UHF nodes are selected to scan the ~562 MHz band
  - Node 19 (industrial zone) with SuperScanstick antenna
  - Node 20 (industrial zone) with SuperGainer antenna
  - Node 47 (kabelnet) with SuperScanstick antenna
- The results of the experiments can be downloaded at visualization time

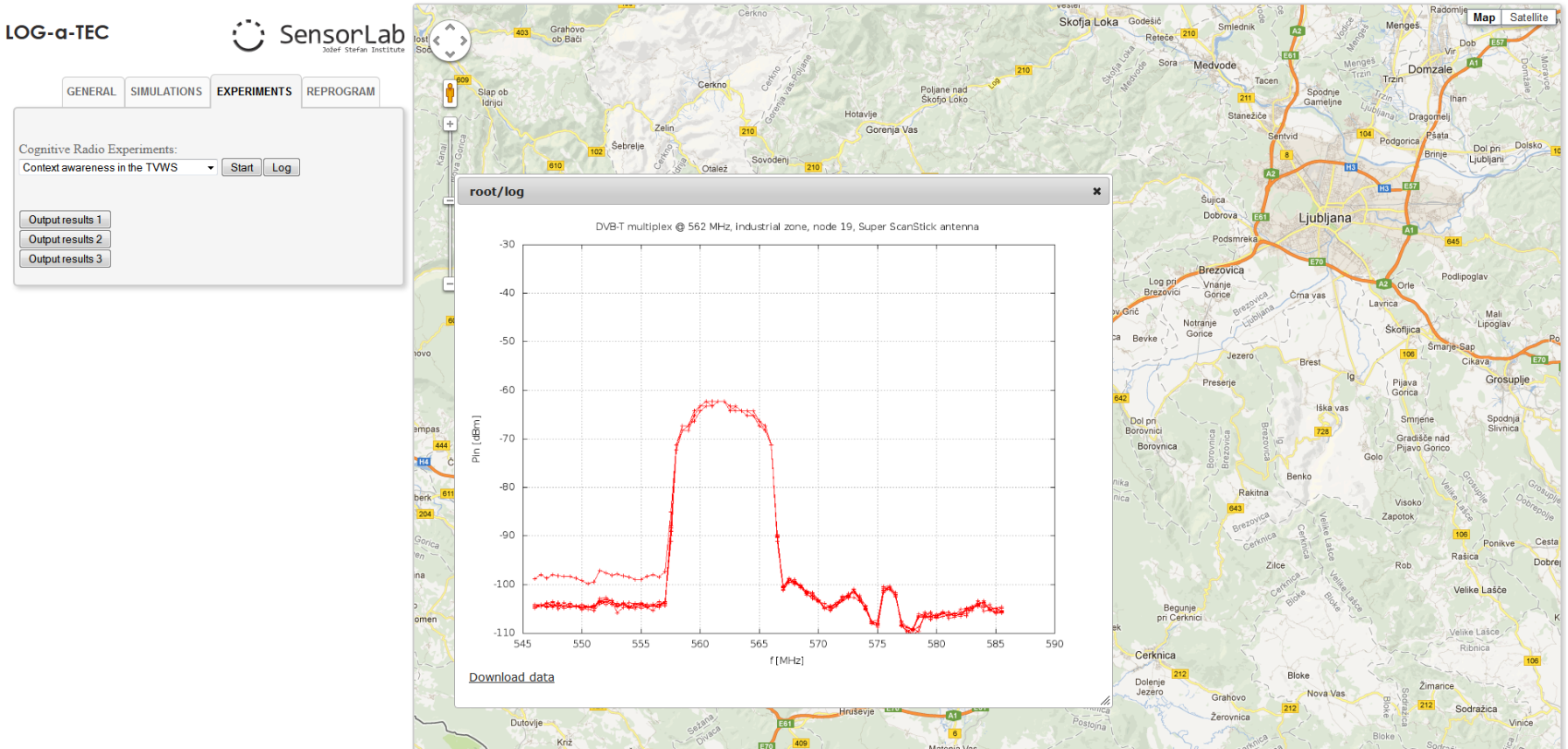
Example run of the context awareness experiment in TV white spaces

- While the experiment is being run, you will be kept updated with the progress via the console

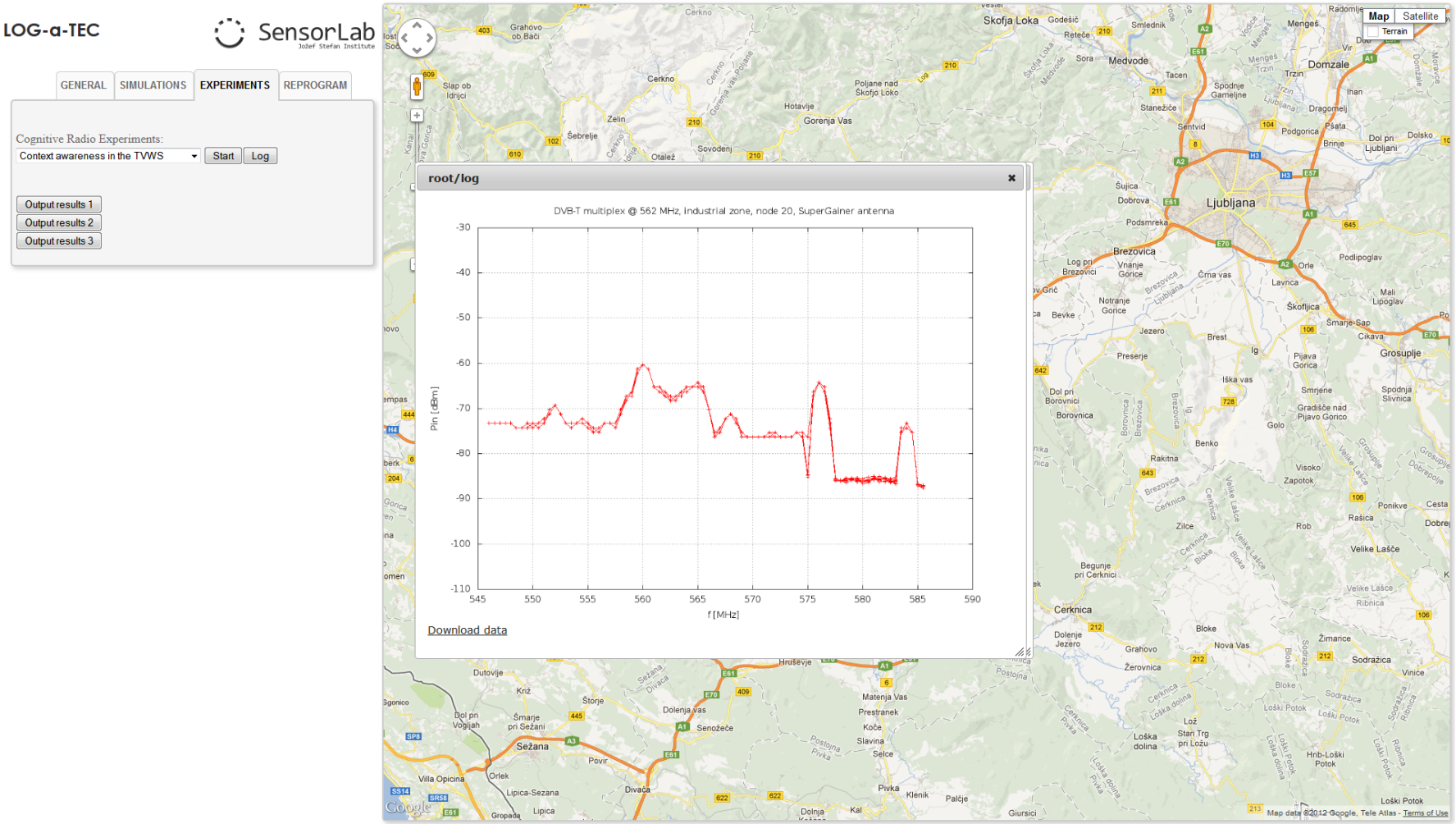


Visualization of the results for Node 19

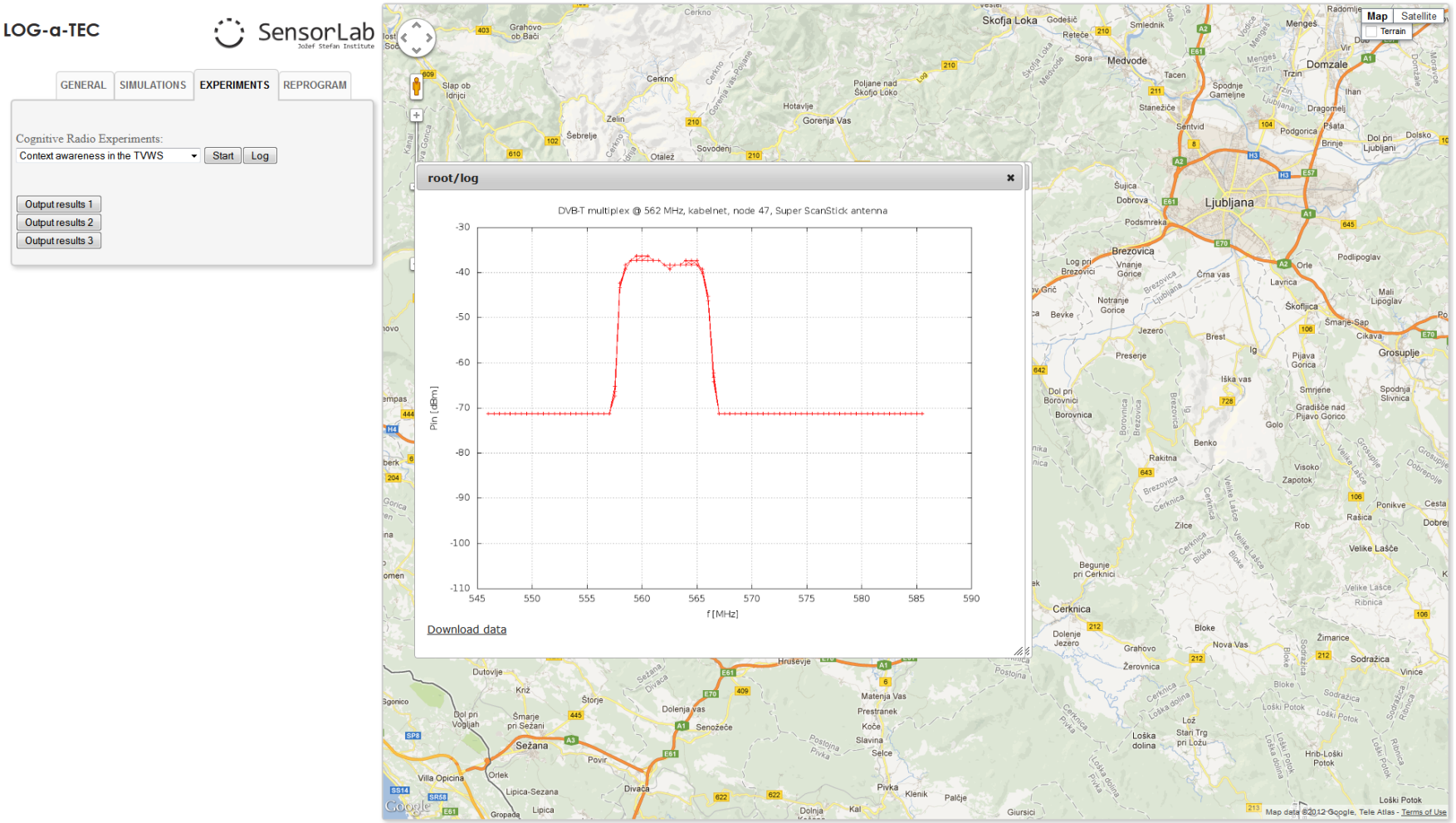
- The results of the experiment are displayed in a graphical form



Visualization of the results for Node 20

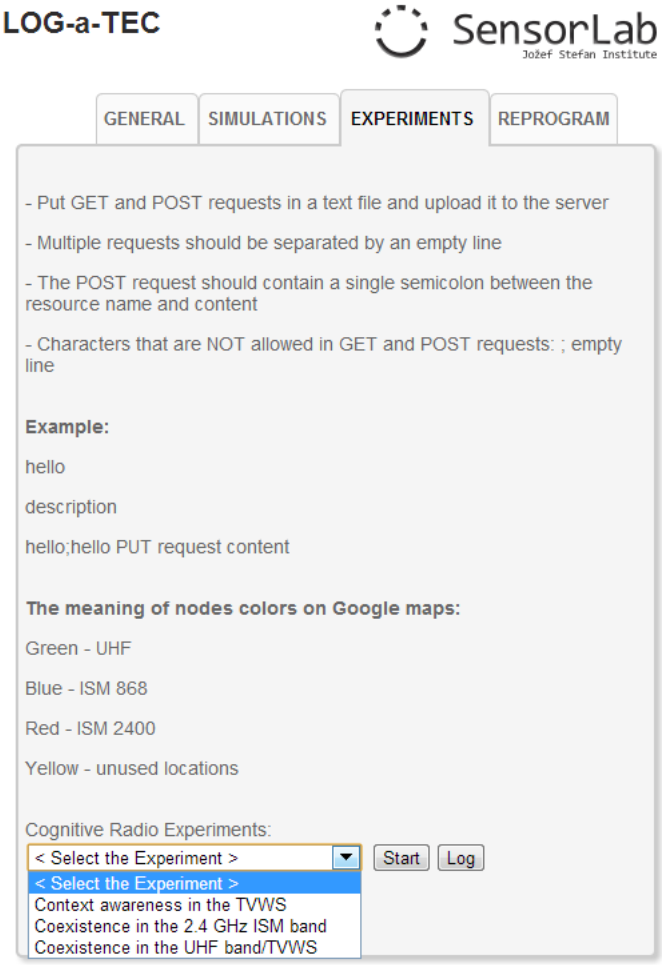


Visualization of the results for Node 47



Step 7

- Compose and run your own experiment using the GET and POST commands to talk to the desired nodes



Step 8

- LOG-a-TEC also supports remote reprogramming of the nodes
- This functionality is currently used only by internal experimenters and developers of the testbed. It will be available to outside experimenters at a later time