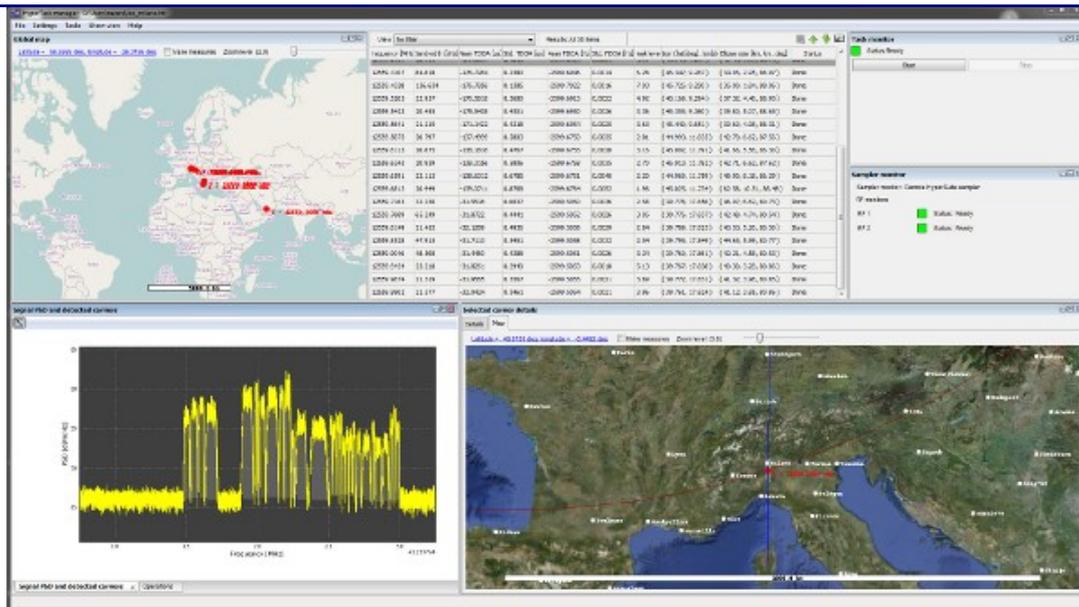


HYPERTASK

3.2

AUTOMATIC ANALYSIS AND GEOLOCATION OF SATELLITE CARRIERS



The last decades have seen a tremendous growth of the number of active communication satellites in all areas in the world as well as their users and the emergence of the VSAT systems. Consequently, the number of cases of illegal transponder use, active disruption of transmissions or satellite interference is constantly growing and impacts on the cost of civilian satellite communications. On the military or intelligence side, it is now important to locate transmitters in any satellite, friendly or not. HyperTask joint to HyperLoc gives powerful answers to these problems allowing automatic localization of transmitters in L to Ka bands, for satellite communication carriers or interference.

Global features

HyperTask is a software tool which automates some complex processes and specially dedicated to carrier analysis and geolocation.

While **HyperLoc** is able to localize satellite carriers using recorded signals, **HyperTask** do this job in real time. This process is fully automated and runs, without any involvement from the operator, by remote controlling several **HyperLoc** instances.

HyperTask gives answers to the following operational needs:

- the geolocation process is fully automated. After the task specification, the operator do not need to

interact with the system except for displaying the results,

- computing power optimization: **HyperTask** (remote) controls several **HyperMon** / **HyperLoc** instances in order to minimize the task duration. Thus, for a geolocation task, **HyperTask** is typically able to locate up to 50 carriers within 15 minutes (using a 32 cores server),
- easy integration inside monitoring systems: thanks to its RPC interface, **HyperTask** is remote controllable. Launching a task can be achieved using a simple remote command.

Description

SIGNALS

HyperTask always works by acquiring data from a compatible sampler stream. Concerning geolocation tasks, **HyperTask** is able to sample up to 30 targets simultaneously.

TASK FLOW

For each **HyperTask** task, the operator always follows the same steps:

- selecting the task,
- defining task parameters,
- launching the task.

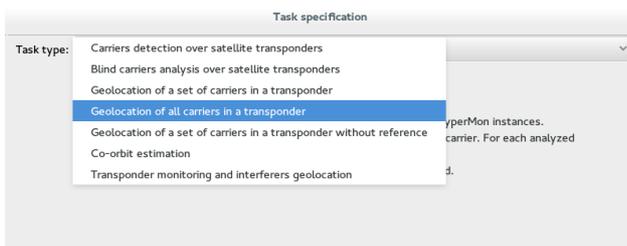
When the task is completed, **HyperTask** generates a report which summarizes:

- task setting,
- results for each processed carrier,
- task logs.

TASK SELECTION

In a first step, the following missions are proposed to the operator:

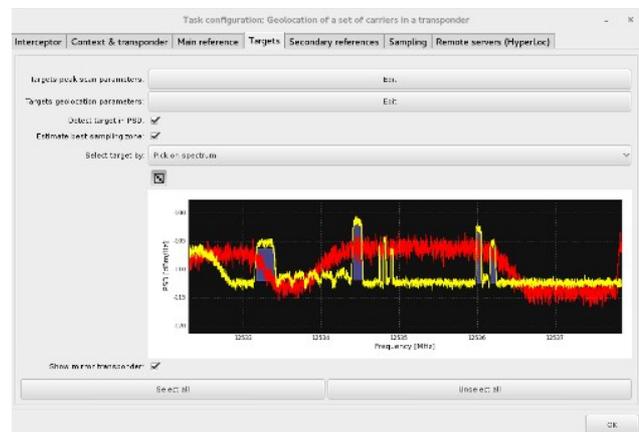
- carriers detection over a list of the selected satellite transponders,
- blind analysis of all detected carriers over a list of the selected satellite transponders,
- geolocation of a selected set of carriers (possibly all carriers) in the selected transponder of the selected satellite,
- geolocation without reference carrier of a selected set of carriers: this task requires very accurate orbits of both main and mirror satellites,
- co-orbit estimation : task which computes in real time and continuously the compensation parameters of the co-orbit algorithm,
- transponder monitoring with geolocation of new detected carriers or interferences,



TASK PARAMETERS

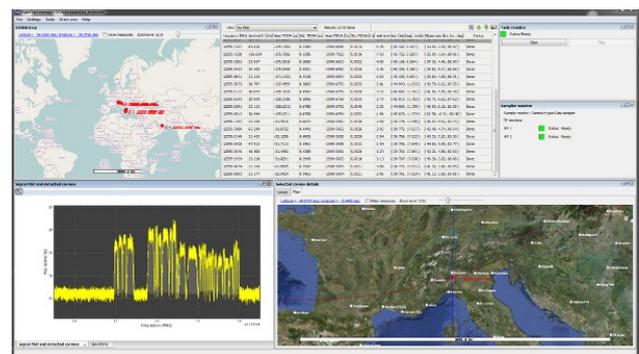
Each task defines its specific parameters. Concerning geolocation tasks, the operator should define:

- Interceptor definition (location and pointed satellites),
- the transponder of interest,
- the main reference, secondary references and targets carriers with their detection parameters,
- sampling parameters,
- **HyperLoc** instances to control and use for this task.



LAUNCHING THE TASK

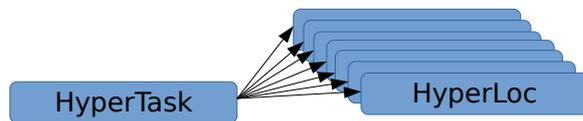
When the task has been configured, the operator requests for the task execution. This request is the last action required by **HyperTask** until the final task result.



PERFORMANCES

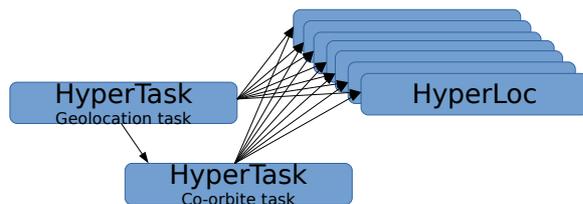
HyperTask spreads all the computing processes, required by the running task, over the selected **HyperLoc** / **HyperMon** instances. This principle allows to maximize the computing power in order to achieve the task results in a minimum delay.

As an example, 50 carriers of a transponder are detected and localized within 15 minutes. The corresponding task was running on a (32 cores) server and controlled 16 **HyperLoc** instances.



HyperTask can control up to 16 **HyperLoc** / **HyperMon** instances.

Two **HyperTask** tasks are able to exchange some information and share the same **HyperLoc** instances. This is the case for a geolocation task which runs in parallel with a co-orbit task: the first task ask for the compensation parameters to the second one, automatically, transparently and without any action required from the operator. This configuration is relevant when the operator wants to have very accurate locations regardless the processing of secondary references.



Regarding geolocation or analysis performances, the reader should refer to **HyperLoc** and **HyperMon** datasheets.

DATABASES

HyperTask comes along with its own databases:

- a satellite database that contains all known Geo-synchronous and Geo-stationary telecommunication satellites currently declared. For each entry, it provides the orbits, the coverage in up-link and down-link, the transponder matrix, etc...
- a transmitter (targets & references) database.

Of course, the user is allowed to create new items in these databases or to modify already existing items.

NETWORK INTERFACE

HyperTask can be remote controlled with its network interface (XML-RPC requests). This interface has been built in order to expose some simple and macroscopic carrier localizations and analysis functions.

This interface allows an easy integration of the localization or analysis feature inside any carrier monitoring system.

Operating system

HyperTask 3.x works on MS Windows XP, Vista, 7, 8 64bits and Linux (RedHat / CentOS, OpenSuse, Debian, Fedora) operating systems.

Contact

NOVAGRID S.A.S.

3 Allée de la Grande Égalonne
35740 PACÉ
FRANCE

Tél : +33 (0)223 413 797
+33 (0)223 413 879
Email : contact@novagrid.com