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Status of the Configuration Information System for the NICA Experiments

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Outline

- Introduction (goals of the information system)
- Existing configuration information systems
  - ATLAS online configuration as possible solution
  - Using the Dynamic Deployment System (FAIR)
- General architecture of the Configuration Information System
- Database object model
- Web-interface (view/edit mode)
- Configuration Manager
- Conclusions (status, next steps)

Introduction

The important task: to develop an configuration information system with integrating database.

Database contains:

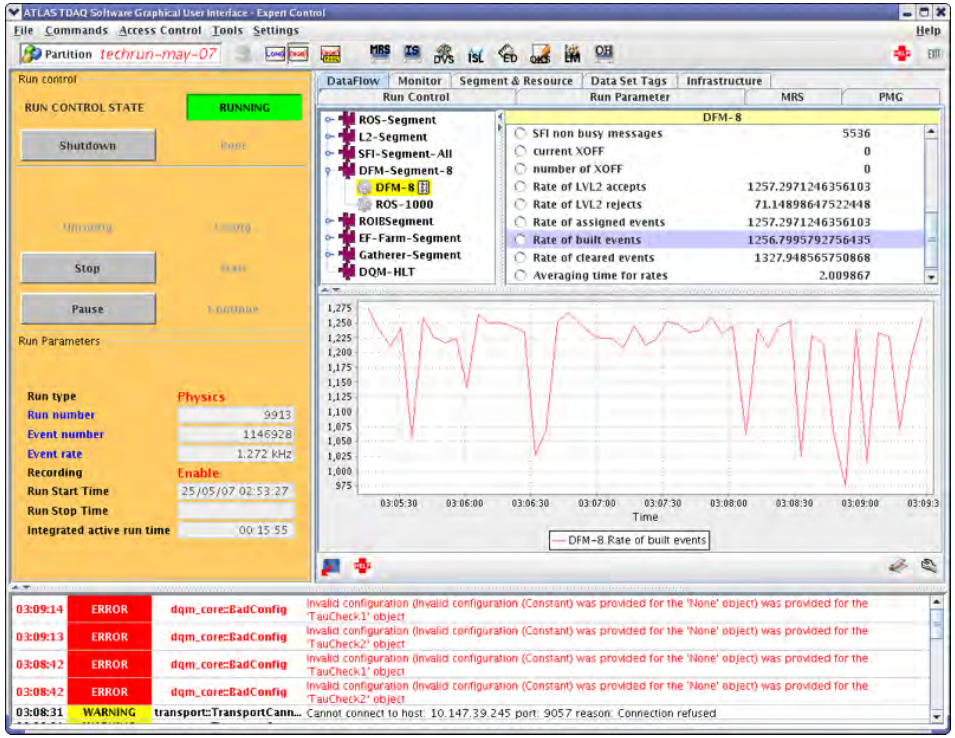
- information about the configuration parameters for configuring detectors;
- description of the sequence of software tasks that need to be run during the experiment sessions.

Goals of information system:

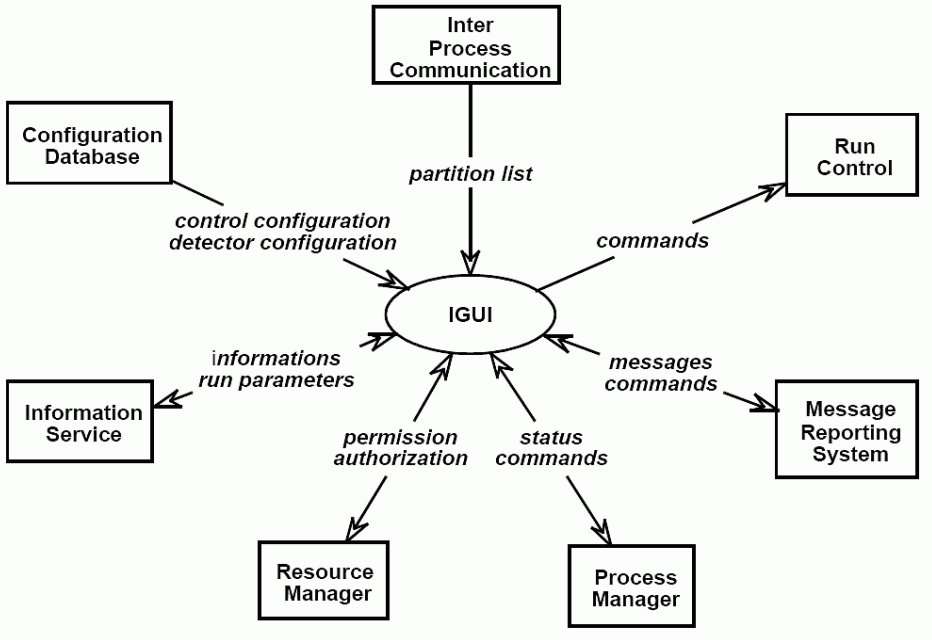
- store and provide configuration data for online processing:
  - set of various detectors configuration parameters (working voltage etc.);
  - sequences of software tasks with their dependencies (online raw data digitization, online histogramming, fast event reconstruction, event monitor);
  - setup and tasks dependencies;
- should to be able to start, stop and monitor tasks during experiment sessions

ATLAS online configuration as possible solution

ATLAS IGUI Expert Control Panel



Context diagram of ATLAS Integrated Graphical User Interface (IGUI)



Disadvantage: difficult complex structure, consists of many components that are not needed in our case.

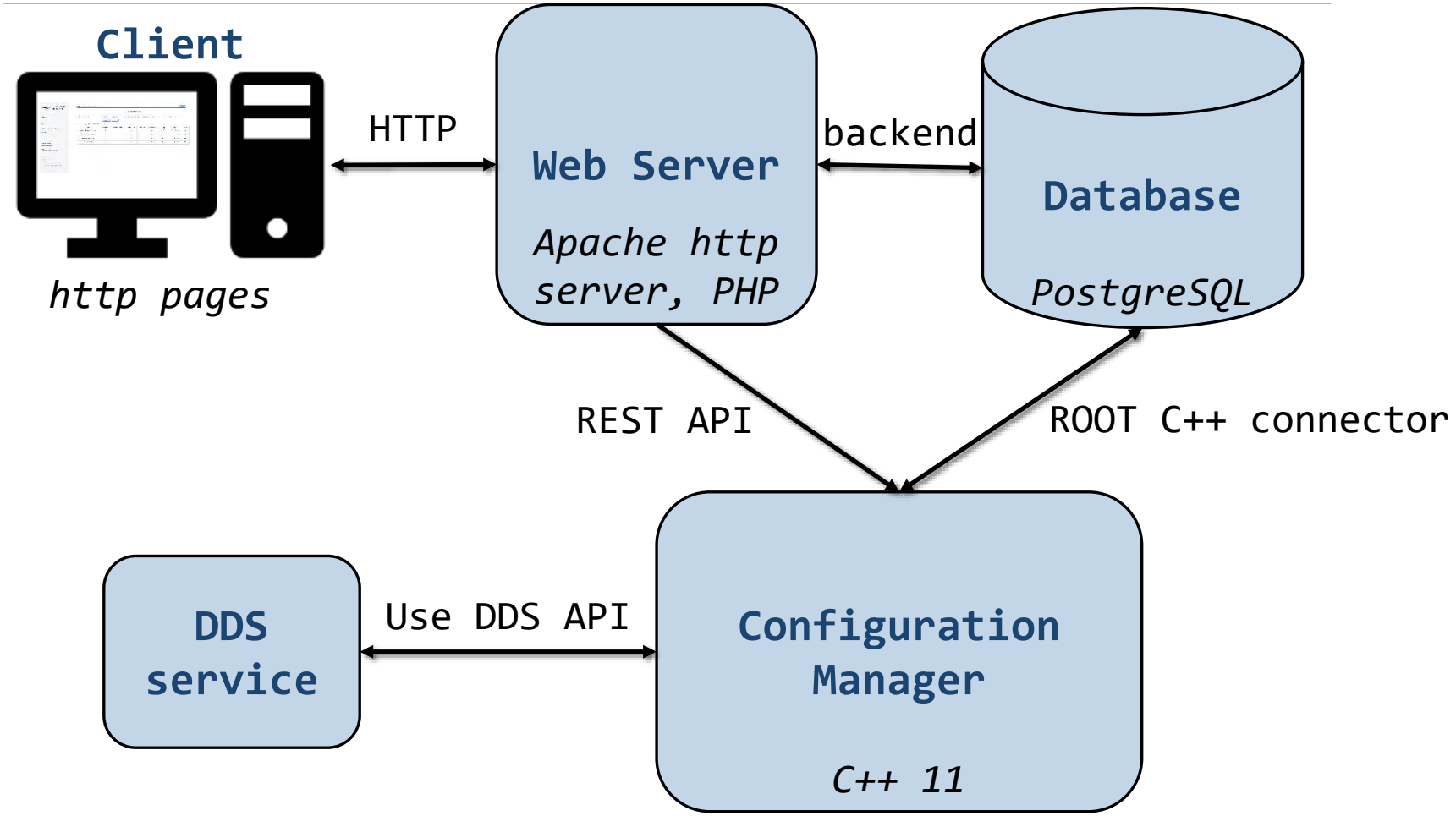
Decision: independently develop a component that implements interaction with the database.

Using the Dynamic Deployment System (FAIR)

- DDS: tool-set that automates and significantly simplifies a deployment of user defined processes (tasks) and their dependencies.

- DDS: deploys agents to execute user tasks.
- DDS agent:
  - supports multiple tasks slots;
  - is able to run and watchdog multiple tasks simultaneously;
  - can provide messages between tasks;
- very simple general server and users requirements:
  - server requirements (C++11 compiler, BOOST 1.67 or higher (built by a C++11 compiler, with C++11 enabled), shell: BASH (or a compatible one), incoming connection on dds-commander port (configurable));
  - user requirements (outgoing connection on dds-commander's port (configurable), shell: BASH (or a compatible one)).

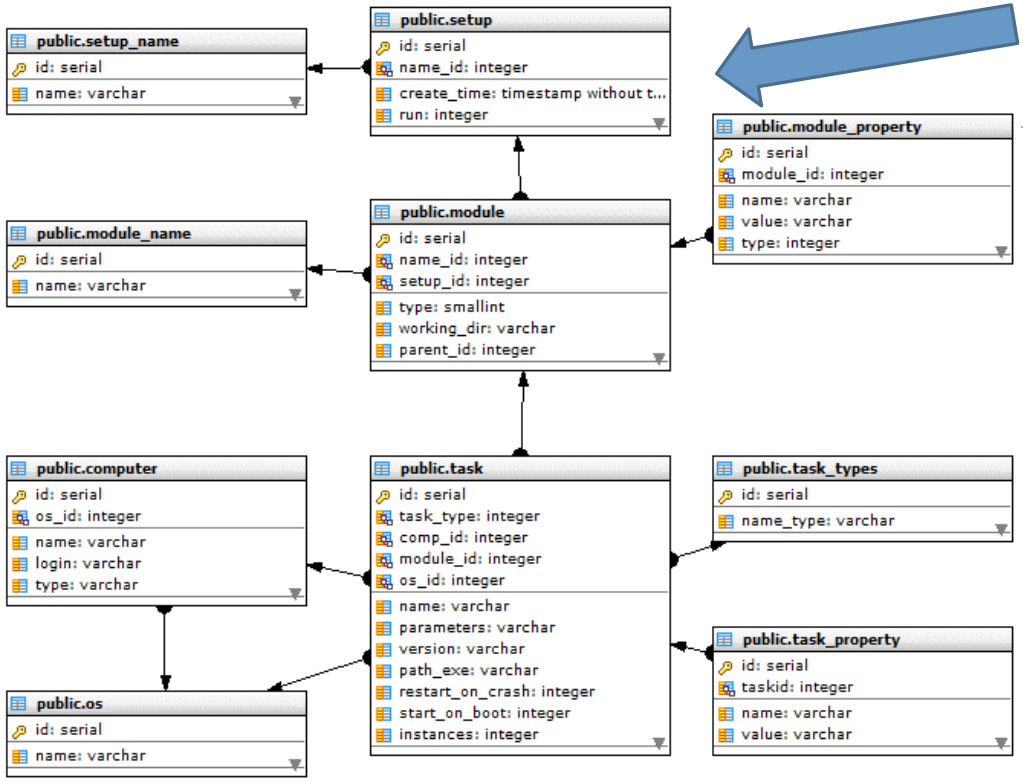
General architecture of the Configuration Information System



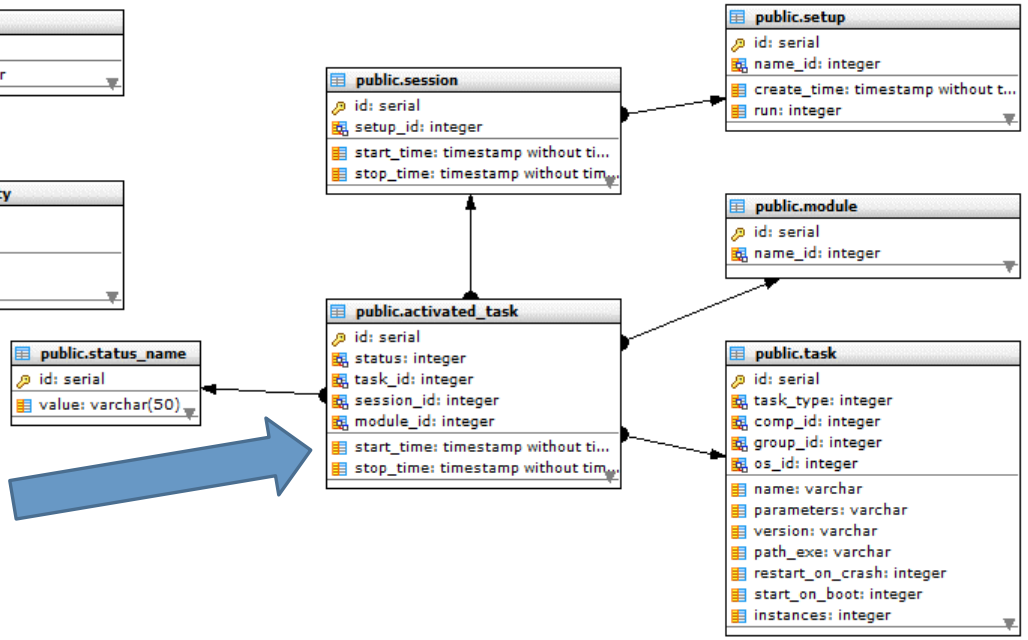
Database object model

Permanent part

A set of various configuration parameters, such as those required for setting the detectors into operation modes.

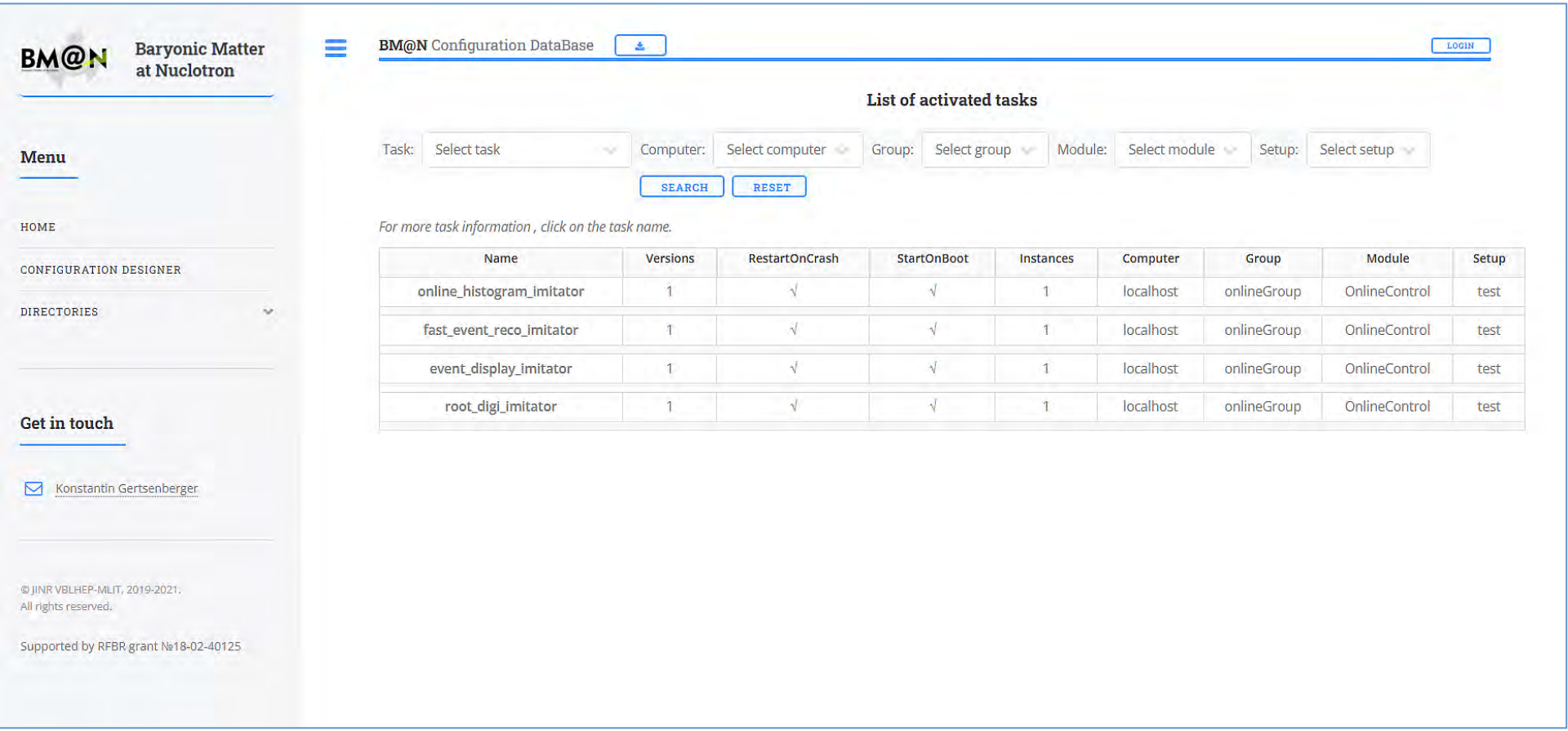


Dynamic part

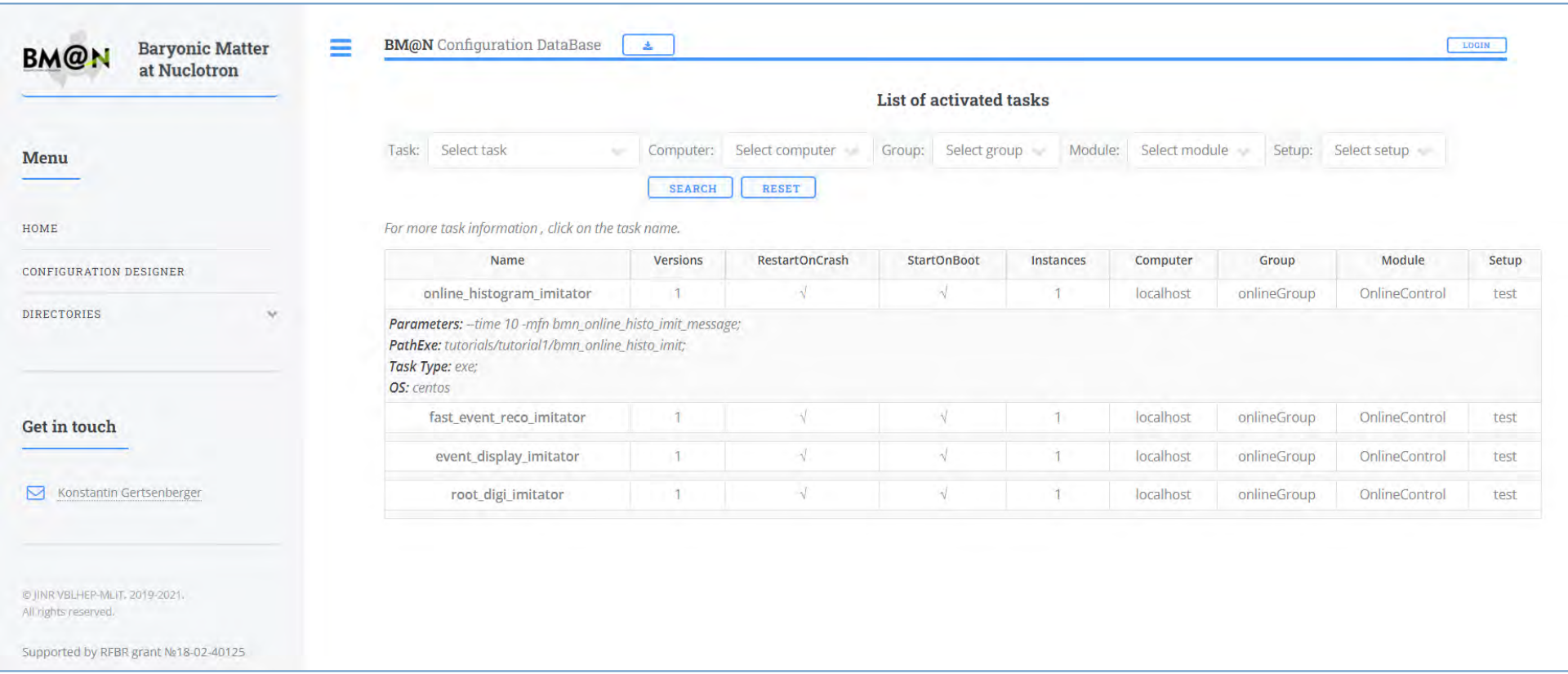


Descriptions of a sequence of software tasks to be started and run during experiment sessions, the place of their launch.

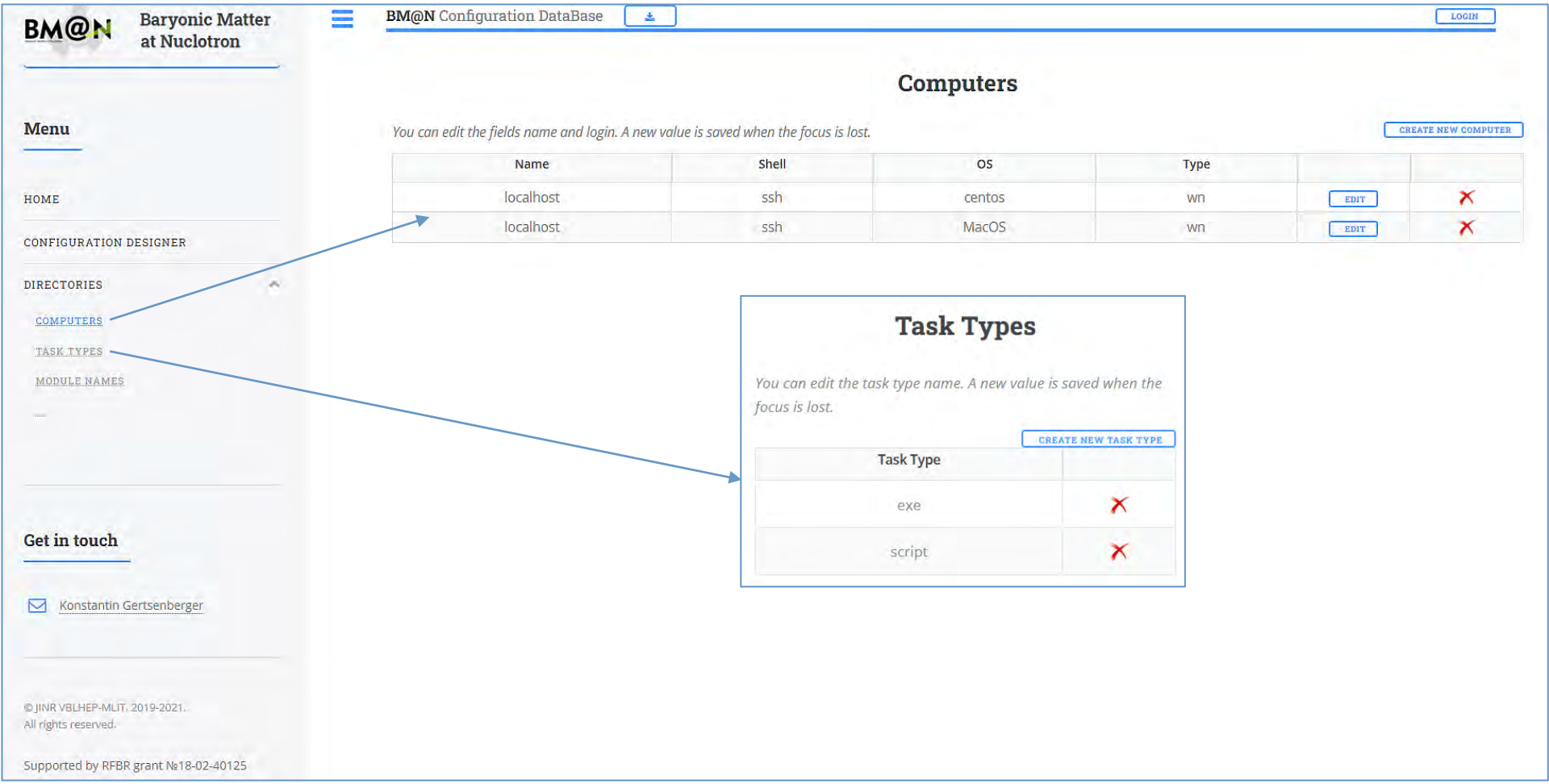
Web-interface
Monitoring view (1)



Web-interface
Monitoring view (2)



Web-interface
Edit mode



Configuration Manager

- Listens and performs commands (REST API in use):
  - Start all setup tasks
  - Stop task
  - Restart task
- Reads from DB data concerning tasks to be started for setup.
- Prepares tasks for start using DDS system (convert data into DDS topology form).
- Starts all tasks of topology using DDS.
- Gets from DDS server info about all started tasks.
- Stores in the DB the info about all started tasks.

Conclusions

Status

- Configuration information system design (client-server architecture) is developed.
- Database is implemented in PostgreSQL.
- Web-interface implementation in progress.
- Configuration Manager under development.
- DDS system is alive, DDS API is in use in Configuration Manager.
- Test environment produced.

Next steps

- Finish work with the Web-interface and Configuration Manager.
- Deploy and use the system with real configurations of the first NICA experiment, BM@N.

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Thank you for the attention!

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