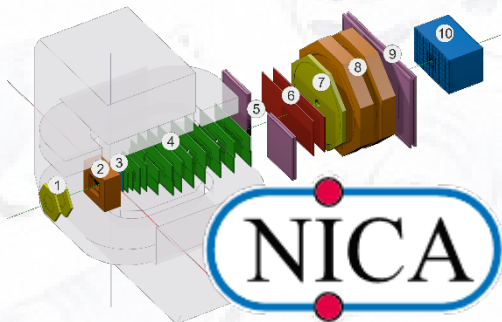


# Configuration Information System for BM@N online processing and data monitoring

*E. Alexandrov<sup>1</sup>, I. Alexandrov<sup>1</sup>, I. Filozova<sup>1</sup>,  
K. Gertsenberger<sup>1</sup>, D. Pryahina<sup>1</sup>, G. Shestakova<sup>1</sup>,  
A. Yakovlev<sup>1</sup>*

<sup>1</sup>JINR, Dubna

8th Collaboration Meeting of the BM@N,  
02-09 October 2021



Joint Institute for Nuclear Research

# Outline

- **Goals of the system**
- **ATLAS online configuration as possible solution**
- **Why use the Dynamic Deployment System (FAIR)**
- **General Architecture of the BM@N Configuration System**
- **Configuration Manager**
- **DB Object model (permanent part)**
- **DB Object model (dynamic part)**
- **WEB interface view/edit mode**
- **WEB interface monitoring view**
- **Test environment**
- **Status, next steps**

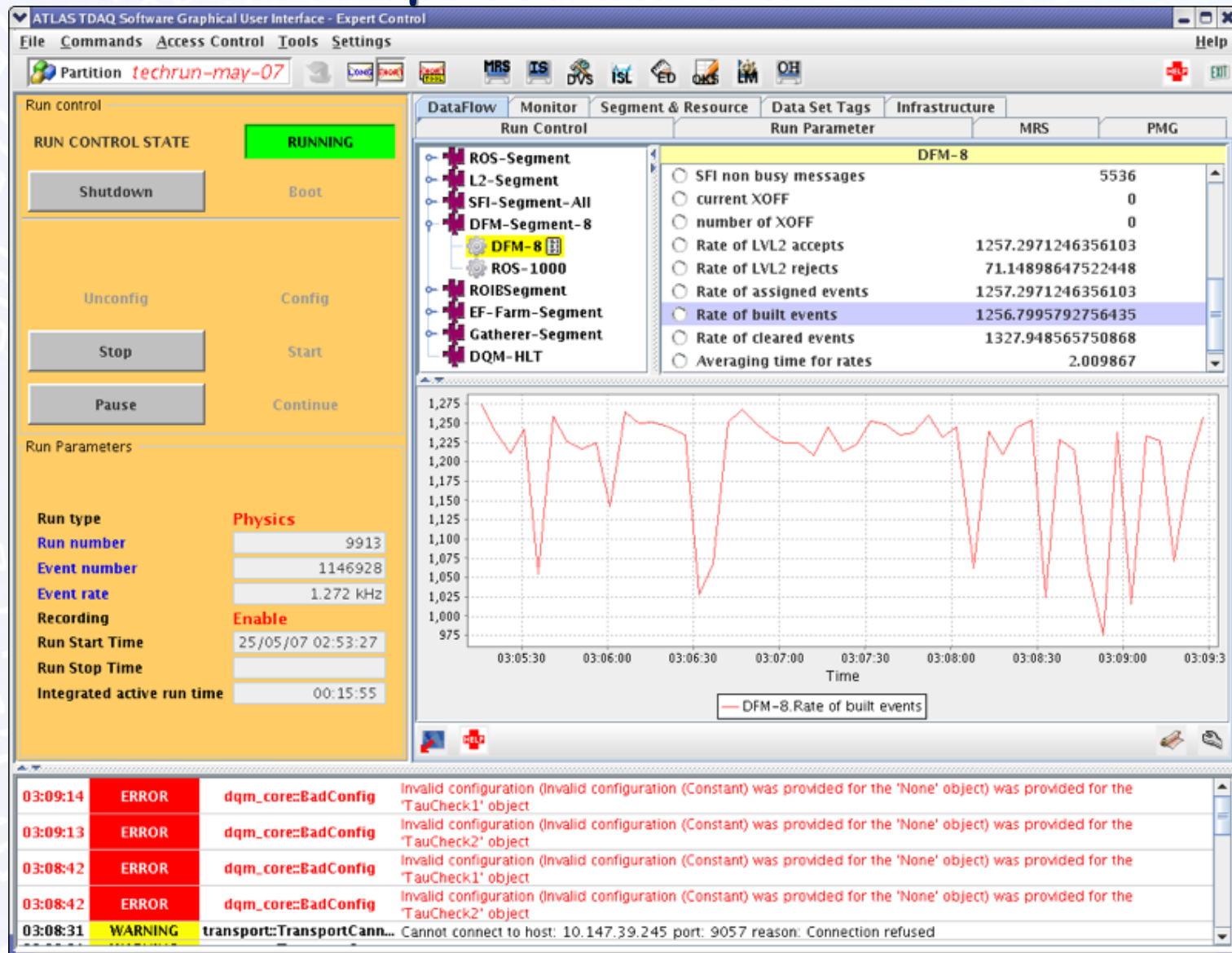
# Goals of system

- **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**



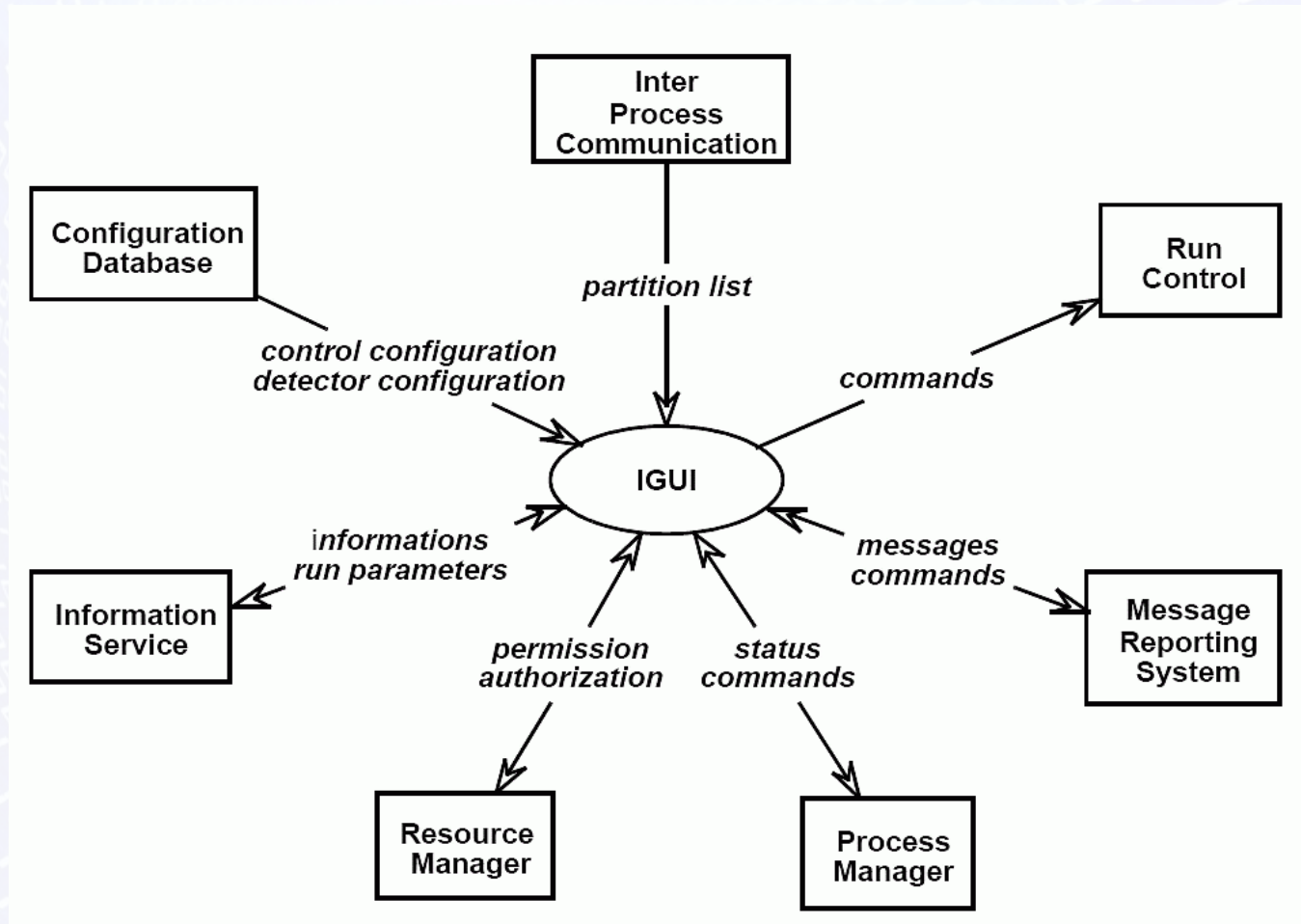
# ATLAS online configuration as possible solution

## ATLAS IGUI Expert Control Panel



# ATLAS online configuration as possible solution (2)

## Context diagram of ATLAS Integrated Graphical User Interface (IGUI)

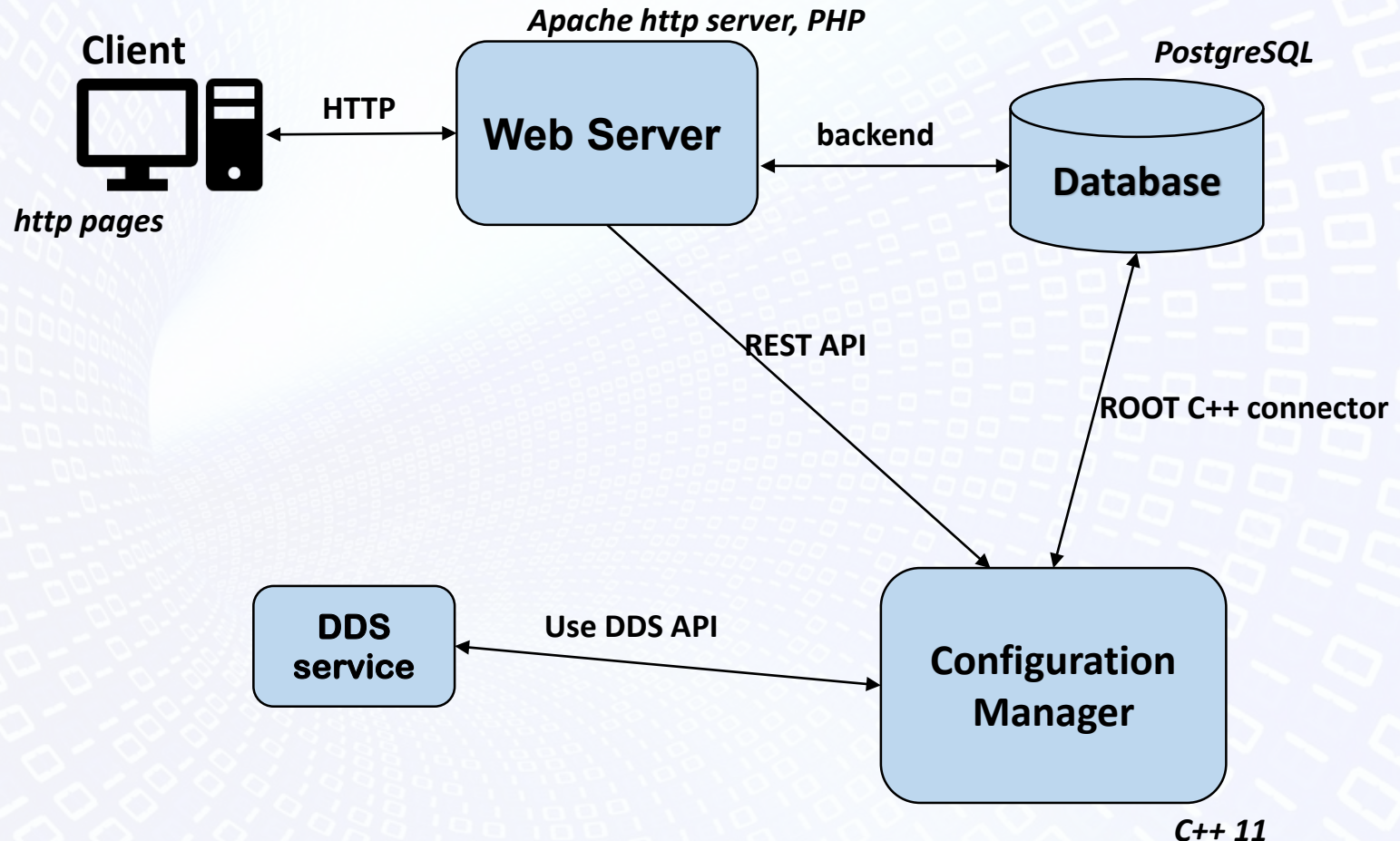




# Why use the Dynamic Deployment System (FAIR)

- **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**
    - a 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 BM@N Configuration System



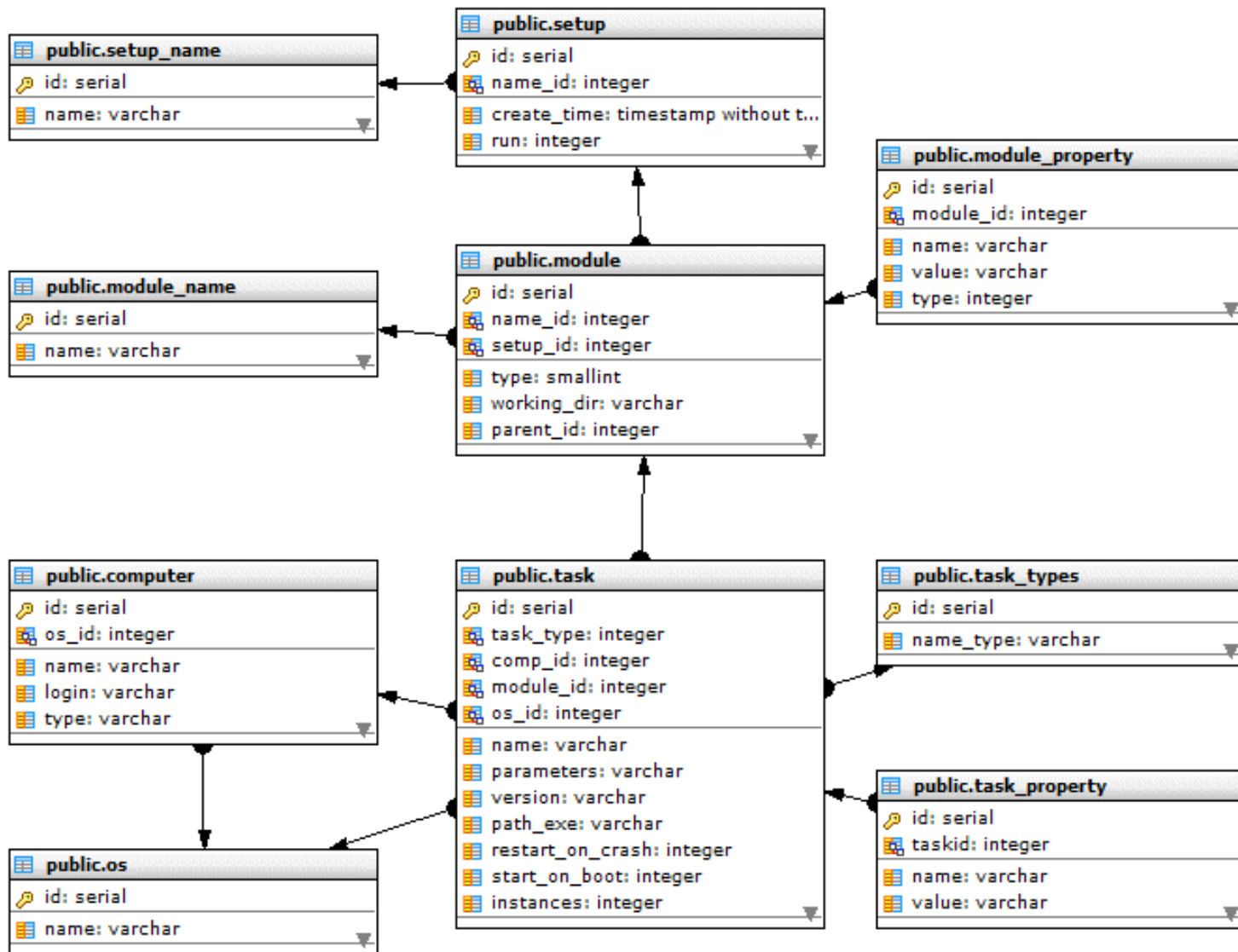


# Configuration Manager

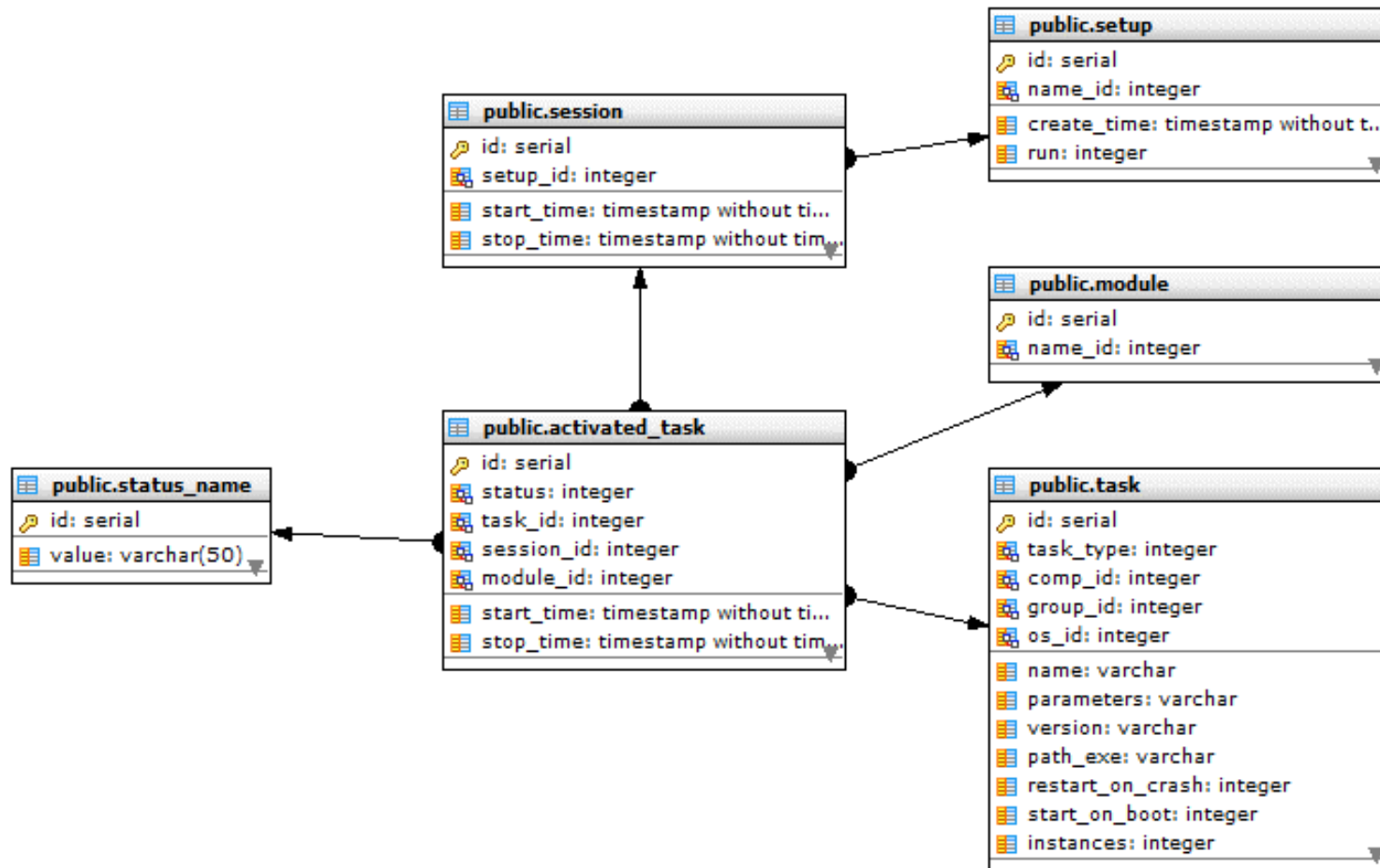
- listens and performs commands (REST API in use)
  - Start all setup tasks
  - Stop task
  - Restart task
- reads from DB data concerning tasks to be started for setup
- prepares tasks for start using DDS system (convert data into DDS topology form)
- starts all tasks of topology using DDS
- gets from DDS server info about all started tasks
- stores in the DB the info about all started tasks



# DB Object model(permanent part)



# DB Object model(dynamic part)





# Web-interface. Monitoring view (1)

## Menu

HOME

CONFIGURATION DESIGNER

DIRECTORIES

## Get in touch

✉ [Konstantin Gertsenberger](#)

© JINR VBLHEP-MLIT, 2019-2021.  
All rights reserved.

Supported by RFBR grant №18-02-40125



BM@N Configuration DataBase



LOGIN

### List of activated tasks

Task:  Computer:  Group:  Module:  Setup:

For more task information, click on the task name.

Name	Versions	RestartOnCrash	StartOnBoot	Instances	Computer	Group	Module	Setup
<a href="#">online_histogram_imitator</a>	1	√	√	1	localhost	onlineGroup	OnlineControl	test
<a href="#">fast_event_reco_imitator</a>	1	√	√	1	localhost	onlineGroup	OnlineControl	test
<a href="#">event_display_imitator</a>	1	√	√	1	localhost	onlineGroup	OnlineControl	test
<a href="#">root_digi_imitator</a>	1	√	√	1	localhost	onlineGroup	OnlineControl	test

# Web-interface. Monitoring view (2)

## Menu

HOME

CONFIGURATION DESIGNER

DIRECTORIES

## Get in touch

✉ [Konstantin Gertsenberger](#)

© JINR VBLHEP-MLIT, 2019-2021.  
All rights reserved.

Supported by RFBR grant №18-02-40125



BM@N Configuration DataBase



LOGIN

## List of activated tasks

Task:

Computer:

Group:

Module:

Setup:

SEARCH

RESET

For more task information, click on the task name.

Name	Versions	RestartOnCrash	StartOnBoot	Instances	Computer	Group	Module	Setup
online_histogram_imitator	1	√	√	1	localhost	onlineGroup	OnlineControl	test
<b>Parameters:</b> --time 10 -mfn bmn_online_histo_imit_message; <b>PathExe:</b> tutorials/tutorial1/bmn_online_histo_imit; <b>Task Type:</b> exe; <b>OS:</b> centos								
fast_event_reco_imitator	1	√	√	1	localhost	onlineGroup	OnlineControl	test
event_display_imitator	1	√	√	1	localhost	onlineGroup	OnlineControl	test
root_digi_imitator	1	√	√	1	localhost	onlineGroup	OnlineControl	test



# Web-interface. Edit Mode



## Menu

HOME

CONFIGURATION DESIGNER

DIRECTORIES

[COMPUTERS](#)

[TASK TYPES](#)

[MODULE NAMES](#)

## Get in touch

✉ [Konstantin Gertsenberger](#)

© JINR VBLHEP-MLIT, 2019-2021.  
All rights reserved.

Supported by RFBR grant №18-02-40125

## Computers

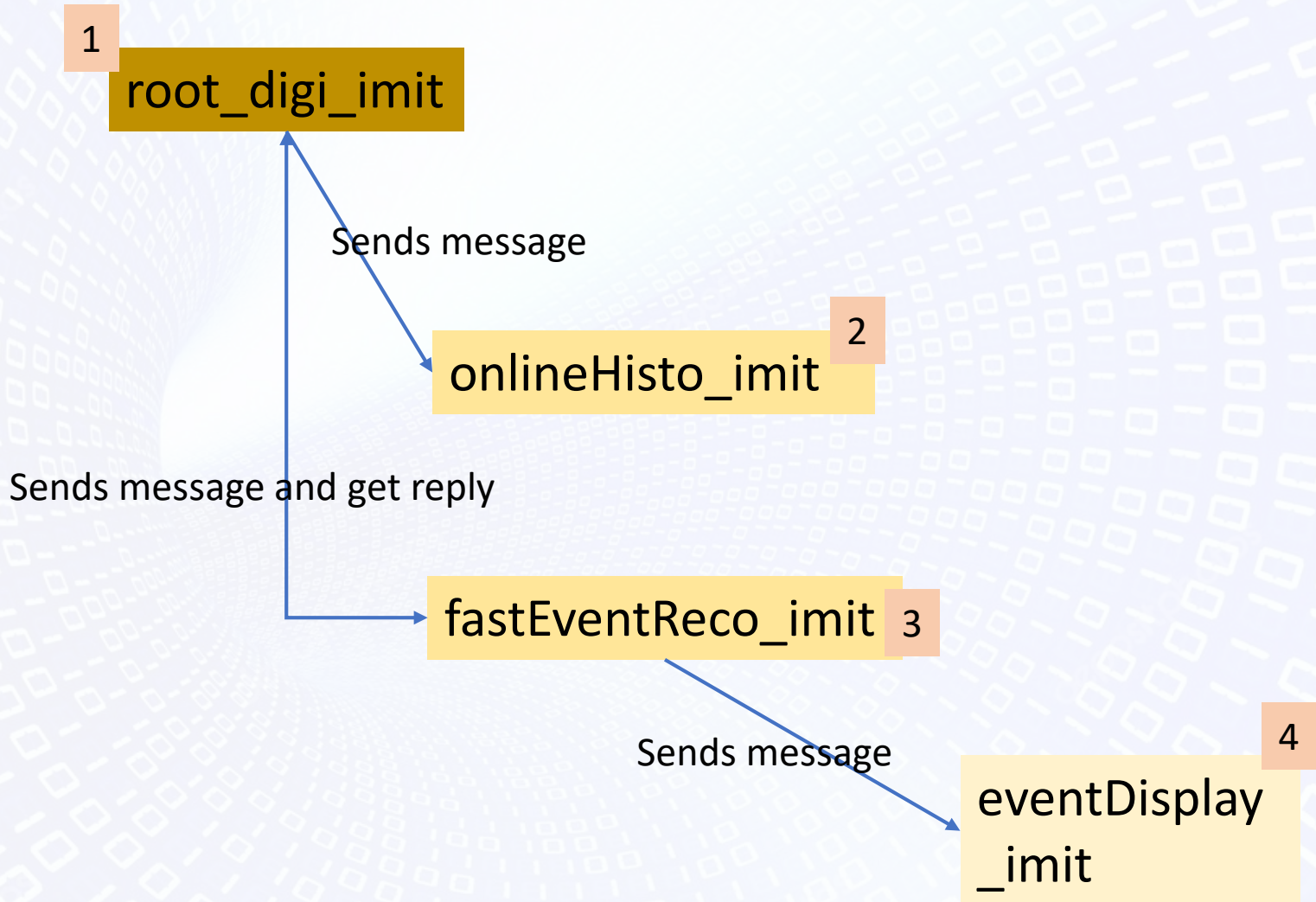
You can edit the fields name and login. A new value is saved when the focus is lost.

[CREATE NEW COMPUTER](#)

Name	Shell	OS	Type		
localhost	ssh	centos	wn	<a href="#">EDIT</a>	✗
localhost	ssh	MacOS	wn	<a href="#">EDIT</a>	✗

# Test environment

Configuration manager uses test\_topology.xml and starts:





# Status

- **Design is developed**
- **Data base is implemented in PostgreSQL**
- **WEB interface implementation in progress**
- **Configuration Manager under construction**
- **DDS system is alive and DDS API is in use in Configuration Manager**
- **Test environment produced**

## Next steps

- **Finish WEB Interface and Configuration manager**
- **Fill DB by real data**

The work was funded by the Russian Foundation for Basic Research (RFBR) grant under the research project 18-02-40125