SPD Software & computing

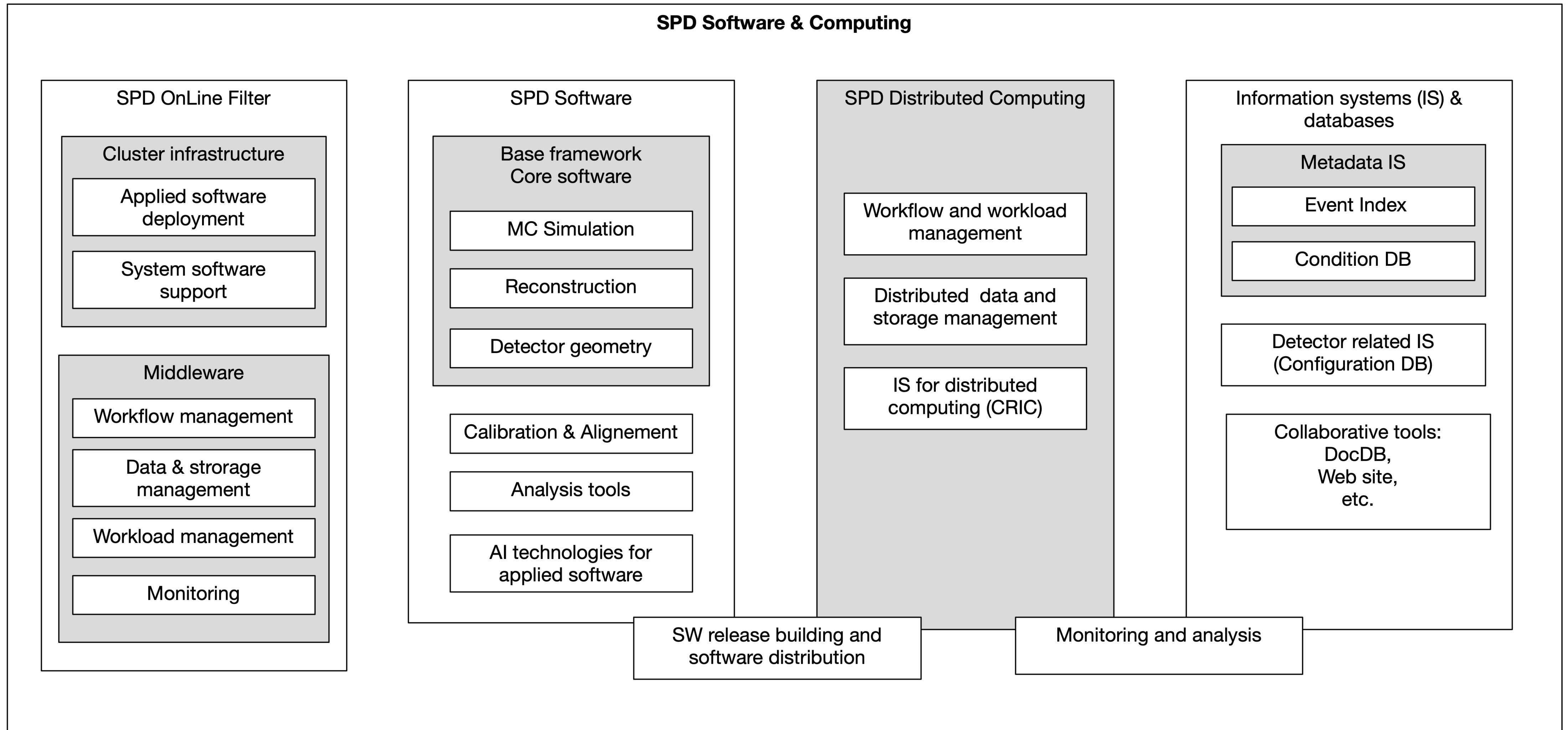## Status report

VI SPD Collaboration Meeting
23 October 2023
**Danila Oleynik, MLIT JINR**

SPD Software and computing Project

SPD Software & Computing

SPD OnLine Filter

Cluster infrastructure

- Applied software deployment
- System software support

Middleware

- Workflow management
- Data & strorage management
- Workload management
- Monitoring

SPD Software

Base framework Core software

- MC Simulation
- Reconstruction
- Detector geometry

- Calibration & Alignement
- Analysis tools
- AI technologies for applied software

SPD Distributed Computing

- Workflow and workload management
- Distributed data and storage management
- IS for distributed computing (CRIC)

Information systems (IS) & databases

Metadata IS

- Event Index
- Condition DB

- Detector related IS (Configuration DB)
- Collaborative tools: DocDB, Web site, etc.

SW release building and software distribution

Monitoring and analysis

SPD OnLine filter
Middleware status

- General architecture of whole system and general components were designed

- Ongoing progress with implementation and debugging of components

- Development team is established

- Foreseen grow of requirements related with simulated data for debugging of realistic workflows

- *More details in my talk this Thursday*
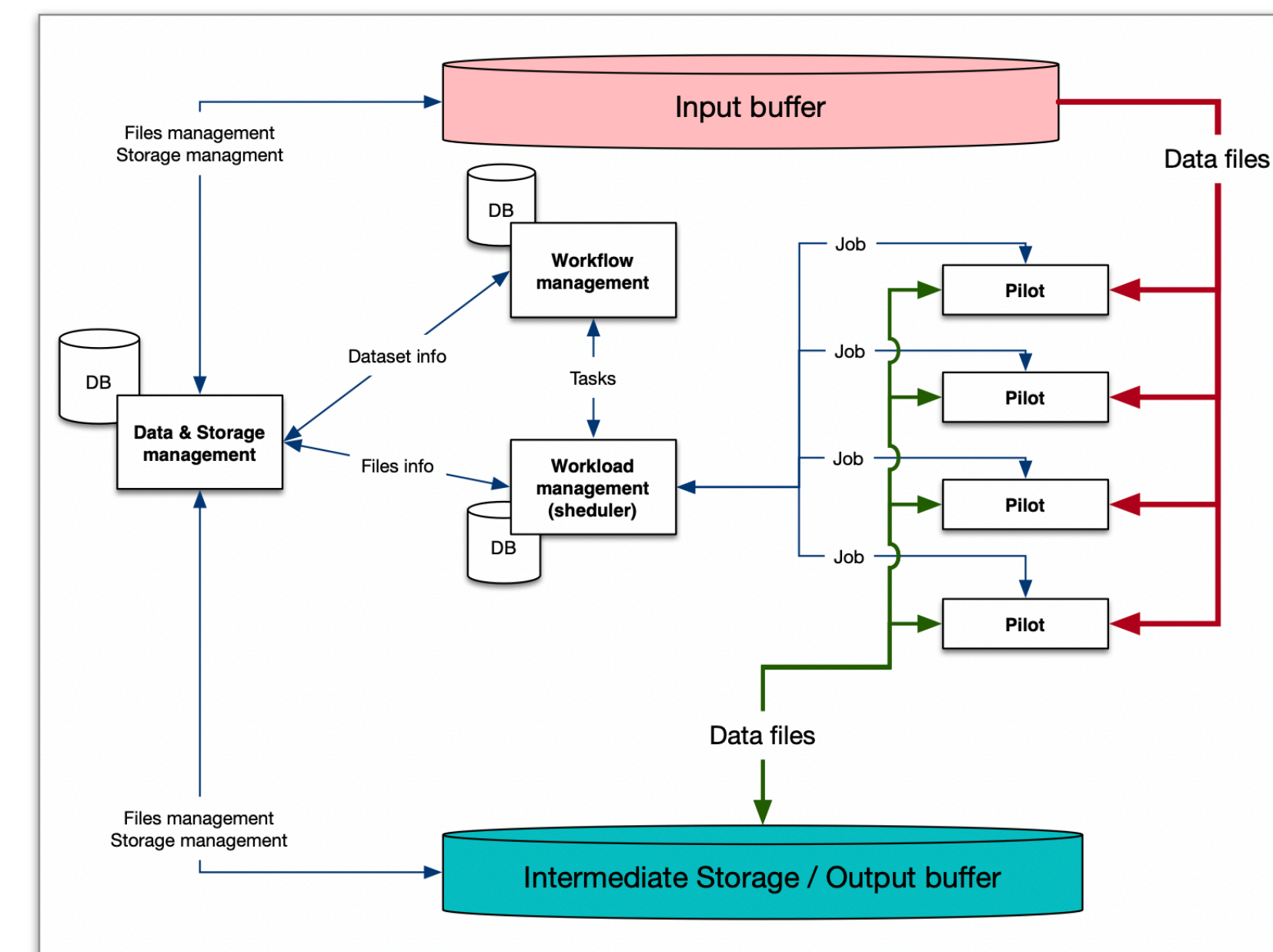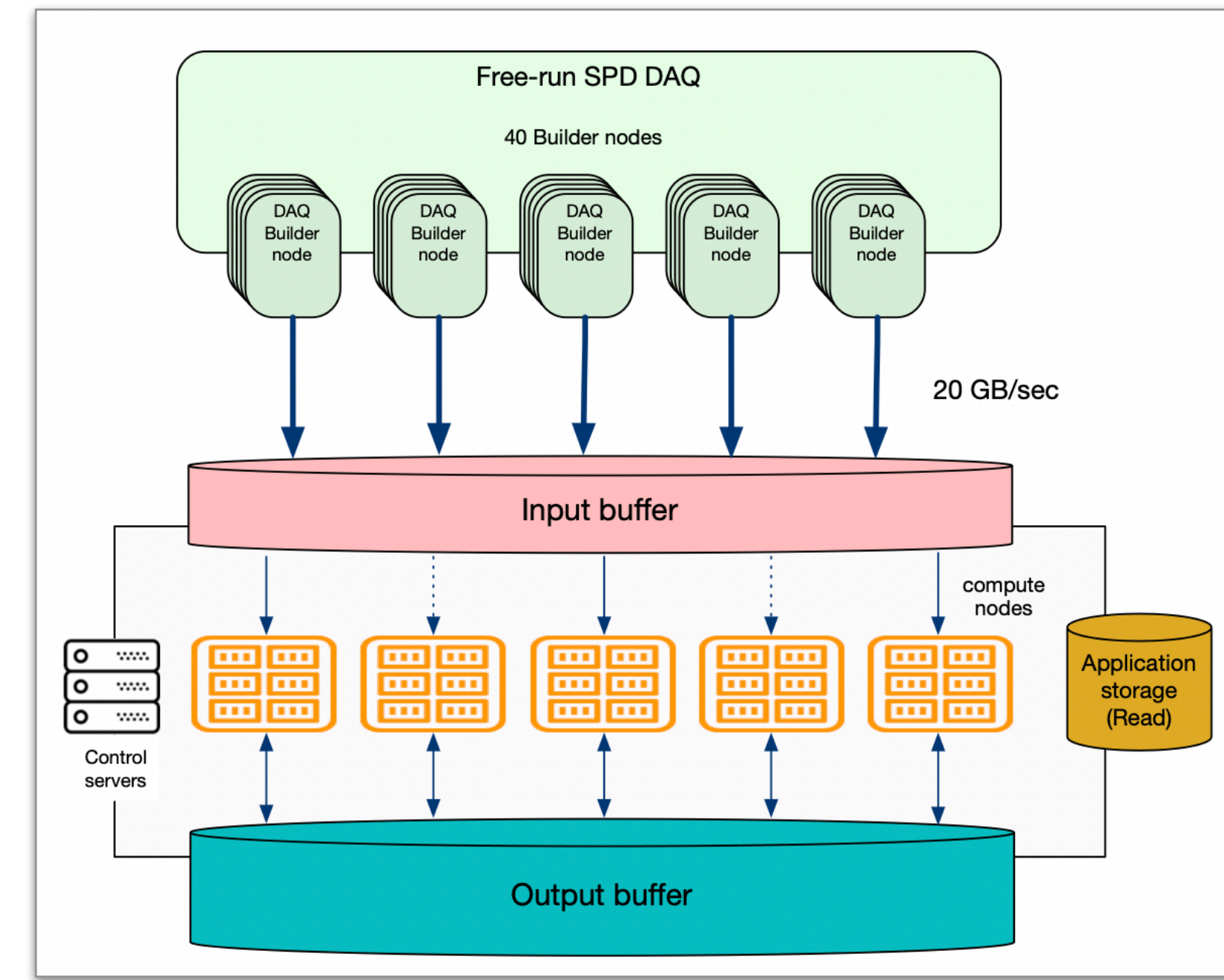
DAQ-SOF testbed

- Last summer, agreement with MLIT about creation of DAQ-SOF test zone was settled

- MLIT provides a dedicated room with required infrastructure:

  - electricity;

  - cold zone with air conditioning for hardware prototypes;

  - workspaces to host up to five persons;

   - *new sofas and coffee machine in the main hall of laboratory :-)*
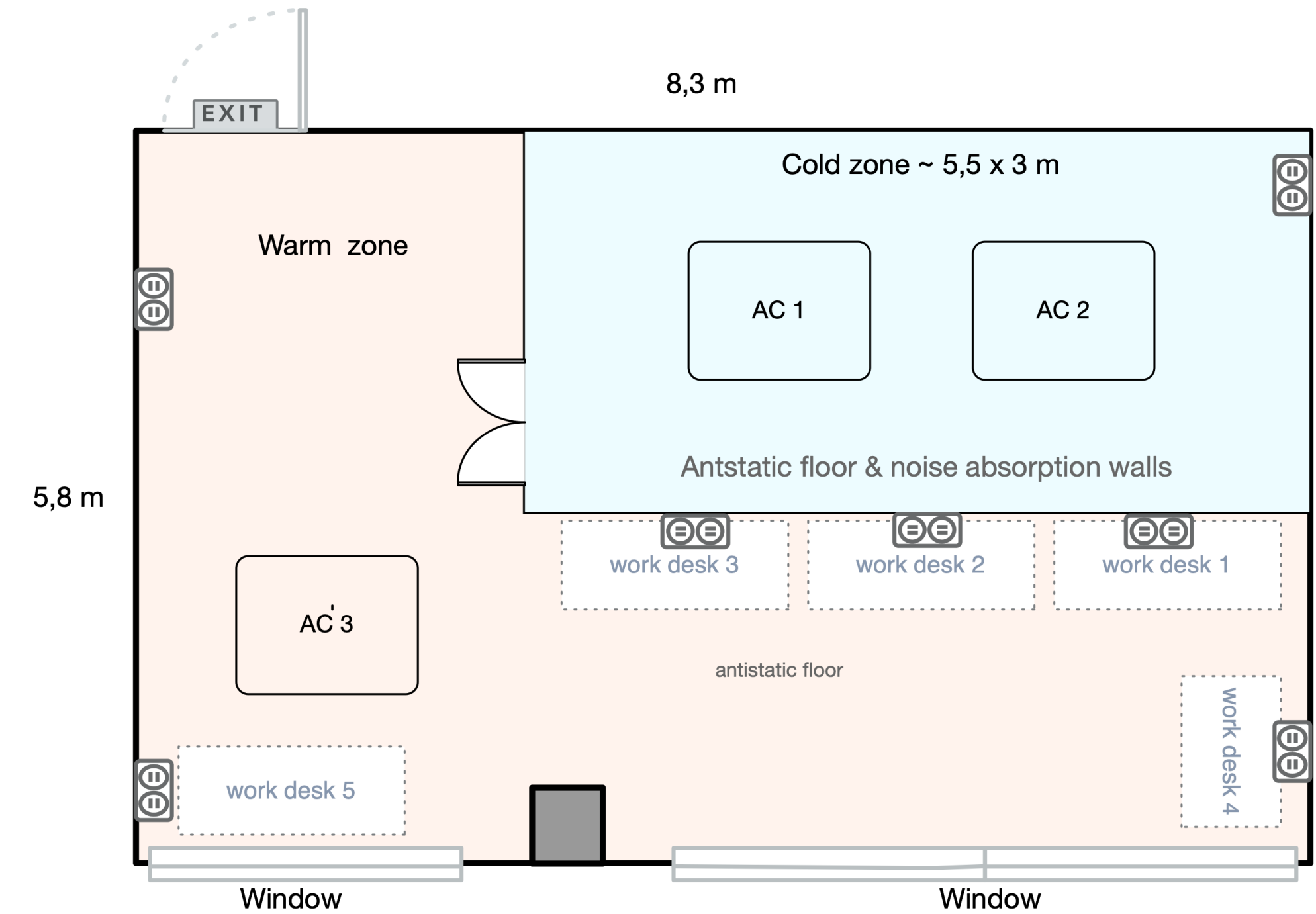
DAQ-SOF testbed

- Room renovation in progress: new floors, walls, wiring, ceilings, furniture and air conditioning. Works should be finished during winter.

Before

New base floor

Floors

New walls

Offline computing system

- General MW components in place

- An agreement about participation in offline computing with a few processing centres: PNPI, SPbSU, INP BSU

- Lack of manpower for adoption of components for SPD data processing
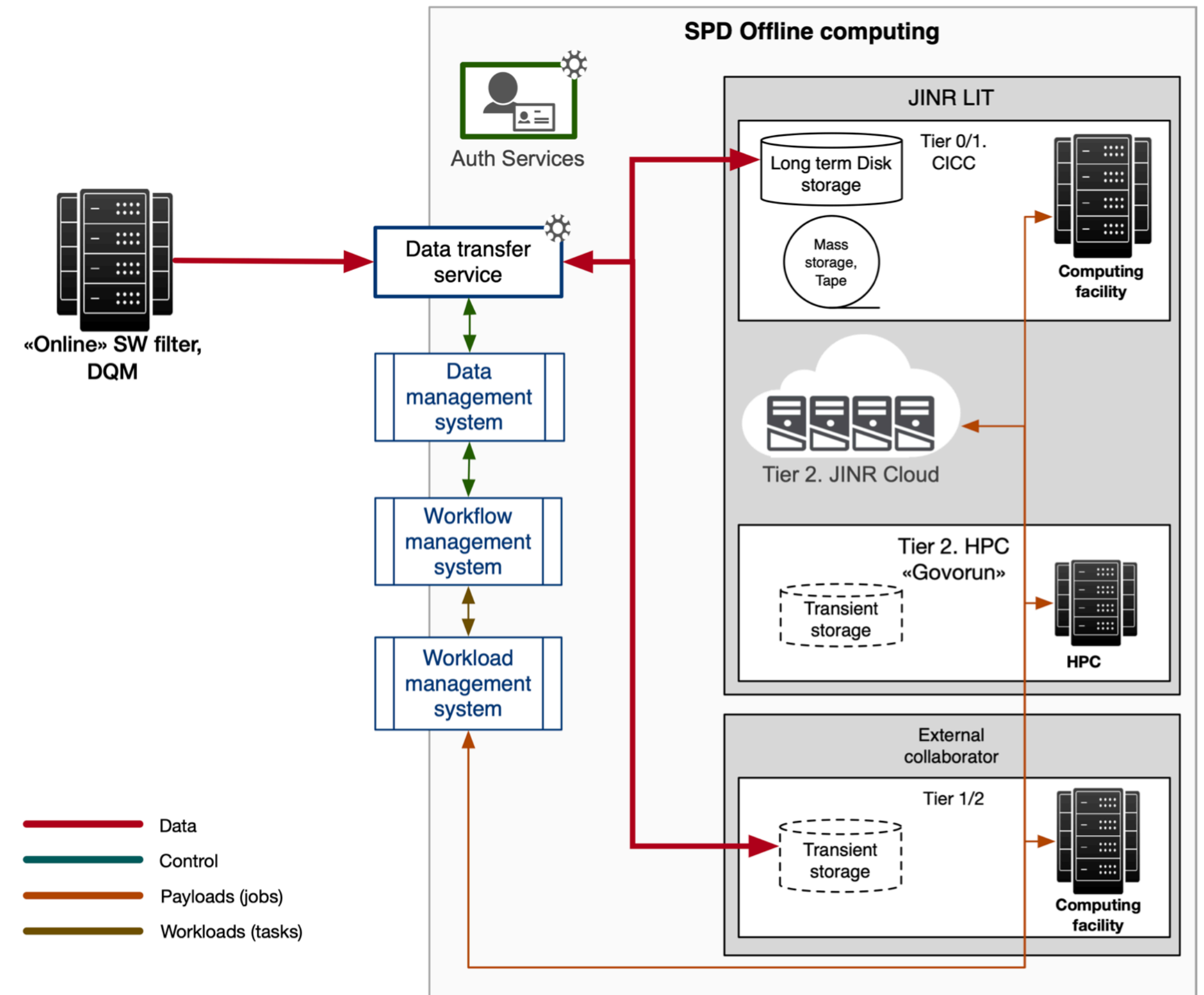
Offline computing guidelines

- In progress preparation of MC production on scale

    - Naming convention

    - Data and storage organization

    - Setting of data processing operation

- Some details in Artem's talk this Thursday

Software: New SpdRoot release

SpdRoot V 4.1.6 [21.10.2023]

- Geometry update (description and position):

    - RS, Ecal, Magnet, BBC, TOF, AEG, TS endcaps

- TOF parameters updated for new geometry.

- Simulation scripts update:

    - jpsi-mumu

    - chic

    - the jpsi-ee example is removed

- Bugfixes:

    - chi2 between tracks fixed in KFParticle

    - an issue with ECal helper

- Git repository: http://git.jinr.ru/nica/spdroot

Information Systems
details in Fedors report this Thursday

- A set of information systems with requirements was defined. Implementation in progress.

  - Tight collaboration with subsystems

- One of general issue: authentication and authorization in respect with JINR general policies

Priorities for the next 6 months

- First public release of the Gaudi-based framework

  - Simulation only

- Online filter computing system continuous tests and debugging

- Running up of the SOF-DAQ testbed

- Mass production with the offline computing system to become routine (at least close to routine)

- Detailed simulation of time slices and the first prototype of the event unscrambling

- Update of the detector description along with the updating the TDR

What we desperately need from the detector subsystems

We repeatedly ask this information since last spring and receive no feedback so far :(

- More details about signal formation in the detectors, for MC hit production

- More details about detector calibration procedures and constants

- Details and naming convention for geometry description

- Input for the database design

  - Detector hardware database (detector elements, cabling etc)

  - Run database

  - Offline DB: Geometry versions, Calib&Align, Magnetic field, …

  - We need all it rather early to have time for proper design, performance tests and tuning