Modification of Data Acquisition System in HLS-II XMCD Experimental station

Zhen zhang, USTC/NSRL, Hefei, China
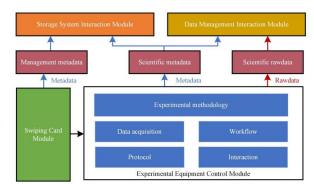
ICALEPCS 2021

The architecture of DAQ system

For HLS-II BL12B

Follow the trend of underlined informatization construction in large scientific equipment

Divided into 4 modules
(1) swiping card module
(2) experimental equipment control module
(3) storage system interaction module
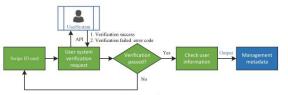(4) data management system interaction module

Upgraded DAQ system architecture

User managenment metadata

User information & group

User authentication process

Hardware for swipe card module

(1) Swipe the ID card at the card reader

(2) Sends the collected ID number to the HLS-II user platform via RESTful API

(3) Verification: success means that the user has applied for the current experimental machine of the experimental station

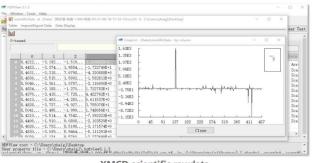(4) After the user checks the information, the management metadata will be output.

Scientific rawdata

KEITHLEY 6517B

(1) The electrometer data at the gold mesh in front of the sample
(2) The electrometer data at the sample

Structure of HDF5

XMCD scientific rawdata

Scientific metadata

Part of JSON file

(1) The scientific metadata from beamline: beamCurrent, beamPosition...
(2) The scientific metadata from beamline station: magneticFieldStrength, vacuum

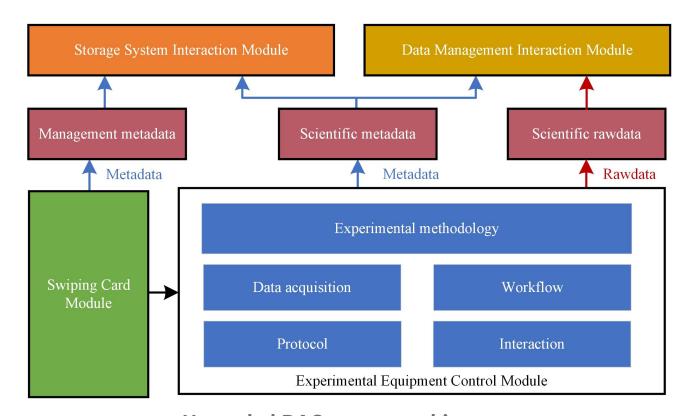| metadata	metadata sources
beamCurrent	beamline
beamPosition	beamline
gasComposition	beamline
gasPressure	beamline
waterFlow	beamline
waterPressure	beamline
waterTemperature	beamline
lowTemperature	beamline
groundResistance	beamline
vibration	beamline
magneticFieldStrength	beamline station
vacuum	beamline station

JSON file of metadata.

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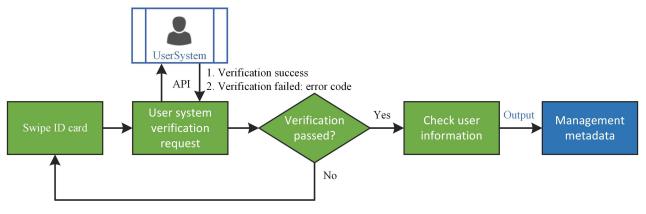(4) data management system interaction module

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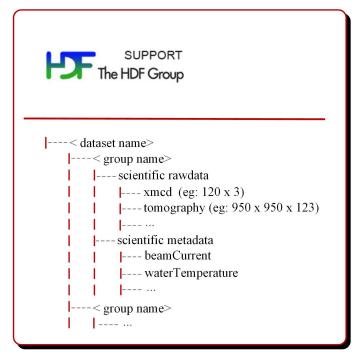

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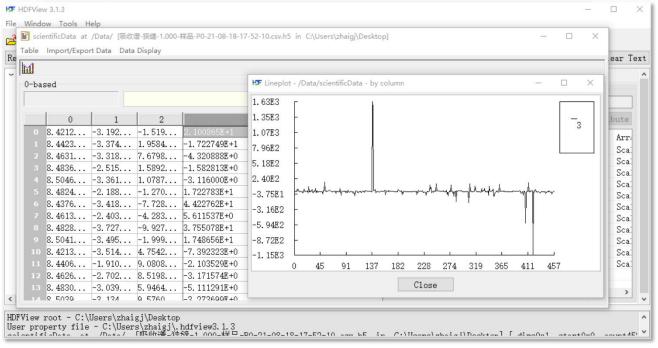
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