

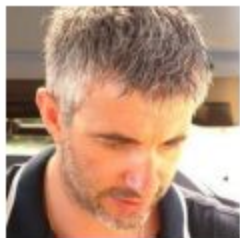


CompSW WG Report

July 26, 2022

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Software and Computing WG (CompSW)



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Meetings Wednesdays @ 11am EDT

- Next meeting is **Aug 3, 2022**
- <https://indico.bnl.gov/event/15646/>

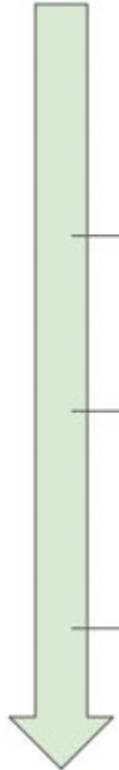
Mailing list

- eic-projdet-comp-sw-l@lists.bnl.gov
- <https://lists.bnl.gov/mailman/listinfo/eic-projdet-comp-sw-l>



A Critical Path for EIC Software

Towards a unified software approach for the EIC



1. Assessment on the software solutions (pro & con list) together with the SimQA and DAQ working groups, guided by the EIC Software Statement of Principles.
2. Propose conclusion and recommendation to collaboration management and Project **by the Summer EICUG meeting.**
3. Software choice treated as any other technology choice? Optional independent review in the Summer.
4. Once decision is made, all new development should go in the official framework.
5. **Aim to have fully transitioned to the official software by October.**










Overview [\[edit\]](#)

Preparations of proposals for the [DPAP](#) decision resulted in multiple software stacks being developed. In the post-DPAP era the community is converging behind the "Detector-1" effort. As such, a Single Software Stack is needed that has input and endorsement from the entire Detector-1 community. In order to move quickly to this, a series of discussions/decisions are scheduled where the key pillars of the stack will be determined.

A procedure has been formalized so that these decisions can be made in a timely manner. Presentations can be found at the links below, but the summary is:

1. *Publicize schedule of topics with dates of discussion and decision*
 2. *Assign chair for each topic. Chair will be POC for the topic. Responsibilities are:*
 1. *Organize discussion session agenda*
 2. *Publish draft list of requirements for the software being discussed at least 1 week in advance.*
 3. *Form list with at least one choice for the software to adopt to address the topic*
 4. *Collect suggestions for modifications to the requirements list and/or the software choices list*
 5. *Lead discussion on topic, starting with requirements list and the list of options*
 3. *Presentations may be made regarding a specific decision topic, but should be communicated to discussion lead in advance for purposes of scheduling.*
 4. *Use guiding principles from the [EIC Software Statement of Principles](#)*
 5. *Discussion is required for all topics (formal presentations only as necessary).*
 6. *Based on the meeting, the joint CompSW and SimQA WG conveners will propose a single option, which will be open for comments and endorsement for one week.*
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n.b. Not every decision made will need to follow this procedure! This is here only for the major decisions needed to get the single stack off the ground so the earlier stacks can be retired and the community united.

		Discussion topic(s)	Decision topic(s)	comments	Point of Contact
May	4	A/IGW			
	11	Transition Period	Present procedure. Decide on list and order of decision topics		
	18	No meeting (Streaming Readout X Workshop)			
	25	Code Repository 	Repository: - Location (GitHub, GitLab+Host) - Admins - Access		David Lawrence
Jun	1	Discussion Schedule	Schedule: - Decide most critical decisions to make before July 27th EICUG meeting - Schedule of topic discussions		
	8	Geometry 	Geometry: - Package (e.g. DD4HEP)		Markus Diefenthaler
	15	Data Model 	Data format - Generated events - Simulated data - Processed data (e.g. ROOT w/ specific tree format)		Whitney Armstrong
	22	Data Model			
	29	Reconstruction Framework 	Reconstruction Framework - Package		Wouter Deconinck
Jul	6	Reconstruction Framework 			
	13	Data and Analysis preservation 	Data Preservation - What is preserved (simulated, DSTs, ...) - Location(s) - Access (S3, xrootd, rucio, ...)		Kolja Kauder
	20	Documentation 	Documentation: - Location of User documentation (wiki, repository,...) - Who will set up skeleton with list of topics (e.g. "Getting Started")		
Aug	27	EICUG Meeting			
	3	Continuous Integration	Continuous Integration		
	10	Containerization Official builds	Containerization - platform (Singularity, Docker, multi, ...) - Supported OSes - Location of images (e.g. cvmfs) Official builds - Location (e.g. cvmfs, container image, ...)		
	17	Calibration DB Conditions DB	Calibration / Conditions DBs - Package - Server/Host - Access		



Code Repository



Convener Summary:

- We will implement a hybrid solution that uses GitHub as the primary repository, while using the eicweb GitLab instance for CI/CD.
- An ad hoc committee of eicweb experts will investigate the best option for leveraging CI/CD at ANL using GitHub (e.g. GitHub runners, mirrors, webhooks, etc).
- The existing "eic" organization at GitHub established by the EICUG Software WG will be used.
 - Some admin privileges will need to be shared with the Detector-1 WG conveners
- The best practices model for the repository will include:
 - Repositories will be open and public unless there is a specific reason to make them private
 - External packages will not be forked/cloned to the eic organization and modified unless under extremely exceptional circumstances.

Decision Document:

https://docs.google.com/document/d/1jT8CXj1cS9FEa0MbpJBV5jBA0T_vu2UdNDX93lJSo9c/edit?usp=sharing

Live Notes:

<https://docs.google.com/document/d/1eOG5UnxFrBZajkucGgjq2ryPukI2yE5BPSmQOZ-GpGM/edit?usp=sharing>

Indico:

<https://indico.bnl.gov/event/15640/>



Geometry Description and Detector Interface

Summary

We will implement the geometry description and detector interface using DD4hep.

Decision Document:

https://docs.google.com/document/d/16dQ-u2u5CdJIN3_slvcl79vTWJYnQytoQclMu2e-TpY/edit?usp=sharing

Live Notes:

<https://docs.google.com/document/d/1C3KuUzRC6nXhCFIvjR2NV1fgqmt6MSuZKjqY-NtffM0/edit?usp=sharing>

Indico:

<https://indico.bnl.gov/event/16154/>



Data Model

Convener Summary:

- We will adopt PODIO as the tool for managing the EDM.
- We will adopt the EDM4hep Data model as the initial Data Model

Decision Document:

<https://docs.google.com/document/d/1sddpfySwvkRSLgpUq4NgnFlw7tLdHc6ofT4trwV45xA/edit?usp=sharing>

Live Notes:

https://docs.google.com/document/d/1seWDXQr570Tv_yJijUCKgXhla6u5HAV-ibO82PR43Xk/edit?usp=sharing

Indico:

day1: <https://indico.bnl.gov/event/15642/>

day2: <https://indico.bnl.gov/event/15643/>

Framework



Convener Summary:

The working group conveners recommend JANA2 as the reconstruction framework.

Although both Gaudi and JANA2 are technically able to meet the requirements, there is too much risk in depending on Gaudi which is not focused on a community outside of LHCb. The efforts invested in the already written juggler algorithms will be able to be reused with relatively minor effort in JANA2 algorithms. Likewise, the efforts invested in fun4all algorithms may be able to be reused.

The translation of the relevant Gaudi/juggler and fun4all algorithms will be completed by the Jefferson Lab EPSCI group by October 2022, aided by the 1 FTE-year per year committed by Jefferson Lab to the support of JANA2 for EIC.

The working group conveners point out that continued engagement with the key4HEP project through the development of modular reconstruction algorithms and functional programming approaches is desirable.

The Jefferson Lab EPSCI group is encouraged to develop JANA2 into a community project where developers from outside Jefferson Lab are valued at all stages of software development.

Decision Document:

https://docs.google.com/document/d/1lomak02ztchkwQB2d_f-58gabBOQF9WaPaQhf8kTvfY/edit

Live Notes:

<https://docs.google.com/document/d/1ldlQ63PxfIDsGdOIkik0OE76EzlpHCt00Br583hOJxl/edit?usp=sharing>










Indico:

day1: <https://indico.bnl.gov/event/15644/>

day2: <https://indico.bnl.gov/event/15645/>



October is coming together, but what about today?

-   Implementation of EPIC detector in DD4hep
-  Data model based on (somewhat extended EDM4hep)
 -  Needs further fleshing out for more advanced simulations, and need to define pathway to collaborate with Key4hep
-  Short-term critical simulations to be done in either fun4all stack or DD4hep+Gaudi stack (e.g. background embedding).
 -  Algorithm porting will be supported by JLab crew to facilitate the transition.
-  Porting of CI infrastructure and core repos from eicweb to GitHub.com ongoing
-  JANA2 transition:
 - Base components to integrate with detector geometry (DD4hep) and data model (PODIO/EDM4hep) being written, based on the infrastructure available in Gaudi/Juggler.
 - Comprehensive suite of reconstruction algorithms in Gaudi and fun4all being ported to Jana2.
 - Aim to keep some level of algorithm interoperability with Key4hep.
-  Tutorials for the “final stack” starting in August.



Communication and Information



<https://eic.cloud.mattermost.com/>



eic-projdet-compsw-l@lists.bnl.gov



eic-projdet-simqa-l@lists.bnl.gov



eicug-software@eicug.org



eicug-software-ai@eicug.org



wiki:

<https://wiki.bnl.gov/eic-project-detector/index.php/SC>

<https://wiki.bnl.gov/eic-project-detector/index.php/SimQA>



<https://indico.bnl.gov/category/410/>

Questions?

