EP – R&D

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Andrea Stano
05/03/2020

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Software forms a critical part of the HEP programme, in the generation and simulation of physics events, in the data acquisition systems and triggers of the experiments, through to the reconstruction...

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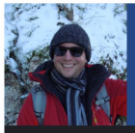
People



BLOMER, JAKOB

(EP-SFT) WP Leaders

Jakob is a staff computer scientist in the EP-SFT group. He is deputy coordinator of the EP R&D software work package. Jakob is the original author and project leader of the CernVM File System, a...

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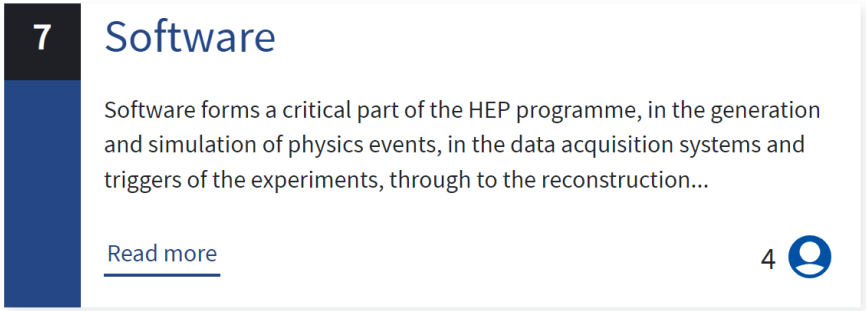
TOPICS



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7. SOFTWARE

Software forms a critical part of the HEP programme, in the generation and simulation of physics events, in the data acquisition systems and triggers of the experiments, through to the reconstruction and analysis phases. Future accelerators, such as CLIC and FCC, plan to increase physics reach through precision and higher rates. Software must be developed to support the lifecycle of the associated experiments, from design and conception to data taking, reconstruction and analysis.

Support for these future physics programmes puts even greater demands on software than today, with greatly enhanced precision and event rates needed for simulation, combinatorial explosions for reconstruction in high pile-up environments and massive data volumes to be handled for analysis across our distributed computing infrastructure.

TASKS

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DOCUMENTS

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PRESENTATIONS

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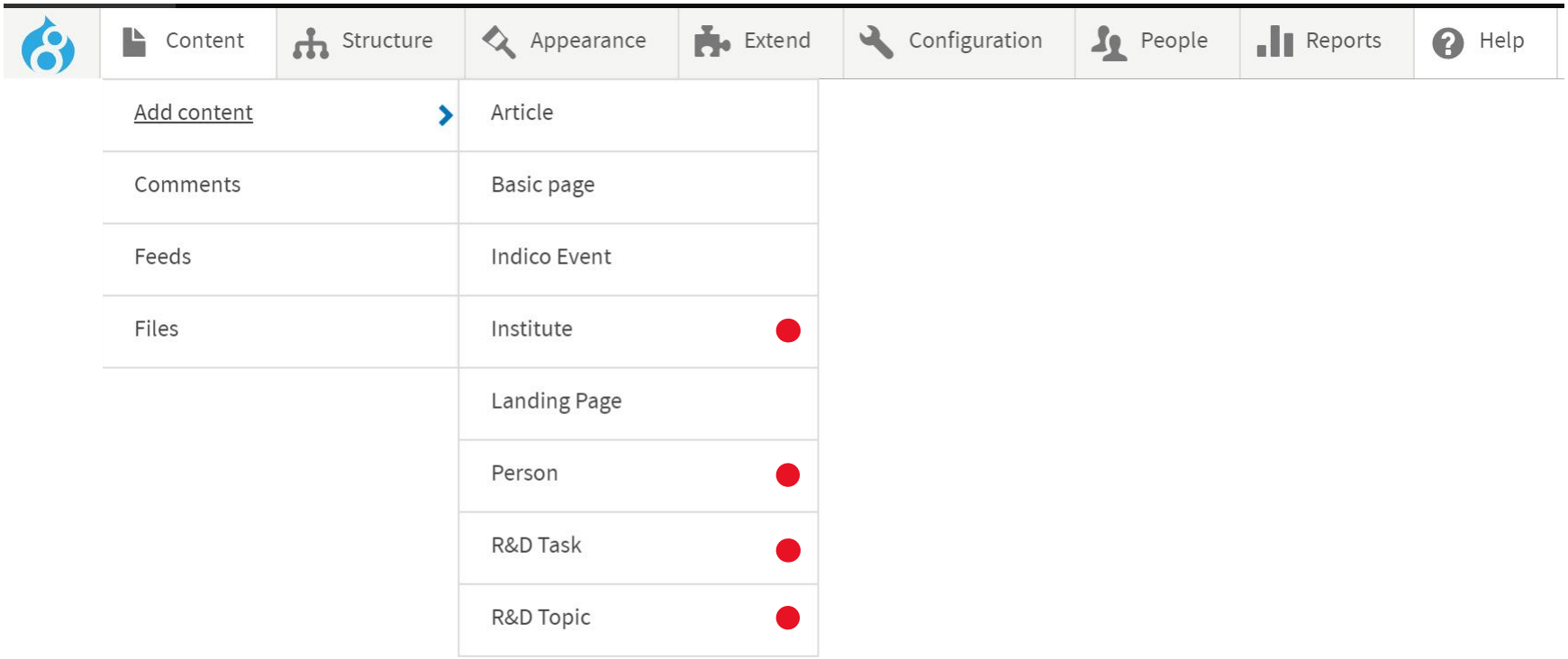
7. Software

7.1. TURNKEY SOFTWARE STACK

Detector studies for future colliders critically rely on well-maintained software stacks to model detector concepts and to understand a detector's limitations and physics reach. These software stacks resemble the offline software of a running experiment, including event generation, detector response simulation, reconstruction algorithms, analysis tools, and distributed computing resource management. In contrast to the software suite of running experiments, detector studies tools must be lightweight and be able to rapidly adapt to detector design changes and varying collider conditions. Moreover, the software must handle a wide range of detail during the detector development lifecycle, from first estimates based on a coarse-grained geometry during the inception phase to detailed physics studies using sophisticated reconstruction algorithms on simulated event data.

The goal of this project is the development of a single turnkey software stack that can be used for the detector studies of both FCC and CLIC communities. A large challenge is in identifying a maximum subset of detector-independent data structures and algorithms, in particular in identifying common parts of the event data model, which is a precondition for applying common reconstruction algorithms. A practical approach is required towards documentation, software dependencies and detector-specific plugin interfaces such that a low maintenance stable software core is readily usable for established and new detector study groups.

ADD CONTENT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Help
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People category *

- (•) Steering Committee
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- ( ) Participants
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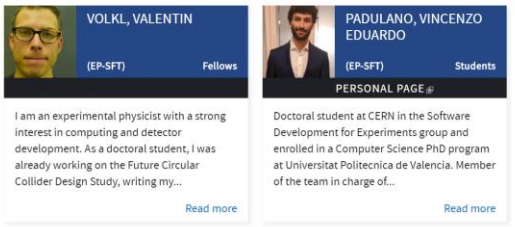
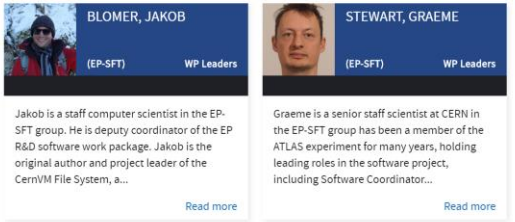


RELATED PARTICIPANTS



JORAM CHRISTIAN

EP-DI
Steering Committee

PERSONAL PAGE

After obtaining his PhD from Karlsruhe University (Germany) in 1993, he joined CERN as a fellow in the DELPHI experiment and became staff in 1996. As member of the detector support group (today known as EP-DT), he worked in several experiments, mainly on detector R&D, construction, operation, technical coordination and group management. His main interest are light based detectors (Cherenkov and scintillation). Since 2018 he is deputy head of the EP department and coordinates the EP R&D programme.

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