User documentation and training at Belle II

Spreading and preserving knowledge in sparse collaboration

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F. Tenchini¹, I. Komarov¹, M. Ritter², S. Cunliffe¹, T. Kuhr²

ilya.komarov@desy.de

¹ DESY
² LMU
Meet the Belle II

Belle II is multipurpose detector located in Tsukuba, Japan.

It studies processes occurring in $e^+e^-$ collusions at the energy of $\sim10$ GeV.

While Belle II inherits many things from its predecessor, our software is not one of them - it’s completely new.

Belle II analysis software (basf2) is C++(17) core with python user interface.
Tasks of the documentation and training group
And how they evolved

- Maintain documentation
- Organise software tutorials
- Advertise new tools

Summer 2017

Provide smooth start for newcomers and effective support for existing users

Now
**Speed of the software development**

**Challenge #1**

- **Software develops fast:**
  - We had 814 commits last month
  - We have 2 major releases per year.
- **Major releases break backward compatibility**

- Documentation needs to be permanently updated
- Users need to be taught how and be ready to migrate to the new release.
Belle II collaboration is scattered. We are 985 members from 118 institutions in 26 countries, most of us reside next to home institute.

- It’s often impossible to “knock the expert’s door” to ask a question - documentation is essential.

- It’s hard to gather people for training sessions in one place and people who need it most (master students) often don’t have travel funds.

- Inclusion is something to be always kept in mind.
Training
a.k.a. B2StarterKits
Schedule and Content

2 workshops/year attached to the general meetings; 3 days per workshop.

• We teach Belle II software

• We teach experimental physics

• We teach data analysis

• We teach working in collaboration

<table>
<thead>
<tr>
<th></th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
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<tbody>
<tr>
<td><strong>Morning</strong></td>
<td>Introduction to the software</td>
<td>“Expert” lectures</td>
<td></td>
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<tr>
<td><strong>Afternoon</strong></td>
<td>Hands-on tutorial</td>
<td>Work in groups</td>
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Addressing the inclusion

Through the organisation

Split them in working groups with advanced students being as mentors.

- Mentors take care of technical issues.
- Mentors coordinate analysis in the working group.
- Mentor is the first point of contact for the student.
- Mentors follow the progress of their students and organise discussions.
- If mentor can’t help, group asks for the help of the expert.
Containerised approach

Reaching those who can’t come

• Materials are collected in dedicated repository

• Materials are updated every workshop

• Latest version of tutorials can be reproduced in the browser thanks to jupyrehub server.
Documentation
Keep it up-to-date

In-code documentation

• Guaranteed up-to-date

• Reviewed changes

• Version control

• Great user interface
Keep it up-to-date
Unit tests to prevent outdates

• **Tutorials** are isolated in code: **high risk of outdate.**

• To cope with than, we covered tutorials with test:

  **Build fails if tutorial crashes;**
  **No build ⇒ no merge.**
Availability of training datasets

**Cloud solution**

Datasets used for trainings:

- Should be regularly updated
- Too big to be part of a framework

Cloud solution:

- All training datasets are kept at Nextcloud instance
- Cron job synchronise datasets “known” servers (build server, kekcc (Japan), naf (Germany))
- Copy to local machines by request
Questions

Prompt responses

• We have an instance of Askbot providing collaborative Q&A service.

• It works quite well:
  • 1233 questions asked in 15 month
  • 83% of them answered
  • Response time is <1 day.

• Adoption is enforced by developers:

Mail to developer’s mailing list:  
Dear experts,  
I have a problem…

Answer:  
Dear user,  
Please ask at questions.belle2.org
One tool to rule them all: cross-source search engine
Sphinx, questions and wiki heritage

Amazing Belle2 Search Tool

1. Enter the query
2. Select release
3. Get results

Results from questions.belle2.org

How does one include continuum suppression variables in...

Results from Sphinx

variables.collections
Python module, in 6.3.1. VariableManager

Results from confluence.desy.de
Conclusion
Belle II Documentation and Training group works hard to establish smooth start for beginners and effective support for existing users.

- The core of training efforts are **B2StarterKit** workshops. We don’t only teach software, we teach doing analysis in Belle II, from means of communications within collaboration to industry-standard tools for data analysis.
  - Centrally organised workshops
  - Jupyterhub instance with tutorial materials
  - Materials are available for local events

- We developed and adopted new documentation strategy. Instead of wikis and mailing lists, we use:
  - **Sphinx** instance for core user documentation
  - **Askbot** instance for Q&A service