

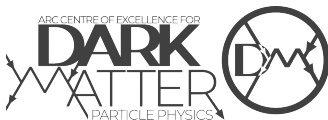
Lecture 3: Git and Continuous Integration

CDM Computing Subgroup Workshop

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Continuous Integration: What and Why?

Two important questions to consider:

- How do you know whether your code is working correctly?
- How do you know whether it is still working correctly after you (or someone else) makes some changes?

Unit Tests

- Usually small/short programs that check the functionality of a specific part of your code
- Will cost time to set up
- Can be very useful for catching bugs during development
- Generally intended to be automated

Continuous Integration

A mindset for development

- Make changes in small, self-contained iterations
- Use automated testing to check every change

How does this help?

- Easier to merge parallel streams of development
- Easier to locate when and where bugs are introduced

Continuous Integration

ATLAS Robot @atlasbot · 2 days ago

❌ CI Result FAILURE (hash 4b1d3faa)

Developer



	Athena	AthSimulation	AthGeneration	AnalysisBase	AthAnalysis
externals	✓	✓	✓	✓	✓
cmake	✓	✓	✓	✓	✓
make	✓	✓	✓	⊘	✓
tests	✓	✓	✓	⊘	✓

Full details available on [this CI monitor view](#). Check [the JIRA CI status board](#) for known problems

✓ Athena: number of compilation errors 0, warnings 0

✓ AthSimulation: number of compilation errors 0, warnings 0

✓ AthGeneration: number of compilation errors 0, warnings 0

⊘ AnalysisBase: number of compilation errors 1, warnings 21

✓ AthAnalysis: number of compilation errors 0, warnings 0

📄 For experts only: Jenkins output [[CI-MERGE-REQUEST-CC7 72909](#)]

Result	Test name	Optional or required	Container	Time
⊘	CI_Test_RecoRun2Data-test	Required	f	23/06/18 21:08
⊘	CI_Test_RecoRun3Data_Checks-test	Required	f	23/06/18 21:08
⊘	CI_Test_RecoRun3Data_Legacy-test	Required	f	23/06/18 21:08
⚠	CI_Test_RecoRun2Data_LegacyVsCA-test	Required	f	23/06/18 21:08
⚠	CI_Test_RecoRun3Data_LegacyVsCA-test	Required	f	23/06/18 21:08
⊘	CI_Test_SystemCheck-test	Required	f	23/06/18 21:08
⊘	CI_Test_ACTS_ActsKRefitting-test	Required	f	23/06/18 21:08
⊘	CI_Test_ACTS_ActsPersistentlyEDM-test	Required	f	23/06/18 21:08
⊘	CI_Test_ACTS_Propagation_ID-test	Required	f	23/06/18 21:08

Showing 1 to 71 of 71 entries

Continuous Integration

- On larger projects, it may not be feasible for developers to build and test the code locally
- Solution: the task of building the code and running the tests is handled by an automation server instead
 - ▶ Github workflows, Gitlab pipelines
 - ▶ Jenkins, Travis, etc

Summary

Continuous Integration is about:

- Continuous testing to ensure correct code
- Automation to reduce mental load and ensure consistent quality

Useful Resources

[GitHub Actions](#) documentation page.

[GitHub pricing](#) for CI compute.

[GitHub documentation](#) for using self-hosted compute.