Summary

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Developing a Testing and Continuous Integration Strategy for your Team tutorial @ Exascale Computing Project Annual Meeting

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License and Citation

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- **The requested citation the overall tutorial is: Gregory R. Watson and David M. Rogers, Developing a Testing and Continuous Integration Strategy for your Team tutorial, in Exascale Computing Project Annual Meeting, online, 2022. DOI: 10.6084/m9.figshare.19608927**
- Individual modules may be cited as *Speaker, Module Title*, in Better Scientific Software tutorial…

Acknowledgements

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IDEAS productivity

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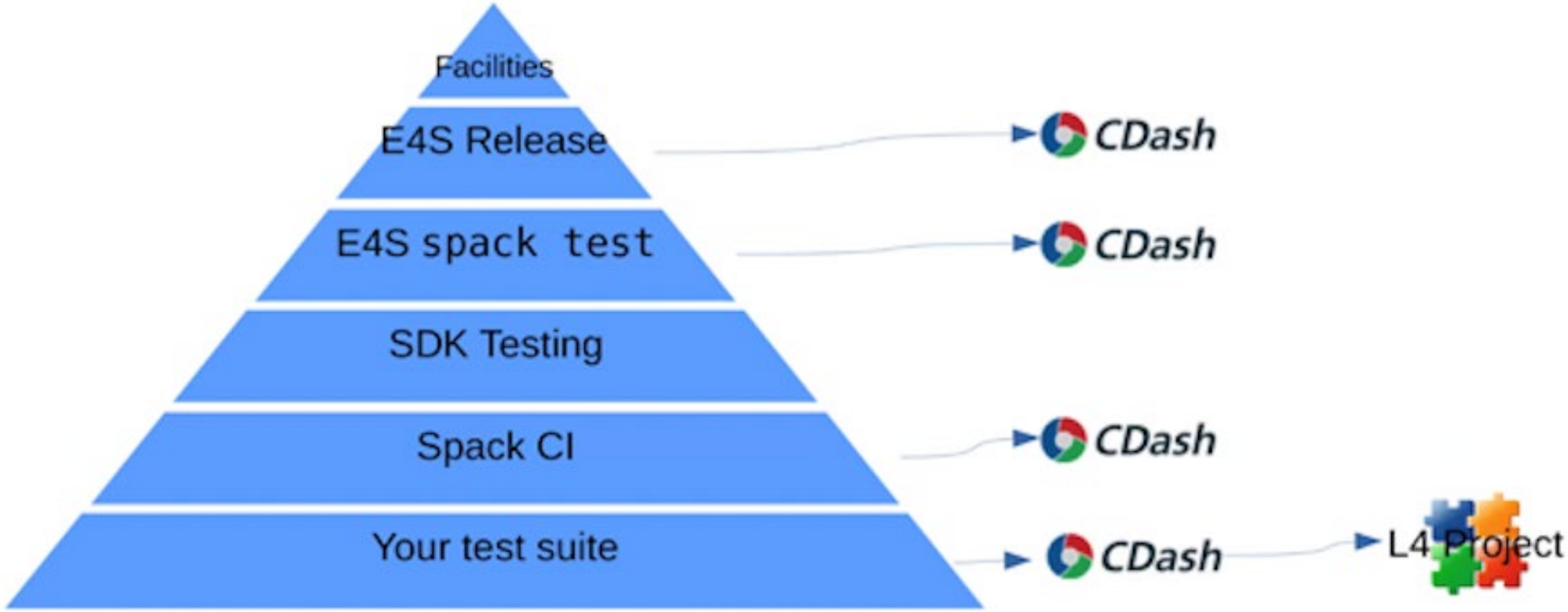
Testing Matters (Maybe even more than you think)



- Individual project test suites are the basis for many layers of testing
  - Well constructed tests add to confidence in and stability of code
  - Fragile or insufficient test suites lead to errors and frustration

We Covered Software Engineering Topics Focused on Testing…

- Testing strategies for complex software systems
- Continuous integration testing

And there are Many More Topics We Didn't Have Time For

- Documentation
- Licensing
- Packaging and distribution
- Issue tracking
- Configuration and build
- Debugging strategies
- Building and sustaining communities around software
- Software publication and citation
- Requirements gathering
- Understanding and debugging floating-point math
- Performance and performance portability
- Project management
- Collaboration around software development
- Designing software for flexibility and extensibility
- Systematic refactoring of large, complex software systems
- Reproducibility

- **Also important topics, but…**
- Less distinction between research software and other software
- More informational resources available
- Next-level concerns for starting researchers
- Very limited time!

IDEAS productivity

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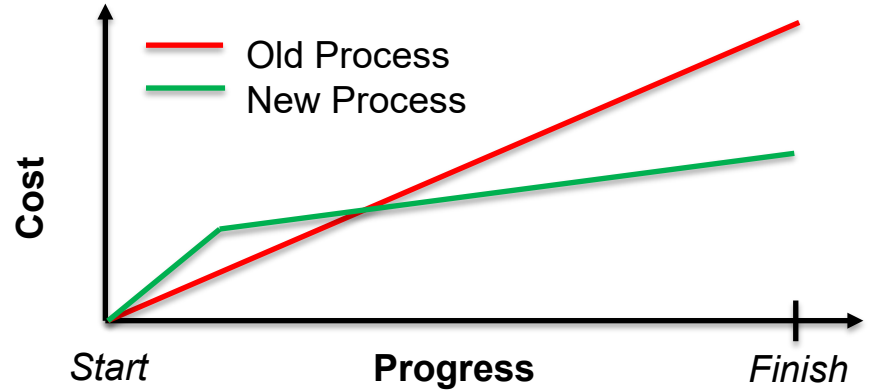
But you're a researcher.
You can't afford to spend
"all" of your time on
software engineering.

A Final Recommendation: Continual, Incremental Software Process Improvement

Target: your project should include "just enough" software engineering so that you can meet your short-term and longer-term scientific goals effectively

1. Identify your team's "pain points" in your software development processes
   - Help: RateYourProject assessment tool: https://rateyourproject.org/
2. Set a goal for something to improve
   - Target processes and behaviors, not just tasks
   - Pick something that you can address in a few months that will give you a noticeable benefit
3. Agree on a plan to address it, identify markers of progress and what is "done"
   - Write them down
   - Help: Progress tracking card examples: https://bssw-psip.github.io/ptc-catalog/catalog
4. Work your plan, track your progress
5. When you are done, celebrate…

…then pick a new pain point to address



The new process costs something to implement, but it pays off over time

Productivity and Sustainability Improvement Planning
https://bssw.io/psip

A goal of BSSw.io is to provide resources for improving your software processes. If you find useful resources that aren't on BSSw.io, consider contributing. Its easy and quick.

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Thanks, and Keep in Touch!

- Email comments and questions to bssw-tutorial@lists.mcs.anl.gov
- We'll provide feedback on pull requests in the hands-on repository
- See the tutorial web site for an archive of all the materials from this tutorial
  - https://bssw-tutorial.github.io/
- Follow us:
  - IDEAS Productivity project
    - Website: https://ideas-productivity.org/
    - Announcement list: http://eepurl.com/cQCyJ5
  - Better Scientific Software
    - Resources: https://bssw.io/
    - Monthly digest: https://bssw.io/pages/receive-our-email-digest
    - RSS feed: https://bssw.io/items.rss

Related Events at the ECP Annual Meeting (*all times Eastern*)

- IDEAS Desk – informal conversations about developer productivity a… re sustainability
  - **Room 125** in the Gather.Town Side Meetings area
  - 12:30pm-2:00pm Monday through Friday
- Validation, Verification and Performance Suites, Prox… tinuous Integration for Exascale Supercomputers
  - 10:00am-11:30am Wednesday
- Advancing Scientific Productivity thro… ific Software
  - 11:30am-12:30am Wednesday
- Hands-on with Progress T… Lightweight Method for Improving Your Software Practices
  - 1:00pm-3:30pm …
- Benefiting f…
  - 2:30pm-… esday
- ECP CI Startu… utorial
  - 2:30pm-6:00pm Friday

Needs to be updated