

Process Improvements

Chapel Team, Cray Inc.
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Outline

- Issue Tracking: JIRA
- Chapel Improvement Proposals (CHIPs)



Issue Tracking: JIRA



JIRA: Background

- **Chapel has historically lacked an issue tracker**
 - Use “futures” to track certain bugs, feature requests, etc.
 - essentially tests that we run, but don't expect to work yet
 - can compliment, but not replace an issue tracker
 - Relied on email for “issue tracking”
- **Many reasons to use an actual issue tracker**
 - Better for developers:
 - shared central location
 - SCM and regression testing integration
 - ownership, prioritization, categorization
 - easy access to comments, status, history, etc
 - Better for users:
 - easy to find, track, and upvote existing issues



JIRA: This Effort

- **Decided on JIRA as our issue tracker**
 - Surveyed popular issue trackers
 - narrowed choice down to JIRA and GitHub issues
 - Ultimately chose JIRA because of flexibility
 - highly configurable and has rich plugin support
- **Started tracking regression testing with JIRA**
 - We historically used a text file under source control
 - simple, but cumbersome and completely manual
 - Regression testing is developer-oriented
 - made for a good trial run
 - improve our process on non-user-facing issues



JIRA: Impact

- **Made triage easier**

- Updates are immediately visible to all developers
- No need to prune/clean-up old information manually
 - which also makes tracking sporadic issues easier

- **Improved bug fixing process in general**

- Now much easier to...
 - ... collaborate with other developers
 - ... add comments to an issue
 - ... identify related issues
 - ... track the progress of an issue
 - ... share an issue with others

JIRA: This Effort



T	Key	Summary	Assignee	P	Status	Resolution	Created	Updated
🔴	CHAPEL-1	Provide a productive parallel language that performs and scales.	Brad Chamberlain	↑	TO DO	Unresolved	03/Mar/14	14/May/15
🟢	CHAPEL-2	timeout on 2015-04-21 on tests that normally complete quickly (xc.*)	Vassily Litvinov	✓	DONE	Done	26/Apr/15	29/Jun/15
🟢	CHAPEL-3	sporadic dropped output (prgenv-cray)	Michael Ferguson	✓	DONE	Done	26/Apr/15	29/Jun/15
🟢	CHAPEL-4	SSCA2_main times out sporadically (perf.xc.16.*)	Greg Titus	✓	DONE	Done	26/Apr/15	29/Jun/15
🟢	CHAPEL-5	miniMD timeouts (perf.xc.16.mpi.gnu, perf.xc.16.ugni.gnu)	Ben Harshbarger	✓	DONE	Done	26/Apr/15	02/Sep/15
🔴	CHAPEL-6	sporadic timeouts in xe.ugni*	Elliot	↑	TO DO	Unresolved	26/Apr/15	10/Sep/15
🟢	CHAPEL-7	sporadic invalid read/write of size 8 in dl_* (valgrind)	Michael Ferguson	✓	DONE	Done	26/Apr/15	29/Jun/15
🔴	CHAPEL-8	types/string/StringImpl/memLeaks/* (gasnet*, gasnet.fifo)	Greg Titus	↑	TO DO	Unresolved	26/Apr/15	20/Jul/15
🟢	CHAPEL-9	sporadic valgrind timeouts (valgrind)	Michael Noakes	✓	DONE	Done	26/Apr/15	29/Jun/15
🟢	CHAPEL-10	sporadic invalid reads/writes (valgrind)	Michael Noakes	✓	DONE	Done	26/Apr/15	29/Jun/15
🟢	CHAPEL-11	invalid reads/writes (valgrind)	Michael Noakes	✓	DONE	Done	26/Apr/15	29/Jun/15
🔴	CHAPEL-12	diten/test_local2 intermittent failure	Unassigned	✓	TO DO	Unresolved	26/Apr/15	29/Jun/15
🔴	CHAPEL-13	bulkcomm execution timeouts (gasnet.fifo)	Elliot	↑	IN PROGRESS	Unresolved	26/Apr/15	13/Jul/15
🟢	CHAPEL-14	execflags/bradc/gdbddash/gdbSetConfig (xc-wb.*)	Lydia Duncan	✓	DONE	Done	26/Apr/15	29/Jun/15
🟢	CHAPEL-15	sporadic x? HW execution timeouts (xe.ugni*)	Unassigned	✓	DONE	Done	26/Apr/15	29/Jun/15
🟢	CHAPEL-16	lulesh timeouts (xe.mpi.pgi, perf.xc.local.cray)	Vassily Litvinov	✓	DONE	Done	26/Apr/15	29/Jun/15
🔴	CHAPEL-17	sporadic [chpl_launched] "output file from job does not exist..." errors (xc.*)	Elliot	↑	IN PROGRESS	Unresolved	26/Apr/15	29/Jun/15
🔴	CHAPEL-18	sporadic slurm "expired credential" problem (xc.*)	Elliot	↑	IN PROGRESS	Unresolved	26/Apr/15	29/Jun/15

<https://chapel.atlassian.net/projects/CHAPEL/issues/>



COMPUTE | STORE | ANALYZE

JIRA: This Effort



The screenshot shows a JIRA issue page for the project 'Chapel / CHAPEL-85'. The issue title is 'testemptyglob.chpl core dump in gasnet runs'. The status is 'DONE (View Workflow)'. The priority is 'Minor'. The issue is assigned to Brad Chamberlain and reported by Michael Ferguson. The description states: 'Has failed for the past several rounds of testing. Nightly log shows a core dump when exiting perhaps. However, I can't reproduce it on cfics01. Also, it doesn't seem to occur with fifo.' The activity section shows two comments: one from Elliot on 19/Aug/15 4:58 PM and one from Brad Chamberlain on 14/Sep/15 5:33 PM. The footer of the page reads 'Powered by Atlassian · Terms of Use · Answers · Maintenance Schedule'.



JIRA: Status and Next Steps

Status:

- Successfully using JIRA to track regression testing
- Available online at: <https://chapel.atlassian.net/projects/CHAPEL/summary>
- Recently started tracking string-as-rec issues

Next Steps:

- Make the JIRA project more user-oriented
 - add issues for existing futures and user bugs
 - start using voting mechanism
 - but leave issue creation for developers initially
 - explore options for users to file issues directly – e.g., web portal?

Chapel Improvement Proposals (CHIPs)



CHIPs: Background

- **There are many ideas for improving Chapel**
- **However...**
 - ...significant time may pass before implementation starts
 - ...the people involved may change before implementation is complete
- **Not all good ideas make it past these barriers**





CHIPs: What is a CHIP?

- **Significant changes should go through these steps:**
 1. Clear communication of the idea
 2. Discussion of the idea
 3. Implementation of the idea

- **A Chapel Improvement Proposal is:**
 - a way to record an idea to aid its progress through these steps
 - a lightweight document
 - a place to record the progress of an idea





CHIPs: Impact, Status, and Next Steps

Impact:

- Project can confidently separate ideas from implementation
- Ideas will not be lost to history

Status:

- CHIPs stored in [doc/chips](#) in the Chapel git repository
- Examples of current CHIPs:
 - Chapel Improvement Proposals
 - Constrained Generics
 - ZeroMQ Integration
 - Constructor Syntax and Semantics
 - Implementing Object Copying
 - Tuple Semantics

Next Steps:

- Further develop CHIP decision-making process
- Create new CHIPs; complete existing CHIPs





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chapel_info@cray.com

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