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

### Issues List

<table>
<thead>
<tr>
<th>Key</th>
<th>Summary</th>
<th>Assignee</th>
<th>Status</th>
<th>Resolution</th>
<th>Created</th>
<th>Updated</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHAPEL-1</td>
<td>Provide a productive parallel language that performs and scales.</td>
<td>Brad Chamberian</td>
<td>To Do</td>
<td>Unresolved</td>
<td>03/Jan/14</td>
<td>14/May/15</td>
</tr>
<tr>
<td>CHAPEL-2</td>
<td>timeout on 2015-04-21 on tests that normally complete quickly (xc.*)</td>
<td>Vassily Librov</td>
<td>Done</td>
<td></td>
<td>26/Apr/15</td>
<td>29/Jun/15</td>
</tr>
<tr>
<td>CHAPEL-3</td>
<td>sporadic dropped output (permgv-cray)</td>
<td>Michael Ferguson</td>
<td>Done</td>
<td></td>
<td>26/Apr/15</td>
<td>29/Jun/15</td>
</tr>
<tr>
<td>CHAPEL-4</td>
<td>SSGA2, main times out sporadically (perf.xc.16.*)</td>
<td>Greg Titus</td>
<td>Done</td>
<td></td>
<td>26/Apr/15</td>
<td>29/Jun/15</td>
</tr>
<tr>
<td>CHAPEL-5</td>
<td>minIMD timeouts (perf.xc.16.mpi.gnu, perf.xc.16.ugni.gnu)</td>
<td>Ben Harshbarger</td>
<td>Done</td>
<td></td>
<td>26/Apr/15</td>
<td>02/Sep/15</td>
</tr>
<tr>
<td>CHAPEL-6</td>
<td>sporadic timeouts in xe.ugni*</td>
<td>Elliot</td>
<td>To Do</td>
<td>Unresolved</td>
<td>26/Apr/15</td>
<td>10/Sep/15</td>
</tr>
<tr>
<td>CHAPEL-7</td>
<td>sporadic invalid read/write of size 8 in di_* (valgrind)</td>
<td>Michael Ferguson</td>
<td>Done</td>
<td></td>
<td>26/Apr/15</td>
<td>29/Jun/15</td>
</tr>
<tr>
<td>CHAPEL-8</td>
<td>types/intf/Stringmpf/memLeak.x (gasnet*, gasnet,tile)</td>
<td>Greg Titus</td>
<td>Done</td>
<td></td>
<td>26/Apr/15</td>
<td>20/Jul/15</td>
</tr>
<tr>
<td>CHAPEL-9</td>
<td>sporadic valgrind timeouts (valgrind)</td>
<td>Michael Noakes</td>
<td>Done</td>
<td></td>
<td>26/Apr/15</td>
<td>29/Jun/15</td>
</tr>
<tr>
<td>CHAPEL-10</td>
<td>sporadic invalid reads/writes (valgrind)</td>
<td>Michael Noakes</td>
<td>Done</td>
<td></td>
<td>26/Apr/15</td>
<td>29/Jun/15</td>
</tr>
<tr>
<td>CHAPEL-11</td>
<td>invalid reads/writes (valgrind)</td>
<td>Michael Noakes</td>
<td>Done</td>
<td></td>
<td>26/Apr/15</td>
<td>29/Jun/15</td>
</tr>
<tr>
<td>CHAPEL-12</td>
<td>dtn/test_local2 intermittent failure</td>
<td>Unassigned</td>
<td>To Do</td>
<td>Unresolved</td>
<td>26/Apr/15</td>
<td>29/Jun/15</td>
</tr>
<tr>
<td>CHAPEL-13</td>
<td>bulkcomm execution timeouts (gasnet,tile)</td>
<td>Elliot</td>
<td>To Do</td>
<td>Unresolved</td>
<td>26/Apr/15</td>
<td>13/Jul/15</td>
</tr>
<tr>
<td>CHAPEL-14</td>
<td>execflags/brad/goldenhash/goldenhash_config (xc-wt.*)</td>
<td>Lydia Duncan</td>
<td>Done</td>
<td></td>
<td>26/Apr/15</td>
<td>29/Jun/15</td>
</tr>
<tr>
<td>CHAPEL-15</td>
<td>sporadic x? HW execution timeouts (xe.ugni*)</td>
<td>Unassigned</td>
<td>Done</td>
<td></td>
<td>26/Apr/15</td>
<td>29/Jun/15</td>
</tr>
<tr>
<td>CHAPEL-16</td>
<td>tclset timeouts (xe.mpi.gpu, perf.xc.local.cray)</td>
<td>Vassily Librov</td>
<td>Done</td>
<td></td>
<td>26/Apr/15</td>
<td>29/Jun/15</td>
</tr>
<tr>
<td>CHAPEL-17</td>
<td>sporadic [shl_launchcmd] &quot;output file from job does not exist... errors (xc.*)</td>
<td>Elliot</td>
<td>To Do</td>
<td>Unresolved</td>
<td>26/Apr/15</td>
<td>29/Jun/15</td>
</tr>
</tbody>
</table>

[https://chapel.atlassian.net/projects/CHAPEL/issues/]
JIRA: This Effort

testemptyglob.chpl core dump in gasnet runs

Details
- Type: Regression
- Status: DONE (View Workflow)
- Priority: Minor
- Resolution: Done
- Affects Version/s: None
- Fix Version/s: None
- Labels: Regression, Sporadic, modules/standard/fileSystem/fileistor/bredu/testemptyglob.chpl
- Regression Date(s): 2015-08-09, 2015-08-17
- Configuration(s): gasnet-fast gasnet-everything

Description
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 cfric101. Also, it doesn't seem to occur with fifo.

Attachments

Activity
- Elliot added a comment - 19/Aug/15 4:58 PM
  This will fail on any machine with more than 10 physical cores (really if here.maxTaskPar > 10)
  It also does fail with fifo, though not as frequently. I've quieted this with https://github.com/chapel-lang/chapel/pull/2348,
  but it needs a real solution yet.
  See that PR for more details.

- Brad Chamberlain added a comment - 14/Sep/15 5:33 PM
  Fixed the right way in https://github.com/chapel-lang/chapel/pull/2522. See the PR and commits for details.
JIRA: Status and Next Steps

Status:
- Successfully using JIRA to track regression testing
- Available online at: [https://chapel.atlassian.net/projects/CHAPEL/summary](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 existing CHIPs
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