Catching Up with State of the Art Continuous Integration Pipelines in Palladio

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Motivation

- Palladio is a complex software project
  - >40 connected projects form product
  - 15 active developers from 3 organisations
  - Based on many Eclipse libraries and tools

- High complexity scares developers
- Continuous Integration (CI) can help
- Has to be easy to use
## Development Process

### Test in Eclipse

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Development Process

Test in Eclipse  >>  Test locally

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### Test remotely
Validation of Code Contributions

Review required
At least 1 approving review is required by reviewers with write access. Learn more.

1 pending reviewer

All checks have passed
3 successful checks

- continuous-integration/jenkins/branch — This commit looks good
- continuous-integration/jenkins/codecoverage — The code coverage did not decrease with respect to the master.
- continuous-integration/jenkins/pr-merge — This commit looks good

Merging is blocked
Merging can be performed automatically with 1 approving review.

Rebase and merge or view command line instructions.
Continuous Integration Infrastructure

- Contribution
- Quality Review
- Github
- Push Event
- Repo Event
- Status
- Jenkins
- Update Site
- Dependencies
- Webserver
Continuous Integration Infrastructure

- Contribution
- Quality Review
- Github
- Push Event Repo Event
- Status
- Jenkins
- Checkout
- Build / Test
- Update Site
- Dependencies
- Webserver
- Deployment
Selected Benefits of Infrastructure

Fast deployment of branches

```java
1    Jenkinsfile

... ...
@@ -1,3 +1,4 @@
1    PalladioPipeline {
2    deployUpdatesite 'releng/org.palladiosimulator.indirections.updatesite/target/repository'
3    + skipDeploy false
3    }
```

...
Selected Benefits of Infrastructure

- Fast deployment of branches

  1  Jenkinsfile

  ```
  ... ...
  @@ -1,3 +1,4 @@
  1 1  PalladioPipeline {
  2 2    deployUpdatesite 'releng/org.palladiosimulator.indirections.updatesite/target/repository'
  3  +  skipDeploy false
  3 4  }
  ```

- Simple integration of further projects

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<thead>
<tr>
<th>S</th>
<th>W</th>
<th>Name ↓</th>
<th>Last Success</th>
<th>Last Failure</th>
<th>Last Duration</th>
<th># Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Palladio Simulator</td>
<td>2 hr 20 min - log</td>
<td>N/A</td>
<td>3 min 6 sec</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trust 4.0</td>
<td>5 hr 29 min - log</td>
<td>N/A</td>
<td>1 min 17 sec</td>
<td>-</td>
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Lessons Learned

- Dedicated persons required for migrations
  - Failed approach: everybody migrates on next change
  - Final approach: hire student to do batch migration (½ year)
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- Dedicated persons required for migrations
  - Failed approach: everybody migrates on next change
  - Final approach: hire student to do batch migration ($\frac{1}{2}$ year)
- Fast feedback and review process pushes confidence
  - Fear of submitting a change reduced (but still exists)
  - At least two people know about a change
Lessons Learned

- Dedicated persons required for migrations
  - Failed approach: everybody migrates on next change
  - Final approach: hire student to do batch migration (½ year)
- Fast feedback and review process pushes confidence
  - Fear of submitting a change reduced (but still exists)
  - At least two people know about a change
- Dedicated persons required for maintaining CI
  - Ensure aligned build process
  - Assistance to new developers
Conclusions

**Future Work**
- Raise awareness for code quality metrics
- CI for documentation

**Benefits**
- Easier contribution
- Reusable building blocks for CI systems

**Diagram**
- Contribution
- Quality Review
- Github
- Push Event
- Repo Event
- Status
- Jenkins
- Update Site
- Dependencies
- Webserver
Image References

- Jenkins Logo “Stay Safe” by Martin Grosche
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