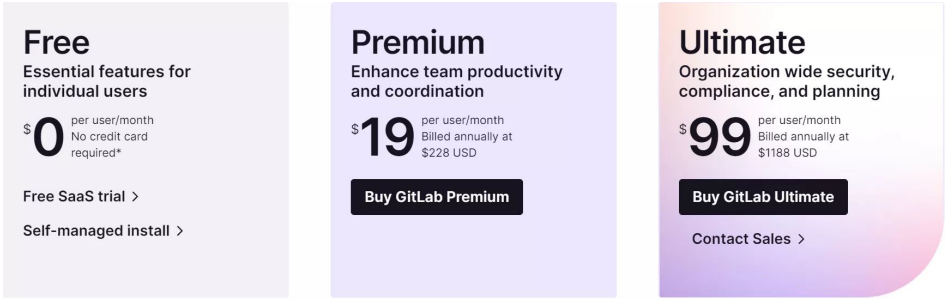
Building an Open Source Continuous Integration (CI) System for CPSWT using Jenkins

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Motivation

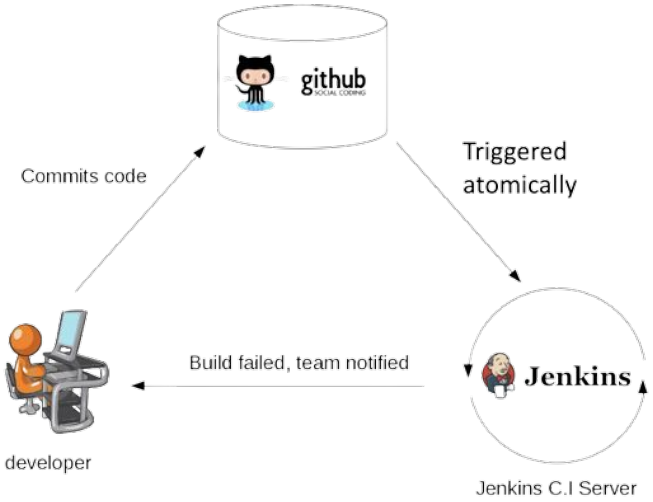
- Early detection of integration Issues
- Cost efficiency
- Customized solutions





Continuous Integration with Jenkins

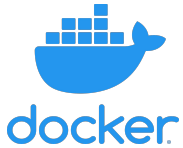
- Developers commit code to a shared repository on a regular basis.
- Automated tools are used to assert the new code's correctness before integration.
- The results from the build will be notified to developers immediately



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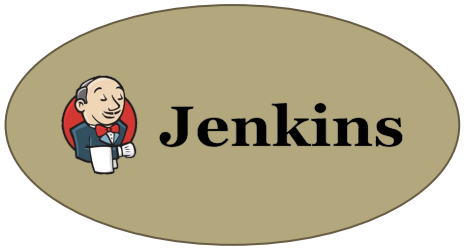
My Work

- Spin up a Jenkins server
- Containerize existing Gradle projects.
- Created Jenkins pipelines using Groovy scripting to automate the build, test process
- Make Jenkins server accessible through HTTP











An Example Use Case

- CPSWT-Meta
  - Extend WebGME to support loading several CPSWT meta models
  - Utilize the Core API to generate a Gradle project based on the loaded meta models
  - Run the Gradle project manually

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An Example Pipeline for CPSWT-Meta

Stage View

	Declarative: Checkout SCM	Clone repository	Build cpswt-meta image	Deploy image	Wait for cpswt-meta container to stop	Output HelloWorldJava from container	Build HelloWorldJava image	Deploy HelloWorldJava image	Wait for HelloWorldJava container to stop	Archive loggings	Declarative: Post Actions
Average stage times: (Average full run time: ~7min 29s)	872ms	1s	2s	15s	694ms	1s	2s	4min 53s	338ms	433ms	4s
#28 Aug 02 20:36 1 commit	1s	1s	2s	15s	614ms	1s	3s	5min 34s	604ms	902ms	1s
#27 Aug 02 20:16 1 commit	833ms	1s	2s	15s	780ms	1s	3s	6min 48s	662ms	1s	2s
#26 Aug 02 20:13 1 commit	807ms	900ms	2s	14s	763ms	1s failed	159ms failed	109ms failed	113ms failed	108ms failed	1s

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Reflections

- Challenges encountered:
  - Switching from various environments
  - Finding the right tools to do the work
- Lessons learned:
  - Read official docs. Don’t blindly trust ChatGPT
  - Seek helps when stuck
- Further steps:
  - A secure and scalable Jenkins server

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