

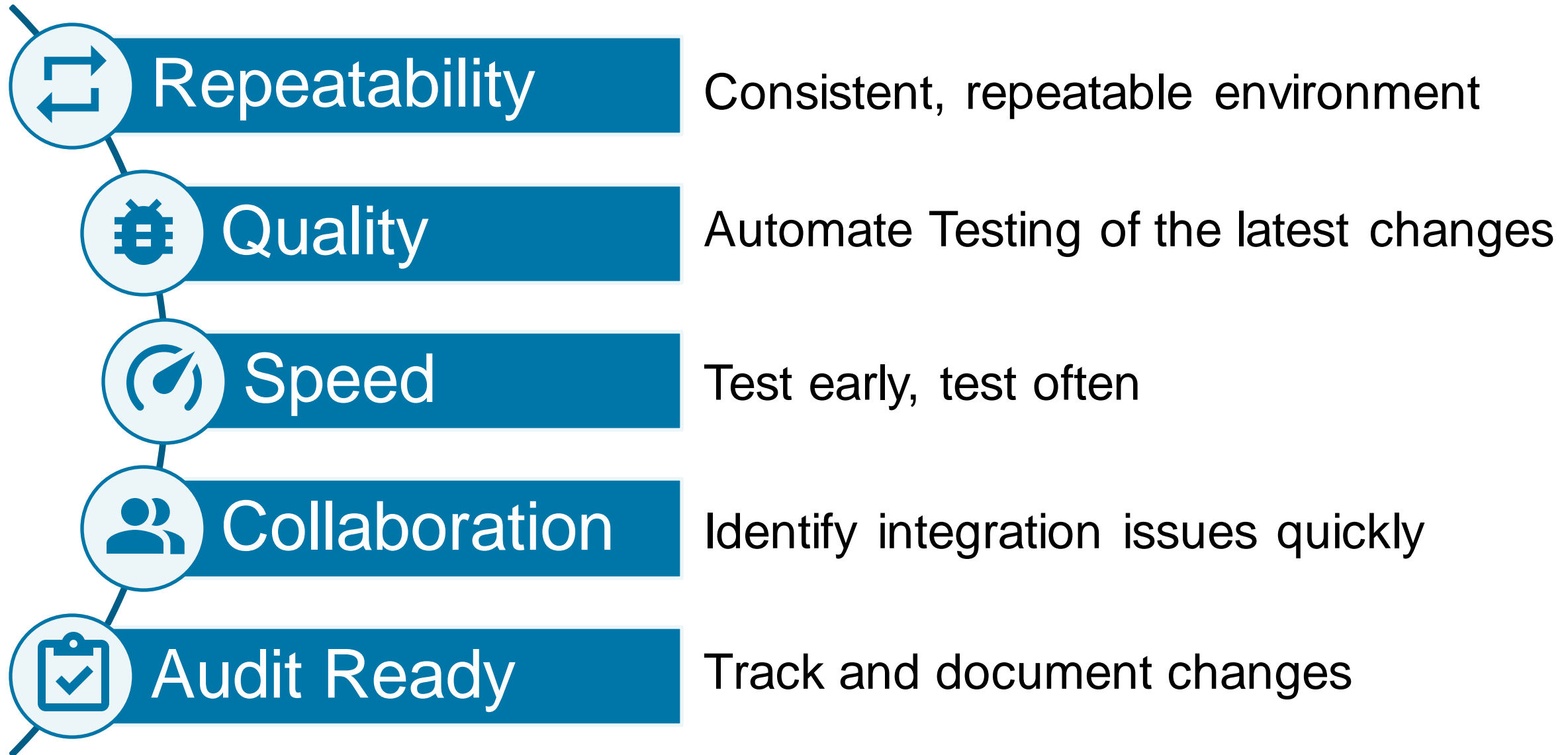
MATLAB EXPO

Simulink 모델 및 코드 검증을 위한 CI/CD (Continuous Integration / Continuous Delivery) 적용

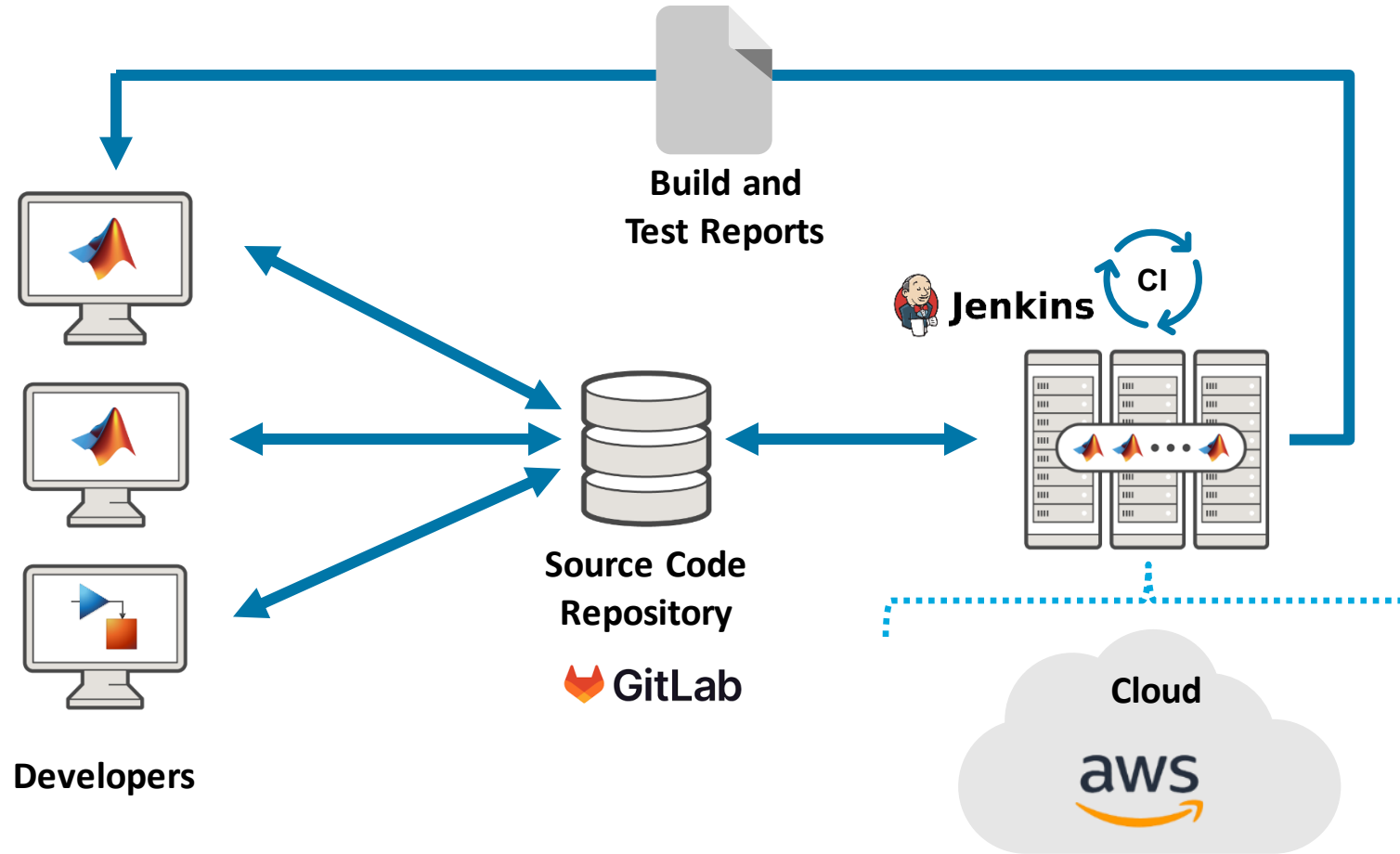
김학범, 매스웍스코리아



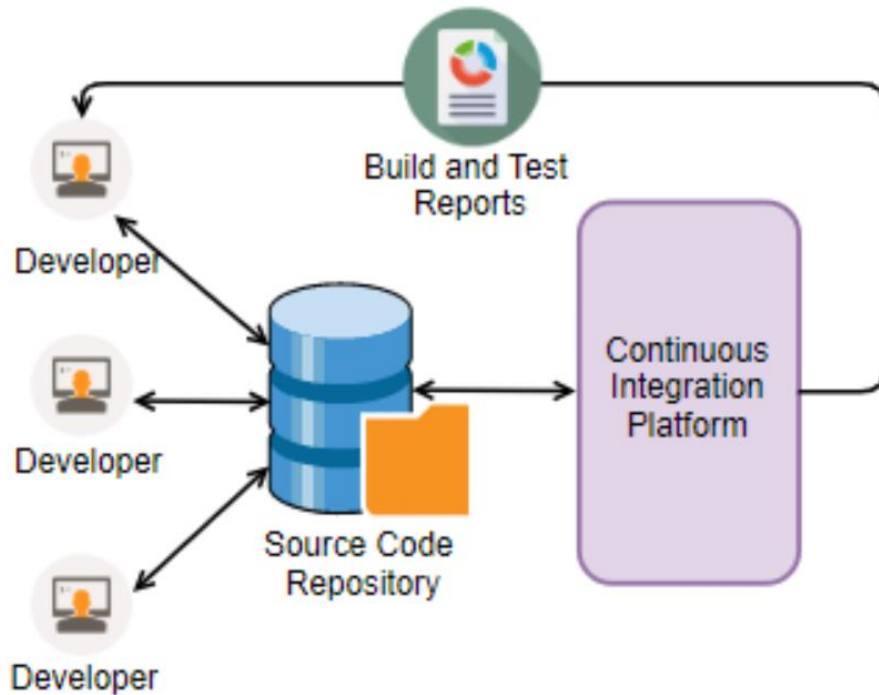
Benefits of Continuous Integration



Overview of the demo on how to compose it (1)



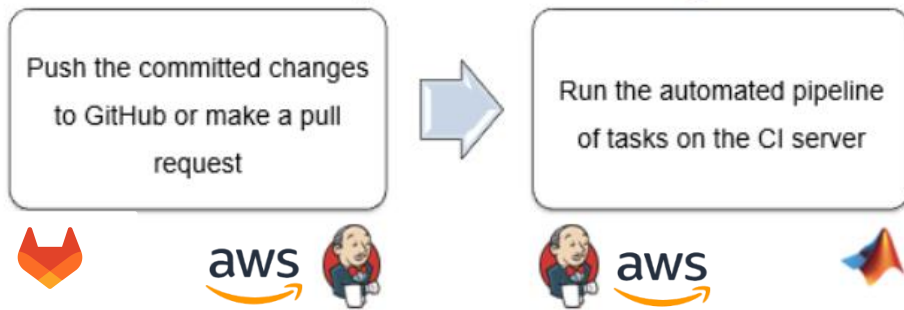
Overview of the demo on how to compose it (2)



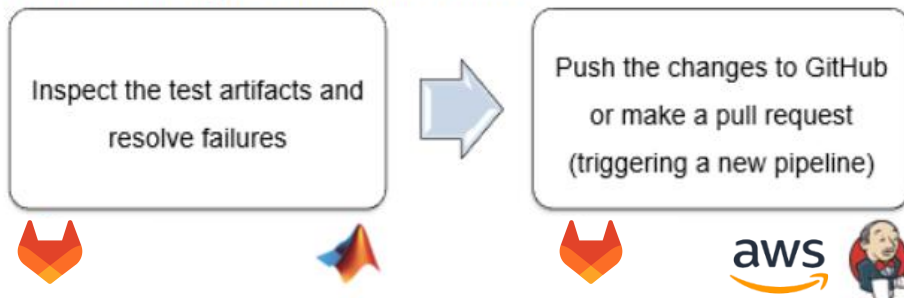
Phase 1: Develop and Qualify Feature in Local Repository



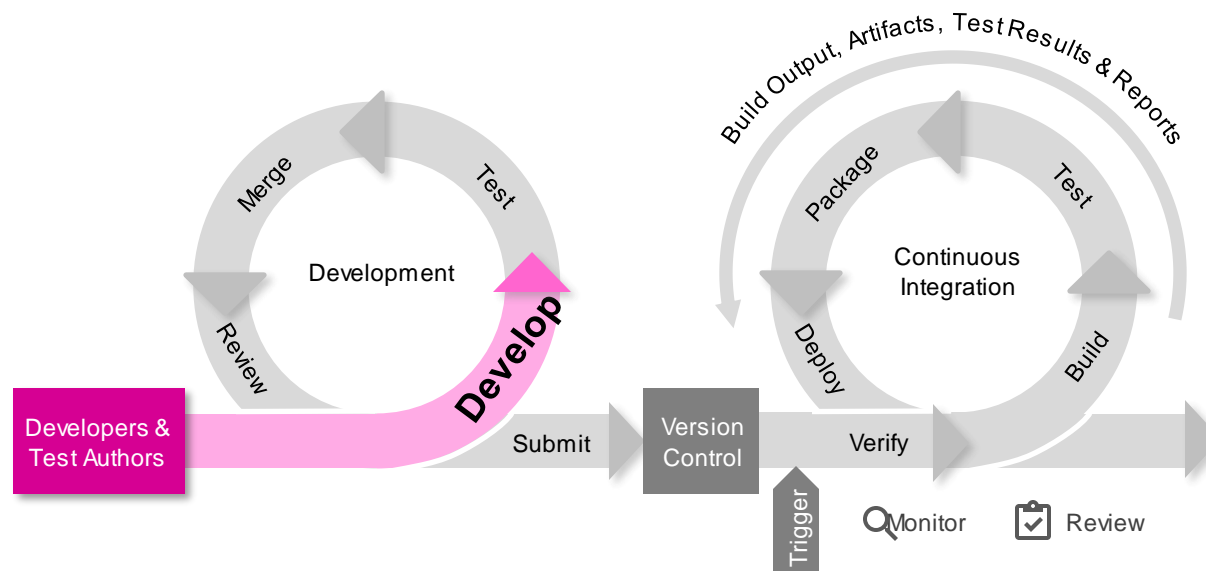
Phase 2: Run Automated Pipeline on Continuous Integration Platform



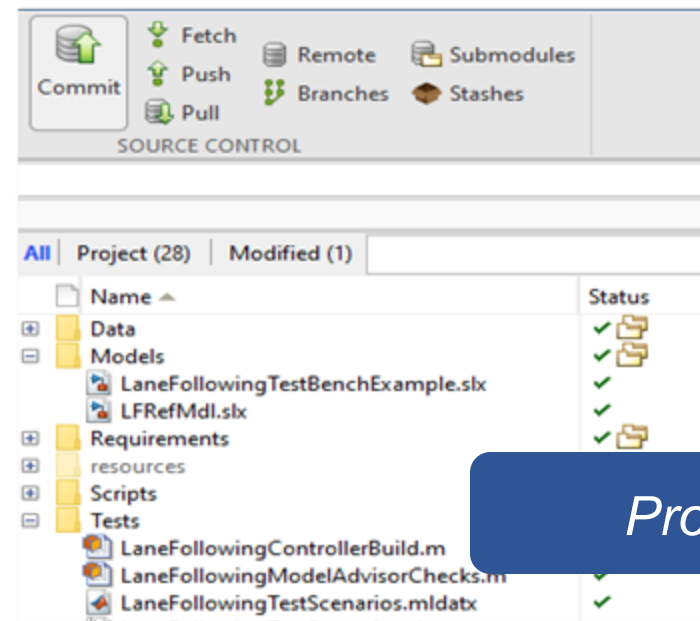
Phase 3: Investigate and Resolve Failures



Continuous Integration Workflow with Model-Based Design

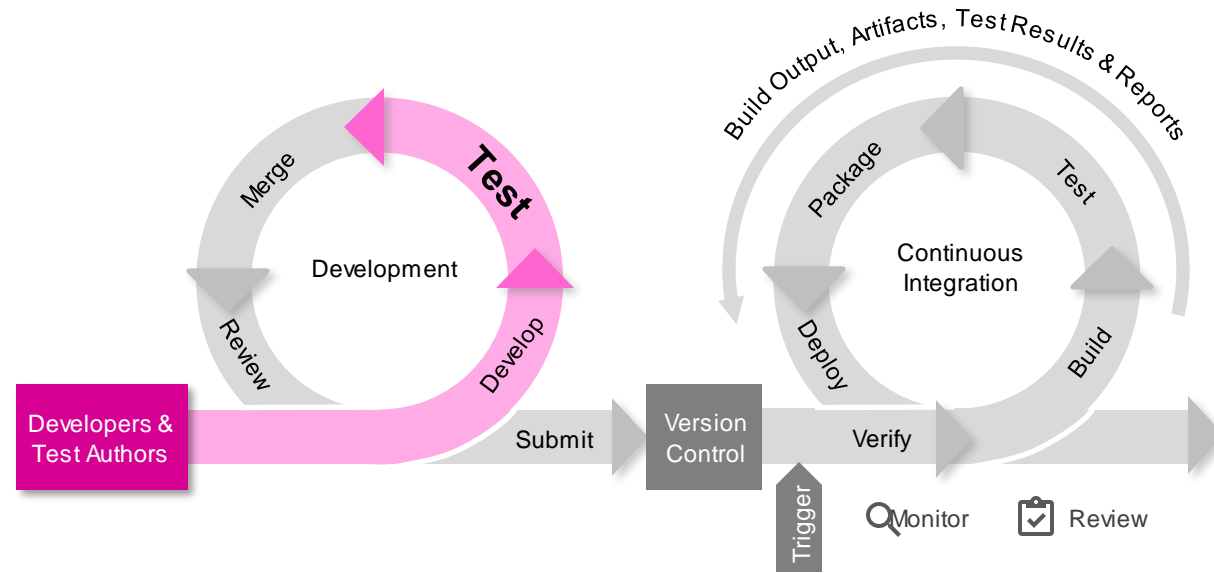


1 Development

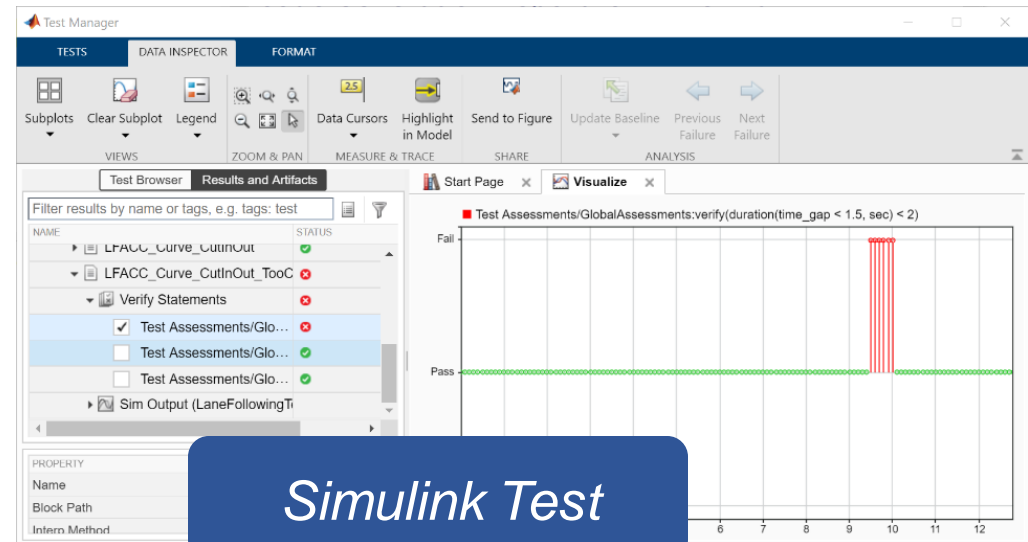


Projects

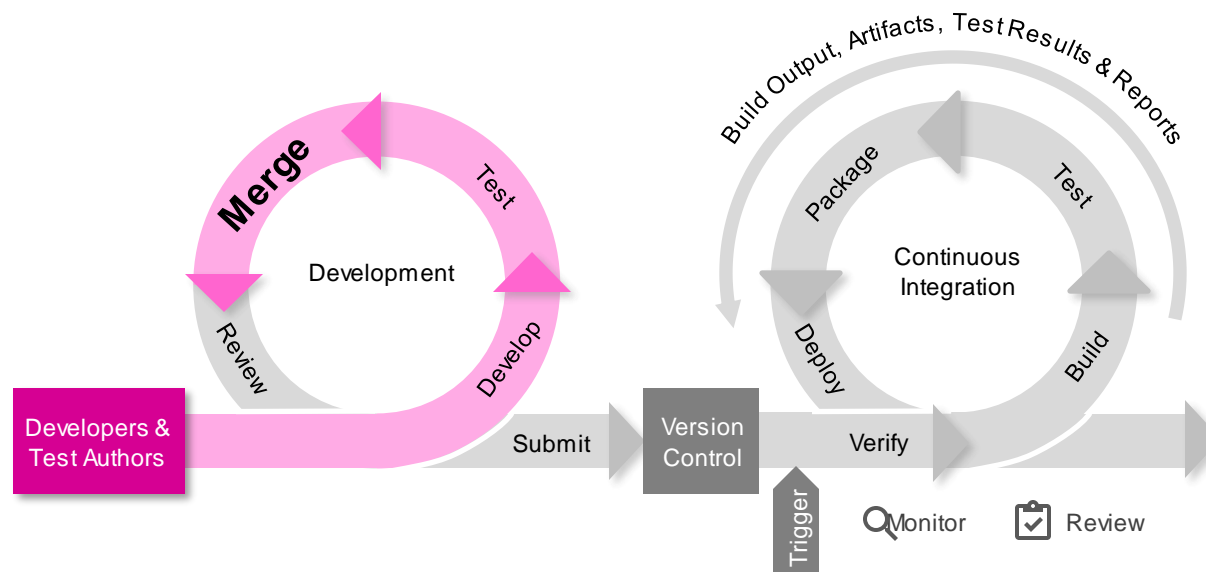
Continuous Integration Workflow with Model-Based Design



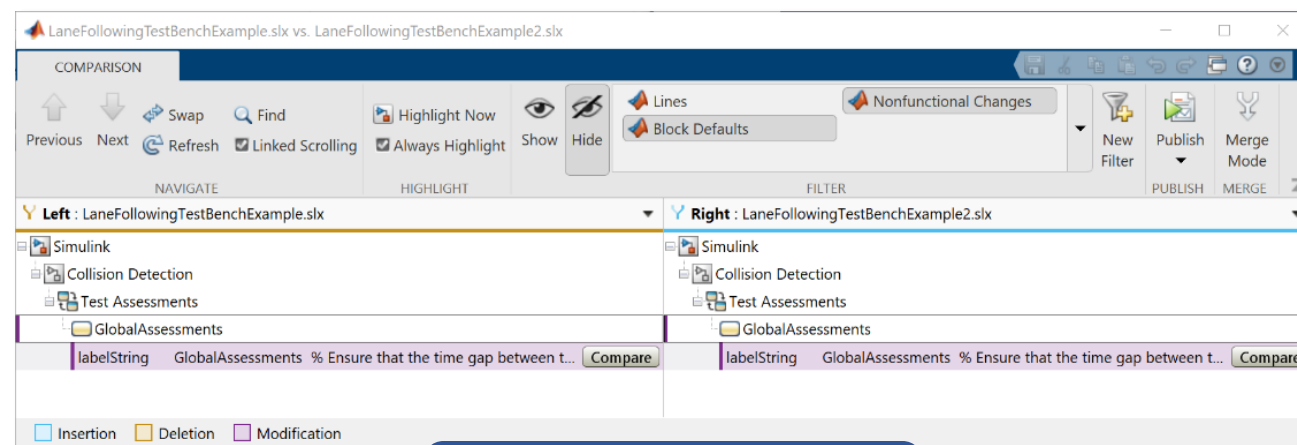
1 Development



Continuous Integration Workflow with Model-Based Design

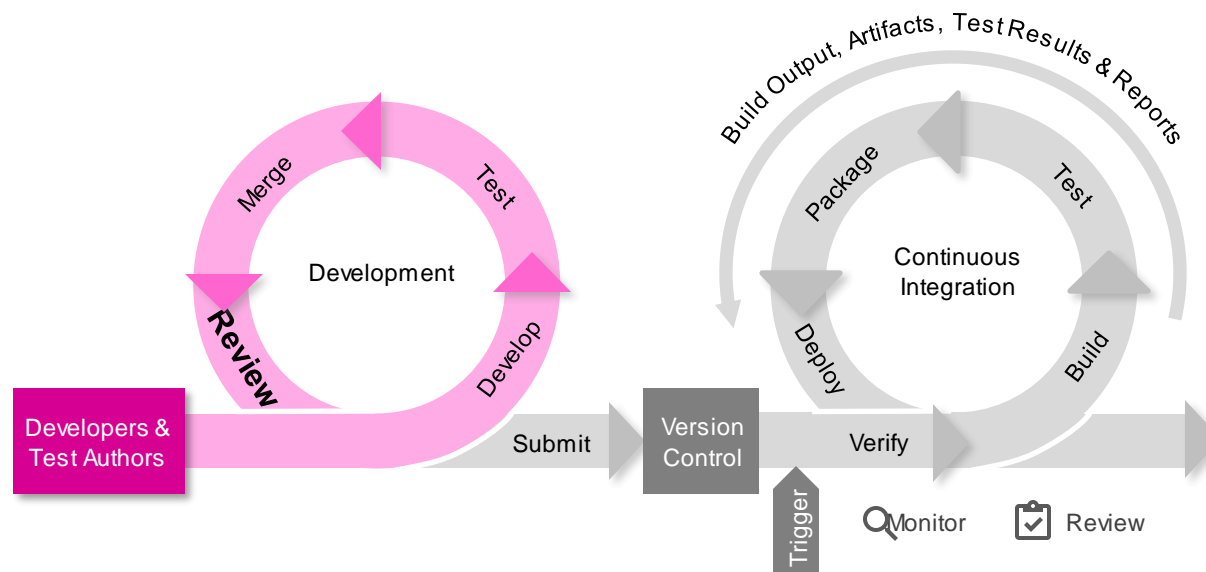


1 Development



Model Compare

Continuous Integration Workflow with Model-Based Design



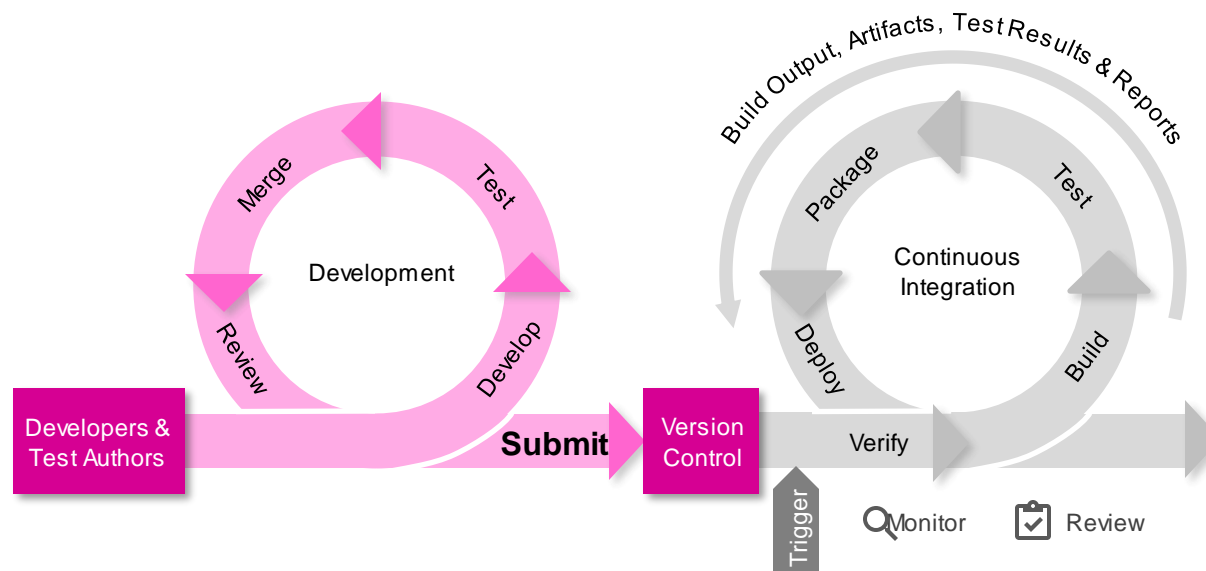
1 Development

David Boissy 12 minutes ago
Ship it!

Reply Resolve

Compare Report

Continuous Integration Workflow with Model-Based Design

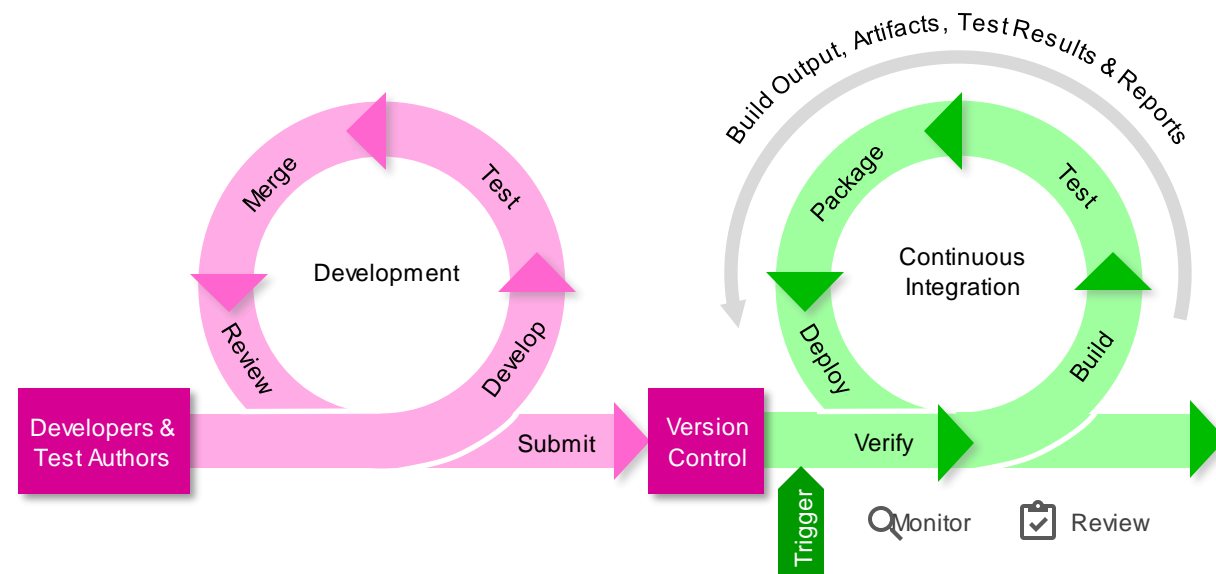


1 Development

Name	Status
Data	✓
Models	✓
LaneFollowingTestBenchExample.slx	✓
LFRRefMdl.slx	✓
Requirements	✓
resources	✓
LaneFollowingTestScenarios.mldatx	✓

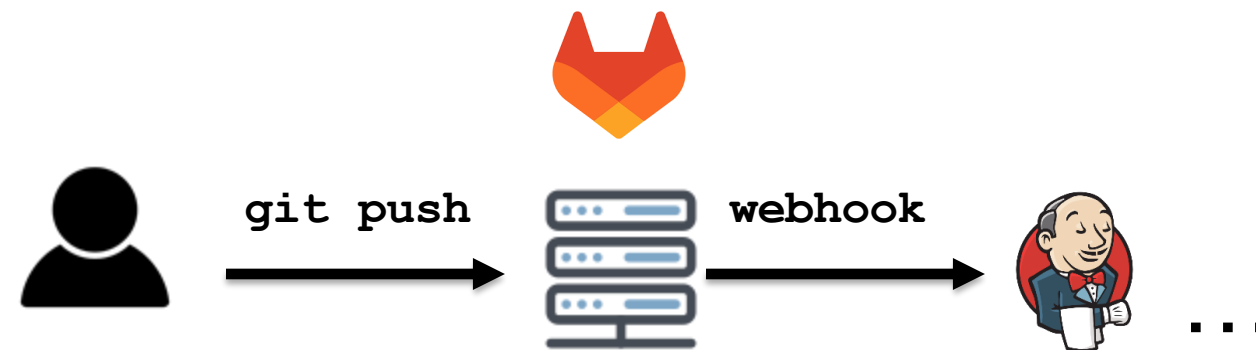
Manage using Projects

Continuous Integration Workflow with Model-Based Design

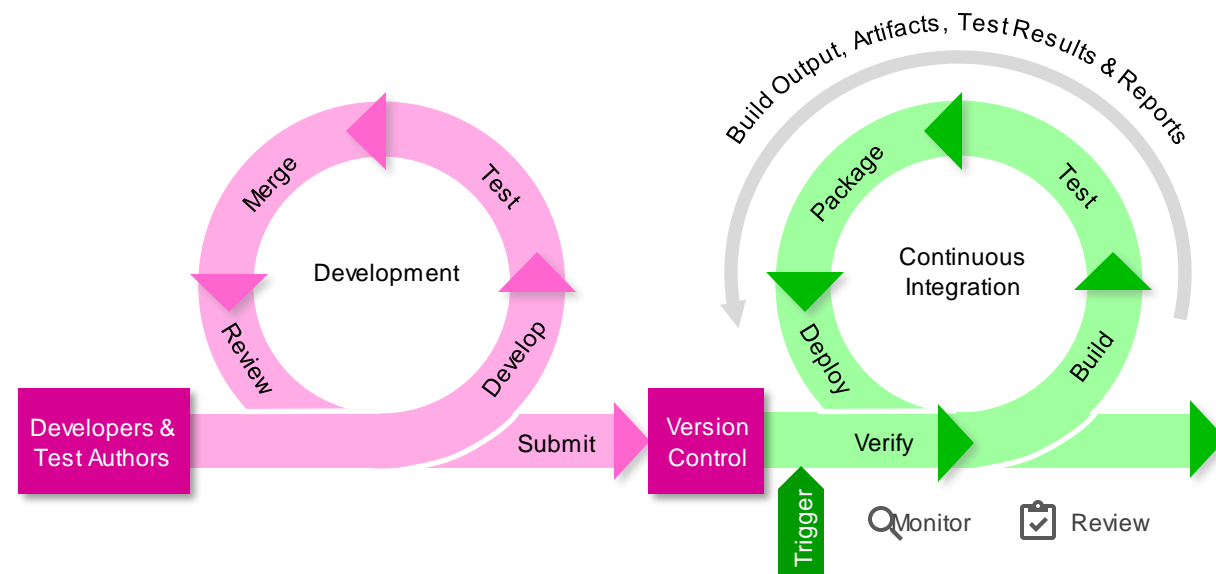


1 Development

2 Continuous Integration

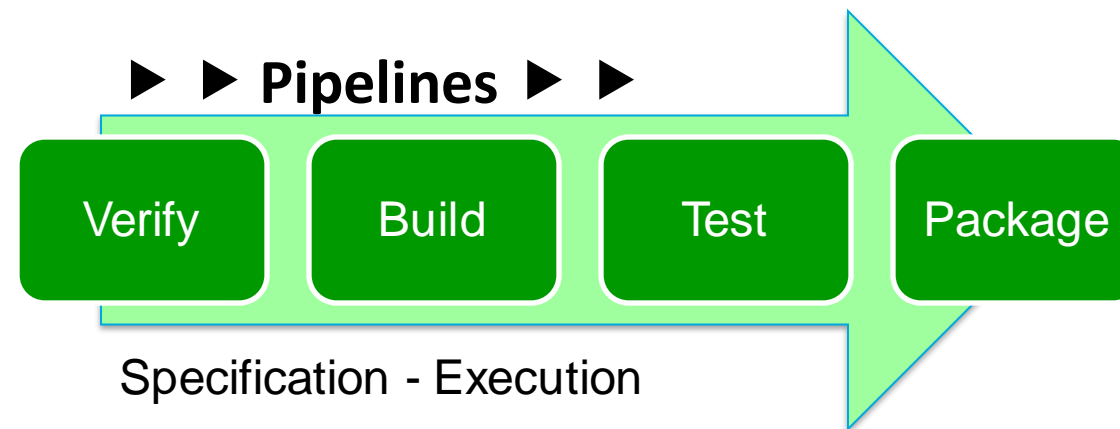


Continuous Integration Workflow with Model-Based Design

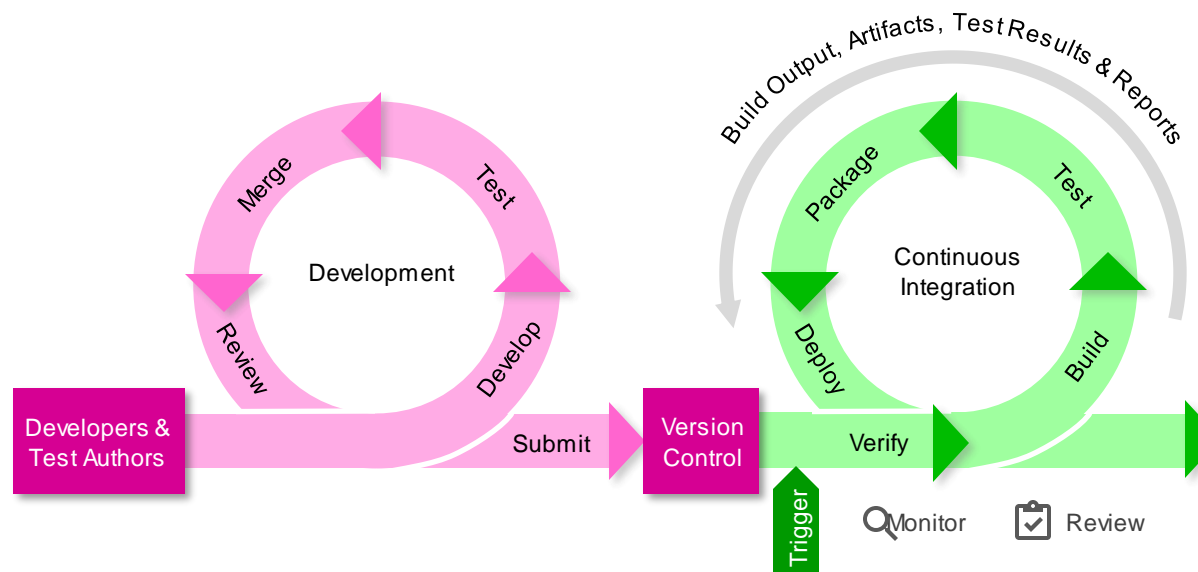


1 Development

2 Continuous Integration

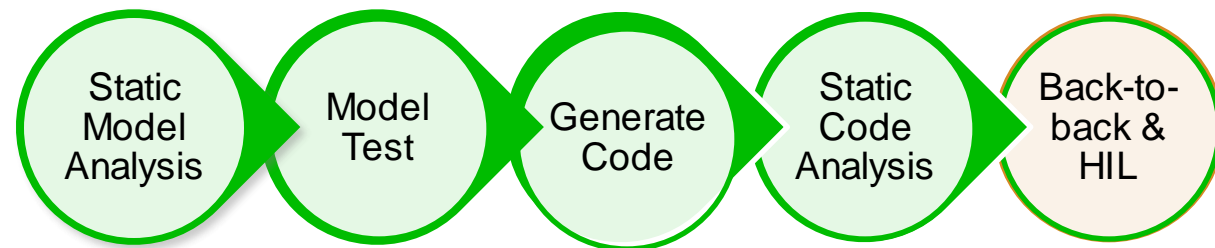


Continuous Integration Workflow with Model-Based Design



1 Development

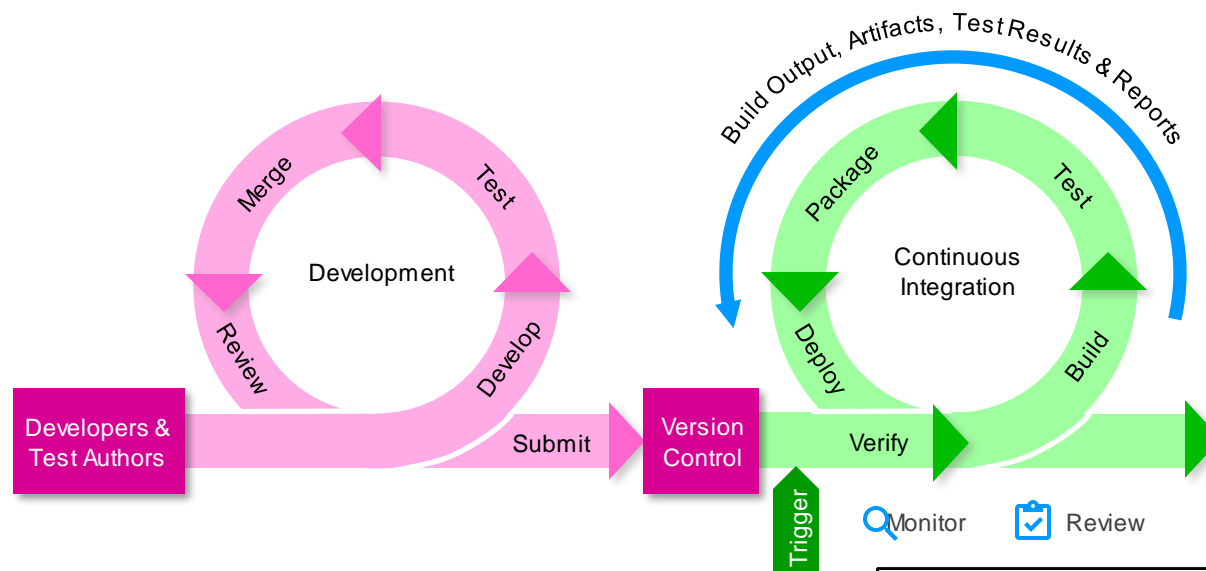
2 Continuous Integration



Reports, Build Logs, Test Results, Code Coverage

Verification, Build and Test

Continuous Integration Workflow with Model-Based Design



- 1 **Development**
- 2 **Continuous Integration**
- 3 **Results Monitor and Review**

Results: 2017-Jan-19 13:34:39
 Result Type: Result Set
 Parent: None
 Start Time: 2017-Jan-19 13:34
 End Time: 2017-Jan-19 13:35
 Outcome: Total: 2, Passed: 2

Aggregated Coverage Results

Analyzed Model	Sim Mode	Comp.	Decision	Condition
AHRS_voter	ModelRefSIL32	32	24%	100%

[Back to Report Summary](#)

AHRS_voter_SLDV_TestCases

Test Result Information

Result Type: Test File Result
 Parent: Results: 2017-Jan-19 13:34
 Start Time: 2017-Jan-19 13:34
 End Time: 2017-Jan-19 13:35
 Outcome: Total: 2, Passed: 2

Test Suite Information

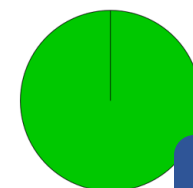
Name: AHRS_voter_SLDV
[Back to Report Summary](#)

MATLAB® Test Report

Timestamp: 04-Feb-2017
 Host: SEBDEEP
 Platform: win64
 MATLAB Version: 9.9.0.1536

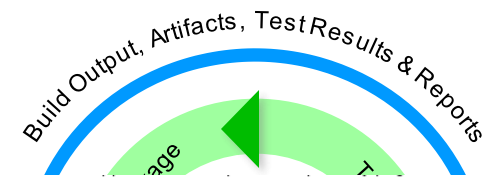
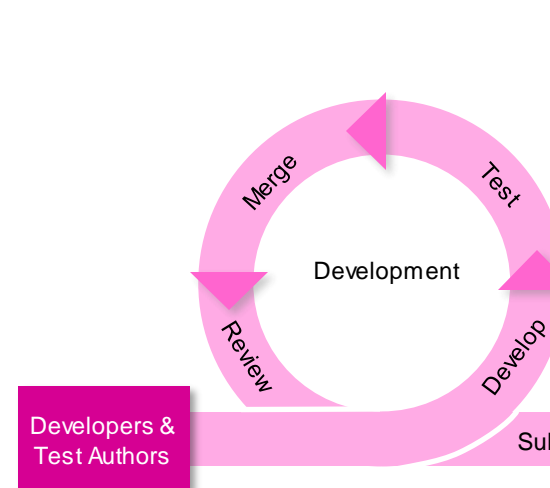
Number of Tests: 4
 Testing Time: 170.767

Overall Result: PASSED



Reports and Review

Continuous Integration Workflow with Model-Based Design



- 1 Development
- 2 Continuous Integration
- 3 Results Monitor and Review
- 4 Merge

You pushed to `testing` 7 minutes ago Create merge request

testing mbdexamplewithgitlab / +

History Find file Web IDE Clone

Fixes #1 authored 11 minutes ago 64fec1ae

Name	Last commit	Last update
Data	initial commit	1 month ago
Design	Fixes #1	11 minutes ago
Requirements	used pdf for crs_req	1 month ago
resources/project	test	9 hours ago
tools	test	4 hours ago
.crs_controller-gitlab-ci.yml	Initial commit	51 minutes ago
.cruiseControlMode-gitlab-ci.yml	Initial commit	51 minutes ago
.driverSwRequest-gitlab-ci.yml	Initial commit	51 minutes ago
.gitattributes	Initial commit	1 month ago
.gitignore	Initial commit	1 month ago
.gitlab-ci.yml	test	4 hours ago
.targetSpeedThrottle-gitlab-ci.yml	Initial commit	51 minutes ago
CruiseControlExample.prj	Initial commit	1 month ago

We complete the form and submit the merge request.

As the owners of the branch, we can accept the merge request by clicking the Merge button. Depending on our CI setup, we can also enable automatic merge after the CI pipeline has passed. All changes are now captured on the main branch, and the pipeline automatically starts running on the master branch.

Demo: Continuous Integration Workflow with Model-Based Design

Code Static Analysis with Polyspace

Build	Checkout	Static Analysis	CruiseControlMode	DriverswRequest	TargetspeedThrottle	crs_controller	Dynamic	CruiseControlMode	DriverswRequest	TargetspeedThrottle	crs_controller	Build	CruiseControlMode	DriverswRequest	TargetspeedThrottle	crs_controller	Polyspace - Bug Finder / Code Prove Together	Polyspace - Upload results to Polyspace Access	Polyspace - Assign Issues to owners	Packaging
1918	4s	129ms	1min 23s	1min 42s	1min 40s	2min 4s	124ms	0ms	0ms	0ms	0ms	142ms	0ms	0ms	0ms	0ms	1min 27s	39s	21s	97ms
1919	4s	125ms			1min 25s		125ms			1min 40s		125ms	1min 32s	1min 38s	1min 37s	2min 22s	1min 51s	1min 41s	1min 12s	94ms
1920	4s	171ms			1min 37s		125ms			1min 53s		172ms	328ms	312ms	328ms	328ms	94ms	94ms	93ms	109ms
1724	4s	125ms					141ms					141ms	1min 36s	1min 42s	1min 42s	2min 26s	1min 27s	124ms	125ms	109ms
1710	3s	109ms					156ms					125ms	2min 58s	3min 47s	3min 46s	3min 46s	1min 56s	1min 41s	1min 9s	82ms
1438	5s	123ms			1min 26s		141ms			1min 37s		125ms	1min 31s	1min 37s	2min 23s	2min 23s	1min 50s	22s	93ms	94ms
1430	4s	109ms			1min 26s		141ms			1min 40s		156ms	296ms	313ms	328ms	344ms	109ms	109ms	94ms	110ms
1419	4s	125ms					125ms					140ms	1min 35s	2min 26s	1min 36s	2min 27s	1min 50s	1min 42s	1min 10s	94ms
1405	3s	125ms			1min 25s		125ms			1min 39s		125ms	1min 31s	1min 38s	2min 23s	2min 22s	1min 51s	22s	109ms	94ms
1527	4s	132ms			1min 41s		128ms			1min 58s		141ms	1min 33s	1min 40s	2min 22s	2min 22s	1min 52s	22s	100ms	95ms
1811	3s	146ms					140ms					143ms	1min 38s	2min 36s	1min 35s	2min 35s	1min 53s	22s	105ms	93ms

고정링크

- Last build: #201.9 min 43 sec
- Last stable build: #171.2 for 11 min
- Last successful build: #171.2 for 11 min
- Last failed build: #171.9 min 39 sec
- Last unsuccessful build: #171.9 min 39 sec
- Last completed build: #151.8 min 39 sec

x5 배속

Demo: Continuous Integration Workflow with Model-Based Design

Stage Logs (Polyspace - Upload results to Polyspace Access)

```

Windows Batch Script -- %psaccess_cmd% -create-project public/MBDwithCICD_JenkinsPipeline (self time 1s)
Windows Batch Script -- %psaccess_cmd% -parent-project public/MBDwithCICD_JenkinsPipeline -project CruiseControlMode_BF -upload .\Code\PolyspaceResults\BF_CruiseControlMode (self time 12s)
Windows Batch Script -- %psaccess_cmd% -parent-project public/MBDwithCICD_JenkinsPipeline -project DriverSwRequest_BF -upload .\Code\PolyspaceResults\BF_DriverSwRequest (self time 12s)
Windows Batch Script -- %psaccess_cmd% -parent-project public/MBDwithCICD_JenkinsPipeline -project TargetSpeedThrottle_BF -upload .\Code\PolyspaceResults\BF_TargetSpeedThrottle (self time 12s)
Windows Batch Script -- %psaccess_cmd% -parent-project public/MBDwithCICD_JenkinsPipeline -project crs_controller -upload .\Code\PolyspaceResults\CP_CruiseControlMode (self time 12s)
Windows Batch Script -- %psaccess_cmd% -parent-project public/MBDwithCICD_JenkinsPipeline -project CP_DriverSwRequest -upload .\Code\PolyspaceResults\CP_DriverSwRequest (self time 11s)
Windows Batch Script -- %psaccess_cmd% -parent-project public/MBDwithCICD_JenkinsPipeline -project TargetSpeedThrottle_CP -upload .\Code\PolyspaceResults\CP_TargetSpeedThrottle (self time 12s)

C:\ProgramData\Jenkins\workspace\ML_Expo_MBD_CICD_Pipeline_New\D:\Polyspace
thCICD_JenkinsPipeline -project TargetSpeedThrottle_CP -upload .\Code\PolyspaceResults
Zipping results
Connecting to https://psaccess.duckdns.org:9443
Connecting as garyryu
Upload .\Code\PolyspaceResults\CP_TargetSpeedThrottle in public/MBDwithCICD_JenkinsPipeline/TargetSpeedThrottle_CP
Upload with IMPORT_ID 1717131093343_83ce1996-f314-4e8a-98e5-7cbc5a96a7a0.zip
Upload successful for RUN_ID 324 and PROJECT_ID 111
ACCESS_URL https://psaccess.duckdns.org:9443/metrics/index.html?a=metrics&p=111&r=324
Upload completed for 1 / 1 runs
Command Completed
Windows Batch Script -- %psaccess_cmd% -parent-project public/MBDwithCICD_JenkinsPipeline -project crs_controller_CP -upload .\Code\PolyspaceResults\CP_crs_controller (self time 12s)
  
```

Link to Polyspace Access

ACCESS_URL <https://psaccess.duckdns.org:9443/metrics/index.html?a=metrics&p=111&r=324>

#	Checkout	Static Analysis	CruiseControlMode	DriverSwRequest	TargetSpeedThrottle	crs_controller	Dynamic Analysis	CruiseControlMode	DriverSwRequest	TargetSpeedThrott
#24	Jun 3, 2024, 4:43 PM	4s	154ms	1min 55s	2min 3s	1min 52s	2min 33s	147ms	0ms	0ms
#23	Jun 3, 2024, 4:34 PM	6s	219ms	3min 20s	3min 34s	3min 35s	158ms	2min 17s	2min 8s	
#22	Jun 3, 2024, 4:21 PM	4s	140ms				156ms			
#21	Jun 3, 2024, 3:57 PM	4s	141ms				156ms			
#20	May 31, 2024, 7:18 PM	4s	141ms				156ms			

MATLAB EXPO



© 2024 The MathWorks, Inc. MATLAB and Simulink are registered trademarks of The MathWorks, Inc. See mathworks.com/trademarks for a list of additional trademarks. Other product or brand names may be trademarks or registered trademarks of their respective holders.

