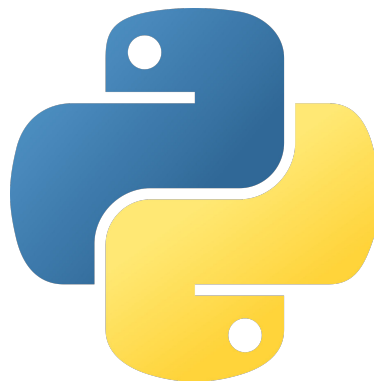


# Updating the Build, Test, and Deploy systems for MDSplus

Stephen Lane-Walsh

# Overview

- Jenkins
  - Security
  - Maintainability
  - Documentation
  - Speed
  - Releases
  - Blue Ocean
- Testing
- CMake
  - `build.sh`→`build.py`



# Jenkins - Security

- Internal server
- Role-Based Active Directory instead of GitHub auth
- Review Plugins
- Auto-Updating\*

# Jenkins - Maintainability

- Jenkinsfile
- Better understanding of how it is built
- Able to add new builds more easily
- Modern plugins are easier to update
- Easier to offload specific jobs to different agents\*

# Jenkins - Documentation

- Better documentation for how it is built\*
- Instructions for adding new jobs\*

# Jenkins - Speed

- More parallel = better
- Run operating systems in parallel
- Run build commands in parallel
- Run tests in parallel

# Jenkins - Releases

- More frequent alpha/stable releases
- Build artifacts published to GitHub
- Enforce proper version bumping\*

The screenshot shows a GitHub release page for the repository 'mdsplus-jenkins'. The release is titled 'alpha\_release-7-144-81' and was released on June 3. The release page includes a 'What's Changed' section with a list of updates, a 'Full Changelog' link, a 'Contributors' section, and a list of 'Assets'.

**alpha\_release-7-144-81**

mdsplus-jenkins released this Jun 3

**What's Changed**

- Build: bootstrap - export PYTHON for scripts like python/generate\_tests by @zack-vii in #2733
- Build: Fix version bumping by @WhoBrokeTheBuild in #2778
- Build: Monkeypatch nose to support python3 by @WhoBrokeTheBuild in #2779
- fix: clean rfa de-/encoding by @zack-vii in #2783
- build: ignore test output by @zack-vii in #2782

**Full Changelog:** [alpha\\_release-7-144-80...alpha\\_release-7-144-81](#)

**Contributors**

WhoBrokeTheBuild and zack-vii

**Assets** 25

MD5plus-alpha-7.144-81.exe	44.4 MB	Jun 3
mdsplus_alpha_7.144.81_debian10-64_amd64_debs.tgz	51.8 MB	Jun 3
mdsplus_alpha_7.144.81_debian10-64_amd64_debs.tgz	32.8 MB	Jun 3
mdsplus_alpha_7.144.81_debian11-64_amd64.tgz	49.4 MB	Jun 3
mdsplus_alpha_7.144.81_debian11-64_amd64_debs.tgz	32.4 MB	Jun 3
mdsplus_alpha_7.144.81_debian12-64_amd64.tgz	48.9 MB	Jun 3
mdsplus_alpha_7.144.81_debian12-64_amd64_debs.tgz	32.3 MB	Jun 3
mdsplus_alpha_7.144.81_debian9-64_amd64.tgz	50.3 MB	Jun 3
mdsplus_alpha_7.144.81_debian9-64_amd64_debs.tgz	31.5 MB	Jun 3
mdsplus_alpha_7.144.81_rhel7.tgz	64.7 MB	Jun 3
mdsplus_alpha_7.144.81_rhel7_rpms.tgz	44.6 MB	Jun 3
mdsplus_alpha_7.144.81_rhel8_amd64.tgz	52.9 MB	Jun 3
mdsplus_alpha_7.144.81_rhel8_amd64_rpms.tgz	35.8 MB	Jun 3

# Jenkins - Blue Ocean

Passed - 1680

- ✓ > Distributions / rhel9 Build & Test / rhel9 Test / tests/64/tditest/testing/test-mdsip - rhel9
- ✓ > Distributions / rhel9 Build & Test / rhel9 Test / tests/64/tditest/testing/test-mdsmisc - rhel9
- ✓ > Distributions / rhel9 Build & Test / rhel9 Test / tests/64/tditest/testing/test-tcl - rhel9
- ✓ > Distributions / rhel9 Build & Test / rhel9 Test / tests/64/tditest/testing/test-tab - rhel9
- ✓ > Distributions / rhel9 Build & Test / rhel9 Test / tests/64/tditest/testing/test-mdsip0 - rhel9
- ✓ > Distributions / rhel9 Build & Test / rhel9 Test / tests/64/tditest/testing/test-treeshr - rhel9
- ✓ > Distributions / rhel9 Build & Test / rhel9 Test / tests/64/tditest/testing/test-tdishr - rhel9
- ✓ > Distributions / rhel9 Build & Test / rhel9 Test / tests/64/python/MDSplus/tests/connection\_tcp\_test - rhel9
- ✓ > Distributions / rhel9 Build & Test / rhel9 Test / tests/64/python/MDSplus/tests/data\_tdipty\_test - rhel9
- ✓ > Distributions / rhel9 Build & Test / rhel9 Test / tests/64/python/MDSplus/tests/segment\_update\_test - rhel9

✓ MDSplus < 242 > Pipeline Changes Tests Artifacts Logout

Branch: alpha | Commit: ccfa885 | 22m 13s | No changes | Started by timer

Start Setup Calculate Version Distributions Additional Testing Publish Publish to GitHub

debi... debian10-64 Clone, debian10-64 Bootstrap, debian10-64 Test, debian10-64 Release

debi... debian11-64 Clone, debian11-64 Bootstrap, debian11-64 Test, debian11-64 Release

debi... debian12-64 Clone, debian12-64 Bootstrap, debian12-64 Test, debian12-64 Release

debi... debian9-64 Clone, debian9-64 Bootstrap, debian9-64 Test, debian9-64 Release

rhel7 B... rhel7 Clone, rhel7 Bootstrap, rhel7 Test, rhel7 Release

rhel8 B... rhel8 Clone, rhel8 Bootstrap, rhel8 Test, rhel8 Release

rhel9 B... rhel9 Clone, rhel9 Bootstrap, rhel9 Test, rhel9 Release

test-as... test-asan Clone, test-asan Bootstrap, test-asan Test

test-ts... test-tsan Clone, test-tsan Bootstrap, test-tsan Test

test-ub... test-ubun Clone, test-ubun Bootstrap, test-ubun Test

ubunt... ubuntu18 Clone, ubuntu18 Bootstrap, ubuntu18 Test, ubuntu18 Release

ubunt... ubuntu20 Clone, ubuntu20 Bootstrap, ubuntu20 Test, ubuntu20 Release

ubunt... ubuntu22 Clone, ubuntu22 Bootstrap, ubuntu22 Test, ubuntu22 Release

ubunt... ubuntu24 Clone, ubuntu24 Bootstrap, ubuntu24 Test, ubuntu24 Release

windo... windows Clone, windows Bootstrap, windows Test, windows Release

Publish to GitHub - <1s

- ✓ > Creating GitHub Release and Tag for alpha\_release-7-145-1 - Print Message <1s
- ✓ > Shell Script <1s
- ✓ > Archive the artifacts 3s
- ✓ > Delete workspace when build is done 12s



# Testing

- Determine test coverage\*
- Allow tests to run in parallel
- Switch from TAP to `junit.xml` (for Jenkins)
- Add IDL and MATLAB\* tests, licensed software
- Add cross-version testing\*

# CMake

- Migrate off of autotools
- More powerful language
- Speed - `make -j`
- Use `ctest` test runner tool, run test with environment
- Integrates with modern tools and IDEs
- Generate `compile_commands.json`
- Visualize dependencies
- Easier to add tests
- Rewrite all utility shell scripts as python, improve portability

# CMake - build.sh→build.py

- Build orchestration tool
- Better `--help` page
- Faster, allows building and testing in parallel
- Drop into a build/test prompt, in docker or on your computer
- Outputs test results as `junit.xml`
- Allows running only the failed tests
- Speeds up development and testing time

# Coming Soon™

- C++ MDSplus Devices
- Self-Configuring Devices (Fernando Santoro)
- MDSplus 8 (Mark Winkel)
- A pure-python implementation of (most of) MDSplus
  - Come see us on Friday for a demo!

Thank You!

PSFC

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