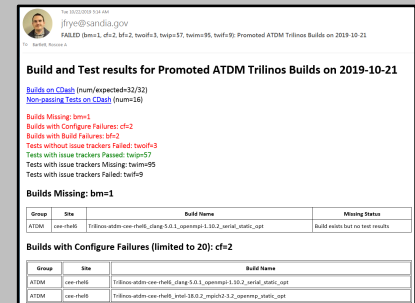
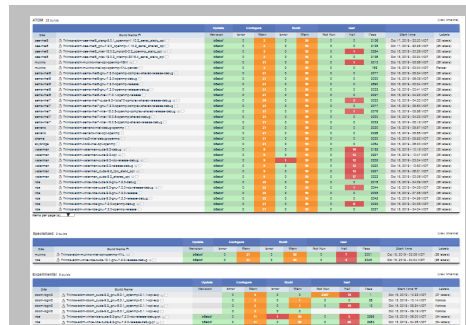
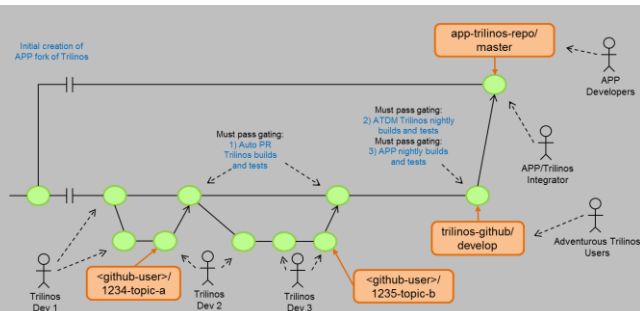


*Exceptional service in the national interest*



# Staying on top of a lot of CDash builds/tests: cdash\_analyze\_and\_report.py

Trilinos Developers Meeting  
October 23, 2019

Roscoe A. Bartlett, Joseph R. Frye  
Sandia National Laboratories

SAND2019-13824 C



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# ATDM Trilinos Nightly Builds and Tests (CDash)



2

ATDM 32 builds

[view timeline]

Site	Build Name	Update		Configure		Build		Test			Start time	Labels
		Revision	Error	Warn	Error	Warn	Not Run	Fail	Pass			
cee-rhel8	Trilinos-atdm-cee-rhel8clang-8.0.1_openmpi-1.10.2_serial_static_opt	b5ebdf	0	2	0	50	0	0	2136		Oct 17, 2019 - 22:20 MDT	(25 labels)
cee-rhel8	Trilinos-atdm-cee-rhel8gnu-7.2.0_openmpi-1.10.2_serial_shared_opt	b5ebdf	0	2	0	50	0	0	2138		Oct 17, 2019 - 23:28 MDT	(25 labels)
cee-rhel8	Trilinos-atdm-cee-rhel8intel-18.0.3_mpic2-2.2_openmpi-10.1.1_serial_static_opt	b5ebdf	0	2	0	50	0	1	2254		Oct 15, 2019 - 00:29 MDT	(25 labels)
cee-rhel8	Trilinos-atdm-cee-rhel8intel-18.0.3_intelmpi-2018.4_serial_static_opt	b5ebdf	0	2	0	50	0	0	2136		Oct 15, 2019 - 03:24 MDT	(25 labels)
mulino	Trilinos-atdm-mulino-intel-mpi-openmpi-HSW	b5ebdf	0	21	0	50	0	1	2013		Oct 15, 2019 - 05:56 MDT	(25 labels)
mulino	Trilinos-atdm-mulino-intel-mpi-openmpi-KNL-gender	b5ebdf	0	3	0	50	0	0	169		Oct 15, 2019 - 03:04 MDT	Panzer
sama-rhel8	Trilinos-atdm-sama-rhel8gnu-7.2.0-openmpi-complex-shared-release-debug	b5ebdf	0	21	0	50	0	0	2077		Oct 15, 2019 - 05:24 MDT	(25 labels)
sama-rhel8	Trilinos-atdm-sama-rhel8gnu-7.2.0-openmpi-debug	b5ebdf	0	21	0	50	0	0	2030		Oct 15, 2019 - 06:09 MDT	(25 labels)
sama-rhel8	Trilinos-atdm-sama-rhel8gnu-7.2.0-openmpi-release	b5ebdf	0	21	0	50	0	0	2090		Oct 15, 2019 - 03:24 MDT	(25 labels)
sama-rhel8	Trilinos-atdm-sama-rhel8gnu-7.2.0-openmpi-release-debug	b5ebdf	0	21	0	50	0	0	2032		Oct 15, 2019 - 03:41 MDT	(25 labels)
sama-rhel8	Trilinos-atdm-sama-rhel8intel-17.0.1-openmpi-release	b5ebdf	0	21	0	50	0	0	2027		Oct 15, 2019 - 04:33 MDT	(25 labels)
sama-rhel7	Trilinos-atdm-sama-rhel7-cuda-9.2-Volta70-complex-shared-release-debug	b5ebdf	0	24	0	50	0	3	2023		Oct 15, 2019 - 04:33 MDT	(25 labels)
sama-rhel7	Trilinos-atdm-sama-rhel7-gnu-7.2.0-openmpi-complex-shared-release-debug	b5ebdf	0	21	0	50	0	0	2077		Oct 15, 2019 - 05:50 MDT	(25 labels)
sama-rhel7	Trilinos-atdm-sama-rhel7-intel-18.0.3-openmpi-complex-shared-release-debug	b5ebdf	0	21	0	50	0	1	2076		Oct 15, 2019 - 05:56 MDT	(25 labels)
sama-rhel7	Trilinos-atdm-sama-rhel7-intel-18.0.3-openmpi-shared-debug	b5ebdf	0	21	0	50	0	0	2030		Oct 15, 2019 - 04:33 MDT	(25 labels)
sama-rhel7	Trilinos-atdm-sama-rhel7-intel-18.0.3-openmpi-shared-release-debug	b5ebdf	0	21	0	50	0	0	2032		Oct 15, 2019 - 05:12 MDT	(25 labels)
serrano	Trilinos-atdm-serrano-intel-mpi-openmpi	b5ebdf	0	21	0	50	0	0	2030		Oct 15, 2019 - 05:57 MDT	(25 labels)
serrano	Trilinos-atdm-serrano-intel-mpi-openmpi	b5ebdf	0	21	0	50	0	0	2026		Oct 15, 2019 - 05:55 MDT	(25 labels)
chama	Trilinos-atdm-icc2-intel-debug-openmpi	b5ebdf	0	21	0	50	0	0	2030		Oct 15, 2019 - 05:52 MDT	(25 labels)
skybridge	Trilinos-atdm-icc2-intel-mpi-openmpi	b5ebdf	0	21	0	50	0	0	4054		Oct 15, 2019 - 06:00 MDT	(25 labels)
waterman	Trilinos-atdm-waterman-cuda-9.2-debug	b5ebdf	0	9	0	50	0	14	2155		Oct 15, 2019 - 10:15 MDT	(25 labels)
waterman	Trilinos-atdm-waterman-cuda-9.2-opt	b5ebdf	0	9	0	50	0	12	2227		Oct 15, 2019 - 10:47 MDT	(25 labels)
waterman	Trilinos-atdm-waterman-cuda-9.2-icc-release-debug	b5ebdf	0	9	1	50	0	12	2225		Oct 15, 2019 - 03:04 MDT	(25 labels)
waterman	Trilinos-atdm-waterman-cuda-9.2-release-debug	b5ebdf	0	9	0	50	0	12	2220		Oct 15, 2019 - 13:53 MDT	(25 labels)
waterman	Trilinos-atdm-waterman-cuda-9.2_gpic_static_opt	b5ebdf	0	9	0	50	0	12	2227		Oct 15, 2019 - 06:21 MDT	(25 labels)
waterman	Trilinos-atdm-waterman-cuda-9.2_shared_opt	b5ebdf	0	9	0	50	0	17	2222		Oct 15, 2019 - 03:06 MDT	(25 labels)
ride	Trilinos-atdm-white-ride-cuda-9.2-gnu-7.2.0-debug	b5ebdf	0	22	0	50	0	0	2016		Oct 15, 2019 - 04:09 MDT	(25 labels)
ride	Trilinos-atdm-white-ride-cuda-9.2-gnu-7.2.0-icc-release-debug	b5ebdf	0	22	0	50	0	1	2044		Oct 15, 2019 - 04:09 MDT	(25 labels)
ride	Trilinos-atdm-white-ride-cuda-9.2-gnu-7.2.0-release	b5ebdf	0	22	0	50	0	0	2038		Oct 15, 2019 - 07:33 MDT	(25 labels)
ride	Trilinos-atdm-white-ride-cuda-9.2-gnu-7.2.0-release-debug	b5ebdf	0	22	0	50	0	0	2045		Oct 15, 2019 - 04:59 MDT	(25 labels)
ride	Trilinos-atdm-white-ride-gnu-7.2.0-openmpi-debug	b5ebdf	0	21	0	50	0	6	2020		Oct 15, 2019 - 04:08 MDT	(25 labels)
ride	Trilinos-atdm-white-ride-gnu-7.2.0-openmpi-release	b5ebdf	0	21	0	50	0	0	2027		Oct 15, 2019 - 04:04 MDT	(25 labels)

Items per page: 25

Specialized 2 builds

[view timeline]

Site	Build Name	Update		Configure		Build		Test			Start time	Labels
		Revision	Error	Warn	Error	Warn	Not Run	Fail	Pass			
mulino	Trilinos-atdm-mulino-intel-mpi-openmpi-KNL	b5ebdf	0	21	0	50	0	7	2001		Oct 15, 2019 - 03:08 MDT	(25 labels)
ride	Trilinos-atdm-white-ride-cuda-10.1-gnu-7.2.0-release-debug	b5ebdf	0	22	0	50	0	4	2045		Oct 15, 2019 - 04:04 MDT	(25 labels)

Experimental 6 builds

[view timeline]

Site	Build Name	Update		Configure		Build		Test			Start time	Labels
		Revision	Error	Warn	Error	Warn	Not Run	Fail	Pass			
doom-logi2	Trilinos-atdm-doom-cuda-9.2-gpu-8.3.1_openmpi-2.1.1-mpi-esp		0	4	0	0	2267	15	1		Oct 15, 2019 - 10:22 MDT	(27 labels)
doom-logi2	Trilinos-atdm-doom-cuda-9.2-gpu-8.3.1_openmpi-2.1.1-mpi-esp		0	3	0	1	0	0	25		Oct 15, 2019 - 10:14 MDT	Kokkos
doom-logi2	Trilinos-atdm-doom-cuda-9.2-gpu-8.3.1_openmpi-2.1.1-mpi-esp		0	3	0	1	0	15	13		Oct 15, 2019 - 09:24 MDT	Kokkos
doom-logi2	Trilinos-atdm-doom-cuda-9.2-gpu-8.3.1_openmpi-2.1.1-mpi-esp		0	3	0	0					Oct 15, 2019 - 09:19 MDT	Kokkos
ride	Trilinos-atdm-white-ride-cuda-9.2-gnu-7.2.0-icc-release-debug-opt	b5ebdf	0	11	1	50	0	3	2095		Oct 15, 2019 - 06:00 MDT	(54 labels)
ride	Trilinos-atdm-white-ride-cuda-9.2-gnu-7.2.0-release-debug-opt	b5ebdf	0	11	0	50	0	20	2953		Oct 15, 2019 - 04:06 MDT	(54 labels)

- ***Existing test failures hide the emergence of new failing tests***
- ***Random configure and build failures due to system issues:***
  - Disk and network I/O issues
  - Machine overloading
  - Compiler license server problems (e.g. Intel license server).
- ***Random test failures due to system issues:***
  - Disk and network I/O issues
  - MPI stat-up problems
  - Non-deterministic (rare) bugs in bleeding-edge system software (e.g. OpenMPI+CUDA CPU/GPU data management).
- ***(Randomly) failing tests due to defects in project code:***
  - Defects in features not used by important customers
  - **Defects in functional software used by important customers**
- ***Missing build and test results on CDash dashboard:***
  - Machine overloading (e.g. queues are full)
  - Machines go down for maintenance in middle of build/testing.
  - Communication problems with CDash server to upload results.

**Can't judge health of a Project from just the amount of red or green on CDash dashboard!**



## 1. Go look at CDash every day

- **Pro:** It is there to look at 😊
- **Con:** Have to remember to look every day
- **Con:** Hard to see history of test failures
- **Con:** Hard to see history of failures (first time?, regularly or randomly failing?)

## 2. Have CDash send out emails for each build each day

- **Pro:** Already implemented in CDash
- **Con:** Spammed a lot of emails if there are failures across many builds
- **Con:** Hard to see if same tests are failing in multiple builds
- **Con:** Can't tell if failures have already been triaged or are new failures

## 3. Generate single summary email: `cdash_analyze_and_report.py`

- **Pro:** Single email no matter how many failures occur
- **Pro:** Reports builds with any missing results
- **Pro:** Show test history
- **Pro:** Show new failures not already reported
- **Pro:** Detect randomly failing tests
- **Pro:** Show patterns of failures across multiple builds
- **Con:** ???



Tue 10/22/2019 5:14 AM

jfrye@sandia.gov

FAILED (bm=1, cf=2, bf=2, twoif=3, twip=57, twim=95, twif=9): Promoted ATDM Trilinos Builds on 2019-10-21

To: Bartlett, Roscoe A

## Build and Test results for Promoted ATDM Trilinos Builds on 2019-10-21

[Builds on CDash](#) (num/expected=32/32)

[Non-passing Tests on CDash](#) (num=16)

**Builds Missing: bm=1**

**Builds with Configure Failures: cf=2**

**Builds with Build Failures: bf=2**

**Tests without issue trackers Failed: twoif=3**

**Tests with issue trackers Passed: twip=57**

**Tests with issue trackers Missing: twim=95**

**Tests with issue trackers Failed: twif=9**

### Builds Missing: bm=1

Group	Site	Build Name	Missing Status
ATDM	cee-rhel6	Trilinos-atdm-cee-rhel6_clang-5.0.1_openmpi-1.10.2_serial_static_opt	Build exists but no test results

### Builds with Configure Failures (limited to 20): cf=2

Group	Site	Build Name
ATDM	cee-rhel6	Trilinos-atdm-cee-rhel6_clang-5.0.1_openmpi-1.10.2_serial_static_opt
ATDM	cee-rhel6	Trilinos-atdm-cee-rhel6_intel-18.0.2_mpich2-3.2_openmp_static_opt



### Tests without issue trackers Failed (limited to 20): twoif=3

Site	Build Name	Test Name	Status	Details	Consecutive Non-pass Days	Non-pass Last 30 Days	Pass Last 30 Days	Issue Tracker
sems-rhel6	<a href="#">Trilinos-atdm-sems-rhel6-gnu-7.2.0-openmp-complex-shared-release-debug</a>	<a href="#">Anasazi_Epetra_MVOPTester_MPI_4</a>	Failed	Completed (Timeout)	1	1	31	
waterman	<a href="#">Trilinos-atdm-waterman_cuda-9.2_shared_opt</a>	<a href="#">ROL_example_PDE-OPT_ginzburg-landau_example_01_MPI_4</a>	Failed	Completed (Timeout)	1	3	2	

### Tests with issue trackers Passed: twip=57

Site	Build Name	Test Name	Status	Details	Consecutive Pass Days	Non-pass Last 30 Days	Pass Last 30 Days	Issue Tracker
waterman	<a href="#">Trilinos-atdm-waterman-cuda-9.2-release-debug</a>	<a href="#">Amesos2_SuperLU_DIST_Solver_Test_MPI_4</a>	Passed	Completed	25	1	26	<a href="#">#5179</a>
mutrino	<a href="#">Trilinos-atdm-mutrino-intel-opt-openmp-HSW</a>	<a href="#">Anasazi_Epetra_OrthoManagerGenTester_0_MPI_4</a>	Passed	Completed	24	0	24	<a href="#">#3585</a>
sems-rhel6	<a href="#">Trilinos-atdm-sems-rhel6-intel-17.0.1-openmp-release</a>	<a href="#">Anasazi_Epetra_OrthoManagerGenTester_0_MPI_4</a>	Passed	Completed	13	2	35	<a href="#">#3585</a>

### Tests with issue trackers Missing: twim=95

Site	Build Name	Test Name	Status	Details	Consecutive Missing Days	Non-pass Last 30 Days	Pass Last 30 Days	Issue Tracker
ride	<a href="#">Trilinos-atdm-white-ride-gnu-7.2.0-openmp-debug</a>	<a href="#">Intrepid2_unit-test_Projection_Serial_Test_Convergence_TET_MPI_1</a>	Missing	Missing	3	24	2	<a href="#">#6020</a>
ride	<a href="#">Trilinos-atdm-white-ride-gnu-7.2.0-openmp-debug</a>	<a href="#">Intrepid2_unit-test_Projection_Serial_Test_InterpolationProjection_HEX_MPI_1</a>	Missing	Missing	3	19	7	<a href="#">#6020</a>
waterman	<a href="#">Trilinos-atdm-waterman-cuda-9.2-debug</a>	<a href="#">ROL_example_PDE-OPT_Old_adv-diff-react_example_01_MPI_4</a>	Missing	Missing	1	4	0	<a href="#">#6124</a>

### Tests with issue trackers Failed: twif=9

Site	Build Name	Test Name	Status	Details	Consecutive Non-pass Days	Non-pass Last 30 Days	Pass Last 30 Days	Issue Tracker
mutrino	<a href="#">Trilinos-atdm-mutrino-intel-opt-openmp-HSW</a>	<a href="#">Anasazi_MultiVecTraitsTest2_MPI_4</a>	Failed	Completed (Failed)	24	24	0	<a href="#">#3499</a>
sems-rhel6	<a href="#">Trilinos-atdm-sems-rhel6-intel-17.0.1-openmp-release</a>	<a href="#">Belos_Tpetra_HybridGMRES_hb_test_1_MPI_4</a>	Failed	Completed (Failed)	5	5	32	<a href="#">#4159</a>
cee-rhel6	<a href="#">Trilinos-atdm-cee-rhel6_intel-18.0.2_mpich2-3.2-openmp_static_opt</a>	<a href="#">Ifpack2_MTSGS_belos_MPI_1</a>	Failed	Completed (Failed)	2	14	12	<a href="#">#5006</a>

**TrilinosATDMStatus/trilinos\_atdm\_builds\_status.sh**


```
${TRIBITS_DIR}/ci_support/cdash_analyze_and_report.py \  
--cdash-project-name="Trilinos" \  
--build-set-name="Promoted ATDM Trilinos Builds" \  
--cdash-site-url="https://testing-dev.sandia.gov/cdash" \  
--cdash-builds-filters "<index-php-filters>" \  
--cdash-nonpassed-tests-filters "<query-tests-php-filters>" \  
--expected-builds-file=\  
    promotedAtdmTrilinosExpectedBuilds.csv \  
--tests-with-issue-trackers-file=\  
    promotedAtdmTrilinosTestsWithIssueTrackers.csv \  
--limit-table-rows=20 \  
<other non-essential arguments> \  
"$@"
```

**Run the script**

```
$ git clone git@gitlab-ex.sandia.gov:atdm/TrilinosATDMStatus.git  
$ cd TrilinosATDMStatus/  
$ git clone git@github.com:TriBITSPub/TriBITS.git  
$ cd ../..  
$ module load sems-env ; module load sems-python/2.7.9  
$ ./TrilinosATDMStatus/trilinos_atdm_builds_status.sh \  
    --date=2019-10-21 --send-email-to=<your-email-address>
```



**cdash/index.php:** `<index-php-filters>`

 [Help](#)

Filters

• Group ▼ is ▼ ATDM

• Build Name ▼ starts with ▼ Trilinos-atdm-

- + [icon] and ▼

- + [icon]

Begin  End

Apply Clear Create Hyperlink


<https://testing-dev.sandia.gov/cdash/index.php?project=Trilinos&date=2019-10-21&filtercount=2&showfilters=1&filtercombine=and&field1=groupname&compare1=61&value1=ATDM&field2=buildname&compare2=65&value2=Trilinos-atdm->

ATDM 32 builds [\[view timeline\]](#)

**cdash/queryTests.php:** `<query-tests-php-filters>`

Query Tests: 16 matches

[Hide Filters](#)

 [Help](#)

Filters

• Group ▼ is ▼ ATDM

• Build Name ▼ starts with ▼ Trilinos-atdm-

• Status ▼ is not ▼ passed

- + [icon] and ▼

- + [icon] and

- + [icon]

Begin  End

Apply Clear Create Hyperlink

<https://testing-dev.sandia.gov/cdash/queryTests.php?project=Trilinos&date=2019-10-21&filtercount=3&showfilters=1&filtercombine=and&field1=groupname&compare1=61&value1=ATDM&field2=buildname&compare2=65&value2=Trilinos-atdm-&field3=status&compare3=62&value3=passed>





```
--expected-builds-file=\
    promotedAtdmTrilinosExpectedBuilds.csv \
```

	A	B	C
1	<b>group</b>	<b>site</b>	<b>buildname</b>
2	ATDM	cee-rhel6	Trilinos-atdm-cee-rhel6_clang-5.0.1_openmpi-1.10.2_serial_static_opt
3	ATDM	cee-rhel6	Trilinos-atdm-cee-rhel6_gnu-7.2.0_openmpi-1.10.2_serial_shared_opt
4	ATDM	cee-rhel6	Trilinos-atdm-cee-rhel6_intel-18.0.2_mpich2-3.2_openmp_static_opt
5	ATDM	cee-rhel6	Trilinos-atdm-cee-rhel6_intel-19.0.3_intelmpi-2018.4_serial_static_opt
6	ATDM	chama	Trilinos-atdm-tlcc2-intel-debug-openmp
7	ATDM	skybridge	Trilinos-atdm-tlcc2-intel-opt-openmp
8	ATDM	mutrino	Trilinos-atdm-mutrino-intel-opt-openmp-HSW
9	ATDM	mutrino	Trilinos-atdm-mutrino-intel-opt-openmp-KNL-panzer
10	ATDM	sems-rhel	Trilinos-atdm-sems-rhel6-gnu-7.2.0-openmp-complex-shared-release-debug
11	ATDM	sems-rhel	Trilinos-atdm-sems-rhel6-gnu-7.2.0-openmp-debug
12	ATDM	sems-rhel	Trilinos-atdm-sems-rhel6-gnu-7.2.0-openmp-release-debug
13	ATDM	sems-rhel	Trilinos-atdm-sems-rhel6-gnu-7.2.0-openmp-release

# cdash\_analyze\_and\_report.py: Tests with Issue Trackers CSV File



```
--tests-with-issue-trackers-file=\
    promotedAtdmTrilinosTestsWithIssueTrackers.csv \
```

	A	B	C	D	E
1	site	buildName	testname	issue_tracker_url	issue_tracker
2	cee-rhel6	Trilinos-atdm-cee-rhel6_intel-18	Ipack2_MTSGS_belos_MPL	<a href="https://github.com/trilinos/Trilinos/issues/5006">https://github.com/trilinos/Trilinos/issues/5006</a>	#5006
3	mutrino	Trilinos-atdm-mutrino-intel-opt	Anasazi_Epetra_OrthoMana	<a href="https://github.com/trilinos/Trilinos/issues/3585">https://github.com/trilinos/Trilinos/issues/3585</a>	#3585
4	mutrino	Trilinos-atdm-mutrino-intel-opt	Anasazi_MultiVecTraitsTest	<a href="https://github.com/trilinos/Trilinos/issues/3499">https://github.com/trilinos/Trilinos/issues/3499</a>	#3499
5	sems-rhel6	Trilinos-atdm-sems-rhel6-intel-1	Anasazi_Epetra_OrthoMana	<a href="https://github.com/trilinos/Trilinos/issues/3585">https://github.com/trilinos/Trilinos/issues/3585</a>	#3585
6	sems-rhel6	Trilinos-atdm-sems-rhel6-intel-1	Belos_Tpetra_HybridGMRES	<a href="https://github.com/trilinos/Trilinos/issues/4159">https://github.com/trilinos/Trilinos/issues/4159</a>	#4159
7	sems-rhel7	Trilinos-atdm-sems-rhel7-cuda-9	Anasazi_Epetra_OrthoMana	<a href="https://github.com/trilinos/Trilinos/issues/3585">https://github.com/trilinos/Trilinos/issues/3585</a>	#3585
8	sems-rhel7	Trilinos-atdm-sems-rhel7-cuda-9	PanzerAdaptersSTK_CurlLap	<a href="https://github.com/trilinos/Trilinos/issues/5179">https://github.com/trilinos/Trilinos/issues/5179</a>	#5179
9	sems-rhel7	Trilinos-atdm-sems-rhel7-cuda-9	PanzerAdaptersSTK_Poisson	<a href="https://github.com/trilinos/Trilinos/issues/5179">https://github.com/trilinos/Trilinos/issues/5179</a>	#5179
10	sems-rhel7	Trilinos-atdm-sems-rhel7-cuda-9	TpetraCore_AddProfiling_Ui	<a href="https://github.com/trilinos/Trilinos/issues/5525">https://github.com/trilinos/Trilinos/issues/5525</a>	#5525
11	sems-rhel7	Trilinos-atdm-sems-rhel7-cuda-9	TpetraCore_CrsMatrix_Unit	<a href="https://github.com/trilinos/Trilinos/issues/5892">https://github.com/trilinos/Trilinos/issues/5892</a>	#5892
12	sems-rhel7	Trilinos-atdm-sems-rhel7-cuda-9	TpetraCore_ImportExport2	<a href="https://github.com/trilinos/Trilinos/issues/5179">https://github.com/trilinos/Trilinos/issues/5179</a>	#5179
13	sems-rhel7	Trilinos-atdm-sems-rhel7-cuda-9	TpetraCore_MatrixMatrix_U	<a href="https://github.com/trilinos/Trilinos/issues/5515">https://github.com/trilinos/Trilinos/issues/5515</a>	#5515



- Test history queries are expensive, so don't run tool in real-time
- Set up cron job to run after the end of the testing day but not during business hours (e.g. 2 AM)
- Use argument **--write-failing-tests-without-issue-trackers-to-file=<file>.csv** to have tool write out the list of failing tests to add the list of tests with issue trackers CSV file.
- Use examples in the repo: <https://gitlab-ex.sandia.gov/atdm/TrilinosATDMStatus>
- Other possible usages:
  - Trilinos Framework team: Monitor “Clean” and “Nightly” builds
  - ROL Team: Monitor “ROL” builds
  - MueLu Team: Monitor “MueLu” builds



- **Configure and Build Errors:**
  - Add number of configure, build, and test failures in each build (with links)
  - Add history of configure/build errors over last X days (with links)
- **Test Failures:**
  - Add `randomly_failing` field with values:
    - 0: Fails every day
    - 1: Randomly fails regularly
    - 2: Randomly fails rarely (don't list in 'twip' table if passing)
  - Add `expected_fail_regex` field
    - E.g.: "Caught signal 11 .Segmentation fault: address not mapped to object at address"
  - Allow for wild-card (regex) matches for sites, builds, and/or tests:
    - E.g.: `buildname: ".*cuda.*"`
    - E.g.: `testname: "MueLu_ParameterList.*"`
  - Add `allow_to_fail` field with values:
    - 0: Not allowed to fail
      - Listed in "Tests with issue trackers Failed: twif=???"
    - 1: Allowed to fail
      - Listed in "Tests with issue trackers allowed to fail Failed: twiatff=???"



# THE END