

Exposing Test Analyses with DrTests

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Roadmap

- Variety of test analyses available
- What architecture to handle these analyses?
- DrTests
- Evaluating DrTests on various analyses
- Conclusion

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Variety of analyses on tests

	Runner	Coverage	Profile	Parametrisable test	Mutation testing	Run examples in comment	Rotten Tests Finder	...
Input	Test cases							
Output	Results of tests run							

Variety of analyses on tests

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Input	Test cases	Test cases						...
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Variety of analyses on tests

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Variety of analyses on tests

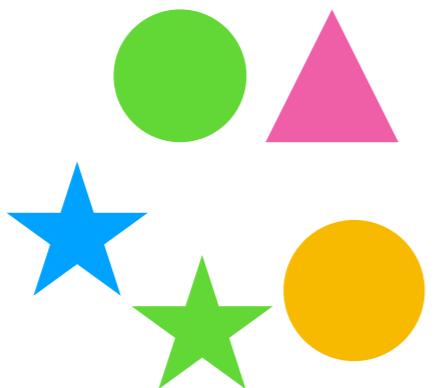
	Runner	Coverage	Profile	Parametrisable test	Mutation testing	Run examples in comment	Rotten Tests Finder	...
Input	Test cases	Test cases	Test cases	Test cases + parameters	Test cases + mutation s	Comments		
Output	Results of tests run	Percentage of methods covered	Time taken for each test run	Results of tests run depending on parameter	Mutants to be killed	Comments containing failing examples		

Variety of analyses on tests

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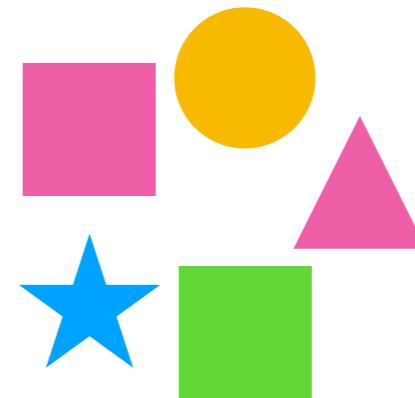
Roadmap

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**Different
Inputs**

Test Runner
Test Coverage
Test profiling
:



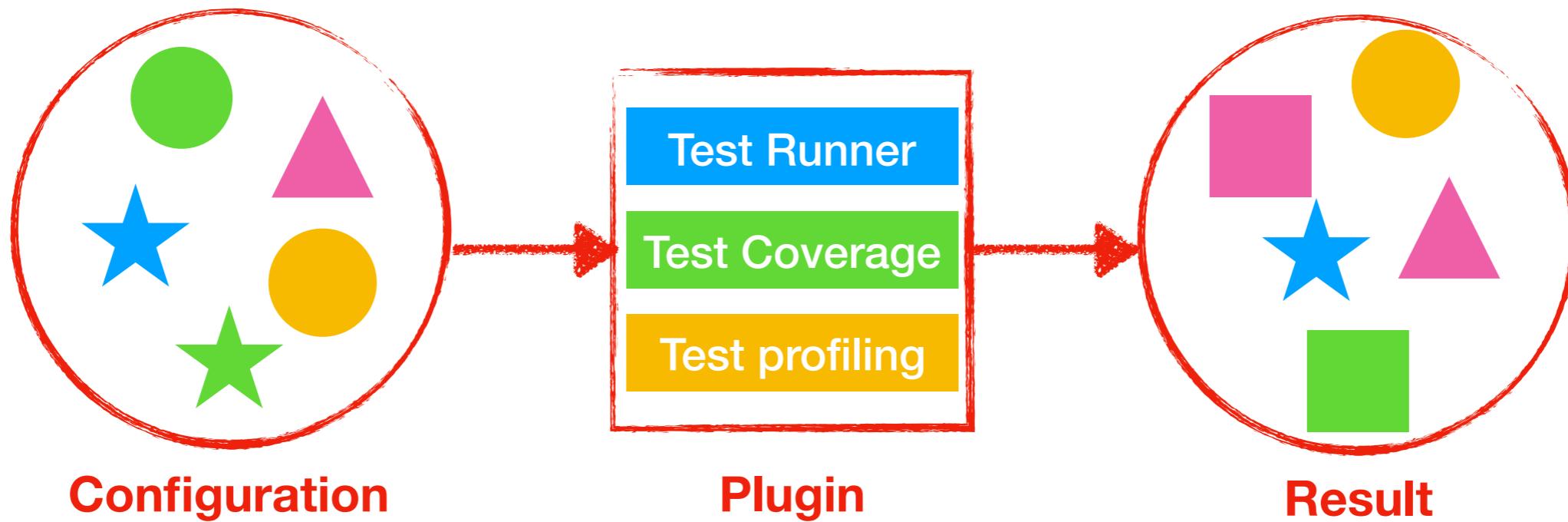
**Different
Outputs**

**How to design an
infrastructure dealing
with all these analyses?**

Roadmap

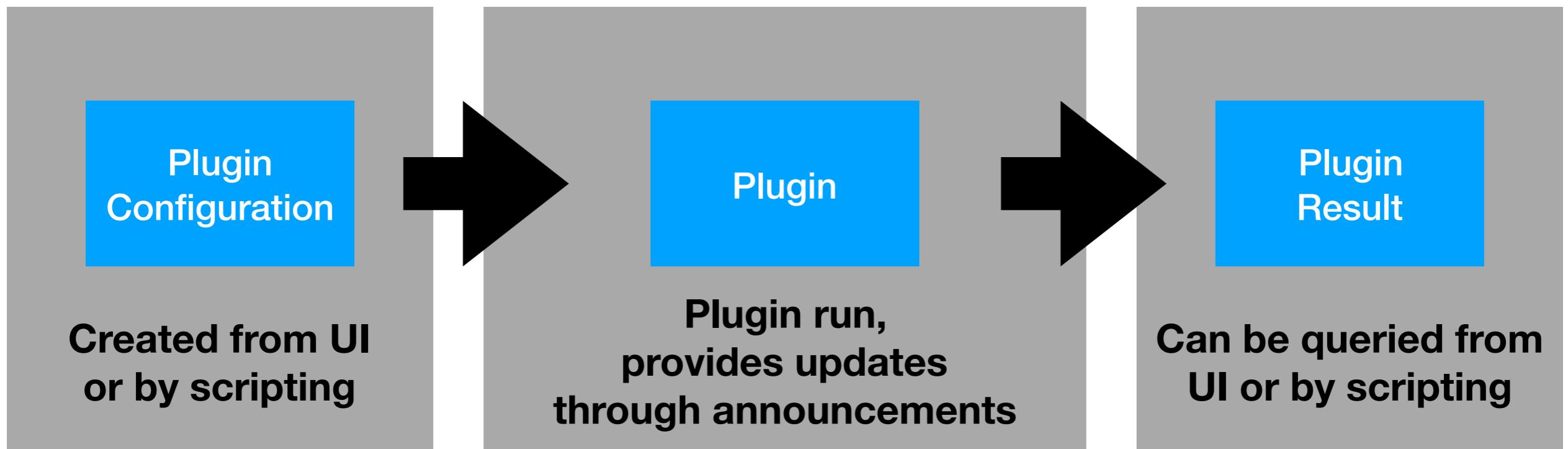
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An architecture to handle test analyses variety:

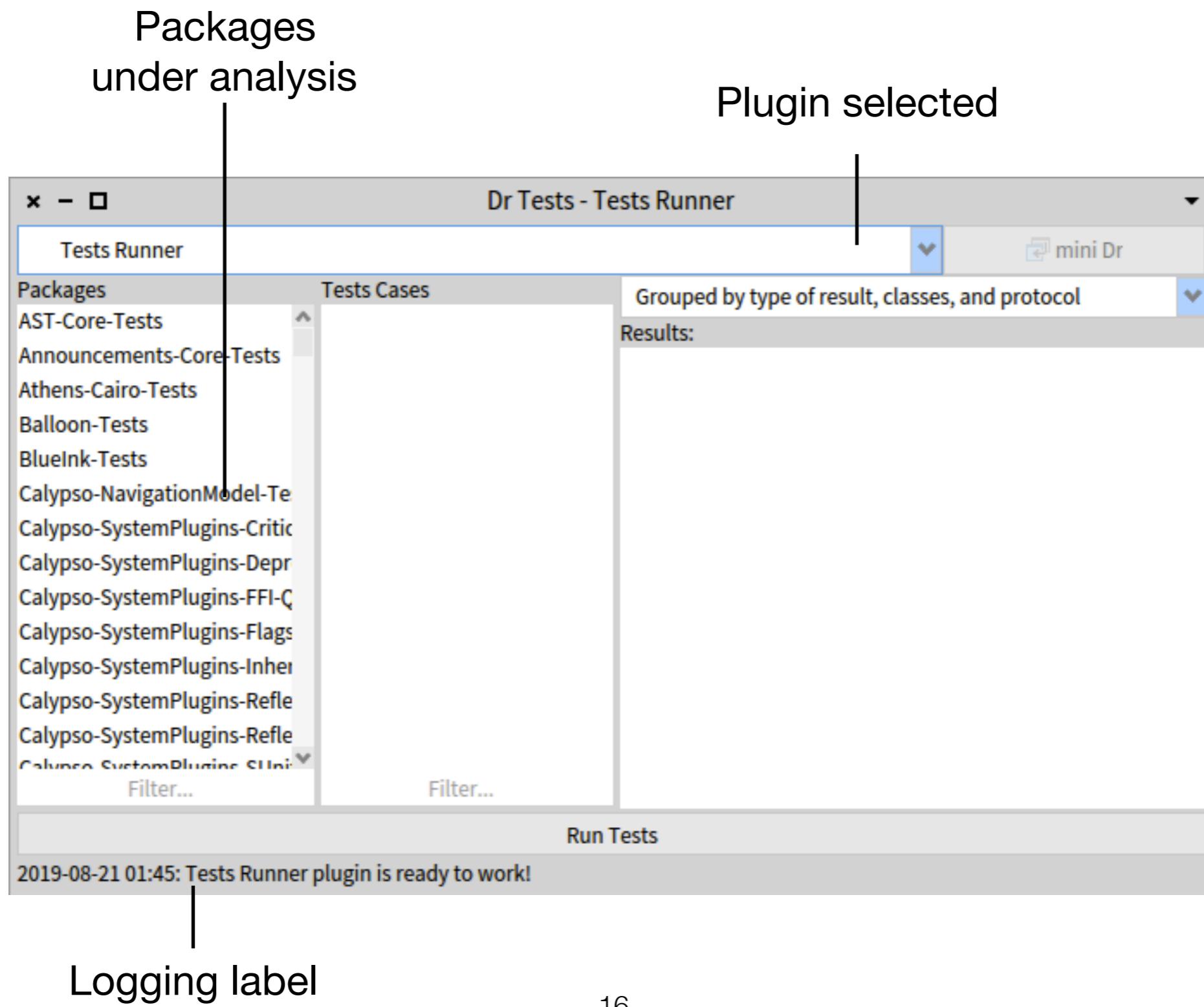


DrTests

Dr Tests Model

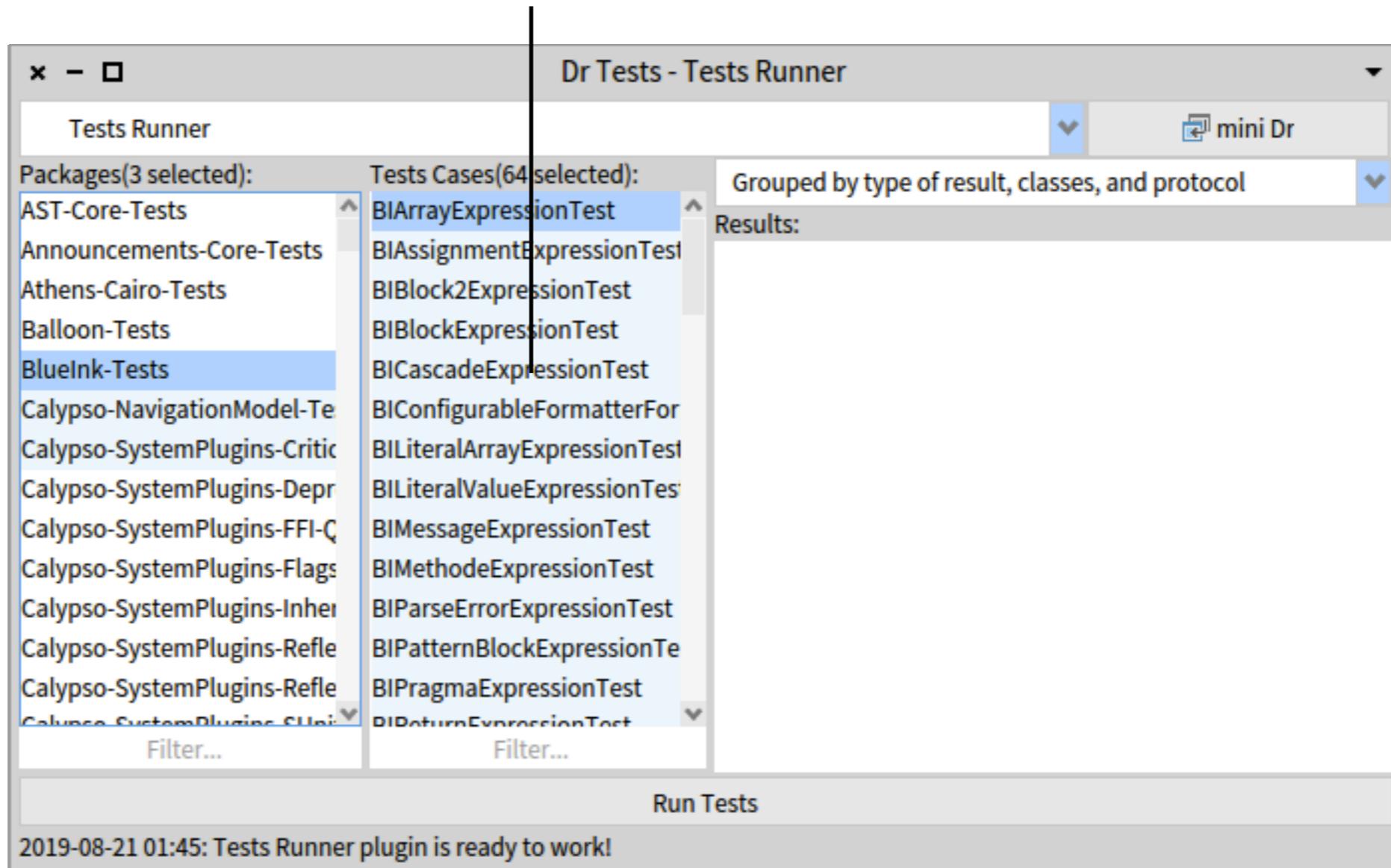


Dr Tests UI



Dr Tests UI

Plugin input



Dealing with different inputs

Packages with comments

Tests

Dr Tests - Test Coverage

Test Packages(1 selected):

- AST-Core-Tests
- Announcements-Core-Tests
- Athens-Cairo-Tests
- Balloon-Tests
- BlueInk-Tests**
- Calypso-NavigationModel-Te
- Calypso-SystemPlugins-Critic
- Calypso-SystemPlugins-Depr
- Calypso-SystemPlugins-FFI-Q
- Calypso-SystemPlugins-Flags
- Calynso-SystemPlugins-Inher

Package under coverage(1 selected):

- BaselineOfSpec
- BaselineOfSpec2
- BaselineOfSystemCommand
- BaselineOfTelePharoSuppor
- BaselineOfTonel
- BaselineOfTraits
- BaselineOfUI
- BaselineOfUnifiedFFI
- BlueInk-Core**
- BlueInk-Extras
- Calynso-Browser

Filter...

Dr Tests - Executable

Executable comments checker

Packages(1 selected):

- Collections-Native
- Collections-Sequenceable
- Collections-Stack
- Collections-Streams
- Collections-Strings**
- Collections-Support
- Collections-Tests
- Collections-Unordered
- Collections-Weak
- Colors
- Commander-Activators-Conti

Classes(3 selected):

- ByteString**
- String
- Symbol

Filter...

Test package & Package under analysis

Dr Tests - Rotten Tests Finder

Rotten Tests Finder

Test Packages(3 selected):

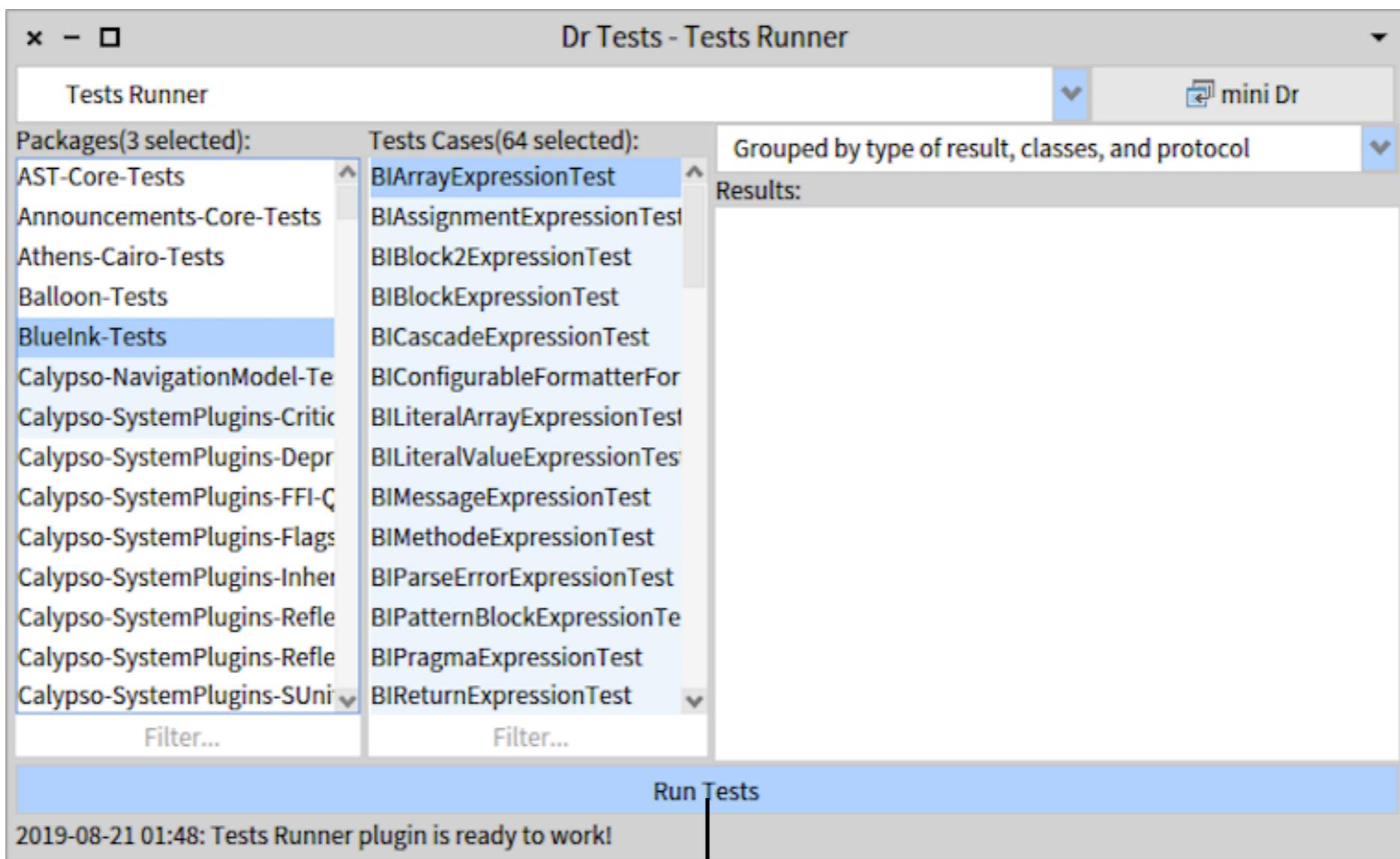
- Calypso-SystemTools-Que
- Clap-Tests
- ClassAnnotation-Tests
- ClassParser-Tests
- CodeImport-Tests
- Collections-Arithmetic-Tes**
- Collections-DoubleLinkedl
- Collections-Tests
- Commander-Core-Tests
- Commander2-Tests
- Compression-Tests

Tests Cases(62 selected):

- Array2DTest**
- ArrayType
- AssociationTest
- BagTest
- ByteArrayTest
- ByteSymbolTest
- CharacterSetTest
- CharacterTest
- CollectionArithmeticTest
- CollectionRootTest
- CollectionTest

Filter...

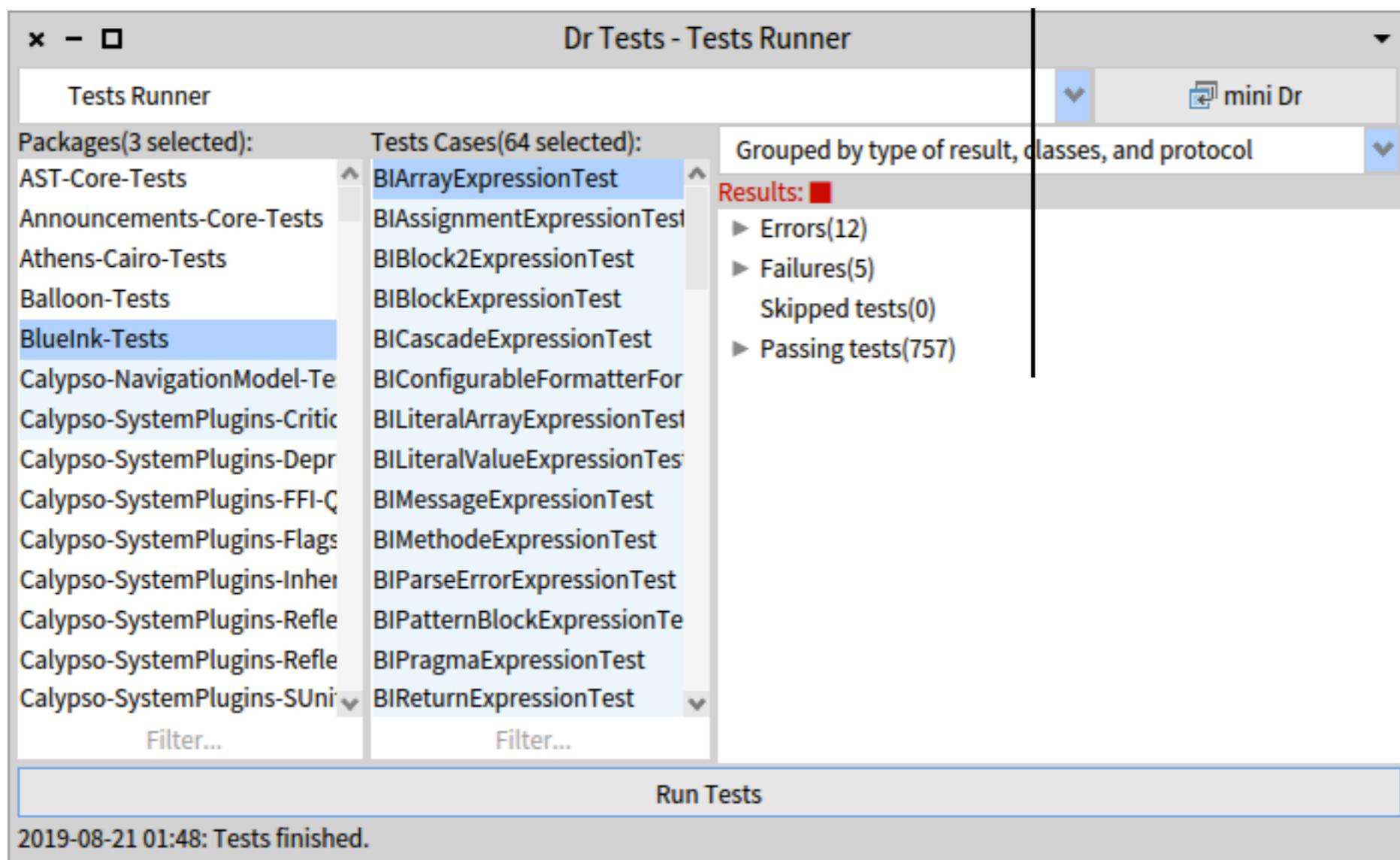
Dr Tests UI



Start plugin

Dr Tests UI

Results
tree



Logging label

Different results

Comments

Grouped by type of result

Results:

- ▶ Errors(17)
- ▼ Failures(1)
 - 'let us make seperate strings' substring
- ▼ Passed tests(111)
 - 'abc' isByteString >>> true
 - 'abc' isOctetString >>> true
 - ('abcd' indexOf: \$a) >>> 1
 - ('abddf' indexOf: \$k) >>> 0
 - 'hello' surroundedBySingleQuotes >>>
 - 'he"llo' surroundedBySingleQuotes >>:
 - ' hello ' surroundedBySingleQuotes >>'

Percentage &
Uncovered methods

List of uncovered methods

Results:

- 58.94 % Code Coverage(0)
- ▼ Uncovered methods(108)
 - numberOfArgumentsForMultiLine
 - newLineBeforeFirstKeyword
 - newLineBeforeFirstKeyword:
 - stringInsideBlocks:
 - oneLineMessages
 - periodsAtEndOfMethod:
 - newLinesAfterMethodComment
 - retainBlankLinesBeforeComments
 - traditionalBinaryPrecedenceArray

Rotten Tests

List of rotten tests

Results:

- DictionaryTest>>#testPrintOnDelimiterLa:
- SymbolTest>>#testCopyReplaceAllWith1C
- SymbolTest>>#testAsCommaStringMore
- StringTest>>#testPairsDo
- DictionaryTest>>#testPrintNameOn
- OrderedCollectionTest>>#testPrintOn
- DictionaryTest>>#testOccurrencesOf
- IntervalTest>>#test0IndexAccessingTest
- OrderedCollectionTest>>#testPrintNameC
- SortedCollectionTest>>#testIdentityIndex
- FloatArrayTest>>#testAsCommaStringMor

Roadmap

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We implemented 3 plugins
with various input
and output

Dr Tests model validation

	Test Runner	Rotten Test	Test Coverage
INPUT	Tests Cases (packages and classes)	Tests Cases (packages and classes)	Tests and Package under analysis
ACTION	Run the test cases	Find Rotten Green Tests	Run tests and verify that methods inside the package were executed
RESULT	Test result sorting by groups	A list of rotten tests	Percentage of covering and list of uncovered methods

Dr Tests model validation

	Test Runner	Rotten Test	Test Coverage
Test Cases			

These analyses are implemented inside DrTests architecture and it works!

RESULT	Test result sorting by groups	A list of rotten tests	Percentage of covering and list of uncovered methods
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Roadmap

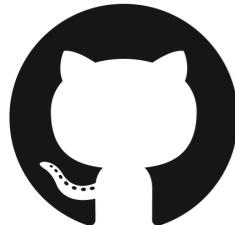
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Conclusion

- ▶ Extensible via plugins
 - ▶ Provides good model to configure, run and gather results from plugins
 - ▶ Be integrated in Pharo 8.0
- ▶ **Future work:**
- ▶ Extend the validation by implementing more plugins

GDayne 

@dayneStorm_ 



juliendelplanque/DrTests

TestRunner UI

Packages containing tests

TestCases

Results summary

The screenshot shows the TestRunner UI interface. On the left, a tree view displays packages containing tests, with 'Network' selected. In the center, a list of test cases is shown under 'TestCaseA|TestCaseB'. On the right, a results summary panel displays test statistics and failed test details.

Test Runner

166 run, 164 passes, 2 skipped, 0 expected failures, 1 failures, 1 errors, 0 unexpected passes

Base64Tests>>#testRangeEncoding

Base64Tests>>#testPrimesEncoding

Run Selected Run Profiled Run Coverage Run Failures Run Errors File out results

Run tests Profile test execution Analyse code coverage Failed tests Re-run failures or errors only Export results Errors

Run Selected	Run Profiled	Run Coverage	Run Failures	Run Errors	File out results
Run tests	Profile test execution	Analyse code coverage	Failed tests	Re-run failures or errors only	Export results

TestRunner UI: coverage and profile

The screenshot displays two windows from the TestRunner UI. The top window, titled 'Test Runner' and 'Not Covered Code (30% Code Coverage) [278]', lists methods in the 'ConnectionQueue' class that have not been covered by tests. The bottom window, titled 'Test Runner Spy Results', shows a call tree and execution times for various methods. A callout points from the text 'Extra windows generated for results' to the bottom window.

Test Runner
Not Covered Code (30% Code Coverage) [278]

Method	Implementation
ConnectionQueue connectionCount	Network-Kernel
ConnectionQueue destroy	Network-Kernel
ConnectionQueue getConnectionOrNil	Network-Kernel
ConnectionQueue getConnectionOrNilLenient	Network-Kernel
ConnectionQueue initPortNumber:queueLength:	Network-Kernel
ConnectionQueue isValid	Network-Kernel
ConnectionQueue listenLoop	Network-Kernel
ConnectionQueue oldStyleListenLoop	Network-Kernel
ConnectionQueue portNumber:queueLength:	Network-Kernel
ConnectionQueue pruneStaleConnections	Network-Kernel
ConnectionQueue host	Network-Kernel
ConnectionRefused host:port:	Network-Kernel
ConnectionRefused class host:port:	Network-Kernel

Filter...

Current image Hier. |

connectionCount

"Return an estimate of the number of currently queued connections. This is only an estimate since a new connection could be made, or an existing one aborted, at any moment."

self pruneStaleConnections.
^accessSema critical: [connections size]

1/89 [1]

Test Runner
Spy Results

```
5 - 7365 tallies, 7370 msec.  
**Tree**  
-----  
Process: (40s) Morphic UI Process: nil  
-----  
10.1% {745ms} TestRunner>>runTestSuites:  
10.1% {745ms} CurrentExecutionEnvironment class>>runTestsBy:  
10.1% {745ms} DefaultExecutionEnvironment>>runTestsBy:  
10.1% {745ms} TestExecutionEnvironment(ExecutionEnvironment)>>beActiveDuring:  
10.1% {745ms} CurrentExecutionEnvironment class>>activate:for:  
10.1% {745ms} BlockClosure>>ensure:  
10.1% {745ms} CurrentExecutionEnvironment class>>activate:for:  
10.1% {745ms} TestRunner>>runTestSuites:  
10.1% {745ms} Set(Collection)>>do:displayingProgress:  
10.1% {745ms} Set(Collection)>>do:displayingProgress:every:
```

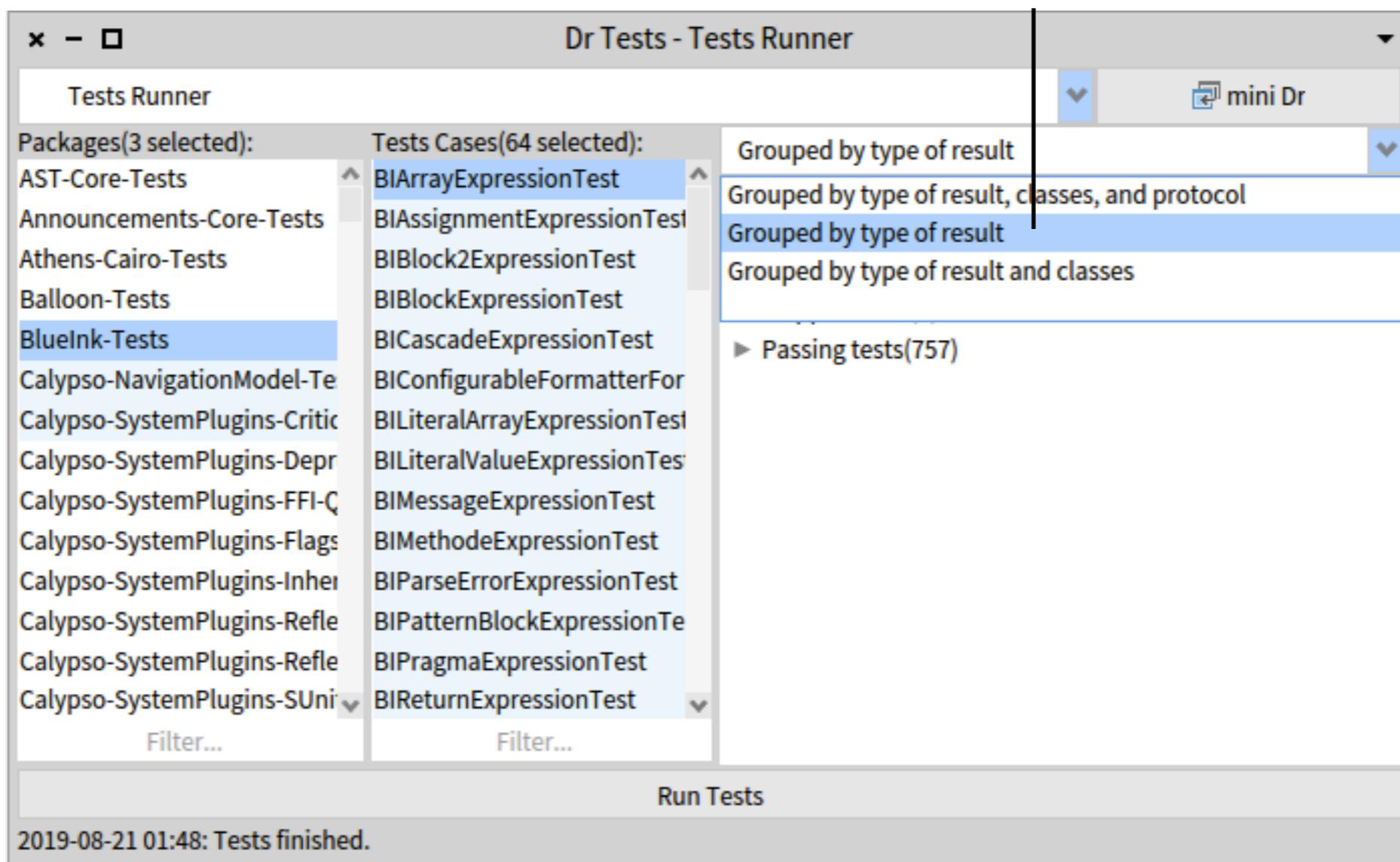
Dr Tests

Packages under analysis	Plugin input	Plugin selected	Results tree	Kind of visualization
<p>Tests Runner</p> <p>Packages(6 selected):</p> <ul style="list-style-type: none"> AST-Core-Tests Announcements-Core-Tests Athens-Cairo-Tests Balloon-Tests BlueInk-Tests Calypso-NavigationModel-Tests Calypso-SystemPlugins-Critic-Que Calypso-SystemPlugins-Deprecati Calypso-SystemPlugins-FFI-Querie Calypso-SystemPlugins-Flags-Que Calypso-SystemPlugins-Inheritanc Calypso-SystemPlugins-Reflectivit Calypso-SystemPlugins-Reflectivit Calypso-SystemPlugins-SUnit-Que Calypso-SystemPlugins-Traits-Qu <p>Filter...</p>	<p>Tests Cases(27 selected):</p> <ul style="list-style-type: none"> ClyAsyncRawQueryCursorTest ClyBrowserItemCursorTest ClyBrowserQueryTestCase ClyBrowserQueryResultTestCase ClyCompositeQueryTestCase ClyCompositeScopeTest ClyConcreteGroupCritiquesTest ClyConstantQueryTest ClyCriticMethodGroupProviderTe ClyCritiqueQueryTestCase ClyDeprecatedMethodGroupProv ClyDeprecatedMethodsQueryTest ClyFFIMethodGroupProviderTest ClyFFIMethodsTest ClyFilterQueryTest <p>Filter...</p>	<p>Grouped by type of result</p> <p>Results: ■</p> <ul style="list-style-type: none"> ▼ Errors(6) <ul style="list-style-type: none"> ClyAsyncQueryTest(ClyWrapQueryTestCase)>>#testIsExecutedF ClyAsyncQueryTest(ClyWrapQueryTestCase)>>#testIsExecutedF ClyAsyncQueryTest(ClyWrapQueryTestCase)>>#testNotExecutedF ClyAsyncQueryTest(ClyWrapQueryTestCase)>>#testIsNotExe ClyAsyncQueryTest(ClyWrapQueryTestCase)>>#testIsNotExe ClyAsyncQueryTest(ClyWrapQueryTestCase)>>#testIsNotExe ▼ Failures(2) <ul style="list-style-type: none"> ClyAsyncQueryTest(ClyWrapQueryTestCase)>>#testHasComposite ClyAsyncQueryResultTest>>#testItemsChangedNotificationShould Skipped tests(0) ► Passing tests(412) 	<p>mini Dr</p> <p>Browse</p> <p>Re-run tests</p> <p>Debug</p>	
Logging label	Start plugin	30	Plugin-defined action(s)	

Skip if no time

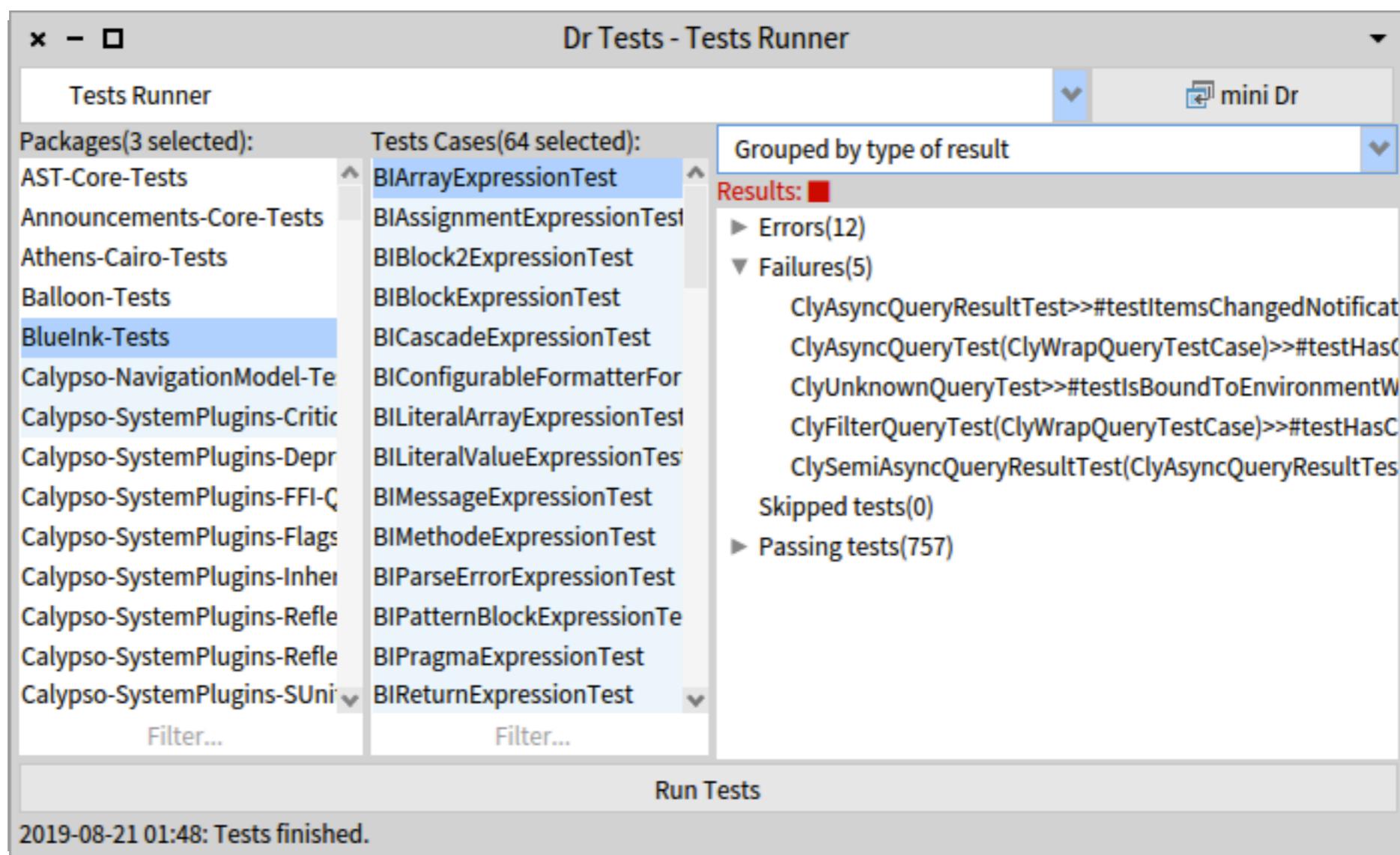
Dr Tests UI

Kind of
visualization



Skip if no time

Dr Tests UI



Skip if no time

Dr Tests UI

Plugin-defined
action(s)

