Tellus Data for Test Case Metrics

Wednesday, March 21, 2018 8:21 AM

Requirements

Gather data source for metrics executive dashboard by CIA: (Tellus + QAI + Product Tree)

1) Number of automated test cases run per build stage (e.g. prebuild, RC, etc.)
2) Amount of time a test case runs
3) Number of automated test cases that fail per build stage
4) Metrics per SBU.
5) Know whether it is a service test or e2e.
6) Number automated test cases that resulted in actual found bugs (Tellus + RPD + QAI)
7) Number of automated test cases that have not found bugs in last 6 months (Tellus + RPD + QAI)

--> Best Practice - workflow after a script failure in automation, we should have a consistent process across all SBU

1. Number of automated test cases run per build stage

The build stage is stored in `Stage` column of CalendarEvent table. Test cases are stored in SchedulerTests.

Possible Stage Values:

```
Prebuild
DEVEL
QA
Staging
Live
RELEASED
```

Prebuild Stage and PrebuildName Columns

Prebuilds are specified by these columns in CalendarEvent table:

`Stage` = `Prebuild`
`PrebuildName` = *<prebuild_name>*

Note: Jobs scheduled before 2014 had another format, which is no longer in use:
`Stage=PREBUILD:`*<prebuild_name>* (and PrebuildName is NULL)

Note that in the latter case, the PREBUILD prefix is all uppercase.

> **Note**: Rows before 2014 might also have values '' (empty string) or `'-1'` because of bugs, but they no longer happen. Newer rows before 2017 might also have some NULL values because of bugs, but they should not happen now.

Example SQL

```
-- Get number of test cases grouped by Stage, for scheduled start datetime range
SELECT e.Stage, count(*) AS NumOfTestCases
FROM SchedulerTestGroups g
JOIN CalendarInstances i
    ON g.InstanceID = i.InstanceID
JOIN CalendarEvent e
    ON i.EventID = e.EventID
LEFT JOIN CalendarGroupPlanAssociations gpa
    ON g.GroupID = gpa.GroupID
```

```
LEFT JOIN CalendarEventPlanConfig pc
    ON gpa.PlanConfigID = pc.PlanConfigID
LEFT JOIN CalendarEventCaseAssociations eca
    ON pc.PlanConfigID = eca.PlanConfigID
LEFT JOIN SchedulerTestCategories c
    ON c.CategoryID = pc.TellusTestPlanID
LEFT JOIN SchedulerTests t
    ON eca.TellusTestCaseID = t.TestID
LEFT JOIN TellusTestcaseResults r
    ON g.GroupID = r.GroupID AND t.TestName = r.TestCaseName
WHERE e.IsDev = 0
    AND g.IsDeleted = 0
    AND i.IsDeleted = 0
    AND e.IsDeleted = 0
    AND (gpa.IsDeleted = 0 OR gpa.IsDeleted IS NULL) -- NULL if association is deleted
    AND (pc.IsDeleted = 0 OR pc.IsDeleted IS NULL)
    AND (eca.IsDeleted = 0 OR eca.IsDeleted IS NULL)
    AND i.Start >= '2018-03-20' AND i.Start < '2018-03-21'
GROUP BY e.Stage
```

Stage	NumOfTestCases
Devel	41
Live	287
Prebuild	473
QA	132

2. Amount of time a test case runs

`Test Case duration = TCEndTime - TCStartTime` from TellusTestcaseResults table

Example SQL:

```
-- List test case duration and status in time range
-- TCErrorMsg: JSON string with test failure message.
-- If TCErrorMsg = '{}', then mark test case as passed,
-- Else if TCErrorMsg = other non-NULL string, then mark it as failed (test completed),
-- Else if TCErrorMsg is NULL, then mark the test case as (environmental) error (test did
not complete).
-- If TCStartTime or TCEndTime (i.e. TCDurationInSecs) is NULL, mark it as error.
-- If JustifierTestCaseID < 0, then mark it as error
-- (due to missing mapping from Tellus test case ID to Justifier test case ID).
SELECT t.JustifierTestCaseID,
    TCDurationInSecs = DATEDIFF(SECOND, r.TCStartTime, r.TCEndTime),
    TCStatus = CASE
        WHEN CONVERT(varchar, r.TCErrorMsg) = '{}' THEN 'Passed'
        WHEN r.TCErrorMsg IS NULL OR TCStartTime IS NULL OR TCEndTime IS NULL
             OR t.JustifierTestCaseID < 0 THEN 'Error'
        ELSE 'Failed'
    END,
    r.TCErrorMsg
FROM SchedulerTestGroups g
JOIN CalendarInstances i
    ON g.InstanceID = i.InstanceID
JOIN CalendarEvent e
    ON i.EventID = e.EventID
LEFT JOIN CalendarGroupPlanAssociations gpa
    ON g.GroupID = gpa.GroupID
LEFT JOIN CalendarEventPlanConfig pc
    ON gpa.PlanConfigID = pc.PlanConfigID
LEFT JOIN CalendarEventCaseAssociations eca
    ON pc.PlanConfigID = eca.PlanConfigID
LEFT JOIN SchedulerTestCategories c
```

```
    ON c.CategoryID = pc.TellusTestPlanID
LEFT JOIN SchedulerTests t
    ON eca.TellusTestCaseID = t.TestID
LEFT JOIN TellusTestcaseResults r
    ON g.GroupID = r.GroupID AND t.TestName = r.TestCaseName
WHERE e.IsDev = 0
    AND g.IsDeleted = 0
    AND i.IsDeleted = 0
    AND e.IsDeleted = 0
    AND (gpa.IsDeleted = 0 OR gpa.IsDeleted IS NULL) -- NULL if association is deleted
    AND (pc.IsDeleted = 0 OR pc.IsDeleted IS NULL)
    AND (eca.IsDeleted = 0 OR eca.IsDeleted IS NULL)
    AND i.Start >= '2018-03-20' AND i.Start < '2018-03-21'
```

JustifierTestCaseID	TCDurationInSecs	TCStatus	TCErrorMsg
81809	146	Passed	{}
81810	143	Passed	{}
81811	202	Passed	{}
-3141	NULL	Error	NULL
-3141	NULL	Error	NULL
118132	922	Failed	{"Test Case: data-fields": [{"Test Step ID: 522704...
118133	268	Passed	{}
118134	586	Failed	{"Test Case: bc-comp-tab": [{"Test Step ID: 5227...
124349	73	Failed	{"Toolbar": [{"Test Case (ID: 124349): Toolbar": [{...
147617	NULL	Error	NULL
139406	644	Failed	{"Test Case: pint-mac-cov": [{"Test Step ID: 7033...
143308	26	Failed	{"Test Case: pint-outliers": [{"Test Step ID: 72763...
146750	138	Failed	{"Test Case: axp2-dls-tax": [{"Test Step ID: 74519...
132919	305	Passed	{}
132920	135	Passed	{}

Note: The negative JustifierTestCaseID indicate data issue: missing Tellus test case mapping to QAI test case (RPD:39349165).

3. Number of automated test cases that fail per build stage

Aggregate the query above.

```
-- Count number of automated test cases per stage, status
WITH cte AS (
SELECT t.JustifierTestCaseID,
    TCDurationInSecs = DATEDIFF(SECOND, r.TCStartTime, r.TCEndTime),
    TCStatus = CASE
        WHEN CONVERT(varchar, r.TCErrorMsg) = '{}' THEN 'Passed'
        WHEN r.TCErrorMsg IS NULL OR TCStartTime IS NULL OR TCEndTime IS NULL
            OR t.JustifierTestCaseID < 0 THEN 'Error'
        ELSE 'Failed'
    END,
    r.TCErrorMsg,
    e.Stage
FROM SchedulerTestGroups g
JOIN CalendarInstances i
    ON g.InstanceID = i.InstanceID
JOIN CalendarEvent e
    ON i.EventID = e.EventID
LEFT JOIN CalendarGroupPlanAssociations gpa
    ON g.GroupID = gpa.GroupID
LEFT JOIN CalendarEventPlanConfig pc
    ON gpa.PlanConfigID = pc.PlanConfigID
```

```
LEFT JOIN CalendarEventCaseAssociations eca
    ON pc.PlanConfigID = eca.PlanConfigID
LEFT JOIN SchedulerTestCategories c
    ON c.CategoryID = pc.TellusTestPlanID
LEFT JOIN SchedulerTests t
    ON eca.TellusTestCaseID = t.TestID
LEFT JOIN TellusTestcaseResults r
    ON g.GroupID = r.GroupID AND t.TestName = r.TestCaseName
WHERE e.IsDev = 0
    AND g.IsDeleted = 0
    AND i.IsDeleted = 0
    AND e.IsDeleted = 0
    AND (gpa.IsDeleted = 0 OR gpa.IsDeleted IS NULL) -- NULL if association is deleted
    AND (pc.IsDeleted = 0 OR pc.IsDeleted IS NULL)
    AND (eca.IsDeleted = 0 OR eca.IsDeleted IS NULL)
    AND i.Start >= '2018-03-20' AND i.Start < '2018-03-21'
)
SELECT Stage, TCStatus, [TCCount] = count(*)
FROM cte
GROUP BY Stage, TCStatus
;
```

Stage	TCStatus	TCCount
Devel	Error	13
Live	Error	91
Prebuild	Error	29
QA	Error	24
Devel	Failed	19
Live	Failed	101
Prebuild	Failed	208
QA	Failed	70
Devel	Passed	9
Live	Passed	95
Prebuild	Passed	236
QA	Passed	38

4. SBU

Tellus database stores *product* ID but not the SBU. The SBU could be obtained via Justifier API using the product ID, as shown below.

In Tellus DB, QAI Product ID is stored in the `JustifierProductID` column of `CalendarEvent` table.

Example SQL Query:

```
-- Count number of automated test cases per product, stage, status
WITH cte AS (
SELECT t.JustifierTestCaseID,
    TCDurationInSecs = DATEDIFF(SECOND, r.TCStartTime, r.TCEndTime),
     TCStatus = CASE
         WHEN CONVERT(varchar, r.TCErrorMsg) = '{}' THEN 'Passed'
          WHEN r.TCErrorMsg IS NULL OR TCStartTime IS NULL OR TCEndTime IS NULL
              OR t.JustifierTestCaseID < 0 THEN 'Error'
          ELSE 'Failed'
     END,
     r.TCErrorMsg,
     e.JustifierProductID,
     e.Stage
```

```
FROM SchedulerTestGroups g
JOIN CalendarInstances i
    ON g.InstanceID = i.InstanceID
JOIN CalendarEvent e
    ON i.EventID = e.EventID
LEFT JOIN CalendarGroupPlanAssociations gpa
    ON g.GroupID = gpa.GroupID
LEFT JOIN CalendarEventPlanConfig pc
    ON gpa.PlanConfigID = pc.PlanConfigID
LEFT JOIN CalendarEventCaseAssociations eca
    ON pc.PlanConfigID = eca.PlanConfigID
LEFT JOIN SchedulerTestCategories c
    ON c.CategoryID = pc.TellusTestPlanID
LEFT JOIN SchedulerTests t
    ON eca.TellusTestCaseID = t.TestID
LEFT JOIN TellusTestcaseResults r
    ON g.GroupID = r.GroupID AND t.TestName = r.TestCaseName
WHERE e.IsDev = 0
    AND g.IsDeleted = 0
    AND i.IsDeleted = 0
    AND e.IsDeleted = 0
    AND (gpa.IsDeleted = 0 OR gpa.IsDeleted IS NULL) -- NULL if association is deleted
    AND (pc.IsDeleted = 0 OR pc.IsDeleted IS NULL)
    AND (eca.IsDeleted = 0 OR eca.IsDeleted IS NULL)
    AND i.Start >= '2018-03-20' AND i.Start < '2018-03-21'
)
SELECT JustifierProductID, Stage, TCStatus, [TCCount] = count(*)
FROM cte
GROUP BY JustifierProductID, Stage, TCStatus
;
```

JustifierProductID	Stage	TCStatus	TCCount
-1	QA	Failed	1
0	Live	Error	1
0	Live	Failed	2
0	Prebuild	Failed	16
33	Live	Failed	2
33	Live	Passed	1
145	QA	Failed	1
165	QA	Error	1
165	QA	Failed	4
165	QA	Passed	3
170	QA	Error	1
170	QA	Failed	1
170	QA	Passed	2
176	Live	Failed	1
176	QA	Failed	5
176	QA	Passed	1
177	Devel	Failed	1
177	Live	Failed	1
178	Live	Passed	1

Note: The JustifierProductID values -1 and 0 are invalid values, caused by environmental (Tellus) bugs (RPD:39345855).

Example Justifier API Query - Get SBU by Product ID:

HTTP GET http://is.factset.com/justifier/api/FactSetProducts/3673
where 3673 is JustifierTestCaseID.

```
<FactSetProduct $id="i1">
  <Id> 3673 </Id>
  <EntityKey> 3327301 </EntityKey>
  <PathKey> 3645-299-3673 </PathKey>
  <Name> PA 3.0 </Name>
  <Description nil="true" />
  <Notes nil="true" />
  <Path> Analytics > Portfolio Analysis > PA 3.0 </Path>
  <lastUpdatedDate> 2017-02-02T18:26:15.17 </lastUpdatedDate>
  <UpdatedBy> cwerner </UpdatedBy>
  <Deleted> false </Deleted>
</FactSetProduct>
```

The SBU is in its Path element:
`<Path> Analytics > Portfolio Analysis > PA 3.0 </Path>`

5. Service Test vs E2E

Service tests have TestEnvironment values WST, SoapUI, or SITINT in CalendarEvent table. Other values such as FPE, SGE are e2e tests. That is, add this expression to query above:

```
ServiceOrE2e = CASE
    WHEN e.TestEnvironment = 'SITINT' OR e.TestEnvironment = 'WST'
         OR e.TestEnvironment = 'SoapUI' THEN 'Service'
     ELSE 'E2E'
END
```

Example SQL:

```
-- Determine if service test or e2e test
SELECT t.JustifierTestCaseID,
    TCDurationInSecs = DATEDIFF(SECOND, r.TCStartTime, r.TCEndTime),
     TCStatus = CASE
         WHEN CONVERT(varchar, r.TCErrorMsg) = '{}' THEN 'Passed'
          WHEN r.TCErrorMsg IS NULL OR TCStartTime IS NULL OR TCEndTime IS NULL
              OR t.JustifierTestCaseID < 0 THEN 'Error'
          ELSE 'Failed'
     END,
     r.TCErrorMsg,
     e.JustifierProductID,
     e.Stage,
     ServiceOrE2e = CASE
         WHEN e.TestEnvironment = 'SITINT' OR e.TestEnvironment = 'WST'
             OR e.TestEnvironment = 'SoapUI' THEN 'Service'
         ELSE 'E2E'
     END
FROM SchedulerTestGroups g
JOIN CalendarInstances i
    ON g.InstanceID = i.InstanceID
JOIN CalendarEvent e
    ON i.EventID = e.EventID
LEFT JOIN CalendarGroupPlanAssociations gpa
    ON g.GroupID = gpa.GroupID
LEFT JOIN CalendarEventPlanConfig pc
    ON gpa.PlanConfigID = pc.PlanConfigID
LEFT JOIN CalendarEventCaseAssociations eca
```

```
    ON pc.PlanConfigID = eca.PlanConfigID
LEFT JOIN SchedulerTestCategories c
    ON c.CategoryID = pc.TellusTestPlanID
LEFT JOIN SchedulerTests t
    ON eca.TellusTestCaseID = t.TestID
LEFT JOIN TellusTestcaseResults r
     ON g.GroupID = r.GroupID AND t.TestName = r.TestCaseName
WHERE e.IsDev = 0
    AND g.IsDeleted = 0
    AND i.IsDeleted = 0
    AND e.IsDeleted = 0
    AND (gpa.IsDeleted = 0 OR gpa.IsDeleted IS NULL)
    AND (pc.IsDeleted = 0 OR pc.IsDeleted IS NULL)
    AND (eca.IsDeleted = 0 OR eca.IsDeleted IS NULL)
    AND i.Start >= '2018-03-20' AND i.Start < '2018-03-21'
```

JustifierTestCaseID	TCDurationInSecs	TCStatus	TCErrorMsg	JustifierProductID	Stage
-3141	NULL	Error	NULL	3670	QA
-3141	NULL	Error	NULL	3670	QA
81811	202	Passed	{}	277	Live
135942	491	Passed	{}	4242	QA
118135	668	Passed	{}	3940	Prebuild
118136	1317	Passed	{}	3940	Prebuild
118137	511	Passed	{}	3940	Prebuild
146750	136	Failed	{"Test Case: axp2-dls-tax": [{"Test Step ID: 745...	4840	QA
138739	223	Passed	{}	4347	Prebuild
112468	149	Failed	{"Test Case: univ-multi-stat-chart": [{"Test Step I...	4347	Prebuild
114475	54	Passed	{}	4347	Prebuild
116376	239	Failed	{"Test Case: returns-chart": [{"Test Step ID: 512...	4347	Prebuild
117876	68	Failed	{"Test Case: multi-statistic-chart": [{"Test Step I...	4347	Prebuild
112429	141	Failed	{"Test Case: edit-currency": [{"Test Step ID: 58...	4347	Prebuild
116264	127	Failed	{"Test Case: currency-risk-free-rate": [{"Test Ste...	4347	Prebuild
139216	180	Failed	{"Test Case: risk-free-rate": [{"Test Step ID: 701...	4347	Prebuild
112047	120	Passed	{}	4347	Prebuild
115199	84	Failed	{"Test Case: annualization-per-year": [{"Test Ste...	4347	Prebuild

Note: Negative JustifierTestCaseID is an environmental error, as indicated by TCStatus 'Error' (caused by missing Tellus test case mapping to Justifier test case ID.)

Common SQL

The queries above have this commonality, which gets a list of job test cases:

```
FROM SchedulerTestGroups g
JOIN CalendarInstances i
    ON g.InstanceID = i.InstanceID
JOIN CalendarEvent e
    ON i.EventID = e.EventID
LEFT JOIN CalendarGroupPlanAssociations gpa
    ON g.GroupID = gpa.GroupID
LEFT JOIN CalendarEventPlanConfig pc
    ON gpa.PlanConfigID = pc.PlanConfigID
LEFT JOIN CalendarEventCaseAssociations eca
    ON pc.PlanConfigID = eca.PlanConfigID
LEFT JOIN SchedulerTestCategories c
    ON c.CategoryID = pc.TellusTestPlanID
LEFT JOIN SchedulerTests t
    ON eca.TellusTestCaseID = t.TestID
LEFT JOIN TellusTestcaseResults r
     ON g.GroupID = r.GroupID AND t.TestName = r.TestCaseName
WHERE e.IsDev = 0
```

```
    AND g.IsDeleted = 0
    AND i.IsDeleted = 0
    AND e.IsDeleted = 0
    -- NULL if test case association is deleted
    AND (gpa.IsDeleted = 0 OR gpa.IsDeleted IS NULL)
    AND (pc.IsDeleted = 0 OR pc.IsDeleted IS NULL)
    AND (eca.IsDeleted = 0 OR eca.IsDeleted IS NULL)
```

Notes:

The `e.IsDev = 0` limits the query to only production test runs (excludes tester's development test runs.)

TCErrorMsg: JSON string with test failure message.

If TCErrorMsg = '{}', then mark test case as passed,
Else if TCErrorMsg = other non-NULL string, then mark it as failed (test completed),
Else if TCErrorMsg is NULL, then mark the test case as (environmental) error (test did not complete).

If TCStartTime or TCEndTime (i.e. TCDurationInSecs) is NULL, mark it as error.

If JustifierTestCaseID < 0, then mark it as error
(it is due to missing mapping from Tellus test case ID to Justifier test case ID; negative value is "placeholder" for the test case mapping).

Schema Description

Sources

Sources

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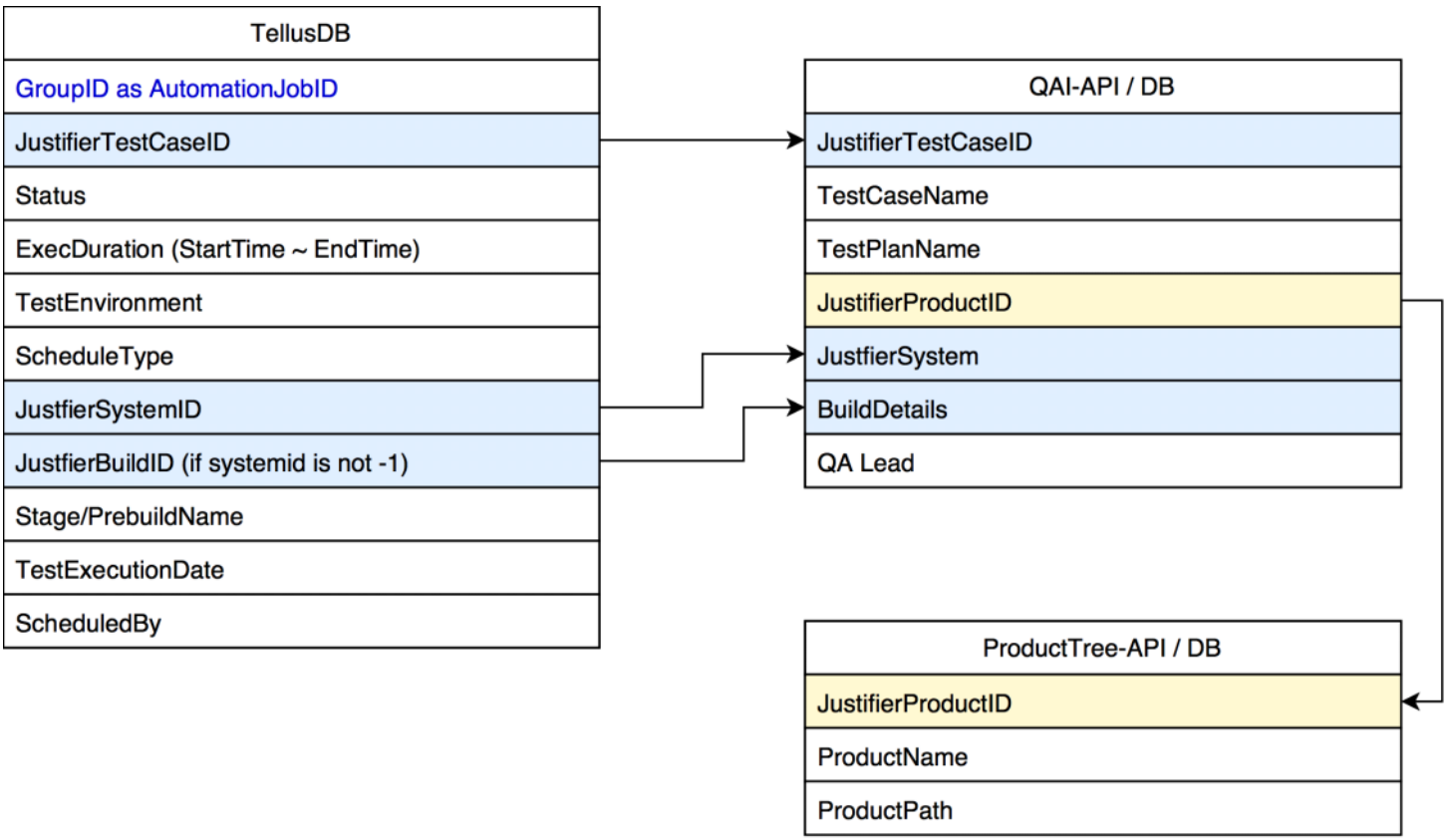

Sample info, appropriate queries in the above pages:

Tellus Data Details		
DataItem	**DBTableName**	**Sample**
GroupID	TellusTestcaseResults	
Status	TellusTestcaseResults	Pass, Fail
TCStartTime	TellusTestcaseResults	
TCEndTime	TellusTestcaseResults	
TCErrorMsg	TellusTestcaseResults	json string
TestCaseName	TellusTestcaseResults	
TestName	SchedulerTests	
JustifierTestCaseID	SchedulerTests	
GroupID	SchedulerTestGroups	
InstanceID	SchedulerTestGroups	
InstanceID		
CalendarInstances		
EventID	CalendarInstances	

EventID	CalendarEvent	
ScheduleType	CalendarEvent	RunNow, AddRecurrence
TestEnvironment	CalendarEvent	FPE,SGE,WST
JustifierSystemID	CalendarEvent	
BuildID	CalendarEvent	
Stage	CalendarEvent	Devel,QA,Live, null
PrebuildName	CalendarEvent	
ScheduledBy	CalendarEvent	
IsDev	CalendarEvent	0,1
text	These columns are only to create connections across tables but not needed as data	
bold text	These columns are to create connections across tables and also needed as data	
	for filtering data only	

TCErrorMsg analysis

Thursday, March 22, 2018 12:43 PM

Some analysis of test case error messages from the TCErrorMsg column of TellusTestcaseResults table.

Note that protractor tests have assertions but other project types such as TestComplete do not use assertions, therefore there is no standard way to determine if they are "assertion" failures or script errors.

Example TCErrorMsg

This is an example test that does have assertions:


```
{
  "Test Case: data-fields": [{
    "Test Step ID: 522704": [{
      "Action: Verify that \"CDS 7yr (USD)\" is not having null value": ["Failed: No
element found using locator: By(xpath, //*[normalize-space(.)=\"CDS 7yr
(USD)\"]/ancestor::div[contains(@class,\"form-row\")]/div[2]//label)"]
    }]
  }, {
    "Test Step ID: 522707": [{
      "Action: Verify that the Input Container doesn't contain any extra fields":
["Expected 30 to equal 29."]
    }]
  }]
}
```


Note: It could have multiple levels of objects.

Samples of error messages

Looking through samples of TCErrorMsg, the **great majority of error messages are probably more likely script issues**, as the great majority of message are not assertion failure. Essentially, only assertion failures has the possibility of product defect, but it is still possible that the script has the wrong expectations, i.e. it could still be script issue.

In actual findings, product defects are a small percentage of test failures. So, the test failures more likely script issues, until found otherwise.

Also, relatively few samples are likely system (Tellus) issues than script issues. Tellus issues also manifest themselves in another way: missing test results (as it gets Python "dispatcher" exception), and TCErrorMsg would be NULL in that case.

Some samples of TCErrorMsg messages from a few days in March 2018 are provided in a separate document because of the large size.

Examples of Probable Script Issues:

- Failed: No element found using locator
  (It is more likely that this is script issue.)
- ...is not a function
- Unable to get the reference

- Cannot read property ... of undefined
- call function result missing 'value'
- Could not get ... window reference
- undefined method ... for false:FalseClass
- undefined method ... for nil:NilClass
- undefined local variable or method
- No window with parameters ... exists
- Element ... not found after waiting for ... secs.
- Unable to get the reference ...
- uninitialized constant
- keyword missing at ...
- ... does not contain ... missing

Example Assertion Failures:

- **Expected** 'American Airlines 2011-1 Pass Through Trust' **to equal** 'American Airlines, Inc.'
- The XPathContains **assertion failed**
- **Expected** = "undefined", **found** = "CASH_CZK_1DAY"

Script assertion failures raises possibility of product issue, but could still be script issue (wrong expectations).

Example Probable Tellus ("environment") Issue:

- Timed out to get FactSet online

But it is still possible that this is script issue.

TCErrorMsg samples

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Sample messages

TcErrorMsg
Samples

Tellus DB Query - jobs ("groups")

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```
-- Tellus jobs ("groups")

SELECT g.GroupID
    ,g.CronID
    ,g.Duration AS GroupDuration
    ,CONVERT(varchar, g.StartDateTime, 126) AS StartDateTime
    ,CONVERT(varchar, g.CreateDateTime, 126) AS CreateDateTime
    ,g.StaxRequest
    ,i.InstanceID
    ,CONVERT(varchar, i.Start, 126) AS Start
    ,CONVERT(varchar, i.Finish, 126) AS Finish
    ,i.EventID
    ,i.SeriesID
    ,e.ParentID, e.IsSeries, e.IsException, e.Title, e.AllDay, e.Priority, e.Duration,
e.LastModified, e.ExecHost, e.IsDev, e.RunNow, e.ScheduleType, e.EmailRecipient,
e.BuildID, e.BuildVersion, e.BitVersion, e.WindowsVersion, e.OfficeVersion,
e.LanguageName, e.VMSUserID, e.Stage, e.PrebuildName, e.HTMLReports, e.HTMLReportsOS,
e.CaccessCode, e.TickerListRequired, e.TickerList, e.BrowserType, e.BrowserVersion,
e.TestServer, e.ControlServer, e.JustifierSystemID, e.JustifierBuildID,
e.JustifierLibraryID, e.JustifierProductID, e.TestEnvironment, e.SeleniumGridHub,
e.Platform, e.PlatformName, e.PlatformVersion, e.DeviceName, e.SGBrowserName,
e.SGBrowserVersion, e.WebStage, e.TestCaseStage, e.TestCasePrebuildName, e.FixedTime,
e.IsRegressionJob, e.IsLateRegressionJob, e.BaseBuild, e.TestBuild, e.Gherkin
    ,e.ProjectType
    ,p.RecurStartDate, p.RecurStartTime, p.RecurType, p.RecurEvery, p.Day0, p.Day1,
p.Day2, p.Day3, p.Day4, p.Day5, p.Day6, p.Day7, p.Day8, p.Day9, p.Day10, p.Day11,
p.Day12, p.Day13, p.RecurMonthlyType, p.RecurMonthlyNth, p.RecurMonthlyDOW,
p.RecurYearlyMonth, p.RecurEndType, p.RecurEndDate, p.RecurEndNum, p.GenStart, p.GenLeft,
p.IsGenComplete, p.ScheduledStart
FROM SchedulerTestGroups g
JOIN CalendarInstances i ON g.InstanceID = i.InstanceID
JOIN CalendarEvent e  ON i.EventID = e.EventID
LEFT JOIN CalendarEvent s ON i.SeriesID = s.EventID
LEFT JOIN CalendarParent p ON s.ParentID = p.ParentID
WHERE g.IsDeleted = 0
    AND i.IsDeleted = 0
    AND e.IsDeleted = 0
    AND (p.IsDeleted = 0 OR p.IsDeleted IS NULL)
```

Tellus DB query - jobs and associated test cases

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```
-- Jobs ("groups") and associated test cases

SELECT g.GroupID
    ,g.Duration AS GroupDuration
    ,CONVERT(varchar, g.StartDateTime, 126) AS StartDateTime
    ,CONVERT(varchar, g.CreateDateTime, 126) AS CreateDateTime
    ,g.StaxRequest
    ,g.CronID
    ,g.InstanceID
    ,i.EventID
    ,i.SeriesID
    ,CONVERT(varchar, i.Start, 126) AS Start
    ,CONVERT(varchar, i.Finish, 126) AS Finish
    ,e.ParentID, e.IsSeries, e.IsException, e.Title, e.AllDay, e.Priority, e.Duration,
e.LastModified, e.ExecHost, e.IsDev, e.RunNow, e.ScheduleType, e.EmailRecipient,
e.BuildID, e.BuildVersion, e.BitVersion, e.WindowsVersion, e.OfficeVersion,
e.LanguageName, e.VMSUserID, e.Stage, e.PrebuildName, e.HTMLReports, e.HTMLReportsOS,
e.CaccessCode, e.TickerListRequired, e.TickerList, e.BrowserType, e.BrowserVersion,
e.TestServer, e.ControlServer, e.JustifierSystemID, e.JustifierBuildID,
e.JustifierLibraryID, e.JustifierProductID, e.TestEnvironment, e.SeleniumGridHub,
e.Platform, e.PlatformName, e.PlatformVersion, e.DeviceName, e.SGBrowserName,
e.SGBrowserVersion, e.WebStage, e.TestCaseStage, e.TestCasePrebuildName, e.FixedTime,
e.IsRegressionJob, e.IsLateRegressionJob, e.BaseBuild, e.TestBuild, e.Gherkin
    ,p.RecurStartDate, p.RecurStartTime, p.RecurType, p.RecurEvery, p.Day0, p.Day1,
p.Day2, p.Day3, p.Day4, p.Day5, p.Day6, p.Day7, p.Day8, p.Day9, p.Day10, p.Day11,
p.Day12, p.Day13, p.RecurMonthlyType, p.RecurMonthlyNth, p.RecurMonthlyDOW,
p.RecurYearlyMonth, p.RecurEndType, p.RecurEndDate, p.RecurEndNum, p.GenStart, p.GenLeft,
p.IsGenComplete, p.ScheduledStart
    ,gpa.PlanConfigID
    ,pc.TellusTestPlanID
    ,pc.JustifierTestPlanID
    ,pc.JustifierConfigName
    ,eca.TellusTestCaseID
    ,t.JustifierTestCaseID
    ,c.CategoryName AS TellusTestPlanName
    ,t.TestName AS TellusTestCaseName
    ,t.ProjectType
    ,t.SubProjectType
    ,t.InstallerNeeded
FROM SchedulerTestGroups g
JOIN CalendarInstances i
    ON g.InstanceID = i.InstanceID
JOIN CalendarEvent e
    ON i.EventID = e.EventID
LEFT JOIN CalendarEvent s
    ON i.SeriesID = s.EventID
LEFT JOIN CalendarParent p
    ON s.ParentID = p.ParentID
LEFT JOIN CalendarGroupPlanAssociations gpa
    ON g.GroupID = gpa.GroupID
LEFT JOIN CalendarEventPlanConfig pc
    ON gpa.PlanConfigID = pc.PlanConfigID
LEFT JOIN CalendarEventCaseAssociations eca
    ON pc.PlanConfigID = eca.PlanConfigID
LEFT JOIN SchedulerTestCategories c
```

```
    ON c.CategoryID = pc.TellusTestPlanID
LEFT JOIN SchedulerTests t
    ON eca.TellusTestCaseID = t.TestID
WHERE g.IsDeleted = 0
    AND i.IsDeleted = 0
    AND e.IsDeleted = 0
    AND (p.IsDeleted = 0 OR p.IsDeleted IS NULL)  -- NULL if not recurrence
    AND (gpa.IsDeleted = 0 OR gpa.IsDeleted IS NULL)
    AND (pc.IsDeleted = 0 OR pc.IsDeleted IS NULL)
    AND (eca.IsDeleted = 0 OR eca.IsDeleted IS NULL)
```

Tellus DB Query - jobs and associated test cases results

Wednesday, March 21, 2018 11:39 AM

```
-- Jobs ("groups") and associated test cases and test case results
SELECT g.GroupID
    ,g.Duration AS GroupDuration
    ,CONVERT(varchar, g.StartDateTime, 126) AS StartDateTime
    ,CONVERT(varchar, g.CreateDateTime, 126) AS CreateDateTime
    ,g.StaxRequest
    ,g.CronID
    ,g.InstanceID
    ,i.EventID
    ,i.SeriesID
    ,CONVERT(varchar, i.Start, 126) AS Start
    ,CONVERT(varchar, i.Finish, 126) AS Finish
    ,e.ParentID, e.IsSeries, e.IsException, e.Title, e.AllDay, e.Priority, e.Duration,
e.LastModified, e.ExecHost, e.IsDev, e.RunNow, e.ScheduleType, e.EmailRecipient,
e.BuildID, e.BuildVersion, e.BitVersion, e.WindowsVersion, e.OfficeVersion,
e.LanguageName, e.VMSUserID, e.Stage, e.PrebuildName, e.HTMLReports, e.HTMLReportsOS,
e.CaccessCode, e.TickerListRequired, e.TickerList, e.BrowserType, e.BrowserVersion,
e.TestServer, e.ControlServer, e.JustifierSystemID, e.JustifierBuildID,
e.JustifierLibraryID, e.JustifierProductID, e.TestEnvironment, e.SeleniumGridHub,
e.Platform, e.PlatformName, e.PlatformVersion, e.DeviceName, e.SGBrowserName,
e.SGBrowserVersion, e.WebStage, e.TestCaseStage, e.TestCasePrebuildName, e.FixedTime,
e.IsRegressionJob, e.IsLateRegressionJob, e.BaseBuild, e.TestBuild, e.Gherkin
    ,p.RecurStartDate, p.RecurStartTime, p.RecurType, p.RecurEvery, p.Day0, p.Day1,
p.Day2, p.Day3, p.Day4, p.Day5, p.Day6, p.Day7, p.Day8, p.Day9, p.Day10, p.Day11,
p.Day12, p.Day13, p.RecurMonthlyType, p.RecurMonthlyNth, p.RecurMonthlyDOW,
p.RecurYearlyMonth, p.RecurEndType, p.RecurEndDate, p.RecurEndNum, p.GenStart, p.GenLeft,
p.IsGenComplete, p.ScheduledStart
    ,gpa.PlanConfigID
    ,pc.TellusTestPlanID
    ,pc.JustifierTestPlanID
    ,pc.JustifierConfigName
    ,eca.TellusTestCaseID
    ,t.JustifierTestCaseID
    ,c.CategoryName AS TellusTestPlanName
    ,t.TestName AS TellusTestCaseName
    ,t.ProjectType
    ,t.SubProjectType
    ,t.InstallerNeeded
    ,r.TCStartTime
    ,r.TCEndTime
    ,r.TCErrorMsg
FROM SchedulerTestGroups g
JOIN CalendarInstances i
    ON g.InstanceID = i.InstanceID
JOIN CalendarEvent e
    ON i.EventID = e.EventID
LEFT JOIN CalendarEvent s -- (optional) non-NULL only if recurring job
    ON i.SeriesID = s.EventID
LEFT JOIN CalendarParent p -- (optional) recurrence info
    ON s.ParentID = p.ParentID
LEFT JOIN CalendarGroupPlanAssociations gpa
    ON g.GroupID = gpa.GroupID
LEFT JOIN CalendarEventPlanConfig pc
    ON gpa.PlanConfigID = pc.PlanConfigID
LEFT JOIN CalendarEventCaseAssociations eca
    ON pc.PlanConfigID = eca.PlanConfigID
LEFT JOIN SchedulerTestCategories c
```

```
    ON c.CategoryID = pc.TellusTestPlanID
LEFT JOIN SchedulerTests t
    ON eca.TellusTestCaseID = t.TestID
LEFT JOIN TellusTestcaseResults r
    ON g.GroupID = r.GroupID AND t.TestName = r.TestCaseName
WHERE g.IsDeleted = 0
    AND i.IsDeleted = 0
    AND e.IsDeleted = 0
    AND (p.IsDeleted = 0 OR p.IsDeleted IS NULL)  -- NULL if not recurrence
    AND (gpa.IsDeleted = 0 OR gpa.IsDeleted IS NULL)
    AND (pc.IsDeleted = 0 OR pc.IsDeleted IS NULL)
    AND (eca.IsDeleted = 0 OR eca.IsDeleted IS NULL)
```

Tellus DB - TellusStaxJobStatus table

Tuesday, March 20, 2018 11:43 AM

TallusStaxJobStatus table is "post-morten" job status analysis. It has no "in-progress" status.

JobStatus Codes

0 -> job did not start yet
StatusMessage will be NULL

1 -> completed without any exception
Completed cleanup phase
Note: In actual data, some TellusTestResult phase might be incomplete, or passed + failed < total

2 -> started but did not complete
StatusMessage will be NULL

3 -> timed out
StatusMessage will be NULL

4 -> terminated with some exception
StatusMessage usually not NULL

Example StatusMessages

Example StatusMessage Values:
Error while reading the test configuration file
Error for Log parsing
Test logs not generated
Error at copy test suite to VM
Error for creating directory in shared drive
Error at VM deploy
NULL
Force termination by tellus-admins
Error for copying test logs to shared drive
Error while reading the test configuration file.
Error at Mapping TDrive
Error at testlist update or create
Error while downloading test suite
Error at serial number allocation

Tellus DB - CalendarEvent table

Thursday, March 22, 2018 8:11 AM

Stage and PrebuildName Columns

Prebuilds are specified by these columns in CalendarEvent table:
`Stage` = `Prebuild`
`PrebuildName` = *<prebuild_name>*

Note: Jobs scheduled before 2014, had another format, which is no longer in use:
`Stage=PREBUILD:`*<prebuild_name>* (and PrebuildName is NULL)

Note that in the latter case, the PREBUILD prefix is all uppercase.

Possible Stage Values:
`Prebuild`
`DEVEL`
`QA`
`Staging`
`Live`
`RELEASED`

Service Testing Notes

Currently TestEnvironment has SoapUI, SITINT, WST.
WST is Web Service Testing.
In the future, SoapUI and SITINT will fall under WST:

- Tellus TestEnvironment will be WST.
- Tool in QAI and ProjectType in Tellus will be SoapUI, WebSocket, etc.

Tellus DB - CalendarGroupPlanAssociations

Thursday, March 22, 2018 8:32 AM

```
USE [tellus]
GO

/****** Object:  Table [dbo].[CalendarGroupPlanAssociations]    Script Date: 3/22/2018
8:32:06 AM ******/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[CalendarGroupPlanAssociations](
     [GroupPlanAssocID] [bigint] IDENTITY(1,1) NOT NULL,
     [GroupID] [int] NOT NULL,
     [PlanConfigID] [bigint] NOT NULL,
     [IsDeleted] [bit] NOT NULL,
PRIMARY KEY CLUSTERED
(
     [GroupPlanAssocID] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY],
UNIQUE NONCLUSTERED
(
     [GroupID] ASC,
     [PlanConfigID] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]
GO

ALTER TABLE [dbo].[CalendarGroupPlanAssociations] ADD  DEFAULT ((0)) FOR [IsDeleted]
GO

ALTER TABLE [dbo].[CalendarGroupPlanAssociations]  WITH CHECK ADD FOREIGN KEY([GroupID])
REFERENCES [dbo].[SchedulerTestGroups] ([GroupID])
GO

ALTER TABLE [dbo].[CalendarGroupPlanAssociations]  WITH CHECK ADD FOREIGN
KEY([PlanConfigID])
REFERENCES [dbo].[CalendarEventPlanConfig] ([PlanConfigID])
GO
```

Tellus DB - CalendarEventPlanConfig table

Thursday, March 22, 2018 8:34 AM

```
USE [tellus]
GO

/****** Object:  Table [dbo].[CalendarEventPlanConfig]    Script Date: 3/22/2018 8:34:44
AM ******/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[CalendarEventPlanConfig](
     [PlanConfigID] [bigint] IDENTITY(1,1) NOT NULL,
     [EventID] [bigint] NOT NULL,
     [TellusTestPlanID] [int] NULL,
     [JustifierConfigName] [varchar](256) NULL,
     [JustifierTestPlanID] [int] NULL,
     [Duration] [int] NOT NULL,
     [IsDeleted] [bit] NOT NULL,
PRIMARY KEY CLUSTERED
(
     [PlanConfigID] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY],
UNIQUE NONCLUSTERED
(
     [EventID] ASC,
     [TellusTestPlanID] ASC,
     [JustifierConfigName] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]
GO

ALTER TABLE [dbo].[CalendarEventPlanConfig] ADD  DEFAULT ((0)) FOR [IsDeleted]
GO

ALTER TABLE [dbo].[CalendarEventPlanConfig]  WITH CHECK ADD FOREIGN KEY([EventID])
REFERENCES [dbo].[CalendarEvent] ([EventID])
GO
```

Tellus DB - CalendarEventCaseAssociations

Thursday, March 22, 2018 8:35 AM

```
USE [tellus]
GO

/****** Object:  Table [dbo].[CalendarEventCaseAssociations]    Script Date: 3/22/2018
8:35:32 AM ******/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[CalendarEventCaseAssociations](
     [CaseAssocID] [bigint] IDENTITY(1,1) NOT NULL,
     [PlanConfigID] [bigint] NOT NULL,
     [TellusTestCaseID] [int] NULL,
     [IsDeleted] [bit] NOT NULL,
     [JustifierTestCaseID] [int] NULL,
PRIMARY KEY CLUSTERED
(
     [CaseAssocID] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]
GO

ALTER TABLE [dbo].[CalendarEventCaseAssociations] ADD  DEFAULT ((0)) FOR [IsDeleted]
GO

ALTER TABLE [dbo].[CalendarEventCaseAssociations]  WITH CHECK ADD FOREIGN
KEY([PlanConfigID])
REFERENCES [dbo].[CalendarEventPlanConfig] ([PlanConfigID])
GO

ALTER TABLE [dbo].[CalendarEventCaseAssociations]  WITH CHECK ADD FOREIGN
KEY([TellusTestCaseID])
REFERENCES [dbo].[SchedulerTests] ([TestID])
GO
```

Tellus DB - SchedulerTests table

Thursday, March 22, 2018 9:02 AM

Column Description

JustifierTestCaseID

QAI test case ID.
If value is negative, it is a placeholder for test cases that do not (yet) have mapping to QAI test case. Its value is the negative value of *Tellus* test case ID.
It is (negative) unique value, because this column has UNIQUE NOT NULL constraint

Schema

```
USE [tellus]
GO

/****** Object:  Table [dbo].[SchedulerTests]    Script Date: 3/22/2018 9:01:55 AM
******/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[SchedulerTests](
	[TestID] [int] IDENTITY(1,1) NOT NULL,
	[TestName] [varchar](256) NOT NULL,
	[TestPath] [varchar](256) NOT NULL,
	[isDeleted] [bit] NOT NULL,
	[TELLUSB01] [bit] NOT NULL,
	[TELLUSDEVB01] [bit] NOT NULL,
	[Owner] [varchar](256) NULL,
	[Author] [varchar](256) NULL,
	[TestEnvironment] [varchar](10) NULL,
	[AutomationStatusID] [smallint] NULL,
	[BasePath] [varchar](256) NULL,
	[ProdTestPath] [varchar](256) NULL,
	[ProdBasePath] [varchar](256) NULL,
	[JustifierTestCaseID] [int] NULL,
	[ProjectType] [varchar](50) NULL,
	[SubProjectType] [varchar](50) NULL,
	[InstallerNeeded] [bit] NULL,
	[SCM] [varchar](3) NULL,
	[PackageName] [nvarchar](128) NULL,
	[ScriptPath] [nvarchar](256) NULL,
	[ApplicationRepo] [nvarchar](512) NULL,
 CONSTRAINT [PK_SchedulerTests] PRIMARY KEY CLUSTERED
(
	[TestID] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY],
 CONSTRAINT [u_schedulertests_justifiertcid] UNIQUE NONCLUSTERED
(
	[JustifierTestCaseID] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY],
 CONSTRAINT [UK_TestName] UNIQUE NONCLUSTERED
(
```

```
    [TestName] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]
GO

ALTER TABLE [dbo].[SchedulerTests] ADD  CONSTRAINT [DF_SchedulerTests_isDeleted]  DEFAULT
((0)) FOR [isDeleted]
GO

ALTER TABLE [dbo].[SchedulerTests] ADD  DEFAULT ((0)) FOR [TELLUSB01]
GO

ALTER TABLE [dbo].[SchedulerTests] ADD  DEFAULT ((0)) FOR [TELLUSDEVB01]
GO

ALTER TABLE [dbo].[SchedulerTests] ADD  DEFAULT ('FPE') FOR [TestEnvironment]
GO

EXEC sys.sp_addextendedproperty @name=N'MS_Description', @value=N'The location (path) to
this test' , @level0type=N'SCHEMA',@level0name=N'dbo', @level1type=N'TABLE',
@level1name=N'SchedulerTests', @level2type=N'COLUMN',@level2name=N'TestPath'
GO
```

Tests Resulting in RPD

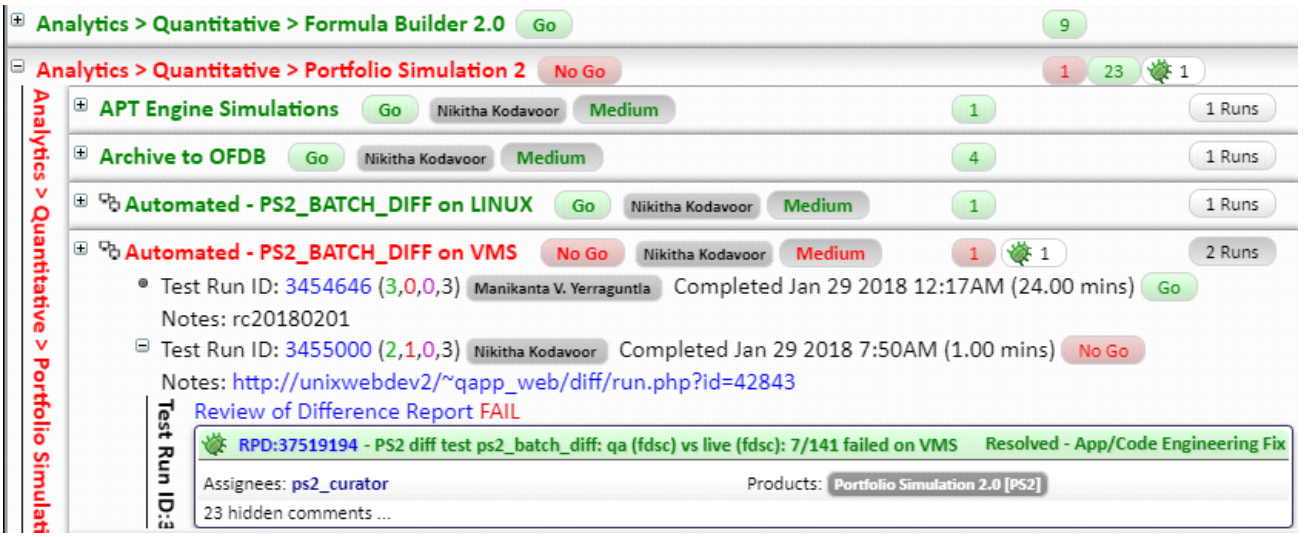
Friday, March 23, 2018 9:50 AM

[In Progress]

Example QAI SWP with RPD:

This example is not necessarily automated test, but it shows QAI test result's association with RPD. "No Go" SWP tests could have associated RPD.

http://is.factset.com/justifier/#31955



RPD type is "Bug Report".
If RPD Status is Resolved as "Engineering Fix", then it is confirmed bug (there is no "Accepted as Bug" status).

Tellus job metrics/results tables

Monday, March 26, 2018 8:12 AM

Job phases, in order:

VMTimeMetrics
MetricDownloadTestCases,
MetricInstallAtlasBuild,
TellusTestResult, TellusTestcaseResults
MetricProcessLogs,
MetricCleanup

VMTimeMetrics to MetricProcessLogs are chunk level; MetricCleanup is job level only.

FPE uses all phases: VMTimeMetrics, ..., to MetricCleanup.
SGE only uses MetricDownloadTestCases, TellusTestResult, MetricProcessLogs, MetricCleanup.
SITINT, WST, SoapUI do not use phases.