

Automation workflow of Office Dependent Data (ODD) Verification



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1 Introduction

Automated provisioning is the ability to deploy an information technology or telecommunications service by using predefined procedures that are carried out electronically without requiring human intervention.

Data validation is an important part of any application, as it helps to make sure that the device is configured with the required data.

Currently the ODD verification Testing effort requires RJIL engineers to validate data in the device. These checks are performed when vendor provides the device logs and ODD sheets.

Automating the ODD verification will reduce the manual effect and time for validation. Reports will be generated for each execution with the matching and mismatching information. So, it is very easy to identify the mismatching data. Once the script is developed for a specific node, it is easy to reuse the same script to validate latest ODD sheets provided by the vendor.

2 Scope of Work

2.1 Automation Scope for ODD verification

The scope of the automation effort is to create a framework using **iTest Enterprise** that will be able to run automatically (or on demand) and return a report with the validation results.

2.2 Automation Coverage of ODD verification

Automated process for **ODD** verification covers the following Network Nodes:

- **EPC Team:**
 - a. *MME NODAL* (100% complete).
 - b. *SAE-Gateway* (100% complete)
 - c. *PCRF* (100% complete)
 - d. *DRA* (25% complete)
- **IMS Team:**
 - e. Radisys Media Resource Function (MRF) - (100% complete)

2.3 ODD verification Reporting

Requirements: Reports should be available in HTML/XML/Text format for each test case run.

Sample of validation report:

Test Report

Summary

Test case: project://PCRF/test_cases/ODD_Verification_PCRF_Mumbai.fttc
Owner:
Testbed:
Parameter file:
Execution started: 2015/01/12 17:12:55
Execution completed: 2015/01/12 17:13:40
Execution duration: 00:00:44

Total report items: 2264
Total issues: 98
Pass/OK: 45
Fail/Error: 3
Warnings: 0
Information: 50
Report ID: 1945

Executed Steps

Action	Session	Description	Step	Timestamp
...

Report

Message	Index	Step	Procedure	Session	Source	File
Active_Host : 6120XG-1A is present in both excel and log	2.1.6.1....	1.6.1.1....	Validate...		analysis	ODD_Verificati...
Active_Host : 6120XG-1B is present in both excel and log	2.1.6.1....	1.6.1.1....	Validate...		analysis	ODD_Verificati...
Active_IPv4 : 10.64.17.136 is present in both excel and log	2.1.6.1....	1.6.1.1....	Validate...		analysis	ODD_Verificati...
Active_IPv4 : 10.64.17.137 is present in both excel and log	2.1.6.1....	1.6.1.1....	Validate...		analysis	ODD_Verificati...
StandBy_Host : OA-PCRF-01-01-B is present in both excel and log	2.1.6.2....	1.6.2.1....	Validate...		analysis	ODD_Verificati...
StandBy_Host : OA-PCRF-01-01-A is present in both excel and log	2.1.6.2....	1.6.2.1....	Validate...		analysis	ODD_Verificati...
StandBy_IPv4_Address : 10.64.17.135 is present in both excel and log	2.1.6.2....	1.6.2.1....	Validate...		analysis	ODD_Verificati...
StandBy_IPv4_Address : 10.64.17.134 is present in both excel and log	2.1.6.2....	1.6.2.1....	Validate...		analysis	ODD_Verificati...
Fetching CMD_A values from LOG	2.1	1	Start		analysis	ODD_Verificati...

2.4 ODD verification Test Prerequisites

Requirements: Lab Machine - a windows machine that has access to all Nodes under test.

In order to execute testcase, the following resources need to be configured in the machine:

- **Lab Machine**

1.1 Windows PC with the following tools need to be installed:

- a. iTest
- b. Mozilla web browser (21 or above version)
- c. Microsoft office
- d. TCL 8.4 or above version

2.5 iTest Parameters for ODD verification

The values in the testcase which need to be modified for each ODD verification can be specified as parameters, so we can directly change the values in the parameter tab instead of modifying in the actual testcase.

Notes: List of parameters need to be used in the testcase.

Note	Details
*	<p>ODD workbook:</p> <p>ODD workbook located path need to speicified as a parameter.</p> <p>Eg: workbook - D://RCP//PCRF//new_info//PCRF_ODD_RJLAB1_MUM.XLSX</p>
**	<p>Device logs:</p> <p>Device logs located path need to speicified as a parameter.</p> <p>Eg: Slot1_log - project://PCRF/Logs/11tk.txt</p>
***	<p>Table Range:</p> <p>Inorder to fetch the data from ODD excel sheet, table header and table values range need to specified.</p> <p>Eg: Table_range: 3 D - 3 F Table_header_range: 3 A - 3 C</p>
****	<p>Validate Headers:</p> <p>The values which need to be validate can be speicified as parameters.</p>

Eg: validate_headers: Virtual_IP,Active_IP,Hostname

Test Case Parameters

Save Parameters As...

☐ Show the parameter values that will be used for execution.

Name	Value	Description
OAM_VLANS		
OAM_Virtual_LANs		
table_range	10 A - 10 D	
table_header_range	2 A - 2 D	
validate_headers	VLAN,Plat_Mgt,XMI	
Interface		
table_range	3 D - 3 F	
table_header_range	3 A - 3 C	
validate_other_headers_active	Active_Host,Active_IPv4	
table_range_standby	9 A - 9 C	
table_header_range_standby	9 D - 9 F	
validate_other_headers_standby	StandBy_Host,StandBy_IPv4_Address	
workbook	D://RCP//PCRF//new_info//PCRF_ODD_RJLAB1_MUM.XLSX	
VLAN36	project://PCRF/Logs/VLAN136.txt	
Interconnect	project://PCRF/Logs/OA.txt	
Slot1_log	project://PCRF/Logs/11tk.txt	

☐ Mask the value

Advanced Merging Behavior

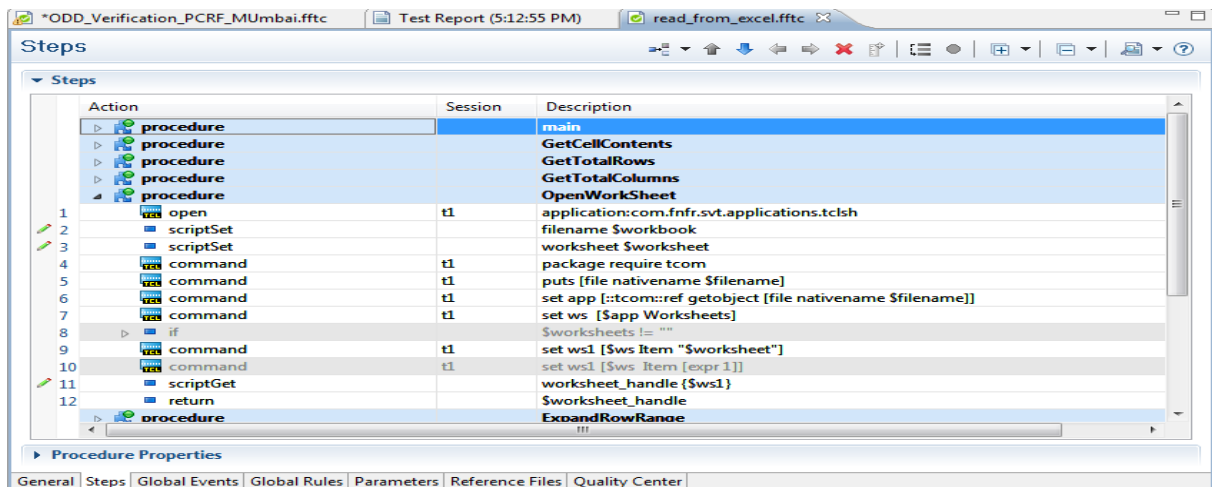
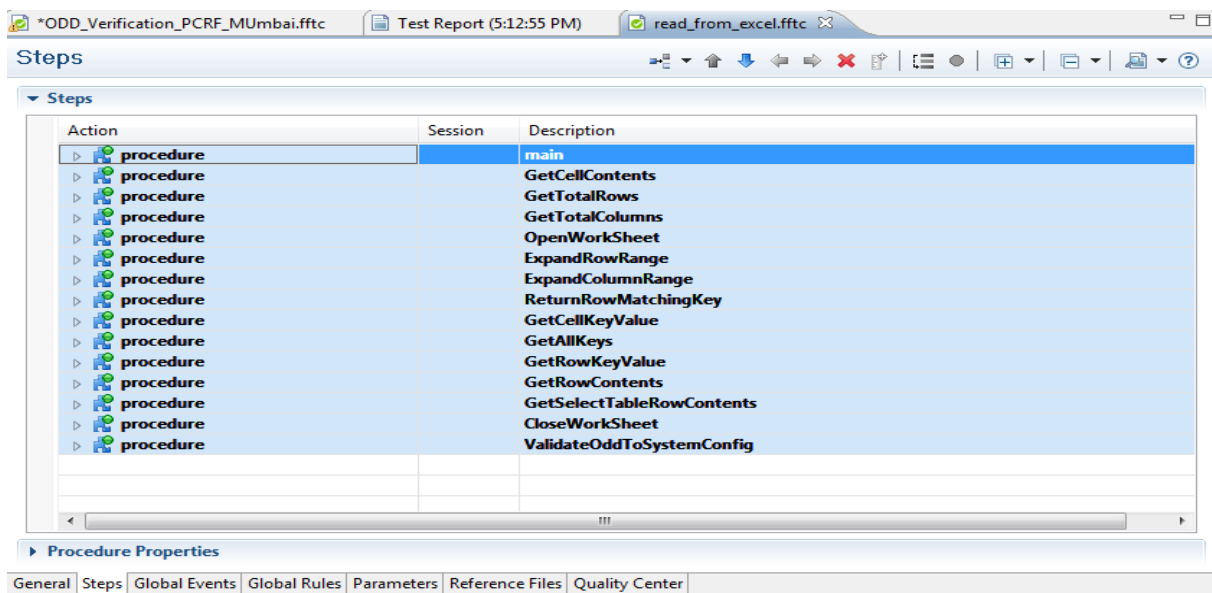
General Steps Global Events Global Rules Parameters Reference Files Quality Center

2.6 Test Case logic to read content from the Excel sheet

We can fetch the information from the excel sheet by using TCL package 'TCOM'.

Steps:

1. Specify all needed parameters
2. Open tclsh session profile.
3. Invoke the tcom packages
 - o Package require tcom
4. By using tcom API commands create separate procedures to read content from the excel file.



2.7 Test Case logic for ODD verification

We have to create separate procedures for each module to get the information and validate the values.

Steps:

1. Read the content from the device log file by using command "readfile"

Ex: readfile [param VLAN36]

In the parameter the path of the VLAN36 log is specified as shown in chapter 2.5

The following process need to follow to fetch the data from excel sheet:

2. We have to specify the worksheet name located in the excel workbook.

Eg: set worksheet_name "OAM VLANs"

3. Call the read_from_excel.fttc testcase procedure "OpenWorkSheet" by specifying the arguments (workbook path and worksheet name) to get the worksheet handle. And store the step response into a variable worksheet_handle.

Eg: read_from_excel.fttc#OpenWorkSheet -worksheet "\$worksheet_name" -workbook [param workbook]

The screenshot displays a test case procedure editor for a procedure named 'Get_ODD_values'. The procedure steps are as follows:

- 1. comment: Fetching values from ODD
- 1.1. comment: Fetching Active IP values from ODD
- 1.1.1. comment: Set test variables for active node
- 1.1.1.1. eval: set worksheet_name "OAM VLANs"
- 1.1.1.2. call: read_from_excel#OpenWorkSheet -worksheet "\$worksheet_name" -workbook [param workbook]
- 1.1.2. comment: Get Active IP values from ODD
- 1.1.2.1. call: read_from_excel#GetSelectTableRowContents -worksheet_handle \$worksheet_handle -table_range "[param slot/Active_IP/table_header_range],[param slot/Active_IP/table_range]"
- 1.1.2.2. call: read_from_excel#CloseWorkSheet -workbook [param workbook]
- 1.1.2.3. close: t1
- 1.2. comment: Fetching HOSTNAME from ODD
- 1.3. comment: Fetching Signalling IP values from ODD
- 1.4. comment: Fetching VIRTUAL-IP values from ODD

The 'Step Properties' pane at the bottom shows the command: `call: read_from_excel.fttc#OpenWorkSheet -worksheet "$worksheet_name" -workbook [param workbook]` and the response: `::tcom::handle0x02EB2678`.

4. To get the values from the worksheet, call the testcase "read_from_excel.fttc" procedure "GetSelectTableRowContents" by specifying the arguments worksheet handle, table header and table value ranges.

Ex: read_from_excel.fttc#GetSelectTableRowContents -worksheet_handle \$worksheet_handle -table_range "[param slot/Active_IP/table_header_range],[param slot/Active_IP/table_range]"

The screenshot shows a test suite editor with a list of steps. Step 1.1.2.1 is selected, showing a 'call' action with the following parameters: `read_from_excel.fttc#GetSelectTableRowContents -worksheet_handle $worksheet_handle -table_range "[param slot/Active_IP/table_header_range], [param slot/Active_IP/table_data_range]"`. Below the steps, the response is displayed as a table:

Bay #	Device	Plat Mgt	XMI
1.0	CMP-A	10.64.17.138	10.64.17.170
2.0	SPR FE-1	10.64.17.139	10.64.17.171
3.0	SPR BE-2	10.64.17.140	10.64.17.172
4.0	SPR STORAGE	SPR Storage	
5.0	MUM CL01 MPE-A	10.64.17.142	10.64.17.173
6.0	MUM CL02 MPE-A	10.64.17.143	10.64.17.174
7.0	EMPTY	10.64.17.144	10.64.17.175
8.0	EMPTY	10.64.17.145	10.64.17.176
9.0	CMP-B	10.64.17.146	10.64.17.177

- After reading the content from the excel file, call the testcase "read_from_excel.fttc" procedure "CloseWorkSheet" to close the worksheet.

Ex: `read_from_excel.fttc#CloseWorkSheet -workbook [param workbook]`

- After getting the information from both ODD and device logs, store the corresponding step response into a variable.

- Step -> Step Properties -> Other Post Processing -> Store Response

The screenshot shows the 'Step Properties' dialog box for step 1.1.2.1. The 'Store Response' option is selected under 'Other Post-processing'. The response is stored in the variable 'Active_IP_ODD'. The dialog box also shows options for 'Make it global' and 'Store only the text of the response'.

7. Create the response map for each step response to define the queries which need to validate.

The screenshot shows the iTest Response Mapping tool interface. The 'Table Map Editor' is active, showing a table named 'table1' with columns 'Bay', 'Device', and 'Active_IP'. The 'Queries' panel on the right lists queries for 'Active_IP(rowNumber)' from 1 to 14, with matches and values displayed. The 'Response' panel at the bottom shows a call to 'read_from_excel.fttc#GetSelectTableRowContents' with parameters for worksheet_handle, table_range, and table_header_range. The response data is shown in a table with columns 'Bay', 'Device', and 'Active_IP'.

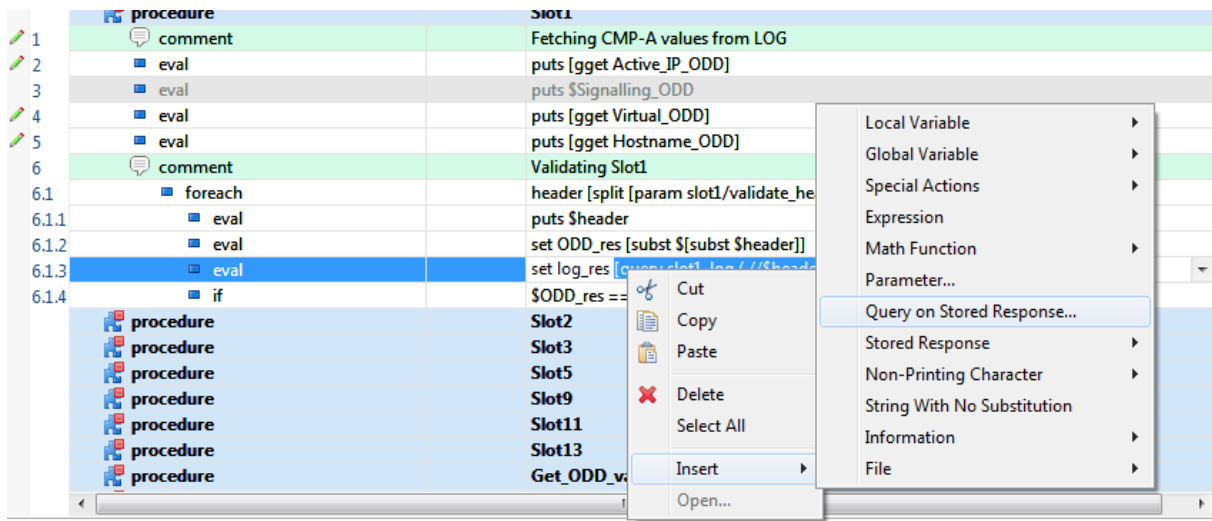
Bay	Device	Active_IP
1.0	CMP-A	10.64.17.138
2.0	SFR FE-2	10.64.17.139
3.0	SFR BE-A	10.64.17.140
4.0	SFR STORAGE	SFR Storage
5.0	MUM CL01 MPE-A	10.64.17.142
6.0	MUM CL02 MPE-A	10.64.17.143
7.0	EMPTY	10.64.17.144
8.0	EMPTY	10.64.17.145
9.0	CMP-B	10.64.17.146
10.0	SFR FE-2	10.64.17.147

8. Apply the response map to the corresponding step in the testcase. When a response map is applied to a response, we will see blue boxes around each item of data (in the Response view) that matches the queries defined in the response map.

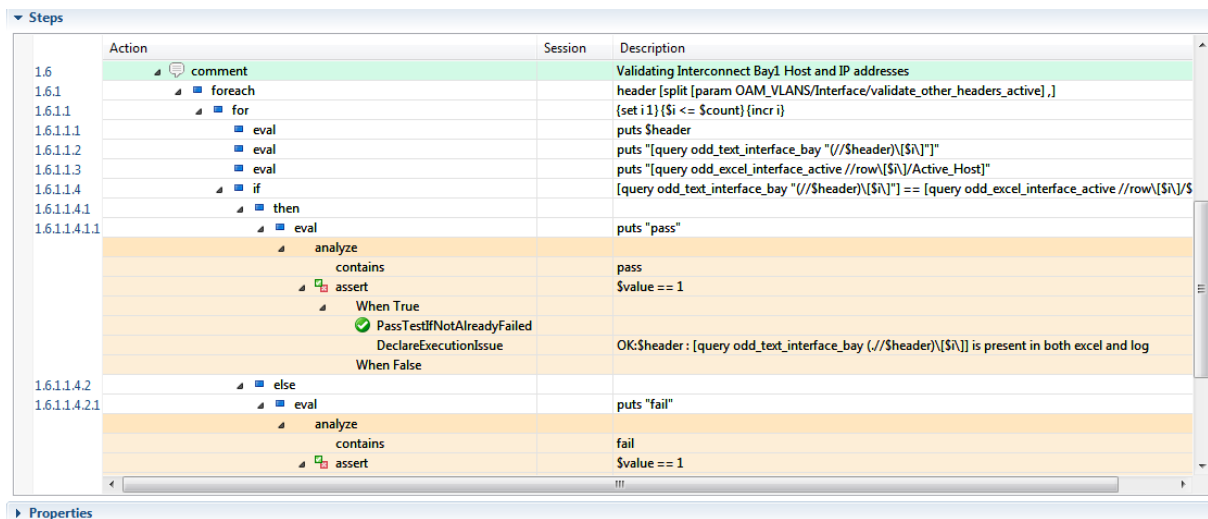
The screenshot shows the iTest Explorer tool interface. The 'Steps' panel is active, showing a list of steps. The 'Expected Response' section for step 1.1.2.1 is highlighted, showing a response map file 'project://PCRF/response_maps/New_RM/Active_IP.fttc'. The 'Response' panel at the bottom shows the same call to 'read_from_excel.fttc#GetSelectTableRowContents' with parameters for worksheet_handle, table_range, and table_header_range. The response data is shown in a table with columns 'Bay', 'Device', and 'Active_IP'.

Bay	Device	Active_IP
1.0	CMP-A	10.64.17.138
2.0	SFR FE-2	10.64.17.139
3.0	SFR BE-A	10.64.17.140
4.0	SFR STORAGE	SFR Storage
5.0	MUM CL01 MPE-A	10.64.17.142
6.0	MUM CL02 MPE-A	10.64.17.143

9. The queries which need to validate should be store into a variable by using the option Query on Stored response.



10. After storing the values into a variable, we have to implement logic by using tcl commands to compare values in both ODD and device log.



11. Once the comparison done, we have to use the iTest analyze rules to perform Pass / Fail validation on the results of a step. We can use the Analysis Rule wizard to create an analysis rule that performs one of the following operations:

- Validates something about the response to a test case step (and then performs specified actions like passing or failing the test, displaying an execution message, and then charting the extracted value over time).
- Generate execution message.

iTest Explorer

ODD_Verification_PCRF_Mumbai.fttc

Test Report (5:12:55 PM)

Test Report

Save Test Report As... Open Test Case

Summary

Test case: project://PCRF/test_cases/ODD_Verification_PCRF_Mumbai.fttc

Owner:

Testbed:

Parameter file:

Execution started: 2015/01/12 17:12:55

Execution completed: 2015/01/12 17:13:40

Execution duration: 00:00:44

Total report items: 2264

Total issues: 98

Pass/OK: 45

Fail/Error: 3

Warning: 0

Information: 50

Report ID: 1945

Result: Fail

Executed Steps

Action	Session	Description	Step	Timestamp
...				

Report

Response Error Log Problems Step Issues Execution (5:12:55 PM)

Message	Index	Step	Procedure	Session	Source	File
Active_Host : 6120XG-1A is present in both excel and log	2.1.6.1....	1.6.1.1....	Validate_...		analysis	ODD_Verificati...
Active_Host : 6120XG-1B is present in both excel and log	2.1.6.1....	1.6.1.1....	Validate_...		analysis	ODD_Verificati...
Active_IPv4 : 10.64.17.136 is present in both excel and log	2.1.6.1....	1.6.1.1....	Validate_...		analysis	ODD_Verificati...
Active_IPv4 : 10.64.17.137 is present in both excel and log	2.1.6.1....	1.6.1.1....	Validate_...		analysis	ODD_Verificati...
StandBy_Host : OA-PCRF-01-01-B is present in both excel and log	2.1.6.2....	1.6.2.1....	Validate_...		analysis	ODD_Verificati...
StandBy_Host : OA-PCRF-01-01-A is present in both excel and log	2.1.6.2....	1.6.2.1....	Validate_...		analysis	ODD_Verificati...
StandBy_IPv4_Address : 10.64.17.135 is present in both excel and log	2.1.6.2....	1.6.2.1....	Validate_...		analysis	ODD_Verificati...
StandBy_IPv4_Address : 10.64.17.134 is present in both excel and log	2.1.6.2....	1.6.2.1....	Validate_...		analysis	ODD_Verificati...
Fetching CMD_A values from LOG	2.1	1	Get1		comm	ODD_Verificati...