xVT REGRESSION

Introduction - WiFi Regression
AGENDA

- Definition
- Purpose
- Overview
- Products
- Environments
- Tools
- Bug Issue
- Report
DEFINITION

xVT –
Stands for
Cross-Validation Testing

Regression -
• Tests to ensure that previously developed and tested software still performs after a change. Changes that may require regression testing include bug fixes … tend to grow with each found defect, test automation is frequently involved. (Wiki)

Automation -
• Test automation can automate some repetitive but necessary tasks in a formalized testing process already in place or perform additional testing that would be difficult to do manually. (Wiki)
xVT – Cross-Validation Testing

- Validating Drivers & tools
- Validation of source code and releases by automated execution of HVT and DRTU.
- Analysis and comparison of multiple test results.
- Release new validated drivers as soon as possible.

Summary of Reports

- Display detailed analysis and comparison results
- History reports on shared drive
TESTING
OVERVIEW

1. Reproduce suspicious issue
2. Develop Team summit code on TFS
3. DevOps start Testing Procedure
4. Trigger Nightly Regression
5. Verify products if pass regulatory
6. Run HIT Manager on each station
7. xVT member Check tests results
8. Generate report and send Email to xVT Members
10. Create bug

- Jira Software
- Git
- Azure DevOps

Report to FW Fireman Team

If real driver bug
<table>
<thead>
<tr>
<th>Name</th>
<th>Station</th>
<th>IP</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WIFI</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCP2x2_EXM</td>
<td>HWS776</td>
<td>10.185.231.6</td>
<td>399_Controller/HWS399/10.185.231.91</td>
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<tr>
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<td>HWS466</td>
<td>10.185.231.93</td>
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<td>HRP1x1_ANT_DIV_IQexlm</td>
<td>HWS1371</td>
<td>10.185.231.11</td>
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<tr>
<td>GFP2x2_IQexlm</td>
<td>TSMVDT901</td>
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<td>TSMVDT905_Taiwan/TSMVDT905/10.5.221.81</td>
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<tr>
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<td>TSMVDT903</td>
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<td>JFP1x1_ANT_DIV+QNJ_EXM</td>
<td>HWS479</td>
<td>10.185.227.104</td>
<td>Controller_399_EXM/Controller_399_EXM_0_Floor/10.185.231.91</td>
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<td>JFP1x1_ANT_DIV+SNJ_EXM</td>
<td>HWS1733</td>
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<td><strong>BT-IDC</strong></td>
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<td>HRP1x1_ANT_DIV</td>
<td>HWS1783</td>
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<td>JFP2x2</td>
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<td>TYP_2x2_Throughput</td>
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<tr>
<td><strong>Core 51</strong></td>
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<tr>
<td>THP2x2_IQexlm</td>
<td>HWS897</td>
<td>10.185.231.22</td>
<td>Controller_596/HWS596/10.185.231.89</td>
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<tr>
<td>JFP2x2_EXM</td>
<td>HWS344</td>
<td>10.185.231.153</td>
<td>Controller_596/HWS596/10.185.231.89</td>
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<tr>
<td>JFP1x1_ANT_DIV_IQexlm</td>
<td>HWS778</td>
<td>10.185.231.21</td>
<td>Controller_596/HWS596/10.185.231.89</td>
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<td><strong>MVT</strong></td>
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<tr>
<td>CCP2x2_IQexlm</td>
<td>HWS1648</td>
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<td>Controller_1281/HWS1281/10.185.231.4</td>
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<tr>
<td>HRP2x2_IQexlm</td>
<td>HWS759</td>
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<td>Controller_1281/HWS1281/10.185.231.4</td>
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<tr>
<td>HRP1x1_ANT_DIV_IQexlm</td>
<td>HWS1622</td>
<td>10.185.69.92</td>
<td>Controller_1281/HWS1281/10.185.231.4</td>
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<tr>
<td><strong>DRTU</strong></td>
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</tr>
<tr>
<td>JFP1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GFP2</td>
<td></td>
<td></td>
<td>OEM_DRTU_11342_22_21030_0</td>
</tr>
</tbody>
</table>
ENVIRONMENT SETUP

Automated HVT Infrastructure Setup

• HVT – selected version
• TFS Branch – download & build
• IM – suitable / latest version
• HIT Manager – latest version

Automated Tests Execution

• Execute HIT Manager flow
• Backup results on shared drive
SOFTWARE TOOLS OF xVT

Titan – Tests triggering and Cloud Monitoring
Cloud centralized service server. Trigger every station with specific drivers run on HIT Manager and monitor its status.

HIT Manager – Hardware testing execution application
Titan controls stations to run flows on HIT Manager and test on HW equipments.

R2M – Collect data and create reports
Installed on each station, collects CSV files that run on HIT manager, generate comparison reports with limits and send email to xVT members.

Jira – Bug tracing App communicating with Develop team
Bug tracking software. When xVT found real issue, they collect data and log to dev team on Jira.
Start testing a Driver version on various stations

Visualize testing progress on status bar

Select stations and flows intend to test
Final Trigger summary

General
- Request Name: PF_XVT_MAIN_SNJ_M_99.0.63.1_DRV_c9e971_FW_07a083_45607
- Mailing List:
  - sys_windrvbuild@intel.com
  - cs.crv.vt.xvt1@intel.com

Details
- Technology: WiFi
- Program: XVT_Regression
- Cycle Types: xVT_HRP2_SnJ_1679

Targets
- xVT_HRP2_SnJ_1679
  - WiFiDriverOffline:
    \\vfts089b.it.intel.com\Zip\Listener\buildSystem\WIFI_DRV\master\M_99.0.63.1_DRV_c9e971_FW_07a083_45607
FEATURES

Automated Results Analysis

• Analyze test results using limits, filters and graphs (defined by user)
• Compare results of multiple products

Comparisons Editor

• Convenient UI for displaying and editing analysis and comparison configurations.
• Save configurations to xml file.
Select all the CSV Files that generated from HIT Manager without the log file.

Open the path of the Data/CSV files.

Open the path of the Limit File. Limit file’s values are defined based on WiFi/BT Standard.

Email the result to recipients.

Results Editor –
Compare data with defined limits and generate report.
Select each testcase

Set the defined values regarding to regulations

Limits Editor

- Load existing test log
- Add **Parameter** to analyze
- Set **Limits & Filters**
- Define multiple **Charts**
- Save as `.config` file

Select the columns would like to present
Command-Line Execution

- Analysis of directory
- Comparison between two directories.
- Execute in automation

R2M Help:

R2M has 2 or 3 arguments on command line:
1. Input paths - for analysis report fill with only path only. For comparison report fill in two paths separated by '&'.
2. Limits file - .txt or .config file which contains limits and charts for the report.
3. (Optional) Email addresses - list of recipients separated by ';'.

```cmd
linianx@linianx-mobl /m/c/U/1/O/Desktop [255]
/mnt/c/RFST-Tools/R2M/R2M.exe "C:\Users\linianx\OneDrive - Intel Corporation\Desktop\LINIANX-MOBL\data" "C:\Users\linianx\OneDrive - Intel Corporation\Desktop\LINIANX-MOBL\Limits.config" ian1x.lin@intel.com
```

Running Analysis

Done!

Email sent to: ian1x.lin@intel.com
Report path: C:\Users\linianx\OneDrive - Intel Corporation\Desktop\LINIANX-MOBL\20.04.21.15-42-43\data.htm

Powered by Office Integration
# Analysis Report

**Core:** Main - WiFi xVT Regression JFP1x1_ANT_DIV_EXM QNJ WIN10x64

**RFST HVT Drop:** \{user.corp.intel.com\}/etl\etl\RFST\BUILD\HVT\WiFi\4.1.4.2_HighlyBuild

## Station Report

### FPGA Core

**Core:** WiFi xVT Regression JFP1x1_ANT_DIV_EXM QNJ WIN10x64

**RFST HVT Drop:** \{user.corp.intel.com\}/etl\etl\RFST\BUILD\HVT\WiFi\4.1.4.2_HighlyBuild

### FPGA Core

**Test Result:**

- **Passed:**
  - [Full Reset](DC Power Cycle)
  - [Full Reset](NewApi)
  - [Full Reset](OldEnum)
  - [Tx EVM](Smart OFDM and HT)
  - [Tx EVM](Driver CCK)
  - [Tx EVM](Driver Low Band 20MHz)
  - [Tx EVM](Driver Low Band 40MHz)
  - [Tx EVM](Driver High Band 20MHz of 80MHz)
  - [Tx EVM](Driver High Band 20MHz)
  - [Tx EVM](Driver High Band 40MHz)
  - [Tx EVM](Driver High Band 80MHz)
  - [Tx Mask](Driver IT Low Band)
  - [Tx Mask](Driver IT High Band 20MHz)
  - [Tx Mask](Driver IT High Band 40MHz)
  - [Tx Mask](Driver IT High Band 80MHz)

- **Failed:**
  - [Tx Mask](Driver IT High Band 40MHz)
  - [Tx Mask](Driver IT High Band 80MHz)

### Tx Mask (Driver IT High Band 40MHz)

<table>
<thead>
<tr>
<th>Channel</th>
<th>TxMode</th>
<th>Antenna Diversity</th>
<th>Measured Antenna</th>
<th>Rates</th>
<th>Mask margin</th>
<th>MaskMarginCriteria</th>
<th>PowerTarget</th>
<th>Txpower</th>
<th>GainMode</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: CH380</td>
<td>5030</td>
<td>40MHz Wide (x4)</td>
<td>FORCE_ANT_0</td>
<td>6.095</td>
<td>0</td>
<td>True</td>
<td>13.15</td>
<td>13.825</td>
<td>Driver</td>
</tr>
<tr>
<td>A: CH380</td>
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<td>0</td>
<td>True</td>
<td>13.15</td>
<td>13.825</td>
<td>Driver</td>
</tr>
</tbody>
</table>

**Full CSV File:** \{user.corp.intel.com\}/etl\etl\RFST\BUILD\HVT\WiFi\4.1.4.2_HighlyBuild/2022-06-06-23-38-23.csv
STATION REPORT

- Summarized table with each test status
- Trace detailed information for Exceptions
- Link to test flow CSV Files created by HIT Manager
- View locally or by email
Final Summary Report

Nightly Driver Link installed on every station

xVT Regression over Core 62 build results attached.

Link to reports: [Core 62](https://jira.idoc.intel.com/issues/?filter=20598)

Jira Bug Filter

Executive summary:

<table>
<thead>
<tr>
<th>Baseline</th>
<th>Build / Driver Version</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Main</td>
<td>M 99.0.63.1_DRV_bee652_FW_7d816_44944</td>
<td>FAILED</td>
</tr>
</tbody>
</table>

Summary:

- **OS**
  - Win10x64: Tests Blocked: 0, Tests Error: 9, Test Failed: 30, Test Passed: 17152, Total Tests: 17191

Test summary:

<table>
<thead>
<tr>
<th>HW</th>
<th>Passed</th>
<th>Failed</th>
<th>Errorred</th>
<th>Blocked</th>
<th>Notes</th>
<th>Details</th>
<th>Bug ID</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>GFP4x4_PHY IQexlm</td>
<td>6750</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>RxPerSensitivity (UEH H21) Ch:223</td>
<td>Sensitivity point: -61.037 &gt; -61.6</td>
<td>WIFI-108722</td>
<td>Stanislav G.</td>
</tr>
<tr>
<td>(Israel)</td>
<td></td>
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<td></td>
<td>RxPerSensitivity (H67 CDB Tx) Ch:102(F)</td>
<td>Sensitivity point: -72.44 &gt; -73</td>
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<td>Sporadic NaN on EVM test</td>
<td></td>
<td></td>
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<tr>
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<td></td>
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<td>Negative Margin on EVM test</td>
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<td></td>
<td></td>
<td></td>
<td>Ch50: Chain A Mask margin: -6.53 ≤ -5</td>
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<td></td>
<td>NaN results on RxPerDynamic and RxPerSensitivity on Ch:165</td>
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<td>Sporadic NaN on EVM test</td>
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<td>Exception on XVT_CMD_RUNTIME_CALIB_HANDLE</td>
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<td>HBP2X2_TSMC EXM</td>
<td>1615</td>
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<td>0</td>
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<tr>
<td>CCE2X2_EXM (Israel)</td>
<td>1629</td>
<td>5</td>
<td>4</td>
<td>0</td>
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<td></td>
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</tbody>
</table>

Each HW Station connecting with testing extenders

Create bugs on JIRA software
COMMON ISSUE / EXCEPTIONS IN xVT REGRESSION

- HVT Drop
- Driver installation Error
- Titan automation connection Error
- NaN results
- Degradation Results
- BSOD/Station down
- IM tool
- IQexl
- EXM
- Limit Violations
Bug list that provides current bugs that xVT monitoring

<table>
<thead>
<tr>
<th>Key</th>
<th>Summary</th>
<th>Status</th>
<th>Development Testing Environments</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIFI-114046</td>
<td>[xVT Regression][CoreMain/CoreCycle][ CCP ][EXM] Sporadic NaN Results on Tx EVM</td>
<td>PENDING</td>
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<tr>
<td>WIFI-111194</td>
<td>[xVT Regression][CoreMain/CoreCycle][TYP2X2][IQexlm] Tx Power Limitation on TxPwrInfo Regulatory Limit A</td>
<td>PENDING</td>
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<tr>
<td>WIFI-109152</td>
<td>[xVT Regression] Frequency Accuracy degradation in several projects</td>
<td>OPEN</td>
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<td>WIFI-109150</td>
<td>[xVT Regression][EXM Issue's] Misalignment to PXA in TxBandEdge HB channels</td>
<td>OPEN</td>
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<tr>
<td>WIFI-109149</td>
<td>[xVT Regression][EXM Issue's] Misalignment to PXA in TxBandMask 160Mhz</td>
<td>OPEN</td>
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<tr>
<td>WIFI-108723</td>
<td>[xVT Regression][CoreMain][HRP2_TSMC][EXM] Limitation on RxPerDynamic Ch165</td>
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<td>WIFI-108722</td>
<td>[xVT Regression][CoreMain][HRP2_TSMC][EXM] Negative Limitation on Tx EVM (Driver US HE9 RU High Band 20Mhz)</td>
<td>OPEN</td>
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<td>WIFI-103125</td>
<td>[xVT Regression][CoreMain/CoreCycle][ISR GFP4x4][IQexlm] Tx EVM Limitation on Tx pwr VSA</td>
<td>OPEN</td>
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<tr>
<td>WIFI-102795</td>
<td>[xVT Regression][Core 51][JFP1x1_ANT_DIV][IQexlm] ADC Samples Exception failed with status 31</td>
<td>PENDING</td>
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<td>WIFI-99698</td>
<td>[xVT Regression][CoreMain][SNJ + JFP1x1][EXM] - Negative Margin at [Tx Band Edge]-Driver HT US Low Band 20Mhz - Ch13 - 2472</td>
<td>IN PROGRESS</td>
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<tr>
<td>WIFI-99270</td>
<td>[xVT Regression][CoreMain][HRP2_TSMC][EXM] RspSensitivity (HB 20Mhz RU Rate HE9 / HE9) - NaN Results over channel 165</td>
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<tr>
<td>BT-36961</td>
<td>[xVT Regression][BT][HRP1://FP2/TYP2][IQexlm][Nightly]</td>
<td>OPEN</td>
<td></td>
</tr>
</tbody>
</table>
Provide detailed issues on product

Actual Results: Command XVT_CMD_GET_ADC_SAMPLES_V2 failed with status 31

Next step - isolate affecting factor either TE, IQxelm, QNJ, or PNJ.
Discussion with Firmware team members to specify issues about the driver in various versions.

Hi,
please define next steps and owner.
Yaki

As already said before. This looks like a FW issue. FW does not generate interrupt or interrupt was not generated on RFD.

Next steps: Eddie should collect the debug data as Yair N. requested. After collecting this data, the bug should be assigned to Yair N. for analysis. Returning the bug to Eddie.

Hi, Moving to FW, since looks like missing interrupt from FW side.
we see the TX RSP in the RFD Q.

Newly collected logs and report are provided in path below:
\ger.corp.intel.com\ec\proj\Vh\IT\VT\VTUI\API\WIFI\WIFI-102705_ADCSample_Exception_status31\new collect
Please let me know if any issues with the collected logs, thanks.

Following debug session with Gurishkin, Stanislav same test passed with exm TE Gnj JFP AD but not with IQexlm, Pnj + JFP AD
Next step - isolate affecting factor either TE EXM\IQexlm or QNJ/PNJ.
THE END