Joint Program Executive Office
Joint Tactical Radio System

Enhanced Automated Testing




24-25 August 2010
JTRS SCA Working Group

JPEO JTRS

Task Overview

- **Objective**
  - Reduce the number of requirements that cannot be tested in an automated fashion
- **Benefits**
  - Reduce overall cost of SCA certification
- **Impact**
  - 1 new requirement resulting in a small Software Component Descriptor (SCD) XML change
  - Modification or removal of some OE requirements

Requirements Analysis

- **484 total OE Requirements[1],[2]**
  - Focus was on requirements that have no automated test in the JTRS Test Application (JTAP)
- **123 out of 484 OE Requirements reviewed**
  - These requirements do not have an automated test associated with them
- **Categorized requirements into 3 main categories:**
  - Automatable
  - Consider for re-write
    - With a sub-category of “May not be possible”
  - Consider for removal

[1] JTRS Test and Evaluation Laboratory, “SCA 2.2.2 OE Requirements List,” version 2.1, 20-Oct-2009, Available: https://jtel.spawar.navy.mil/docs/sca_2_2_2_oe_requirements_list_v2_1.pdf

[2] JTRS Test and Evaluation Laboratory, “SCA 2.2.2 OE Requirements List v2.1 Errata Sheet,” 13-Mar-2010, Available: https://jtel.spawar.navy.mil/docs/sca%202%202%202_oe%20req%20list%20errata%20sheet.pdf

Results

- **29 requirements were identified that we believe are automatable in their current form**
  - Informed JTEL of these requirements
- **1 requirement approved for modification:**
  - Original
    - OE0092[1]: Valid properties for the configure operation shall at a minimum be the configure readwrite and writeonly properties referenced in the component's Software Profile Descriptor (SPD)
  - Modified
    - OE0092: All configure readwrite and writeonly properties referenced in the component's SPD shall be valid properties for the configure operation

[1] JTRS Test and Evaluation Laboratory, "SCA 2.2.2 OE Requirements List," version 2.1, 20-Oct-2009, Available: https://jtel.spawar.navy.mil/docs/sca_2_2_2_oe_requirements_list_v2_1.pdf

Results, cont'd

- **1 SCD XML change approved to aid in the testing of requirement OE0071**
  - OE0071[1]: The connectPort operation shall raise the OccupiedPort exception when unable to accept the connections because the port is already fully occupied
- **SCA Next addition:**
  - The maximum number of connections a provides port accepts shall be identified as an attribute in the provides port attribute list of the SCD

[1] JTRS Test and Evaluation Laboratory, "SCA 2.2.2 OE Requirements List," version 2.1, 20-Oct-2009, Available: https://jtel.spawar.navy.mil/docs/sca_2_2_2_oe_requirements_list_v2_1.pdf

Results, cont'd

- **3 requirements approved for removal**
  - OE0630[1]: Legacy software shall interface with the Core Framework in accordance with this specification.
  - OE0633[1]: Hardware critical interfaces shall be defined in Interface Control Documents that are available to other parties without restriction.
  - OE0741[1]: All non-standard interfaces shall be defined in Interface Control Documents that are available to other parties without restriction to the extent that interfacing or replacement hardware and software can be developed by other parties without restriction.

[1] JTRS Test and Evaluation Laboratory, "SCA 2.2.2 OE Requirements List," version 2.1, 20-Oct-2009, Available: https://jtel.spawar.navy.mil/docs/sca_2_2_2_oe_requirements_list_v2_1.pdf

Results, cont'd

- **24 other requirements were recommended for removal**
  - The disposition for these requirements were handled through the SCA Requirements Revisions task

Challenges

- **At least 58 requirements were identified as "May not be Possible"**
  - Examples of May not be Possible requirements:
    - Exception throwing requirements
    - POSIX compliance requirements
    - RAM Memory cleanup requirements
    - "Don't crash" requirements

Challenges, cont'd

- **How do you test the generation of a standard CF Exception without a way to force it?**
  - E.g. The remove operation shall raise the CF FileException when a file-related error occurs
- **How do you test the generation of a component-specific Exception without a way to force it?**
  - E.g. The start operation shall raise the StartError exception if an error occurs while starting the resource.