Standard Operating Procedure

for

Java card Applet Development

Version Control

Document Name	Version	Date
SOP for Java Card Applet Development	v1.2	20-06-2022

Prepared by	Technical Support Services	08-06-2022
Approved by	Technical Manager	Saji Krishnan *Saji Krishnan*

Ajitav Mohanty *Ajitav Mohanty*

Revision History

Issue	Date	Reason for change
1	10-06-2021	SOP Procedure documented with standardized approach
1.1	13-06-2022	Addition of Applet test report and timestamp during integration.
1.2	20-06-2022	Addition of Applet Release Notes along with each applet released to the validator.

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Introduction

This document outlines the Workz' standard operating procedure for Java card applet development as per the customer's requirement.

Pre-requisite:

- Inputs:
  - Applet Specification | Requirement
  - SoW (signed)
- Testing tools (on card)
  - Profile (.SPE file)
  - Perso Script
  - Factory input file
  - Java card
  - Java script (for Unit testing)
  - Wojtek

Roles and Responsibilities

Developer:

- To ensure that the application is created as per the SoW and the requirement signed by the customer.
- To ensure that the source code, documents, validation results are checked in to GIT and copied in the respective BAP folder under "SD" (Workz Project directory on the File Server).
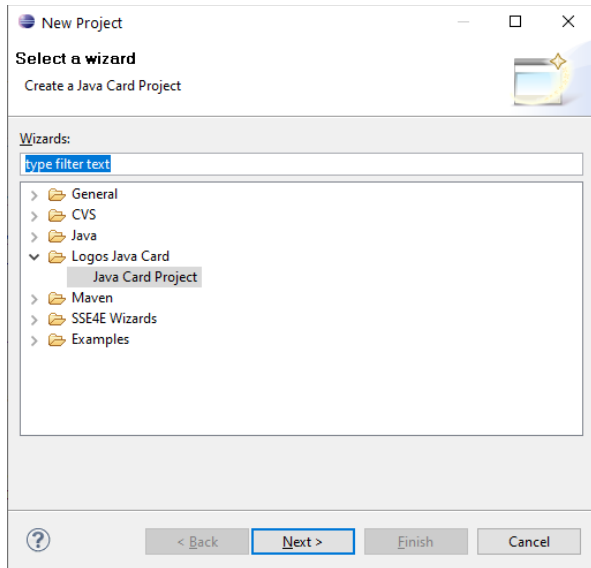
Applet Development:

Tools Setup (Once)

For a quick Setup, please find the following steps.

1. The file "T:\Sales\Mobile Solutions\SIM Data\Development\eclipse_Kepler.rar" needs to be copied to the local drive and unzipped.
2. The prerequisite file "T:\Sales\Mobile Solutions\SIM Data\Development\" also needs to be copied to the "C:\" drive and unzipped.
3. The Folders copied needs to be provided with full read/write privileges.
4. The latest version of Tortoise GIT needs to be installed.
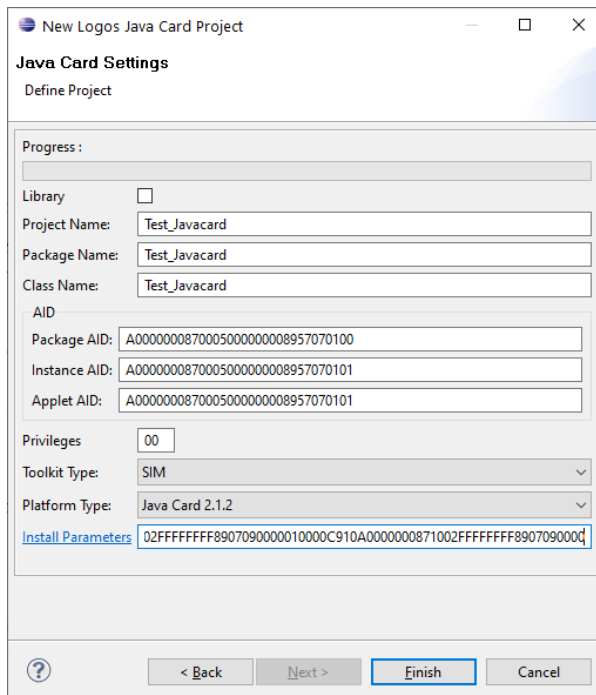
Development

1. To Initiate the development, start the Eclipse ("Kepler" currently used by TSS) and give a proper Workspace.

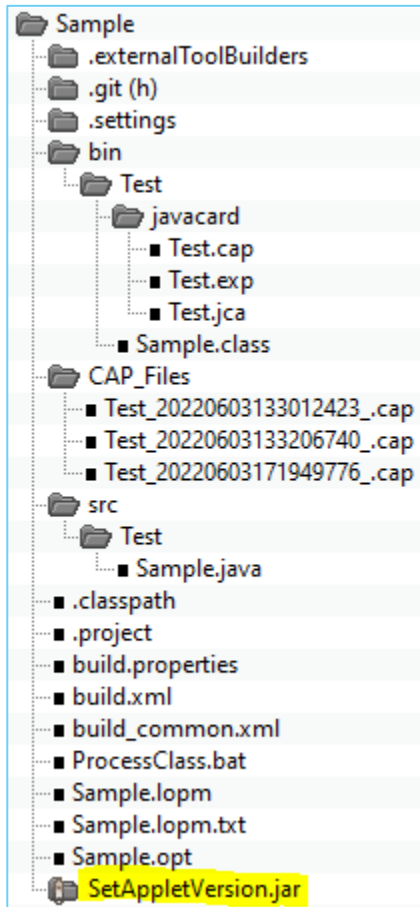2. Create a New Java card project from the Eclipse Project option.

3. Create New project using the Wizard. Alternatively, we can take any existing Project and rename the dependencies.

4. Once the Project is created, the applet can be developed by following the Java card development specs, and TCA stepping stones R7, SIM, USIM and UICC API specification apart from several others.

5. The Project uses logos configurations and therefore the OPT and LOPM file need to be configured correctly using the following details:
    a. OPT file (params):
        i. -exportpath <export path for javacard library and APIs>
        ii. -applet <Applet AID e.g. 0xA0:0x00:…:0x01> <Package name>.<Applet name>
        iii. Network_Detect <Package AID e.g. 0xA0:0x00:…:0x00> <version e.g. 1.0>
    b. LOPM file (params):
        i. -CAPFile="<relative path of the cap file>"
        ii. -PackageAid={<Package AID e.g. 0xA0:0x00:…:0x00>}
        iii. -AppletAid={<Applet AID e.g. 0xA0:0x00:…:0x01>}

iv. -InstanceAid={<Instance AID e.g. 0xA0:0x00:…:0x01>}

v.   -InstallParameters={<Install Parameters e.g.EA2E8012…0000>}

vi. -Privileges={<Privileges e.g. 00>}

6. The Project file should contain the "SetAppletVersion.jar" in the same Project folder. This application generates built CAP file with Date_TimeStamp.

```
📁 Sample
   📁 .externalToolBuilders
   📁 .git (h)
   📁 .settings
   📁 bin
      📁 Test
         📁 javacard
            ■ Test.cap
            ■ Test.exp
            ■ Test.jca
         ■ Sample.class
   📁 CAP_Files
      ■ Test_20220603133012423_.cap
      ■ Test_20220603133206740_.cap
      ■ Test_20220603171949776_.cap
   📁 src
      📁 Test
         ■ Sample.java
   ■ .classpath
   ■ .project
   ■ build.properties
   ■ build.xml
   ■ build_common.xml
   ■ ProcessClass.bat
   ■ Sample.lopm
   ■ Sample.lopm.txt
   ■ Sample.opt
   📁 SetAppletVersion.jar
```

The below configuration for "SetAppletVersion.jar" should be present in the "ProcessClass.bat" as below:

```
:ErrorLOPT
echo Error while generating lopm file
goto End

@echo %date%  %time%



:End
@echo %date%  %time%
java -jar SetAppletVersion.jar -source "./bin"
endlocal
exit
```

7. Once the Project is built for the cap file generation, the applet cap file will be renamed with Date-Time Stamp and will be copied to the CAP_Files folder

Release Notes

The Applet developer then creates the developer notes for the Validator with every release of the applet.
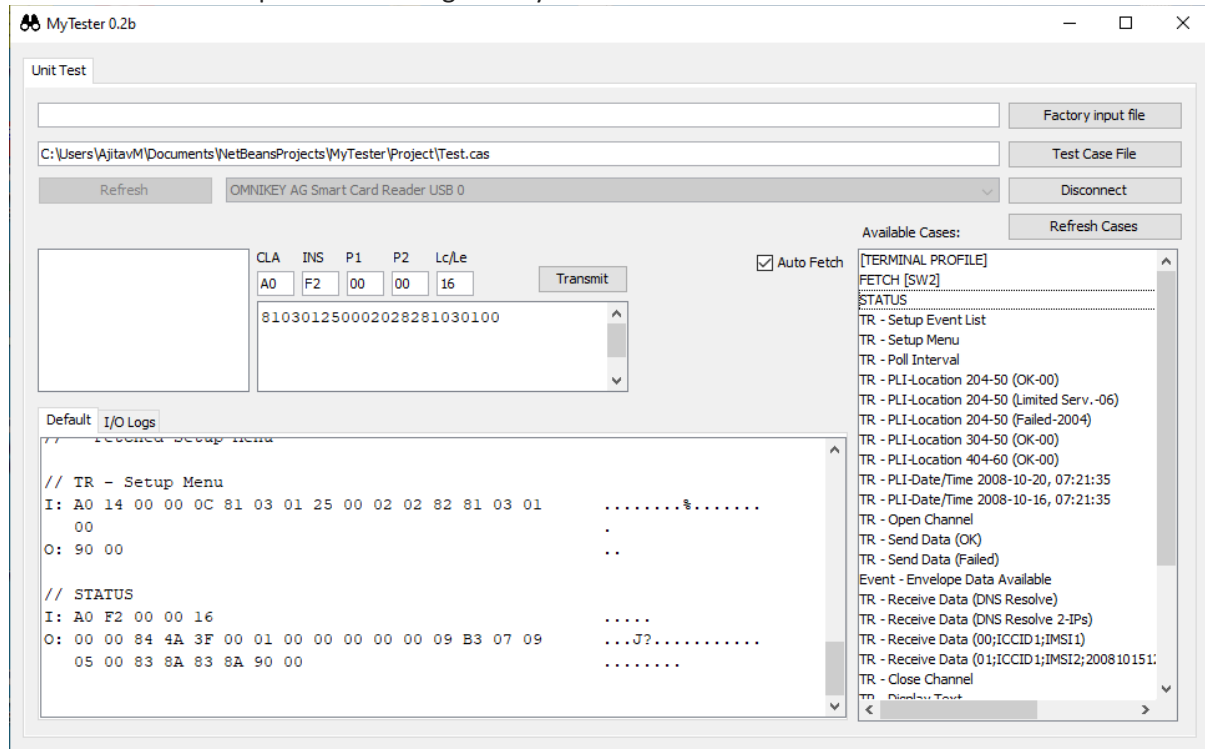
Applet_Release_Not
es_v1.0.docx

This will ensure that the Applet integrity is verified by the validator before executing his tests.
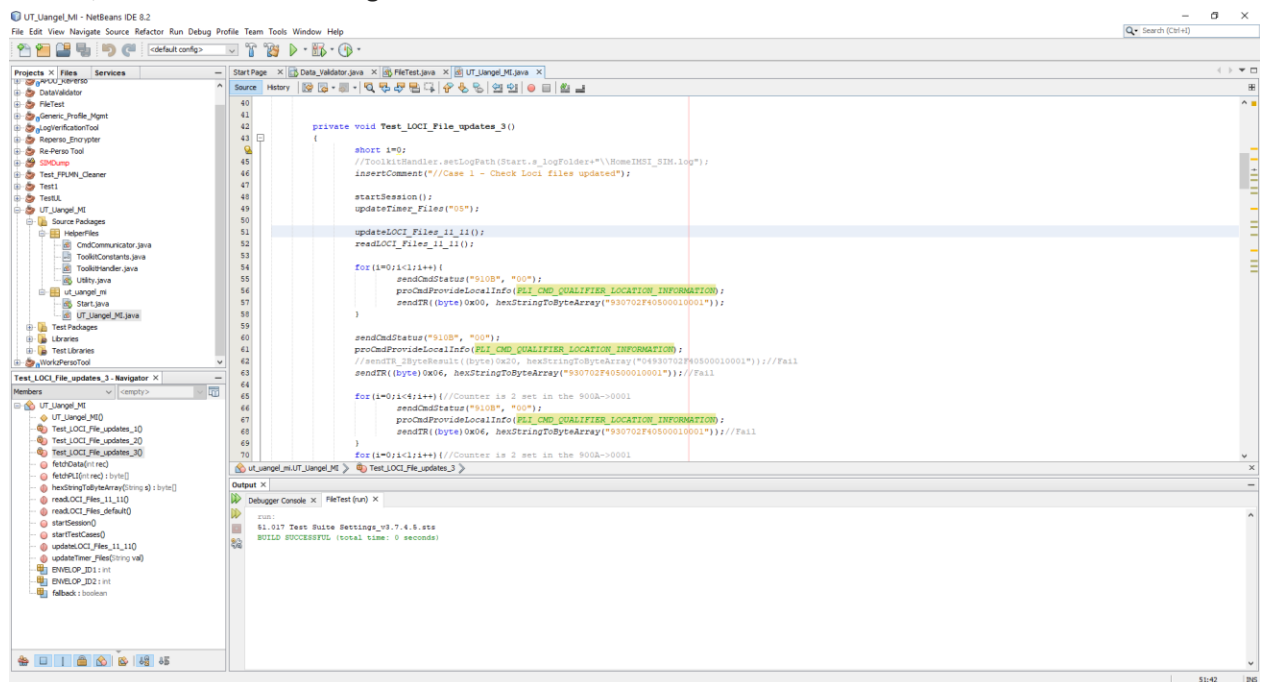
Unit Testing

1. Once the applet is built successfully, the applet can be installed on the supported UICC, the unit test can be performed using Wojtek.
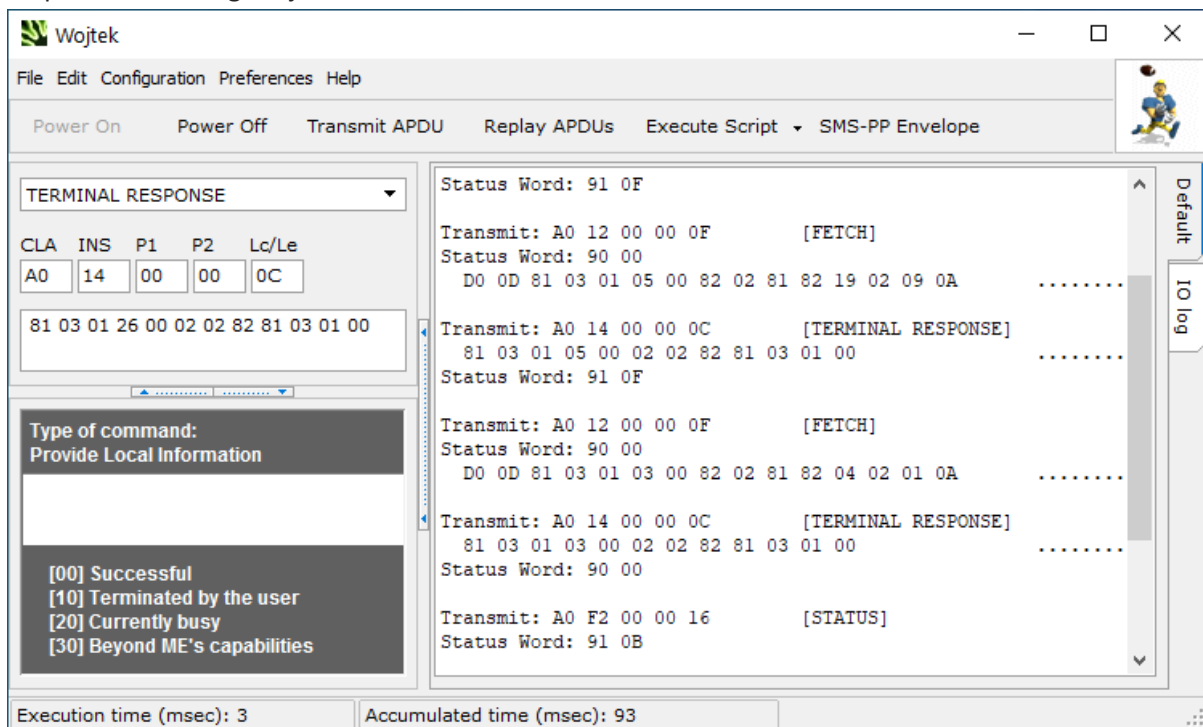
2. Unit test can also be performed using the Mytester tool

3. Stubs are written using Java smartcardio library in Eclipse/Netbeans for covering statement, decision, branch, condition scenarios e.g.

Debugging

1. For issues related to device, the Applets are debugged using the UL-SPY tools.
   2. Additionally, the Applets are created with a debugged version as in-display text and the values are visualized in the simulators or handsets.
   3. Please refer UL Spy Software – User Manual for further details.

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