Intel® RSP Android NFC Application

Installation & User's Guide

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Revision History

Revision	Description
2018.11.11	Initial draft.
2018.12.04	Updated screenshots.
2018.12.13	Branding updates.

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1 Introduction

This document is a guide to the installation, setup and use of the Sensor NFC Application Reference Design, which is one component of the Intel® RSP SW Toolkit. This application is used to program security credentials into the Intel® RFID Sensor Platform (Intel® RSP). The features included in this reference design are intended to provide the minimum functionality required to program the Intel® RSP. THIS SOFTWARE IS NOT INTENDED TO BE A MARKET READY SOLUTION.

1.1 Terminology

Term	Description
RSP Sensor	Intel® RFID Sensor Platform (Intel® RSP)
RSP Controller	RFID Controller for the Intel® RSP
NFC	Near Field Communications

1.2 Reference Documents

Document	Location
Intel® RFID Sensor Platform (RSP) – Installation & User Guide	https://github.com/intel/rsp-sw-toolkit-gw/tree/master/docs
Intel® RFID Sensor Platform (RSP) - Application Interface (API) Guide	https://github.com/intel/rsp-sw-toolkit-gw/tree/master/docs
Intel® RSP Android NFC App - Installation & User Guide	https://github.com/intel/rsp-sw-toolkit-gw/tree/master/docs
Intel® RSP Controller – Application Interface (API) Guide	https://github.com/intel/rsp-sw-toolkit-gw/tree/master/docs

2 Dependencies

2.1 Intel® RFID Sensor Platform (Intel® RSP)

The RSP-H1000, RSP-H3000 and RSP-H4000 are members of the Intel® RFID Sensor Platform (Intel® RSP) family of devices. These devices have capabilities for several on-board sensors including an EPC Gen 2 UHF RFID Interrogator (reader) and embedded NFC tag for configuring security credentials.

RSP-H4000 RSP-H3000 RSP-H1000

Figure 1: RFID Sensor Platform (RSP) Family

2.2 RSP Controller Reference Design

The RSP Controller Reference Design (another component of the Intel® RSP SW Toolkit) is an application that demonstrates the use of the API to collect and process RFID tag data and acts as the IOT RSP Controller between one or more RSP's and an Inventory Management or Asset Tracking application. The RSP Controller Reference Design creates the credentials used by the Sensor NFC Application.

2.3 Android Device

Any device running Android 6 (Marshmallow) or greater and has NFC write capabilities (i.e. Google Nexus 5) will support this reference application.

3 Intel® RSP SW Toolkit - Sensor NFC App

The source code and more information regarding the Sensor NFC Application can be downloaded from the Intel® Open Source Portal https://01.org. The project is located in the "Developer Toolkits" section under "Intel® RSP SW Toolkit". Follow the "GIT REPO" link to obtain the software.

3.1 Building

Using Android Studio, create a new project from the source files above and "Build APK(s)" as shown in the figure below.

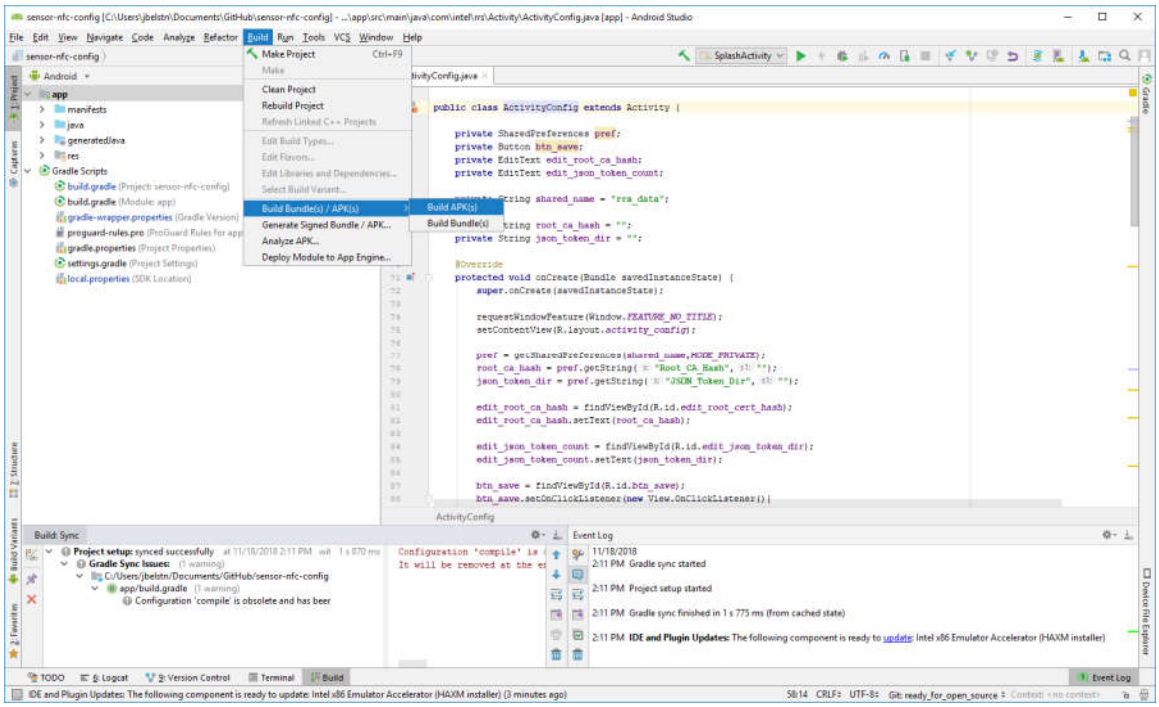

Figure 2: Android Studio IDE

3.2 Installing

There are several ways to "install" the .apk onto the Android device. One way is to use the Android Studio's "platform tools" from the command line as shown below.

```
> copy app-debug.apk C:\Program Files (x86)\Android\android-studio\sdk\platform-tools\
> cd C:\Program Files (x86)\Android\android-studio\sdk\platform-tools\
> adb install "app-debug.apk"
pkg: app-debug.apk
Success
>
```

3.3 Load Root Certificate

Create a Root Certificate as described in Section 4.4 of the RSP Software Toolkit User Guide. Then follow the steps to load the root certificate into the Android Application.

1. Connect the phone and PC with a USB cable
2. From the pulldown, tap the “Android System USB …” for more options.
3. At the popup, select “Transfer Files” as shown in the Figure below

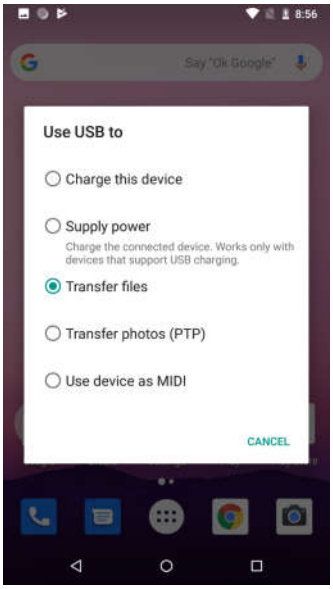

Figure 3 USB Options Popup Window

4. Copy the certificate and tokens to the Download folder as shown below.

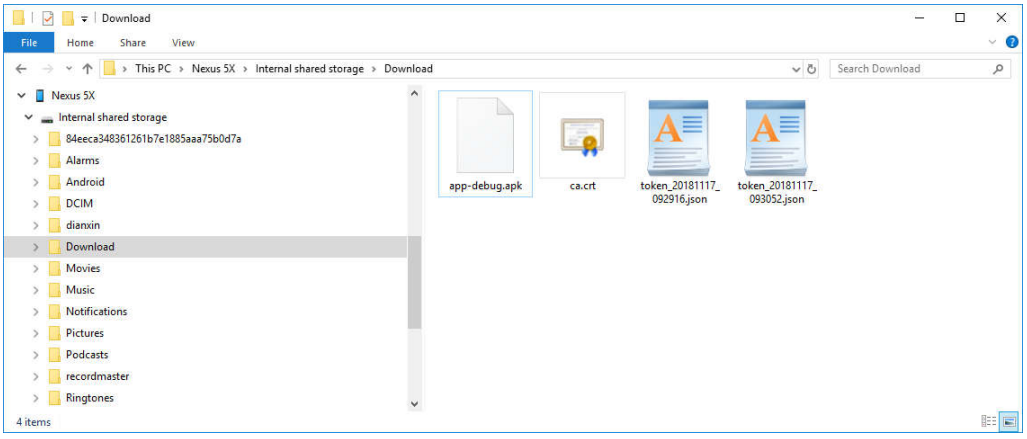

Figure 4 Internal Shared Storage (Root CA)

5. Under Device Settings, Grant Storage Permissions to RSP NFC application as shown in the Figure below

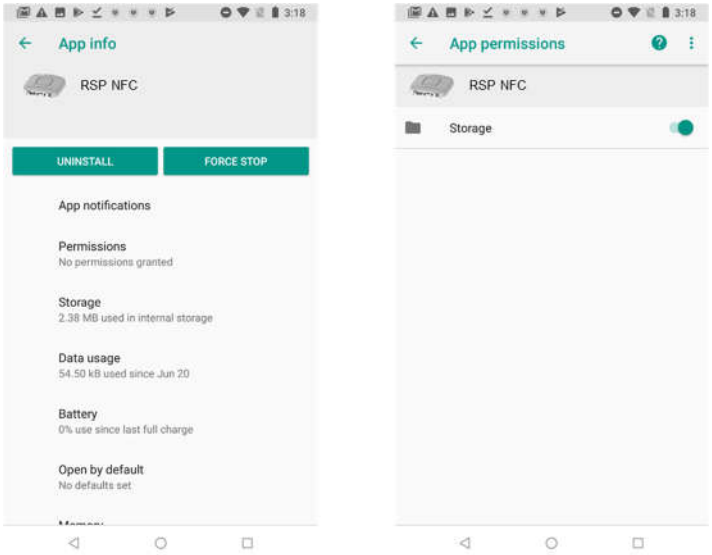

Figure 5 Application Permission Settings

3.4 Generate RSP Tokens

Using RSP RSP Controller Demo Reference Software Command Line Interface (CLI), set the token valid duration desired and generate one or more sensor tokens as shown below.

```
rfid-gw> tokens generate
-----------------------------------------------------------------------------------------------
new provision token path: /opt/rfid-gw/cache/generated_tokens/token_20181111_130018.json
{
  "username" : "gw_generated",
  "token" : "DBAF1C3F7C25EDC8C272FC2DA1A4CEFE562570A1E5F5460B8DAC4A98D1226149",
  "generatedTimestamp" : 1541966418186,
  "expirationTimestamp" : 1542052818186
}
-----------------------------------------------------------------------------------------------
rfid-gw>
```

Each token generated is a JSON file.

```
{
  "username" : "gw_generated",
  "token" : "DBAF1C3F7C25EDC8C272FC2DA1A4CEFE562570A1E5F5460B8DAC4A98D1226149",
  "generatedTimestamp" : 1541966418186,
  "expirationTimestamp" : 1542052818186
}
```

3.5 Load RSP Tokens

Using the USB cable, copy the RSP Tokens to the same directory as the Root Certificate.

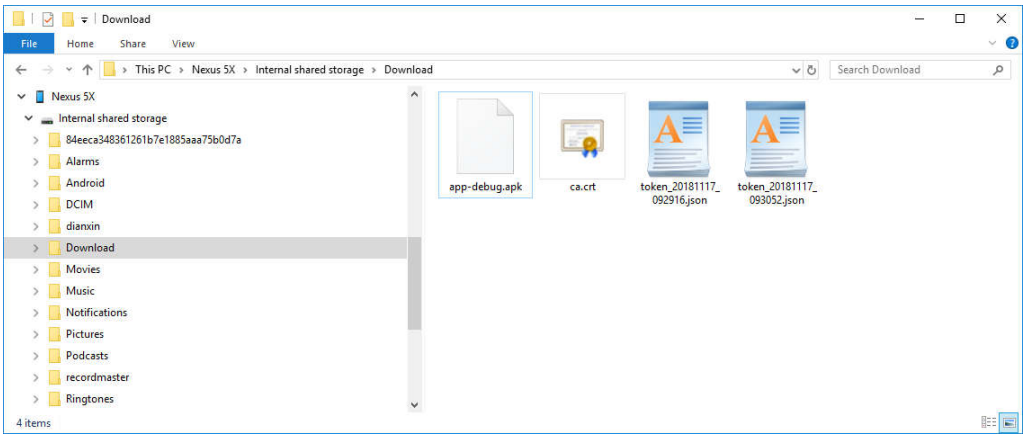

Figure 6 Internal Shared Storage (RSP Tokens)

3.6 Programming an RSP Token

Invoke the RSP NFC application by pressing the icon of the H1000.

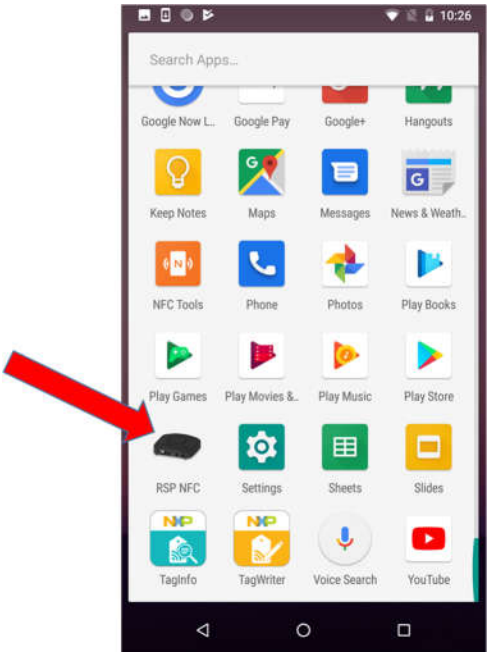

Figure 7 RSP NFC Application

3.6.1 Splash Screen

The first screen instructs the user to download the Root Certificate and Sensor Tokens per the User Guide and to read the User Guide for more details.

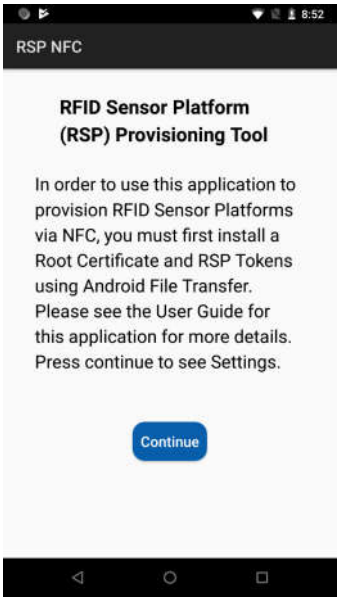

Figure 8 Screen 1

3.6.2 Token List Screen

After pressing the “Continue” button, the second screen will appear showing the tokens that were loaded. Tokens in **BLACK** are valid while tokens in **RED** are expired.

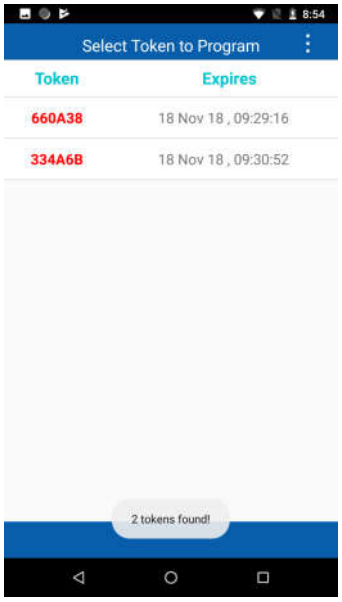

Figure 9 Screen 2

3.6.3 Token Program Screen

Select one of the tokens and press “Program”. The app will search for the NFC tag for approximately 10 seconds, with an option to “Cancel”.

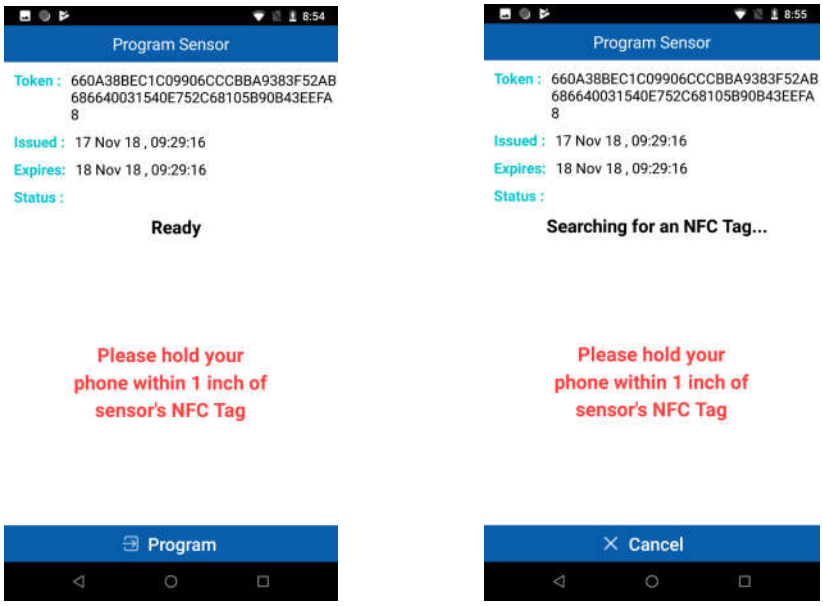

Figure 10 Screen 3

3.6.4 NFC Tag Locations

The Android device must be tapped within 1 – 2 inches of the NFC tag to successfully program. The Figure below shows the location of the NFC tag on each RSP.

Figure 11 NFC Tag Locations Identified

3.6.5 Program Success Screen

A popup will appear indicating the success or failure to program the NFC Tag. If no NFC tag was detected, a popup will indicate so after the 10 second timeout.

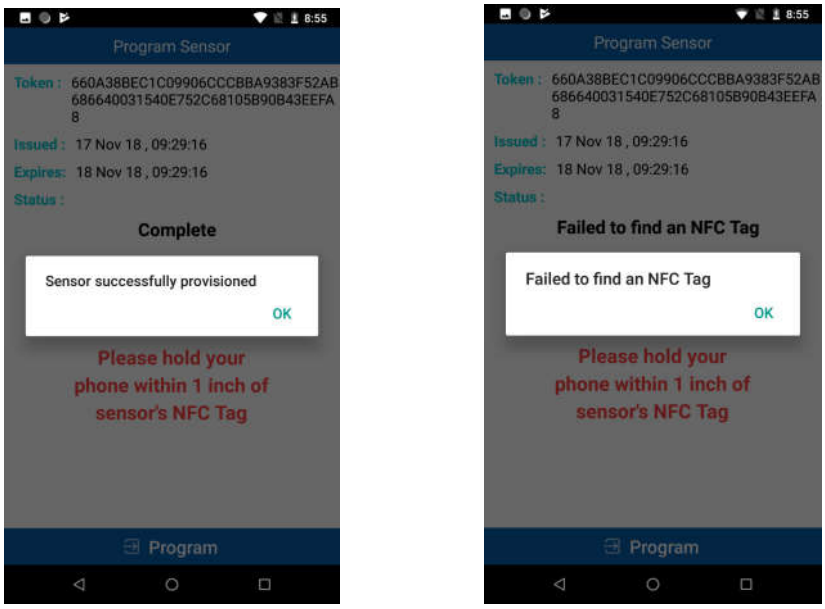

Figure 12 Screen 4