Release Notes

SUOTA Android Application

SW-B-011

Abstract

This document contains the release notes for Dialog Semiconductor's SUOTA Android Application, version 3.190.18.

Contents

Tables

1 Terms and Definitions

API	Application Programming Interface
BLE	Bluetooth Low Energy
CRC	Cyclic Redundancy Check
GA	General Access
GATT	Generic Attribute Profile
LA	Limited Access
MTU	Maximum Transmission Unit
PSM	Protocol Service Multiplexer
SDK	Software Development Kit
SUOTA	Software Update Over The Air
UI	User Interface

2 Release Data

Table 1: Information Table

Software	SUOTA Android Application
Device Type	Android device
Operating System	Android
Operating System Version	Android API level 19 and above
Software Release Date	21-Apr-2020
Software Version Number	3.190.18
Software Release Type (Note 1)	FULL (GA)

Note 1 Releases can be of the following types: FULL (GA), FULL (LA), RELEASE CANDIDATE, ENGINEERING, PATCH or BINARY

3 License

Licenses covering this SUOTA Android Application release are listed in the license.txt file in *SUOTA-Android-3.190.18-src.zip/suota_app_android*.

4 Related Documentation and References

[1] SUOTA-Android-3.190.18-src.zip, Source Release, Dialog Semiconductor

[2] SUOTA-3.190.18.apk, Android Executable, Dialog Semiconductor

[3] AN-B-003, Software Patching over the Air (SPotA), Revision 1.3, Application Note, Dialog Semiconductor

[4] AN-B-010, DA14580 using SUOTA, Revision 1.2, Application Note, Dialog Semiconductor

5 Release Description

5.1 Overview

This is a FULL (GA) release of SUOTA Android Application. It fixes an issue which causes upload failure.

5.2 New and Updated Features of 3.190.18

Table 2: 3.190.18 New Features

Feature Number	Description
1	Target SDK version set to 28

5.3 Fixes and Improvements since 3.190.16

Table 3: 3.190.18 Fixes and Improvements

Fix Number	Description
1	Fixed upload failure if image length is less than block size

6 Release History

6.1 3.190.16

Version 3.190.16 of SUOTA Android Application was released on 24-Oct-2019.

6.1.1 Overview

This was a FULL (GA) release of SUOTA Android Application. It included UI modifications.

6.1.2 New and Updated Features of 3.190.16

Table 4: 3.190.16 New Features

Feature Number	Description
1	Removed embedded fonts ● Use image instead of text for app name in splash screen
2	Modified GPIO Port 0 range (P0_0 - P0_11)
3	Target SDK version set to 26
4	Minor code cleanup and refactoring

6.2 3.190.14

Version 3.190.14 of SUOTA Android Application was released on 20-Dec-2017.

6.2.1 Overview

This was a FULL (GA) release of SUOTA Android Application. It added support for SUOTA 1.3 features. It included several fixes and improvements.

6.2.2 New and Updated Features of 3.190.14

Table 5: 3.190.14 New Features

Feature Number	Description
1	**Support for SUOTA 1.3 features** The app will try to read the new SUOTA characteristics (version, MTU, patch data size, L2CAP PSM). If available, MTU and patch data size values will be used to determine the file chunk size that will be sent on each write during upload. On Android 5 onwards, the app will also request to set the MTU to <patch data size + 3>, and will update the chunk size if the MTU is modified The file chunk size is calculated as MIN(patch data size, MTU - 3). The calculated chunk size is displayed in the log The L2CAP PSM value is not used
2	Changed app name from "Suota" to "SUOTA"
3	**Modified check for location services** The check is done before scanning and not after. The app reads the location services requirement setting from the Bluetooth system app and informs the user if the location services are required but not enabled. The scan is not started until the user enables the location services or bypasses the check
4	Added RuntimePermissionChecker class
5	Modified signal bar and scan UI layout
6	**Simplified enable SPOTA_SERV_STATUS notifications procedure** Explicitly select the required GATT objects. No database enumeration and logging
7	Modified service status notification processing: ● Modified variable/function names to make their intended usage clearer ● Removed SPOTA related processing from SUOTA manager ● SPOTAR_SRV_STARTED notification is considered an error in SUOTA mode
8	Disable multi-window mode because it can cause issues with the app
9	Read advertising data structure length and type as unsigned values
10	Fixed bonded devices show/hide operation. No scan is started. The list is updated in place
11	UI fixes and improvements: ● Fixed scan menu entry update state ● Fixed typo in disclaimer html ● Fixed support "mailto:" URL ● Restored behaviour that was removed with the UI modifications in previous version ● Fixed app theme in styles.xml ● Fixed hex strings format ● Info UI fixes

Feature Number	Description
	• Keep "connecting" dialog if MTU callback is called before service discovery • Prevent fragment change on menu disconnect click • Prevent second click on scan device list • Added back navigation button on disclaimer screen from scan UI
12	Code cleanup and refactoring: • Splash UI code cleanup • Info UI code cleanup • Removed unused HoloCircularProgressBar library • Removed DeviceConnectTask • Removed old about dialog items • Replaced hardcoded strings with resources

6.2.3 Fixes and Improvements since 3.190.12

Table 6: 3.190.14 Fixes and Improvements

Fix Number	Description
1	**Miscalculation of chunk sizes for the last two blocks** In some cases, a miscalculation may occur for the chunk sizes of the last two blocks ([last chunk size of previous to last block] + [last block size] < [normal chunk size]). When that happens, the app sends the last block data in the last chunk of the previous block and then sends an empty packet for the last block. SUOTA in 580 detects this and responds with the appropriate error (code=5). SUOTA in 680 accepts both the excess data and the empty packet, so the upload succeeds. So the issue did not occur at all with 680, and also with 580 when using default block/chunk size During the investigation of this issue, another miscalculation was found. If the upload data size (firmware size plus one byte CRC) was a multiple of the block size, the last block was not initialized and the app crashed when trying to send it. Another related issue was that the app always tried to set the patch length for the last block, even when it was not needed, which prevented the upload procedure from finishing properly
2	Fixed crash in scan start/stop if bluetooth is disabled
3	**Initialize SUOTA step to an invalid value** The SUOTA step was initialized to zero, which is a valid step. Under certain circumstances, the system informed the app that the MTU changed by calling the relevant callback just after the connection was established. The step processing logic tried to start the upload procedure, which led to a crash, since the state of the app was not yet properly initialized. This issue was observed with 585 RCU
4	**Fixed crash on error during DeviceActivity destruction** If an error was detected while the DeviceActivity was being destroyed, the app would try to show the error dialog and crash because the activity was no longer running
5	**Store connected BluetoothDevice as local variable in DeviceActivity** This fixes a crash where the global device variable was used after it was reset. This could happen if a connection in progress was cancelled
6	**Workaround for Xiaomi MTU issue** A BLE stack related issue was observed in Xiaomi devices, that could cause a segmentation fault inside the stack, which resulted in bluetooth restart and SUOTA upload failure. The BLE stack informs the app with a wrong MTU value, so the app starts the upload with bigger chunks that are supported by the stack. This probably causes a buffer overflow inside the stack, which leads to a crash (SIGSEGV). The binaries where the crash occurs are a custom implementation. They are not part of the default bluedroid

Fix Number	Description
	The events that lead to the issue occur in the following way: ● The app reads patch data size from the peripheral and tries to set the MTU accordingly ● Although the app requests a bigger MTU, the stack sends an MTU request with 23 ● The peripheral responds with its own MTU value, which is bigger than the default. This is new behaviour in latest SDK versions, older devices respond with the same value ● The stack erroneously informs the app that the MTU changed to the value set by the peripheral As a workaround, the app reads the MTU characteristic again, after sending the MTU request, in order to have the correct MTU

6.3 3.190.12

Version 3.190.12 of SUOTA Android Application was released on 03-Nov-2016.

6.3.1 Overview

This was a FULL (GA) release of SUOTA Android Application. The user interface was redesigned according to Dialog Semiconductor's brand guidelines.

6.3.2 New and Updated Features of 3.190.12

Table 7: 3.190.12 New Features

Feature Number	Description
1	Redesign the user interface according to Dialog Semiconductor's brand guidelines: ● Added splash screen
2	Side menu
3	Target SDK version set to 23 (Android 6): ● Added ACCESS_COARSE_LOCATION permission (required on Android 6 for BLE scans) ● Check and request permissions at runtime on Android 6. On previous versions all required permissions were granted during installation
4	**Check if location services are enabled** From Android 6 onwards, and depending on the device configuration, the location services may need to be enabled in order to perform BLE scans. If the BLE scan does not return any results and the location services are disabled, the app will display a dialog to notify the user about this behavior
5	Use the new BLE scan API when the device API level is greater or equal to 21 (Android 5.0)
6	Update connection parameters to lower connection interval for upload when the device API level is greater or equal to 21 (Android 5.0)
7	Prevent device sleep during upload procedure
8	If no firmware files are found, display a message to inform the user about the location where firmware files should be added
9	Upload procedure UI improvements: ● Display upload data size ● Display firmware CRC ● Calculate and display upload duration
10	Scan duration set to 10 seconds
11	Minor UI modifications and code cleanup
12	Gradle and Android Studio update

6.3.3 Fixes and Improvements since 3.190.10

Table 8: 3.190.12 Fixes and Improvements

Fix/Improvement Number	Description
1	**Skip SuotaManager step processing on error** The SuotaManager step processing logic continued after an error had occurred. The most common case was trying to send the next block after a same image error. This did not cause any known bugs or unexpected behavior

Fix/Improvement Number	Description
2	**Fixed use of broadcast intents for app processing logic** The app used broadcast intents for internal communication. Its processing logic depends on these broadcasts. The problem with that approach is that these broadcasts may be sent by any application and be received by the app. The app did not prevent that (it is not certain that this is possible in all cases). As a result, if more than one version of SUOTA were running at the same time, it was possible that one version would receive broadcasts sent by another. This could lead to unexpected behavior or a crash. These broadcasts were intended for internal use only, so the LocalBroadcastManager API was used to replace the global broadcasts with local ones

6.4 3.190.10

Version 3.190.10 of SUOTA Android Application was released on 22-Apr-2016.

6.4.1 Overview

This was a FULL (GA) release of SUOTA Android Application. It included several fixes and improvements.

6.4.2 New and Updated Features of 3.190.10

Table 9: 3.190.10 New Features

Feature Number	Description
1	UI improvements
2	Improved support for user configuration saving
3	Check for BLE communication errors
4	Check for SUOTA support after connection has been established
5	Menu option to show bonded devices during scan
6	“About” dialog on scanning activity
7	**Progress text view for firmware upload procedure** Removed per packet log messages which slowed down the procedure on some devices
8	**Support for local service cache refresh** The GATT service “Service Changed” characteristic is not supported very well by the Android BLE stack. In order to make sure that the local service database will be updated with possible modifications on the remote device, we use the hidden API method BluetoothGatt#refresh(), which deletes the local cache causing a full service discovery
9	**Improved local service cache refresh procedure** Due to bluedroid behavior, the cache refresh operation may fail, and, if a service discovery is already in progress, the whole procedure may stop. The cache refresh procedure was changed to mitigate these issues: ● Added refresh method in BluetoothManager ● Start service discovery on connection and initiate the refresh procedure after the services are retrieved. This is the safest place to do that. An actual service discovery will always be performed, even if one was just finished. If the services were retrieved from the cache, a new cache will be created and returned ● Call refresh on device disconnection after a successful update, in order to ensure that a service discovery will be performed on reconnection and any changes in the remote service database will be retrieved

6.4.3 Fixes and Improvements since 3.190.8

Table 10: 3.190.10 Fixes and Improvements

Fix/Improvement Number	Description
1	**Removed redundant call to connect method** Calling BluetoothGatt#connect() after BluetoothDevice#connectGatt() may create problems in some Android versions (for example, 5.0.1). An error occurs that results to a disconnection notification from the BLE stack (the connection may still be active or established later). The DeviceActivity is finished due to disconnection
2	Fixed crash while scanning if advertising data are malformed

Fix/Improvement Number	Description
	The app did not check for malformed advertising data (for example, wrong length in AD structure), so it crashed during scanning if any device sent incorrect advertising data
3	**Fixed setSpotaGpioMap failure bug** When the SPOTAR_IMG_STARTED notification was received, the setSpotaGpioMap method was called immediately (step 3). If the SPOTAR_MEM_DEV write response (step 2) had not been received yet, setSpotaGpioMap would silently fail and the upload procedure would hang
4	**Fixed back button behavior after peripheral reboot** Pressing back after rebooting the peripheral device navigated to the device info screen but the peripheral was disconnected. So the user could try to start a new upload which would fail. The fix makes the back button behavior same as pressing the close button (return to the device scan screen)

6.4.4 Comments

This is the first official release of the SUOTA Android Application by Dialog Semiconductor. Previous releases (1.0 to 1.3) were available on Google Play from Unc Inc. These versions are now named using the versioning rules described in Appendix A.

6.5 3.190.8

Version 3.190.8 of SUOTA Android Application was released on 23-May-2015.

6.5.1 Overview

This was a FULL (GA) release of SUOTA Android Application.

6.5.2 New and Updated Features of 3.190.8

Table 11: 3.190.8 New Features

Feature Number	Description
1	Version 1.3 from Unc Inc

6.6 3.190.6

Version 3.190.6 of SUOTA Android Application was released on 10-Apr-2015.

6.6.1 Overview

This was a FULL (GA) release of SUOTA Android Application.

6.6.2 New and Updated Features of 3.190.6

Table 12: 3.190.6 New Features

Feature Number	Description
1	Version 1.2 from Unc Inc

6.7 3.190.4

Version 3.190.4 of SUOTA Android Application was released on 13-Jan-2015.

6.7.1 Overview

This was a FULL (GA) release of SUOTA Android Application.

6.7.2 New and Updated Features of 3.190.4

Table 13: 3.190.4 New Features

Feature Number	Description
1	Version 1.1 from Unc Inc

6.7.3 Fixes and Improvements since 3.190.2

Table 14: 3.190.4 Fixes and Improvements

Fix/Improvement Number	Description
1	**Serialized characteristic writes when sending data** The application does not have a queue for GATT operations. During the firmware upload procedure, the same characteristic was written multiple times in a loop. The BLE stack dropped the additional operations if the previous had not finished yet

6.8 3.190.2

Version 3.190.2 of SUOTA Android Application was released on 19-Dec-2014.

6.8.1 Overview

This was a FULL (GA) release of SUOTA Android Application.

6.8.2 New and Updated Features of 3.190.2

Table 15: 3.190.2 New Features

Feature Number	Description
1	Version 1.0 from Unc Inc
2	Initial release

Appendix A Software Versioning Rules

This describes the software version numbers and does not apply to documentation version numbers (as found in the footer of this document).

Each software version number string consists of four numbers: MAJOR. BRANCH. MINOR. and BUILD.

#MAJOR: It is increased (by one only) if the project undergoes a major modification, for example major ROM changes. It usually changes only when the project sources undergo major restructuring affecting most of the repository. It is initialized at 1.

#BRANCH: Used in the case of concurrent projects that for special reasons need to be spun off the major repository. It corresponds to different versions of the repository code that have to be supported concurrently. In this case each branch number corresponds to a different GIT branch. The basic project has BRANCH id 0.

#MINOR: Odd numbers indicate Engineering (or Patch or Binary) versions, even numbers indicate Full release versions or Release Candidates of Full versions. Each Full release increases this number by one. After the Full release, the number is increased by one again. Therefore, Project releases correspond to release numbers like 2.0.1.xxx, 2.0.2.xxx. etc. The #MINOR number is initialized at 1.

#BUILD: The # BUILD number increases by one at every repository update and thus indicates the total number of changes since repository initialization. The BUILD number is initialized at 1.

Document Revision History

This section summarizes the changes made to this document and not to the Software that this document describes.

Revision	Date	Description
1.1	21-Apr-2020	SUOTA version 3.190.18
1.0	24-Oct-2019	Initial version.

Document Status Definitions

Status	Definition
DRAFT	The content of this document is under review and subject to formal approval, which may result in modifications or additions.
APPROVED or unmarked	The content of this document has been approved for publication.

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